European Glaucoma Society

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16th EGS Congress

DUBLIN | 1–4 JUNE

2024

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POSTER SESSION 1

515 - P1.001

PREVALENCE AND MANAGEMENT OF PLATEAU IRIS AMONG PATIENTS UNDERGOING PERIPHERAL IRIDOTOMY

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Purpose: To determine the prevalence of plateau iris among patients with angle closure undergoing peripheral iridotomy (PI) at the Italian Hospital of Buenos Aires,Argentina.

Methods: A retrospective observational study was carried out on peripheral iridotomies performed at the Italian Hospital of Buenos Aires from January 2019 to December 2023. Patients were categorized by cause of angle closure: pupillary block, plateau iris, pseudoplateau, and other types. Glaucoma family history and previous acute angle closure glaucoma episodes were also evaluated. Ultrasound biomicroscopy (UBM) and gonioscopy using Goldmann lens were performed in all patients. Plateau iris was defined as the presence of the following UBM criteria in at least two quadrants: anteriorly directed ciliary body, absent ciliary sulcus, iris angulation and iridotrabecular contact.

Results: Involving 135 patients and 165 eyes (mean age: 64.98), predominantly women (80%), the most common cause of angle closure was pupillary block (84.21%), followed by plateau iris (9.77%), pseudoplateau (4.44%), and other types (1.81%). None of the plateau iris group patients had reported previous episodes of acute angle closure glaucoma, and 3 of them (20%) had glaucoma family history. Angle opening after laser treatment with PI was confirmed in all patients.

Conclusion: Under our studied population, plateau iris was the second most common cause of angle closure. PI was successful in all patients, as there were no reports of plateau iris syndrome. We consider early diagnosis of this entity to be essential, as well as differentiating plateau iris syndrome to prevent acute angle closure glaucoma and the development of synechiae leading to cronic glaucoma.

423 - P1.002

SILICONE OIL EXPOSURE IN VITREORETINAL SURGERY IS A RISK FACTOR FOR THE DEVELOPMENT OF POSTOPERATIVE GLAUCOMA-RELATED ADVERSE EVENTS IN CHILDREN

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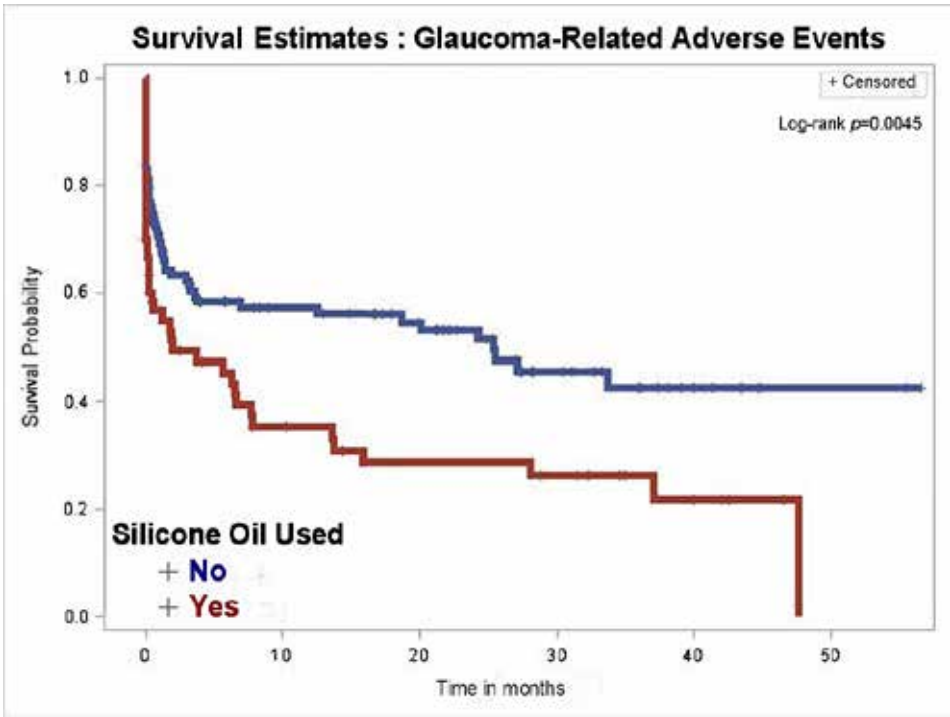
Purpose: To determine whether silicone oil exposure (SOE) during pediatric vitreoretinal (VR) surgery increased the risk of glaucoma-related adverse events (GRAE).

Methods: We reviewed the medical records of consecutive patients (aged 0-18 years) who underwent VR surgery between 2019 and 2021. Eyes with pre-existing glaucoma were excluded. Intraoperative data were collected on whether silicone oil was used. Postoperative data were collected on whether the patient developed GRAE, defined as: elevated intraocular pressure (IOP) > 21mmHg, or received IOP-lowering medications, or underwent IOP-lowering surgery, or diagnosed with glaucoma of childhood. If both eyes of a patient were eligible, only the first-operated eye was included. Independent samples t-tests were used to compare continuous data, chi-square tests were used to compare binary and categorical data, and log-rank tests were used to compare the survival distributions of GRAE between patients exposed vs not exposed to silicone oil during vitreoretinal surgery.

Results: A total of 186 pediatric patients were included with a median age of 8 years (range: 0.08-17 years; interquartile range: 3-12 years) and a median followup of 27 months (range: 0.03-80 months). Sixty-four eyes (34.4%) had silicone oil exposure (SOE). Eyes with SOE (compared to non-SOE) were older (mean 9.8 ± 5.3 vs 7.2 ± 4.8 years, respectively; p = 0.0008) and were more likely to have surgery for retinal detachment vs other indications (79.7% vs 13.9%, respectively; p < 0.0001); there were no differences between the two groups in gender, laterality, or lens status. Overall, 102 (54.8%) eyes developed GRAE, with higher proportion in the SOE group (70.2% vs 46.8%, p = 0.0021). The survival time to the development of GRAE was 2.0 months (95% CI: 0.3, 7.7) for SOE eyes vs 25.3 months (95% CI: 3.6, N/A; p = 0.0045) for non-SOE eyes (Figure).



Conclusion: In our pediatric surgical cohort, exposure to silicone oil during vitreoretinal surgery was a significant risk factor for the development of GRAE.

486 - P1.003

EVALUATION OF OPTIC NERVE HEAD STRUCTURES IN SUPERIOR SEGMENTAL OPTIC NERVE HYPOPLASIA AND COEXISTENCE GLAUCOMATOUS OPTIC NEURUOPATHY WITH SEGMENTAL OPTIC NERVE HYPOPLASIA

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Purpose: To investigate the overhanging of Retinal pigment epithelium (RPE)/Bruch membrane (BM) complex and retinal nerve fiber layer thickness (RNFLT) in superior segmental optic nerve hypoplasia (SSOH) and coexisting glaucomatous optic neuropathy (GON) with SSOH.

Methods: We retrospectively examined 17 eyes with SSOH and 12 with GON with SSOH. Using swept-source optical coherence tomography (SS-OCT) (Triton, Topcon), we measured the circumpapillary RNFLT (cpRNFLT) and RPE/BM complex extension over the laminar cribrosa overall in the quadrants and the 12 sectors. We compared the eyes with SSOH and those with GON with SSOH.

Results: In eyes with SSOH, the patient age was significantly ($p < 0.01$) younger and the baseline intraocular pressure was significantly ($p < 0.01$) lower. There were no significant differences in the cpRNFL overall, while the cpRNFL in the superior quadrant was significantly thinner (53.1 ± 19.0 vs 81.6 ± 31.0 μm; $p = 0.01$) and the cpRNFLT in the inferior quadrant was thicker (109.2 ± 21.7 vs 82.4 ± 25.5 μm; $p < 0.01$) in eyes with SSOH than in the eyes with GON with SSOH. Compared to SSOH, in those with GON with SSOH the RPE/BM complex extended for a longer distance in the inferior quadrant (119.3 ± 50.7 vs 81.2 ± 35.9 μm; $p = 0.04$), while no significant differences were seen in the nasal (171.7 ± 70.4 vs 146.6 ± 50.9 μm; $p = 0.30$) and superior quadrants (139.6 ± 53.4 vs 123.5 ± 44.1 μm; $p = 0.40$).

Conclusion: The RPE/BM complex extended over the laminar cribrosa in the nasal, superior, and inferior quadrants in eyes with SSOH. The overhanging RPE/BM complex in the inferior quadrant was longer and cpRNFL in the inferior quadrant was thinner in the eyes with GON with SSOH.

490 - P1.004

DYNAMIC CHANGES IN LAMINA CRIBROSA THREE-DIMENSIONAL MICROARCHITECTURE AFTER GLAUCOMA SURGERY USING OPTICAL COHERENCE TOMOGRAPHY

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Purpose: To investigate the dynamic changes in lamina cribrosa (LC) three-dimensional (3D) microarchitecture following surgical intraocular pressure (IOP) reduction, based on 3D tomographic reconstructions.

Methods: In this study, spectral-domain optical coherence tomography (SD-OCT, Spectralis, Heidelberg engineering, Heidelberg, Germany) in EDI (enhanced depth imaging) mode was performed in glaucoma patients before and 1 month after glaucoma filtering surgery. Using 3D OCT reconstructions, the paths of the pores in the LC were traced using semi-automatic segmentation software. Changes in several quantitative macro- and microarchitectural parameters were analyzed before and after surgery: LC depth and thickness (determined on a median vertical section of the optic nerve head) and pores' length (µm), tortuosity (ratio of the length of the pore path to the length directly connecting the most anterior to the most posterior point of the path) and verticality (length directly connecting the most anterior to the most posterior point of the path related to the length separating the projection of the ends of the pore path on the vertical axis).

Results: Ten patients underwent SD-OCT imaging before and after surgery. The mean IOP decreased from 23.6 ± 9.03 to 11.3 ± 3.68 mmHg at one month postsurgery ($p < 0.001$). The mean LC depth was reduced from 571.8 ± 125.6 to 419.9 ± 96.0 µm ($p = 0.006$). LC thickness increased significantly: 228.8 ± 29.27 µm preoperatively and 284.4 ± 83.61 µm postoperatively ($p = 0.016$). In lamina 3D microarchitecture, pore length was significantly greater postoperatively: 100.3 ± 18.8 µm preoperatively and 128.1 ± 30.4 µm postoperatively ($p = 0.01$). This lengthening was positively corelated with the degree of LC anterior displacement ($r = -0.675$; $p = 0.032$) and thickening ($r = 0.748$; $p = 0.013$). No significant difference was observed in tortuosity or verticality ($p = 0.912$ and $p = 0.159$ respectively).

Conclusion: We found a significant increase in LC pore length after glaucoma surgery using SD-OCT of the optic nerve head. This lengthening was associated with the degree of LC anterior displacement and thickening. Further studies are necessary to better characterize the dynamics of laminar microarchitecture and its influence on the prognosis of glaucomatous neuropathy.

717 - P1.005

THE INTEGRATED STRESS RESPONSE - A KEY DRIVER OF GLAUCOMATOUS OPTIC DISC CUPPING

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Purpose: To identify key pathways in the pathogenesis of optic disc cupping in glaucoma.

Methods: Single cell RNA sequencing was performed on lamina cribrosa (LC) cells from normal and glaucoma donors. Differential gene expression analysis was performed using Seurat. We identified hallmark pathways using GSEA. We performed motif and track enrichment analysis using icis – Target. We confirmed our findings using PCR, Western blot (WB), immunohistochemistry and immunofluorescence. We performed treatment of LC cells using the ISR inhibitor ISRIB.

Results: Hallmark pathways identified included hypoxia, the UPR and TGFβ signalling. Possible transcription factors identified by icis Target included SRF, GCN4, AP-1, FOS and JUN, all of which have a NES >3. PCR showed an increase in glaucomatous LC cells of key ISR genes ATF4, CHOP, GRP78, GRP94 and eIF2α.This increase was confirmed on western blot. Immunofluorescence showed increased staining of ATF4 and eIF2α in glaucomatous LC cells (Fig. 1). Immunohistochemistry demonstrated increased levels of ATF4, CHOP, GRP78 and αSMA in the prelaminar, laminar and retrolaminar optic nerve head (Fig. 2). Treatment with ISRIB decreased levels of ATF4, CHOP, GRP78, GRP94, eIF2α, COL1A1, Fibronectin and αSMA on PCR and WB (Fig. 3).

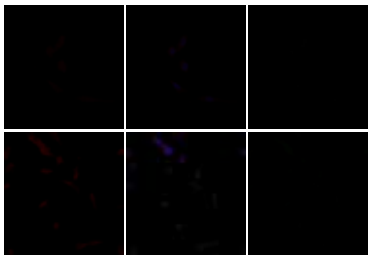

Figure 1a. ATF4 staining in normal (upper) and glaucoma (lower) LC cells

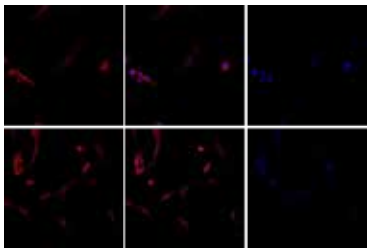

Figure 1b. eIF2α staining in normal (upper) and glaucoma (lower) LC cells.

Figure 2. Immunohistochemistry of ATF4 expression in ONH of glaucoma (upper) and normal (lower) donors.

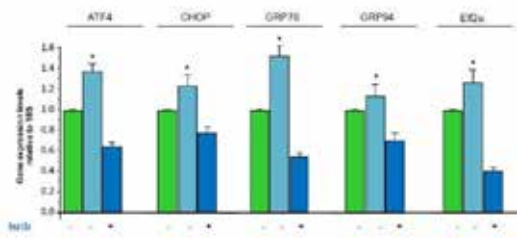

Figure 3.a. Expression of ISR genes of normal (green), glaucoma (light blue) and glaucoma treated (dark blue) LC cells.

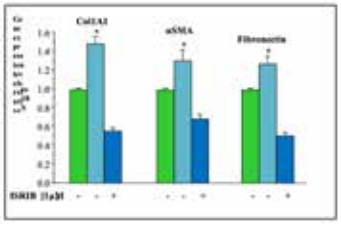

Figure 3.b. Expression of ECM genes of normal (green), glaucoma (light blue) and glaucoma treated (dark blue) LC cells.

Conclusion: We demonstrated through novel and conventional techniques that the ISR is key in LC cell pathology in glaucoma, and further showed that treatment with ISRIB decreases both ISR and extracellular matrix (ECM). gene expression and may represent a novel glaucoma treatment.

825 - P1.006

REGULATORY ROLES OF RNA MODIFICATIONS IN GLAUCOMA PATHOPHYSIOLOGY

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Purpose: Post-transcriptional RNA modifications, referred to as 'epitranscriptome', are found in nearly all cellular RNA species. These modifications have key roles in RNA quality control, including localization, stablility, and translation, although the exact role, especially in wound healing process after glaucoma filtration surgery (GFS), has yet to be discussed. The purpose of this study is to explore the role of RNA modification in the wound healing process after GFS using in vitro model.

Methods: Sample preparation for measurement of comprehensive RNA modifications using mass spec analysis was performed as described previously. In vitro experimental wound healing model after GFS was performed as described previously.

Results: Mitochondrial tRNA, but not cytosolic tRNA, is extensively impaired in in vitro model of wound healing after GFS both in quality of tRNA themselves and quality of tRNA modifications. In this model, TGF-β2 accelerates OXPHOS defects and rewires cellular metabolism. Finally, we found a compound which inhibits TGF-β2-induced fibrosis by improving both mitochondrial modifications and metabolic remodeling, at least partially.

Conclusion: Our findings illustrated unexpected properties of RNA modifications upon wound healing after GFS. RNA modifications may have therapeutic potential in glaucoma treatment, and therefore should be the subject of future studies.

838 - P1.007

VALIDATION OF THE APPLICATION OF MULTIPLEX ELISA KITS FOR COMPLEMENT FACTOR DETECTION IN GLAUCOMA RESEARCH

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Purpose: Our research aims to study the relation between activation of the complement system and progression of glaucoma. This pre-experiment was designed to explore the methods of simultaneously detecting multiple complement factors.

Methods: Five samples of aqueous humor (AH) and EDTA plasma each (including 4 paired samples) were assayed using MILLIPLEX® multiplex ELISA panels. For each sample, we simultaneously tested the concentrations of 15 analytes, including MBL, Complement component C1q, C2, C3, C3b/iC3b, C4, C4b, C5, C5a, C9, and Complement Factor B, D (Adipsin), P (Properdin), H, I. Data acquisition and processing were conducted by MAGPIX® instrument with xPONENT® 4.2 software, and data analysis was performed by SPSS® Statistics 28.

Results: All the 15 analytes in the included samples were detectable. Moreover, the R2 value of all standard curves were greater than 0.97, and measured concentrations of Quality Control (QC) samples were all within the expected range. Intra-assay variability of the AH and plasma samples were less than 9% and 5% respectively. By comparing the paired AH and plasma samples, analyte levels were found significantly lower in AH than in plasma samples. Additionally, the overall concentration patterns of these complement factors exhibited distinctions between AH and plasma with significantly higher ratios of both C4b/C4 and C5a/C5 in AH ($p < 0.05$).

Conclusion: This pre-experiment verified the usability of multiplex ELISA assay in studying the local (AH) and systemic (plasma) pathway-specific activation of the complement system in ocular diseases such as glaucoma. It concurrently suggested distinct immune profiles and complement system activities in intraocular fluid and peripheral blood.

874 - P1.008

THREE DIMENSIONAL BIOPRINTED MODEL OF THE HUMAN LAMINA CRIBROSA

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Purpose: The LC is a key site of damage in glaucoma, and undergoes extensive biomechanical and histological remodelling. In-vivo imaging remains inferior to histological analysis, while animal models are limited in their lack of applicability to humans. Current research has relied on the use of 2D models. Herein, we aim to address these limitations by bioprinting a 3D biomechanical model of the human LC, allowing us to; study the biomechanical changes in the LC in response to strains levels similar to elevated intraocular pressure; provide insights into the pathogenesis of glaucoma; identify potential biomarkers for early detection and novel interventions for glaucoma treatment.

Methods: We will construct a custom bioreactor that relies on cyclic positive air pressure to deform and strain optic nerve head tissue constructs that are grown on a two-layer silastic membrane similar to a FLEXCELL well plate. This approach allows uniform cyclic air pressure to apply higher levels of cyclic strain to a LC region of the construct and deform that region posteriorly. Similarly, surrounding peripapillary sclera of the construct will be supported by the two layer membrane, preventing some posterior deformation, but still allowing for in-plane tensile strain to be applied to the scleral region. This system will allow differential cyclic strains and deformations to be applied to both the scleral and LC regions of the construct that best mimic the in vivo condition.

Results: The macro-architecture of the model is first defined by 3D delineation of anatomic tissue surfaces within a high-resolution, histologic, fluorescent 3D reconstruction of the posterior eye and ONH obtained from three human donors of European descent. The stack of segmented LC binary images were used to construct an isosurface image volume of the LC microstructure. The images were spaced at 1.5 µm between images and pixels measuring 1.5 µm x 1.5 µm. The BIONOVA X was used to print multiple LC slices using a polyethylene glycol hydrogel to multi well plates, with which a 10 µm feature resolution was achieved.

Conclusion: Our mechanical and physiologically relevant 3D substrate of the human LC can be used by other researchers in glaucoma with high fidelity to in-vivo conditions.

335 - P1.009

STRUCTURAL FEATURES OF OPTIC NERVE HEAD IN MODERATE GLAUCOMA WITH SINGLE-HEMISPHERIC AND BI-HEMISPHERIC VISUAL FIELD DEFECTS

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Purpose: To compare the structural features of optic nerve head (ONH) in moderate glaucoma with single-hemispheric and bi-hemispheric visual field (VF) defects.

Methods: Open-angle glaucoma (OAG) patients with moderate glaucoma of VF mean deviation (MD) between -6 and -12 dB were consecutively enrolled based on a retrospective review of their medical records. Eyes were classified into two groups based the patterns of VF defect; those with single-hemispheric VF defects and those with bi-hemispheric VF defects. Structural features, such as bruch's membrane opening (BMO) area, lamina cribrosa (LC) thickness, temporal β-zone parapapillary atrophy (βPPA) with and without bruch's membrane (βPPA+BM, βPPA-BM), and peripapillary retinal nerve fiber layer (RNFL) thickness were analyzed using spectral-domain optical coherence tomography (SD-OCT; Heidelberg Spectralis OCT). Clinical and structural characteristics were compared between the two groups and logistic regression analysis was performed to identify risk factors associated with bi-hemispheric VF defects.

Results: A total of 137 eyes of 137 patients were included in the analysis. 80 eyes were classified into the single-hemispheric VF defects group and 57 eyes were classified into the bi-hemispheric group. Among the eyes with single-hemispheric defects, 17 eyes had an inferior VF defects and 63 eyes had superior VF defects. The mean age of the 137 eyes was 62.18 ± 10.77 years, and had a mean MD of -9.26 ± 2.15 dB. The bi-hemispheric group had longer axial length ($p = 0.038$), thinner central corneal thickness ($p = 0.003$). thinner LC ($p < 0.001$), and larger temporal βPPA+BM ($p = 0.002$) compared with the single-hemispheric group. Multivariate logistic regression analysis revealed that all of these parameters were independently associated with bi-hemispheric VF defects in moderately advanced glaucoma.

Conclusion: In Korean OAG patients with moderate VF defects, those with bi-hemispheric VF defects have structurally more susceptible optic disc, such as longer axial length, thinner central corneal thickness, thinner LC, and larger βPPA+BM compared to those with single-hemispheric VD defects. Our findings suggest that glaucoma patients with structurally vulnerable ONH are prone to suffer from concurrent bi-hemispheric VF damage, and further highlight the importance of ONH evaluation in monitoring glaucoma patients.

375 - P1.010

ASSOCIATION BETWEEN THE SHAPE OF THE CIRCLE OF ZINN-HALLER AND THE PRESENCE OF GLAUCOMA IN HIGHLY MYOPIC EYES

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Purpose: To investigate the association between the Circle of Zinn and Haller (CZH) and the presence of glaucoma using swept-source optical coherence tomography angiography (SS-OCTA) images of the optic nerve of patients with high myopia (HM).

Methods: This study included 227 eyes of 114 patients with HM, comprising 134 and 93 eyes with and without glaucoma, respectively. The characteristics of CZH, including visualisation, pattern, and location, were assessed using SS-OCTA. The factors affecting the presence of glaucoma and the correlations between the CZH distance and axial length (AXL) were identified using logistic regression analysis and Pearson correlation analysis, respectively.

Results: CZH was detected more frequently in HM patients with glaucoma (71.6%) than in patients without glaucoma (51.6%) ($p < 0.002$). However, the visualisation of CZH was not related to the presence of glaucoma in multivariate regression analysis (odds ratio [OR], 0.688; 95% confidence interval [CI], 0.328–1.444; $p = 0.322$). Moreover, the patterns of CZH were not associated with the presence of glaucoma (all $p > 0.05$). AXL showed a significant correlation with CZH distance in all patients ($r = 0.399$; $p < 0.001$).

Conclusion: CZH was more commonly detected in HM patients with glaucoma. However, no clear associations of glaucoma with the visualisation, pattern, or location of CZH were observed in the present study. The correlation between AXL and CZH distance in eyes with HM warrants further investigation. These results may offer insights into the pathogenesis of glaucoma in eyes with HM as OCTA technology advances.

450 - P1.011

LOW DIASTOLIC SYSTEMIC BLOOD PRESSURE AT NIGHT TIME IS ASSOCIATED WITH CENTRAL VISUAL FIELD DEFECT IN EARLY AND MODERATE NTG

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Purpose: To investigate the association between systemic blood pressure-related hemodynamic indices and central-most visual field defects (CMVFDs) in patients with early and moderate normal tension glaucoma (NTG).

Methods: This cross-sectional study examined 30 eyes of 30 early and moderate NTG patients with CMVFDs of 245 consecutive patients who underwent 24-hour BP monitoring and were diagnosed with NTG. Hemodynamic variables and ocular examination results of the subjects were compared with early and moderate NTG patient without CMVFD. CMVFD was defined as a glaucomatous defect with at least 1 abnormal point at $p < 1\%$ within the central 5 degrees on two consecutive 24-2 VF tests.

Results: There were no significant differences between the patients in baseline demographics, except for body weight ($p = .009$). Intraocular pressure, number of glaucoma medications, axial length of eye, spherical equivalent, central corneal thickness and mean deviation in visual field test were not significantly different. However, cup-to-disc ratio, pattern standard deviation in visual field test, and inferotemporal segmental thickness of retinal nerve fiber thickness in OCT showed different values. In univariate logistic regression analysis, 24-hour and night average diastolic blood pressure, night systolic blood pressure in the 24-hour BP monitoring, and body weight were significantly associated with CMVFDs. In multivariate logistic regression analysis, average diastolic blood pressure at night in the 24-hour BP monitoring (odds ratio [OR] 0.877; $p = .037$) was the only independently associated factor for CMVFDs in early and moderate NTG.

Conclusion: In some patients with normal tension glaucoma, CMVFDs were identified in the early and moderate stages. Several hemodynamic factors and body weight were associated with CMVFDs. Especially, low diastolic blood pressure at night time (Nocturnal diastolic hypotension) is independently related to CMVFDs and should be taken into consideration when providing systemic care to NTG patients.

485 - P1.012

RISK FACTORS ASSOCIATED WITH GLAUCOMA SEVERITY IN HIGHLY MYOPIC GLAUCOMA

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Purpose: To investigate risk factors influencing glaucoma severity in highly myopic glaucoma.

Methods: One-hundred fifteen eyes of 115 patients with highly myopic glaucoma (average age, 51.5 years) were included in this cross-sectional comparative study. Based on the Hodapp-Parrish-Anderson criteria, subjects were divided into 3 groups; mild, moderate and severe glaucoma groups. Clinical evaluations were performed including measurements of the intraocular pressure, spherical equivalent (SE) refractive error, axial length (AXL), central cornea thickness and visual field mean deviation (MD). The topographic parameters of ß-zone parapapillary atrophy (PPA) (area, maximal radial extent, angular extent around disc, disc/ß-zone PPA area ratio) and optic nerve head parameters (area, ovality index, disc tilt angle) were measured using swept-source optical coherence tomography. Clinical factors were compared by analysis of variance and post hoc multiple comparisons were performed. Linear regression analysis was conducted to evaluate the relationships between the glaucoma severity and parameters.

Results: The mild, moderate and severe glaucoma groups contained 64, 24 and 27 patients, respectively. In terms of the entire population, the SE was -8.73 (range: -21.375 to -0.75) diopters and mean AXL was 26.99 (range: 24.69-33.48) mm. The MD was -7.30 (range: -27.42 to -1.39) dB. There was a significant difference among the three groups with respect to the SE and AXL. The severe glaucoma group showed lower SE than the other two groups (mild: -8.22 and moderate: -8.70 vs. severe: -10.14 diopters, p = 0.044). The mild glaucoma group had shorter AXL than the others (mild: 26.73 vs. moderate: 26.98 and severe: 27.69 mm, p = 0.009). The severe glaucoma group demonstrated significantly larger ß-zone PPA area (4.34 mm^2) followed by mild and moderate group in order (2.13 and 1.86 mm^2, p = 0.002) and longer ß-zone PPA maximal radial extent (1.23 ± 0.69 mm) compared to the mild and moderate group (both 0.91 mm, p = 0.022). In multivariate regression analysis, larger disc/ß-zone PPA area ratio was the only significant factor associated with the severity of glaucoma (β = 1.185, p = 0.037).

Conclusion: Longer AXL, lower SE, and larger PPA area were observed in patients with more severe glaucomatous changes. These might be associated with the severity of highly myopic glaucoma.

526 - P1.013

COMPARISON OF PERIPAPILLARY MICROVASCULAR PARAMETERS BETWEEN NORMAL TENSION GLAUCOMA AND PRIMARY OPEN-ANGLE GLAUCOMA EYES USING ADAPTIVE OPTICS

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Purpose: The aim of this observational study was to morphologically analyze peripapillary arteries in patients with normal tension glaucoma (NTG) and primary open-angle glaucoma (POAG) using adaptive optics (AO). The secondary objective was to assess the correlation between glaucoma severity, assessed using the visual field and optical coherence tomography (OCT), and the vascular parameters of peripapillary arterioles.

Methods: Patients were selected from the AGORA cohort. AO, swept-source OCT-angiography (SS-OCT-A), and OCT were performed. AO centered on the optic nerve was used to measure vascular parameters of a supero-temporal and an infero-temporal peripapillary arteriole. The peripapillary arteriole wall thickness (W1 and W2), lumen diameter (LD), total diameter (TD) and wall-to-lumen ratio (WLR) were calculated. SS-OCT-A centered on the optic nerve was used to measure the peripapillary capillary perfusion density (CPD) and flux index (CFI).

Results: Sixty eyes of 60 glaucoma patients were included and 42 patients were analyzed: 20 POAG and 22 NTG patients. There was no significant difference in W1, W2, TD, LD, WLR, CPD and CFI between POAG and NTG patients. In the whole cohort, a greater inferior hemifield defect was significantly associated with a higher WLR of the supero-temporal peripapillary artery ($p = 0.0234$).

Conclusions: Our AO study did not show any significant difference in the measured vascular parameters of peripapillary arterioles between POAG and NTG patients. Regardless of glaucoma type, a greater inferior hemifield defect was significantly associated with an increased upper WLR, suggesting a concordance between the altered visual field area and the focal vascular anomaly on AO.

Key words: adaptive optics; optical coherence tomography angiography; primary open-angle glaucoma; normal tension glaucoma

528 - P1.014

A SHOT GUN PROTEOMIC APPROACH UNCOVERS ALTERATIONS OF IMMUNE SYSTEM POLARIZATION, MITOCHONDRIA METABOLISM AND INFLAMMATORY PATHWAYS IN PERIPHERAL BLOOD MONONUCLEAR CELLS OF SUBJECTS DIAGNOSED WITH PRIMARY OPEN ANGLE GLAUCOMA

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Purpose: Several studies have pointed out phenotypical alterations of circulating immune cells and increased plasma levels of pro-inflammatory signals in subjects diagnosed with glaucoma but the molecular alterations have never been explored. Hence, we have undertaken a shot-gun proteomics study of peripheral blood mononuclear cells (PBMC) isolated from subjects diagnosed with primary open angle glaucoma (POAG) and cataract (controls) to figure out proteome dysregulations in circulating immune cells.

Methods: After authorization by the local ethic committee, PBMCs (n = 12 POAG, n = 12 cataract; age: 68.2 ± 5.0y POAG, 71.3 ± 9.8y, cataract; comparable gender ratio) were isolated from peripheral blood by Ficoll-histopaque sedimentation and lysed in denaturing urea (8M) buffer. Thereafter, 200 µg of proteins were reduced, alkylated and digested with lysil-C-endopeptidase/trypsin. Cleaned peptides (750 ng) were injected in a Orbitrap Exploris 240 online with a nanoUHPLC and analysed by DDA and DIA mode (label free quantification). Proteins were searched by Proteome Discoverer and FragPipe (DIA-NN library-free) and output data analysed by R.

Results: Data commented refers to the DIA output (DDA data were overlapping). Quality controls (e.g., Coefficient of Variation, blood proteins contamination, etc.) were checked as optimal. After having applied a quantile normalization strategy, proteins were filtered for identification in at least 75% of POAG and cataract PBMCs. In total, 4113 proteins identified and quantified were common to POAG and cataract; 467 proteins were exclusive of POAG and 121 of cataract. Volcano plot (Log2_Fold Change > 0.5, $p < 0.05$; $p < 0.05$ after Benjamini-Hochberg correction) indicated that 259 proteins were upregulated in POAG and 117 in cataract. GeneOntology (GO) analysis ($p < 0.05$) showed that, with respect to cataract, POAG PBMCs were enriched in terms for:
- Chromatin remodelling and gene expression;
- Inflammatory signalling cascades (NF-kB) and T-lymphocytes pathways;
- Mitochondrial metabolism (redox enzymes);

Conversely, cataract PBMCs, with respect to POAG cells, were enriched in terms for:
- Humoral immunity;
- Proteolytic balance;

Conclusion: Proteomics data suggest that glaucoma PBMCs are charged with dysregulation of key intracellular pathways. Further studies are needed to figure out the distribution of cell subsets, polarization and metabolic trajectories along with the role of these factors in mediating the neuroinflammation state that accompanies glaucoma progression.

605 - P1.015

TOPOLOGY OF PIEZO I/II IN THE HUMAN AND MURINE EYE

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Purpose: Increased IOP represents an important risk factor for open angle glaucoma. The perception of IOP and its autoregulation are incompletely understood. Mechanosensitive receptors are known for the autoregulation of blood pressure, which provide feedback to the autoregulative system for setting the controlled variable blood pressure. Piezo represent a family of mechanically activated cation channels which act as cellular pressure sensors.We therefore hypothesize there is an analogy to IOP via a similar mechanism as sensing proteins. Using immunohistochemical methods on deparaffinized tissue sections from enucleated murine and human eyes the presence and localisation of piezo proteins were investigated.

Methods: Human and murine (black6) eyes were fixed in buffered formalin, embedded in paraffin and cut on a microtome. For Piezo-1 immunohistochemistry, rehydrated sections were incubated with anti-Piezo-I antibodies (Proteintech#15939-1-AP). For Piezo-II immunoreactivity, the primary antibody used was anti-Piezo-II (Atlas #HPA 031974). Standard staining with Hemotoxin Eosin (HE) was also carried out for orientation. The stained sections were scanned using an automated light microscope scanner (MIRAX). The sections were analyzed on the computer and the binding sites of PIEZO antibodies were evaluated and correlated with the HE staining.

Results: PIEZO-I/II expression was detected in the Müller cells of the retina and in both epithelia of the ciliary body in all samples. PIEZO-II expression was also detected in the corneal epithelium. Evidence of PIEZO-II expression in the retina is found in the RPE in the inner and outer plexiform layer, the ganglion cell layer and in the retinal nerve fiber layer.

Conclusion: The interesting topographical distribution led to further experiments on the expression of the PIEZO genes in tissue to investigate the relevance of the protein for ocular metabolism. The topography of the PIEZO proteins shows a selectivity for the relevant tissue, so that a function of the mechanosensitive ion channel can be assumed. If the expression and the relationship can be confirmed in the animal model, a pharmacological influence by selective agonists would be interesting to investigate in further experiments.

638 - P1.016

EXPLORING AQUEOUS HUMOR EXOSOMES AS POTENTIAL BIOMARKERS FOR GLAUCOMATOUS FUNCTIONAL DAMAGE

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Purpose: This study aimed to investigate the potential of aqueous humor exosomes, nanosized vesicles with diverse biological cargo, as biomarkers for glaucomatous functional damage, comparing them with cytokines

Methods: Aqueous humor samples were collected from patients with primary open angle glaucoma (POAG) and age-matched control subjects. Exosomes were isolated with Exosome Isolation Reagent and characterized using Exoview human tetraspin cargo kit. Cytokines of aqueous humor were also analyzed using a bead-based multiplex cytokine assay. Clinical parameters, including IOP and visual field tests, were recorded.

Results: In patients with POAG (n = 18) exhibited higher exosome concentrations and smaller exosomes compared to the controls (n = 16). In multivariate regression analysis, the density of exosomes was positively correlated with the severity of visual field loss (P = 0.029). In contrast, cytokine concentrations in aqueous humor were primarily associated with IOP, showing limited relevance to visual field damage.

Conclusion: Aqueous humor exosomes, particularly their abundance and characteristics have the potential to serve as biomarkers for glaucomatous functional loss. Further exploration of diverse cargos within exosomes may offer valuable insights for developing targeted strategies for patients with glaucoma.

716 - P1.017

GLAUCOMATOUS LAMINA CRIBROSA CELLS AND THE UBIQUITIN-PROTEASOMAL PATHWAY

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Purpose: Lamina cribrosa (LC) cells play an integral role in extracellular-matrix remodelling and fibrosis in human glaucoma. LC cells bear similarities to myofibroblasts that adopt an apoptotic-resistant, proliferative phenotype, a process linked to dysregulation of tumour-suppressor-gene p53 pathways, including ubiquitin- proteasomal degradation via murine-double-minute-2 (MDM2). Here, we investigate p53 and MDM2 in glaucomatous LC cells.

Methods: Primary human LC cells were isolated from glaucomatous donor eyes (GLC) and age-matched normal controls (NLC) (n = 3 donors/group). LC cells were cultured under standard conditions ± 48 hours treatment with p53-MDM2-interaction inhibitor RG-7112. Markers of p53-MDM2, fibrosis, and apoptosis were analysed by real-time polymerase-chain-reaction (qRT-PCR), western blotting, and immunofluorescence. Cellular proliferation and viability were assessed using colorimetric methyl-thiazolyl-tetrazolium salt assays (MTS/MTT).

Results: In GLC versus NLC cells, protein expression of p53 was significantly decreased ($p < 0.05$), MDM2 was significantly increased, and immunofluorescence showed reduced p53 and increased MDM2 expression in GLC nuclei. RG-7112 treatment significantly increased p53 and significantly decreased MDM2 gene and protein expression. GLC cells had significantly increased protein expression of COL1A1 and αSMA, and significantly decreased BAX and caspase-3 protein expression, and significantly increased proliferation after 96 hours. RG-7112 treatment significantly decreased COL1A1 and αSMA and significantly increased BAX and caspase-3 gene expression, and significantly decreased proliferation in GLC cells. MTT-assay showed equivocal cellular viability in NLC/GLC cells with/without RG- 7112-treatment.

Conclusion: Our data suggests that proliferation and ubiquitin-proteasomal pathway is significantly dysregulated in GLC cells with MDM2 led p53 protein degradation negatively impacting its protective role. Targeting the p53-MDM2-ubiquitin- proteasomal pathway warrants further clinical investigation.

769 - P1.018

ASSOCIATION OF MYOPIA AND PARAPAPILLARY CHOROIDAL MICROVASCULAR DENSITY IN PRIMARY OPEN-ANGLE GLAUCOMA: AN OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY STUDY

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Purpose: To compare the parapapillary choroidal microvascular density (PPCMv) between myopic eyes with and without glaucoma.

Methods: In this cross-sectional study, we recruited myopic eyes of spherical equivalent > -3.0 diopters with and without open-angle glaucoma (OAG), non-myopic eyes with OAG and controls. 4.5x4.5mmOCTA images of the optic nerve head were obtained using a commercial spectral domain OCTA system. Automated PPCMv density was calculated in inner and outer annuli in addition the radial peripapillary capillary, using the customized software. A marginal model of generalized estimating equations was performed to adjust for confounding factors and intra-class correlation.

Results: 35 myopic eyes with glaucoma (MG), 96 non-myopic eyes with glaucoma (NMG) matched for visual field defect, 37 myopic eyes without glaucoma (MNG), and 73 controls were included. Mean ages were (mean [SD]) 57.43 [11.49], 60.40 [10.07], 52.84 [9.35], and 54.74 [12.07] and female percentages were 60%, 22%, 48%, and 26% in MG, MNG, NMG, and controls, respectively. There was a trend toward decreasing inner and outer annular PPCMv densities (mean[SD]) from control (0.15 [0.04] and 0.12 [0.04]) to MNG (0.14[0.08] and 0.12 [0.08]) to NMG (0.09 [0.05] and 0.07 [0.04]) to MG (0.09 [0.04] and 0.07 [0.03]). The mean difference in PPCMv densities between glaucoma groups compared to control (mean difference [95%CI]) were -0.06 [-0.08 to -0.04; p < 0.001 for inner whole annular PPCMv density in NMG vs control and -0.07(-0.10 to -0.04; P < 0.001 for inner whole annular PPCMv density in MG vs control), which was consistent in all ROIs. No interaction was between glaucoma and myopia when adjusted for potential confounders (p > 0.112)

Conclusion: Our findings demonstrate a trend of parapapillary choroidal microvascular density attenuation to a greater extent in glaucoma compared to that in myopia

867 - P1.019

INVOLVEMENT OF ENDOTHELIN-1(ET-1) IN THE PATHOGENESIS OF POAG

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Purpose: To determine the value of ET-1 in the plasma and humor aqueous patients with POAG and control group of patients without glaucoma.To investigate the correlation of plasm ET-1 and humor aqueous (AH ET-1) with the parameters of visual field and OCT in POAG and non glaucomatous group.

Methods: In this prospective, clinical, manipulative study included 60 patients of both sexes. All patients were hospitalized at the Department of Ophthalmology KCUS, for glaucoma surgery (Trepanotrabeculectomy) or for cataract surgery. Patients were divided into 2 groups of 30 patients: patients with POAG and a control group of patients hospitalized for surgery cataract without glaucoma. Additionally done clinical biochemical and immunological determination of the value of plasm ET-1 and AH ET-1. We followed the parameters of the visual field (Otopus 101), MD and LV, and the diameter of the excavation (C / D) and vertical diameter of excavation using OCT.

Results: There was no SS differences in the plasm ET-1 between POAG and control group, but SS higher values of ET-1 in AH in POAG than in the CG; CG 1,13 pg/ml; POAG 2.80 pg/ml. There was a SS positive correlation between plasm ET-1 and vertical diameter of excavation in the POAG group (rho = 0.448, $p < 0.05$)and SS positive correlation between AH ET-1 and C/D ratio (rho = 0.551, $p < 0.05$), and AH ET-1 and vertical diameter of exavation (rho = 0.515, $p < 0.05$). Positive correlation of AH ET-1 and MD of VF (rho = 0.637, $p < 0.01$)., and LV of VF(rho = 0.644, $p < 0.01$).

Conclusion: The concentration of ET-1 in aqueous humor is significantly increased in patients with POAG compared to the control group and showed correlation with IOP, parameters of OCT and VF.

275 - P1.021

POSTURE INDUCED INTRAOCULAR PRESSURE CHANGE IN EYES AFTER VITRECTOMY

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Purpose: The eyes with a history of vitrectomy exhibit a higher incidence of open-angle glaucoma in the previous studies. This research sought to investigate whether vitrectomized eyes experience greater fluctuations in intraocular pressure (IOP) when assuming different postures compared to eyes that have not undergone vitrectomy.

Methods: Our study focused on patients who underwent vitrectomy in only one eye between 2022 and 2023 in Chang Gung Memorial hospital. We conducted a comparison of intraocular pressure (IOP) changes in different postures between the vitrectomized eye and the unaffected fellow eye. Patients under 20 years of age, those with a follow-up period of less than one month, and individuals who had used anti-glaucomatic medication or steroids within the past month were excluded. We measured ocular biometry parameters such as axial length, anterior chamber depth, and lens thickness, along with other anterior segment measurements. Throughout the study, we collected posture-specific IOP data (sitting, lying, lateral decubitus, and face-down positions) prospectively to analyze and compare the results.

Results: We enrolled and examined a total of thirty-four patients in this study. The paired t-test revealed that the eyes that underwent vitrectomy exhibited significantly higher intraocular pressure in the face-down position compared to their normal fellow eyes (20.01 ± 4.15 mmHg compared to 19.19 ± 3.68; p = 0.02). However, there were no statistically significant differences between the two eyes when in the supine or lateral decubitus position. Moreover, a notable increase was observed in the percentage of intraocular pressure from the face-down position to the sitting position in vitrectomized eyes, which was more prominent compared to the changes seen in non-vitrectomized eyes (16.76 ± 15.96% compared to 12.79 ± 14.54%; p = 0.02).

Conclusion: Our study findings strongly suggest that vitrectomized eyes are more susceptible to intraocular pressure (IOP) fluctuations, particularly in the face-down position. By understanding this increased risk of IOP fluctuation, we might develop more targeted and effective postoperative management strategies for patients who have undergone vitrectomy. Additionally, our research contributes to a deeper comprehension of the mechanisms underlying changes in intraocular pressure and the potential link to the incidence of glaucoma following vitrectomy.

813 - P1.021

OCULAR HYPERTENSION AFTER PARS PLANA VITRECTOMY: A RESTROSPECTIVE ANALYSIS

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Purpose: To evaluate the incidence of Ocular Hypertension (OHT) at 1 month and 3 months after Pars Plana Vitrectomy (PPV).

Methods: Retrospective study including vitrectomy-naive patients submitted to uncomplicated PPV for the treatment of epirretinal membrane (ERM), macular hole (MH) and vitreomacular traction (VMT), performed by the same surgeon at the Deparment of Ophthalmology of Centro Hospitalar de Vila Nova de Gaia/Espinho, between 2009 and 2023. Exclusion criteria included pre-operative presence of OHT, defined as an intraocular pressure (IOP) of ≥ 21 mmHg or need for topical/systemic hypotensive medication and insuficient post-operative clinical data. Data regarding demographics, primary diagnosis, concomitant phacoemulsification surgery and type of tamponade (balanced salt solution – BSS, air or C3F8 gas) was collected. The main outcomes were the presence of OHT 1 month post-operatively, and Non-Transitory Ocular Hypertension (NTOHT), defined as OHT 3 months post.

Results: Four hundred and eighty patients were initially included in the study; 75 were excluded for lack of clinical data (n = 24, 5.0 %) or for presence of pre-operative OHT (n = 51, 10.6%). Mean age of included patients was 72.3 years (SD = 8.06, range 9-90), with 265 (55.6%) being male. One month after surgery, 32 patients (7.9%) had developed OHT; 19/110 (17.3%) cases who underwent C3F8 tamponade developed OHT, a significantly higher proportion when compared with air (3/71, 4.5 %) or BSS (10/224, 4.2%) - $X^2 = 18.23$, $p < 0.001$. Neither gender, age or combined phacoemulsification posed a higher risk of OHT in a binary logistic regression model. NTOHT was present in 11 (2.7%) patients. No association was found between OHT 3 months afters surgery and the type of tamponade, diagnosis, gender or same-time performance of cataract surgery.

Conclusion: Pars plana vitrectomy may be associated with high rates of OHT shortly after surgery, specially in cases which C3F8 gas tamponade is used; however, OHT rates seem to plummet with time, reaching a vale of 2.7% 3 months post operatively.

731 - P1.024

LONG TERM OUTCOME OF GLAUCOMA DRAINAGE DEVICE SURGERY IN THE MANAGEMENT OF PAEDIATRIC GLAUCOMA AT A TERTIARY CENTRE

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Purpose: Glaucoma drainage devices are commonly employed in the management of paediatric glaucoma. We aim to evaluate the long term outcomes in a paediatric cohort.

Methods: This is a single-centre retrospective analysis of (n = 85 eyes) consecutive cases of glaucoma drainage device insertion (64 Baerveldt & 21 Molteno tubes) between 2003-2013. All cases were tube surgeries undertaken in children/ adolescents (≤ 18 years old). Surgical outcomes on complete and qualified success as defined by World Glaucoma Congress. Failure defined as IOP in excess of success criteria, further glaucoma procedures, NPL vision. Secondary outcomes include: Visual acuity, IOP, medications, cup-to-disc ratio and complications.

Results: 85 eyes of 61 patients were included with an average follow up of 13.5 years (161 months). Of these 75 Eyes had completed 10 years follow-up data, and the final follow-up data were used in the analysis for all eyes. Preoperatively, the mean age was 9.03 years old. Causes of glaucoma were heterogeneous in this complex cohort (Mean Pre-op: VA 0.74 logMAR, IOP 30.7 mmHg, number of medications 4.1). At final follow-up, IOP and medications were significantly reduced ($p < 0.05$) with mean IOP of 14.2 mmHg requiring 1.02 medications and VA of 1.05. The complete success rate on final follow up-on average 13.5 years-as 30.5% with a qualified success of 55.2%. Of the 38 eyes (44.7%) which failed, rates of re-operation and progression to no perception of light were collated -15 eyes required further glaucoma procedures.

Conclusion: This research represents an extensive long-term evaluation of paediatric tube shunt surgery. Our results demonstrated the safety and efficacy of this procedure in this group of very complex glaucoma condition.

274 - P1.025

COMPARISON OF THE EFFICACY OF RIPASUDIL/BRIMONIDINE FIXED-DOSE COMBINATION VERSUS CONCOMITANT USE OF RIPASUDIL AND BRIMONIDINE FOR THE REDUCTION OF INTRAOCULAR PRESSURE

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Purpose: Recently, 0.4% ripasudil (RIP)/0.1% brimonidine (BMD) fixed combination (RBFC) eye drops were approved in Japan for the reduction of intraocular pressure (IOP) in patients afflicted with glaucoma. To date, only a few comparative studies on efficacy between the concomitant use of RIP and BMD and RBFC alone have been reported. The purpose of this present study was to compare the efficacy of IOP reduction between RBFC and the concomitant use of 0.4% RIP and 0.1% BMD in Japanese glaucoma patients.

Methods: This study involved 48 eyes of 48 Japanese glaucoma patients seen at the Oike-Ikeda Eye Clinic, Kyoto, Japan from December 2022 to July 2023 whose eye-drop treatment was newly switched from concomitant use of RIP and BMD to RBFC alone and who could be followed for more than 3 months post switch. In all patients, IOP was measured at before switching and at 3-months after switching to RBFC using a Goldmann applanation tonometer. In the patients who switched to RBFC treatment in both eyes, only the right-eye IOP-value data was used, while in the patients who were switched to RBFC eye-drop treatment in only 1 eye, the IOP-value data of that eye were used. IOP values were compared between before and after switching to RBFC using the paired t-test for statistical analysis.

Results: In the 48 eyes of the 48 patients (27 males and 21 females; mean age: 67.0 ± 13.3 years) enrolled in the study, the mean observational period was 6.6 ± 2.3 months, and the mean number of anti-glaucoma components used was 4.7 ± 1.0. The most prevalent type of glaucoma observed was normal-tension glaucoma (n = 17 eyes), followed by primary open-angle glaucoma (n = 16 eyes). Mean IOP at pre switch and at 3-months post switch was 13.9 ± 4.6 and 13.1 ± 5.0 mmHg, respectively. Mean IOP at 3-months post switch was significantly reduced when compared with that at pre switch ($p = 0.0462$).

Conclusion: The findings in this study revealed that IOP at 3-months post switch was significantly reduced when compared with that at pre switch.

311 - P1.026

SAFETY AND LONGEVITY OF IOP CONTROL AFTER BIMATOPROST ADMINISTRATION: INTERIM ANALYSIS OF A PHASE 3B CLINICAL TRIAL

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Purpose: To evaluate safety and duration of intraocular pressure (IOP)-lowering effect after single and repeat administration of intracameral 10-µg bimatoprost implant in patients with open-angle glaucoma (OAG) or ocular hypertension (OHT).

Methods: Ongoing (enrollment completed), open-label, multicenter study (NCT03850782) evaluating outcomes of as-needed administrations of bimatoprost implant in patients with OAG or OHT inadequately managed with topical IOP-lowering medication for reasons other than efficacy. IOP-lowering rescue treatment is allowed if retreatment criteria are not met. Primary endpoint is time to rescue/retreatment after the initial implant administration analyzed by Kaplan-Meier method. Safety measures include treatment-emergent adverse events (TEAEs) and reading-center evaluation of corneal endothelial cell density (CECD). Data collected through 13-January-2023 from patients who received up to 2 implant administrations were analyzed.

Results: In total, 423 patients received 10-µg bimatoprost implant on day 1 (Cycle 1), 123 patients also received a second administration (Cycle 2), and 215 patients had IOP data available through month 12. Median time (95% CI) from the first implant administration to either a second administration or rescue treatment was 379 (362, 512) days; cumulative probability of not requiring a second administration or rescue treatment by day 360 was 56.5%. A second implant administration also provided a long duration of IOP control. Mean change from baseline IOP in non-rescued eyes (mmHg) was −7.3 at week 24 and −6.2 at month 12. The most common ocular TEAEs in study eyes were conjunctival hyperemia (Cycle 1: 12.8%; Cycle 2: 10.6%) known to be associated with administration procedure and increased IOP (Cycle 1: 8.5%; Cycle 2: 14.6%). Mean (± SE) % change from baseline in CECD at 12 months after implant administration was −3.5 ± 0.80% in Cycle 1 and −10.4 ± 3.15% in Cycle 2. The Cycle 1 implant was no longer visible or ≤ 25% of initial size in 69.8% and 97.7% of study eyes at months 12 and 24, respectively.

Conclusion: In this interim analysis based on available data, the IOP-lowering effect of the initial bimatoprost implant administration was well maintained for > 1 year in most patients, with similar results after the second implant. The safety profile of as-needed administration was acceptable.

312 - P1.027

PHASE 3, RANDOMIZED, PAIRED-EYE STUDY COMPARING THE 10 μG INTRACAMERAL BIMATOPROST IMPLANT WITH SLT IN PATIENTS WITH GLAUCOMA OR OCULAR HYPERTENSION

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Purpose: To evaluate the intraocular pressure (IOP)-lowering effect and safety of up to two administrations of the bimatoprost implant vs selective laser trabeculoplasty (SLT) in patients with open-angle glaucoma (OAG) or ocular hypertension (OHT).

Methods: Phase 3, randomized, masked, 2-year study in 183 patients with OAG or OHT inadequately managed with topical IOP-lowering medication for reasons other than efficacy (NCT02507687). Patients received one 360° SLT in one eye and up to two administrations of 10 μg bimatoprost implant in the contralateral eye. Initially, all implant-treated eyes received a 2nd implant at week 16 if safety criteria were met. After a protocol amendment, implant-treated eyes were retreated with flexible scheduling only if the IOP was > 17 mmHg. The primary efficacy variable was IOP change from baseline with primary timepoints at weeks 4, 12, and 24. IOP measurements after use of rescue treatment were excluded from analysis. Safety measures included treatment-emergent adverse events (TEAEs) and corneal endothelial cell density (CECD).

Results: Mean (± SE) IOP at baseline was 25.2 ± 0.22 mmHg in implant-treated eyes and 25.1 ± 0.22 mmHg in SLT-treated eyes. Mean (± SE) IOP reduction from baseline (mmHg) in eyes treated with up to 2 implants vs SLT was 6.8 ± 0.28 vs 6.2 ± 0.28 at week 4, 6.9 ± 0.30 vs 6.4 ± 0.30 at week 12, and 6.9 ± 0.27 vs 6.5 ± 0.28 at week 24. Overall, 67.5% and 50.2% of eyes treated with 1 or 2 implants vs 68.7% and 60.6% treated with SLT remained unrescued at day 360 and 720, respectively. The most common ocular TEAE was increased IOP for both implant- and SLT-treated eyes. Mean (± SE) percentage change from baseline in CECD at month 24 was -3.1 ± 0.43% in SLT-treated eyes vs -6.2 ± 1.13% in implant-treated eyes (-7.9 ± 2.04% with fixed readministration and -5.2 ± 1.35% with flexible administration).

Conclusion: The bimatoprost implant was statistically and clinically noninferior to SLT in IOP change from baseline at weeks 4, 12, and 24 overall and in the subgroup of patients receiving the flexible dosing regimen. Both the implant and SLT demonstrated sustained (2-year) IOP lowering in a substantial proportion of eyes. The safety profile of flexible implant readministration was favorable compared with fixed implant readministration.

313 - P1.028

THE ADVERSE EFFECTS OF ORAL NICOTINAMIDE/NICOTINIC ACID: AN OVERVIEW OF REVIEWS

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Purpose: Nicotinamide, a form of vitamin B3, is a commonly utilised as a health supplement. Recent trials highlight its potential neuro-regenerative effects in glaucoma. However, there are no studies on the adverse effects of nicotinamide use in ophthalmology. We examined the prevalence of clinically important adverse effects of oral nicotinamide/ nicotinic acid in humans.

Methods: A systematic search of reviews or meta-analyses was undertaken using pre-defined search criteria on PubMed Medline®, with hand searching of citations and references. Inclusion was agreed on by two independent researchers after review of abstracts or full text.

Results: In total, 13 reviews were included based on pre-selected criteria, revealing the following: 1) Oral nicotinamide and nicotinic acid was associated with a range of adverse effects (AEs) including GI upset, liver dysfunction, flushing/vasodilatory effects, skin rash, fatigue, headache. 2)Oral nicotinamide is associated with a lower prevalence of AEs compared to nicotinic acid, particularly cutaneous AEs. 3) There is significant variation in dosage of oral nicotinamide/nicotinic acid reported, ranging from 0.25 g/day to 18 g stat dose. 4) AEs are more common with higher doses of oral nicotinamide/nicotinic acid, and limits of tolerability depend on co-morbid status (eg: cardiovascular disease, diabetes). 5) Only 4 reviews described discontinuation or reduction in dosage of nicotinamide for AEs. 6) The majority of AEs diminished or resolved with reduction or discontinuation of oral nicotinamide/nicotinic acid.

Conclusion: Adverse effects from oral niacin/nicotinamide are diverse and dose-dependent, however there remains a paucity of literature examining its side effects in a systematic manner. Further research should utilise standardized dosing, and employ standardized reporting of outcome measures and adverse effects.

367 - P1.029

LUBRICATING EYE DROPS IN THE EMERGENCY EYE DEPARTMENT

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Purpose: Dry Eye Disease (DED) is a prevalent condition encountered frequently at the emergency eye department (EED) at Manchester Royal Eye Hospital (MREH). However, there is variability in the prescription of lubricating eye drops among different healthcare providers. This Quality Improvement Project (QIP) aimed to develop an up-to-date, standardized algorithm for the prescription of lubricating eye drops in the EED at MREH, based on international and national guidelines. Impact of the guideline was to be primarily evaluated through incidence of appropriate prescriptions, with secondary analysis addressing hospital costs.

Methods: Data from 845 EED attendances over a 3-month period was analyzed, with 157 patients meeting inclusion/exclusion criteria. Following literature review and collaboration with the corneal team, an EED lubricant prescription algorithm was formulated. Three plan-do-study-act (PDSA) cycles were conducted, with interventions including emails, posters, in-person reminders, and education for incoming trainees. Appropriateness of prescriptions was determined through evaluation against the algorithm and clinical correlation by a specialized registrar.

Results: The study found a substantial increase in the rate of appropriate prescriptions, rising from 55% to 93% across the three PDSA cycles. Additionally, EED lubricant prescription costs were reduced by 51%, translating to approximately £50/week in hospital savings. DED is often poorly and inconsistently managed in the emergency setting, possibly due to lack of training in the area.

Conclusion: This study demonstrates that implementation of a standardized, easy-to-follow guideline for lubricating eye drops can result in improved Dry Eye Disease management in the EED while additionally yielding cost savings for the hospital.

381 - P1.030

A PHASE 3 EXTENSION TRIAL TO EVALUATE THE LONG-TERM SAFETY AND EFFICACY OF THE 10 µG INTRACAMERAL BIMATOPROST IMPLANT IN PATIENTS WITH OPEN-ANGLE GLAUCOMA (OAG) OR OCULAR HYPERTENSION (OHT; MAIA)

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Purpose: In clinical trials, intraocular pressure (IOP) lowering with bimatoprost implant in OAG/OHT has been reported to persist beyond the period of intraocular drug bioavailability. This study evaluated long-term safety and duration of the IOP-lowering effect with bimatoprost implant in a phase 3 clinical trials extension.

Methods: MAIA, a 24-month, open-label, multicenter extension study (NCT03891446), enrolled patients with OAG/OHT who had completed 1 of 4 phase 3 trials or an open-label phase 4 study of bimatoprost implant efficacy and safety. IOP and use of added (rescue) IOP-lowering treatment in patients receiving 10-µg bimatoprost implant in 2 of the phase 3 trials (ARTEMIS) on day 1, weeks 16, and 32 were analyzed herein. Safety measures included treatment-emergent adverse events (TEAEs) and corneal endothelial cell density (CECD).

Results: As of 28 November 2023, 127 eyes were included; 80.3% had OAG and 26.0% post-washout IOP > 25 mmHg at baseline in the lead-in studies. Overall, 78.0% and 37.0% of eyes remained unrescued at days 360 and 420 from last implant, respectively. Among the 52 eyes rescued between days 360 and 420, the mean (SE) IOP at rescue was 18 mmHg (0.54) (median 18). Mean IOP (SE) in the 15, 18, and 11 eyes remaining unrescued for 2, 3, and 5 years from last implant was 16.6 (0.58), 18.6 (0.56), and 17.0 (0.68) mmHg, respectively. Visual field mean deviation (mean [SE]) within 1 year from last implant in unrescued eyes was -2.4 (0.48), within 2 years was -0.3 (0.72), and 3 years -0.2 (0.74). Most common ocular TEAE was visual field defect (5.5%). Proportion of study eyes with corneal TEAEs was 5.5%. Mean (SE) percentage change in CECD from screening at month 24 was –2.0% (1.18%) and month 36 was -4.2% (1.24%). By month 60, 98.3% of the third (last) implant from the lead-in study had biodegraded to absent/≤ 25% of initial size.

Conclusion: After the last bimatoprost SR implant in the ARTEMIS studies, sustained IOP lowering was observed for ≥ 2 years and up to 5 years in some eyes. Safety profile in this extension study was comparable to the lead-in trials.

407 - P1.031

BEYOND THE PRESSURE: EXPERT VIEWS ON CHALLENGES AND UNMET NEEDS IN THE LANDSCAPE OF GLAUCOMA CARE

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Purpose: Prompt diagnosis and management of glaucoma are vital to initiate treatment, typically targeted at lowering intraocular pressure. However, late presentation of disease, diagnostic delays and poor treatment adherence are key challenges in glaucoma diagnosis and management. Our aim was to provide expert insights on the current challenges and unmet needs in glaucoma diagnosis and management.

Methods: This abstract summarises a meeting of an international panel of experts on glaucoma held at Rome, Italy in June 2023. Insights from this meeting were considered in the context of the wider literature on glaucoma diagnosis and management to determine key challenges, unmet needs and priorities in this field.

Results: Key challenges in the diagnosis of glaucoma include late presentation and lack of awareness of the disease among glaucoma patients and non-specialist healthcare professionals. The lack of screening tests remains an important barrier to the diagnosis. Targeted engagement and education, as well as implementation of clinical practice guideline-based screening and diagnosis recommendations are needed to facilitate early diagnosis. Considerations for diagnostic tools and referral pathways were also discussed. Following diagnosis, key challenges in the management of glaucoma included lack of qualified specialists, poor access to facilities and limited treatment options for patients. Treatment options available may be associated with poor adherence, due to the mode of administration and associated side effects. The other challenges were access to specialists, surgery and treatment, limited resources and lack of new drugs for neuroprotection. Optometrists play pivotal role in glaucoma patients with early detection and referral to ophthalmologist and monitoring of patients with stable condition.

Conclusion: There is a need for improvement in ophthalmologist support and strengthening of training to optimise glaucoma care. Also creating awareness about regular screening practices and access to healthcare services for glaucoma in general public is required. Furthermore, expansion of glaucoma therapeutic options, including different modes of administration, is needed to improve adherence and outcomes. Advances in patient education targeting adherence to therapies are a priority. To address the variation seen in challenges to glaucoma care across nations, strategies should be targeted at local and regional levels.

408 - P1.032

THROUGH THE SOCIAL LENS: A COMPREHENSIVE STUDY OF GLAUCOMA DISCOURSE

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Purpose: This study explored relevant online conversation on glaucoma to understand the type of information patients are being exposed to in relation to glaucoma, specifically the myths being shared online. And to identify areas that expose diverse ways to address the challenges regarding adherence with anti-glaucoma eyedrops.

Methods: A search was conducted of online news, blogs, forums, Twitter/X, and YouTube between September 2022 and 2023 in the US, UK, Germany, Spain, Italy and France. The search terms included glaucoma, adherence, mental health, home remedies and treatment costs. The search was conducted by Edelman DXI, using Talkwalker, an industry leading social listening platform.

Results: This study reported a total of 576,000 mentions and 1.2 million engagements across social media regarding glaucoma. Glaucoma coverage was highest in Germany with 230,000 mentions and engagement with online glaucoma content was prominent in Spain 109,000. Glaucoma awareness was championed by healthcare professionals (HCP) and health organisations with campaigns to encourage regular screening for early detection. Positive sentiment was driven by celebrities speaking out about glaucoma. There were 416,000 glaucoma-based posts in forums within the timeframe analysed. In the USA, r/Glaucoma on Reddit emerges prominently as a site for shared community and advice, as does the Glaukom Forum in Germany. Mental health struggles and treatment costs emerged as key topics of interest. Patient forums were a constant source of guidance and support. High costs make some glaucoma treatments inaccessible for patients and these drives increased levels of interest in home remedies and alternative treatments. Home remedies such as castor oil, herbal teas and supplements were often marketed as fool proof solutions to glaucoma. Issues related to instilling eyedrops correctly or recollecting to use them consistently and storage emerged within the conversations. A flurry of eyedrops recall created a sense of anxiety among glaucoma sufferers who question the efficacy and safety of their eyedrops.

Conclusion: Glaucoma awareness is supported by HCPs and healthcare organisations. The study highlighted the need to encourage potential sufferers for early screening, diagnosis, treatment and adherence. There is a need to debunk the false claims about using home remedies and alternative treatments.

430 - P1.033

DEVELOPMENT AND CHARACTERIZATION OF TRABECULAR MESHWORK TARGETED RNAI MOLECULE PLATFORM VIA LOCAL INTRACAMERAL ADMINISTRATION FOR GLAUCOMA

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Purpose: The trabecular meshwork controls the intraocular pressure (IOP) by draining aqueous humor. Dysfunction of the trabecular meshwork will cause high IOP, the major risk factor of glaucoma. Although many medical and surgical treatment options are available, glaucoma patients are still at high risk of visual impairment. Thus, a new therapeutic, like small interfering RNAs (siRNAs) based gene silencing, would be a welcome strategy to treat glaucoma.

Methods: Hence, we here report proprietary Trabecular Meshwork Targeted RNAi Molecule (TRiM™) Platform, which utilizes ligand-mediated delivery through a single intracameral injection. The target gene knockdown is evaluated by RNAScope and quantitative polymerase chain reaction (qPCR) in rodent and non-human primates (NHP) at multiple time points. The protein expression in NHP is analyzed by western blot. The ADME properties are characterized by HPLC/MS, and platform safety profile is determined by ocular exam, fundus/optical coherence tomography (OCT) imaging, and histopathology.

Results: Our platform conjugate, dosed by a single intracameral injection of 50 ug/eye, has achieved up to 70% target gene silencing and the effect last for at least 2 months in rat. A single 1 mg/eye dose in NHP resulted in significant transcript and protein knockdowns in trabecular meshwork on D35. The ADME study in rabbits, dosed at 1 mg/eye, indicated sustained high enrichment of testing article in trabecular meshwork region versus other parts of the eye at post-treatment week 4. The initial safety evaluation in rabbits, with up to 5 mg/eye dosage, showed no testing article related findings in all ocular tissues and other peripheral organs as 35 days after injection. All data suggests our platform conjugate demonstrates a potential high efficacy and a favorable safety profile of infrequent administration of siRNA into trabecular meshwork with glaucoma treatment potential.

Conclusion: Overall, we have successfully provided a proof-of-concept that siRNA could be a new therapeutic approach, with an infrequent dosing interval, for trabecular meshwork gene knockdown in treating glaucoma. We believe our Trabecular Meshwork TRiM™ platform will open a new opportunity for other ocular indications.

629 - P1.034

ANALYSIS OF KIDNEY-RELATED ADVERSE EVENTS ASSOCIATED WITH ACETAZOLAMIDE PRESCRIPTION

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Purpose: Acetazolamide decreases the production of aqueous humor, reducing intraocular pressure. This allows acetazolamide to be used for treatment of glaucoma. Direct comparative studies on renal function before and after acetazolamide use are rare. We investigated acetazolamide and its kidney-related side effects related to changes in renal function and metabolic acidosis.

Methods: During a 15-year period at a tertiary university hospital, we retrospectively examined all cases of acetazolamide prescription. Among these patients, we conducted analyses, focusing on those who were involved in nephrology outpatient clinic or consultative services. Data collection included patient age at prescription, sex, serum creatinine before and after acetazolamide prescription, metabolic acidosis.

Results: During the 15 years from 2008 to 2023, acetazolamide was prescribed to a total of 4393 patients. Among these, 483 individuals attended the nephrology department. After excluding 32 patients undergoing hemodialysis, 7 undergoing peritoneal dialysis, and 119 with insufficient data, a total of 325 patients were included in the analysis. At Table 1, it was verified that there was no alteration in eGFR before and after the administration of acetazolamide across all grade of renal function. We were able to compare serum bicarbonate levels before and after acetazolamide administration in 194 patients, and it was confirmed that metabolic acidosis occurred slightly in 34 patients.

Conclusion: In this study, it was confirmed that changes in renal function before and after using acetazolamide were minimal regardless of the stage of chronic renal failure.

Table 1. Comparison of eGFR before and after acetazolamide (total N = 325)

eGFR** Category	N	Pre_eGFR**	Post_eGFR**	p*
≥ 90	54	125.1 ± 39.6	109.2 ± 61.5	0.0062
60 ≤ and < 90	97	73.7 ± 7.7	73.1 ± 16.0	0.7140
45 ≤ and < 60	51	37.7 ± 3.9	38.6 ± 7.5	0.2966
30 ≤ and < 45	75	52.2 ± 4.1	51.6 ± 11.2	0.6572
15 ≤ and < 30	32	22.6 ± 4.2	20.9 ± 7.7	0.1564
< 15	16	11.6 ± 2.4	9.9 ± 3.1	0.0053

* paired t-test was performed.
** eGFR : estimated glomerular filtration; calculated by MDRD equation.

866 - P1.035

TEAR FILM OSMOLARITY IN PATIENTS TREATED FOR GLAUCOMA OR OCULAR HYPETENSION

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Purpose: To evaluate tear film osmolarity in patients treated with intraocular anti-hypotensive drugs.

Methods: Forty patients treated for glaucoma or ocular hypertension (OHT) were consecutively recruited for the study. Each patient was asked to complete an assessment of ocular surface disease symptoms, the Ocular Surface Disease Index, and underwent a comprehensive ocular surface assessment, including measurement of osmolarity of the tear film, Schirmer test, tear breakup time (TBUT) and corneal and conjunctival staining.

Results: In our stydy we find that we haveTwenty-three patients (60%) reported symptoms of ocular surface disease. Eighteen patients (47.5%) had a tear osmolarity ≤ 308 mOsms/L, 11 (27.5%) between 309 and 328 mOsms/L and 10 (25%) > 328 mOsms/L. A tear deficit a was observed in 20 patients (50%). In the other side twenty-seven patients (65.2%) had abnormal tear quality analyzed with TBUT, and 16 patients (40%) showed positive staining using the Oxford scheme. Tear osmolarity was significantly correlated with Ocular Surface Disease Index ($r = 0.486$; $p = 0.002$) and TBUT ($r = -0.49$; $p = 0.009$). In fact There was a statistically significant correlation between tear osmolarity and number of medications ($r = 0.409$; $p = 0.009$), number of instillations ($r = 0.405$; $p = 0.01$), and number of instillations of preserved eye drops ($r = 0.629$; $p < 0.0001$). Using the multiple regression method.

Conclusion: in conclusion ;Tear osmolarity was increased in patients treated for glaucoma or OHT, particularly in those using multiple stored eye drops. Evaluation of the ocular surface of patients treated for glaucoma.

879 - P1.036

PROSPECTIVE OCULAR SURFACE EVALUATION OF OSDI AND SPEED SCORES AND THEIR CLINICAL ASSOCIATIONS IN NORMAL AND GLAUCOMA SUBJECTS

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Purpose: To evaluate ocular surface disease (OSD) and dry eye outcomes in normal and glaucoma subjects using Ocular surface disease index (OSDI), Standard Patient Evaluation of Eye Dryness (SPEED) scores and clinical parameters.

Methods: Prospective comparative study with 131 eyes of 131 subjects (Controls-39, Glaucoma- 92) who had dry eye evaluation with OSDI and SPEED questionnaire, Schirmer test, tear breakup time (TBUT). Glaucoma was further categorised as suspects on antiglaucoma medication (AGM), mild (mean deviation (MD) less than -6dB), moderate (MD less than -12dB) and severe glaucoma (MD greater than -12dB). Univariate and multivariate linear regression analyses were performed to analyse clinical associations of both scores.

Results: Controls and glaucoma patients had similar mean age (62.08 ± 11.77 vs 63.14 ± 10.41 years, p = 0.608) and gender distribution (43.6% vs 62%, p = 0.053). Compared to controls, the glaucoma group had significantly more patients with dry eye (17.95% vs 35.87%, p = 0.042), lower mean TBUT (6.33 ± 3.4 vs 8.03 ± 3.2s, p = 0.008), and higher OSDI (5.63 ± 10.8 vs 1.74 ± 4.5, p = 0.004) and SPEED score (1.55 ± 3.15 vs 0.28 ± 1.1, p = 0.001). In the glaucoma group 13.04% (n = 12) were suspects on AGM, 42.39% (n = 39) had mild glaucoma, 22.83% (n = 21) had moderate glaucoma and 21.73% (n = 20) had severe glaucoma. The number of AGM use ranged from 1-4 medications with 47.83% (n = 39), 33.70% (n = 31), 17.39% (n = 16) and 1.08% (n = 1) on 1, 2 ,3 and 4 medications respectively. There was no significant difference in presence of dry eye (p = 0.706), TBUT (p = 0.939), OSDI (p = 0.281) or SPEED score (p = 0.953) among patients in glaucoma group based on disease severity. On multivariate analysis, increasing number of AGM (β = 0.435, p = 0.001) was significantly associated with higher OSDI score.

Conclusion: Increasing number of AGM is associated with worsening OSDI score. OSDI score is a relatively sensitive clinical tool compared to SPEED to screen for OSD induced by AGM. No single clinical parameter can be used to screen OSD in this study.

963 - P1.037

EFFECTS OF DIFFERENT CONCENTRATIONS OF ALPHA2-AGONIST ON CONJUNCTIVAL WHITENING

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Purpose: To assess the difference in the decrease of conjunctival redness (CR) with varying concentrations of α2-agonist (brimonidine tartrate) eye drops.

Methods: Ninety eyes of 45 patients without ocular disease were enrolled. CR was measured using the Oculus Keratograph 5M (OCULUS Optikgeräte GmbH, Germany) before instillation of brimonidine tartrate eye drops at different concentrations (0.25 mg/ml: Lumobry, Bausch&Lomb, Canada; 2 mg/ml: Brimvera, Esteve Pharmaceuticals, Spain) each one in one eye. CR was reassessed 5 minutes post-instillation. The measured parameters included initial nasal bulbar hyperemia (iNBH), initial temporal bulbar hyperemia (iTBH), initial nasal limbar hyperemia (iNLH) and initial temporal limbar hyperemia (iTLH), final nasal bulbar hyperemia (fNBH), final temporal bulbar hyperemia (fTBH), final nasal limbar hyperemia (fNLH) and final temporal limbar hyperemia (fTLH).

Results: The sample size was 90 eyes of 45 healthy patients. Mean age was 43.4 ± 16.5 years. The mean values were as follows: iNBH: 1.15 ± 0.46 in Lumobry group (LG) and 0.97 ± 0.34 in Brimvera group (BG) ($p = 0.037$); iTBH: 0.90 ± 0.35 in LG and 0.81 ± 0.30 in BG ($p = 0.180$); iNLH: 0.61 ± 0.32 in LG and 0.54 ± 0.28 in BG ($p = 0.297$); iTLH: 0.60 ± 0.33 in LG and 0.51 ± 0.28 in BG ($p = 0.179$); fNBH: 0.43 ± 0.25 in LG and 0.41 ± 0.22 in BG ($p = 0.658$); fTBH: 0.47 ± 0.29 in LG and 0.38 ± 0.19 in BG ($p = 0.088$); fNLH: 0.22 ± 0.17 in LG and 0.25 ± 0.20 in BG ($p = 0.569$); fTLH: 0.30 ± 0.25 in LG and 0.20 ± 0.17 in BG ($p = 0.019$). Comparing LG and BG, there were no significant differences in the efficacy to decrease CR: iNBH-fNBH ($p = 0.929$), iTBH-fTBH ($p = 0.509$), iNLH-fNLH ($p = 0.631$) and iTLH-fTLH ($p = 0.983$).

Conclusion: No significant differences were observed in the vasoconstrictor efficacy of different concentrations of α2-agonist in healthy individuals. These outcomes could be extrapolated to their usefulness before glaucoma filtering surgery to decrease intraoperative bleeding and thereby to improve postoperative outcomes.

976 - P1.038

DECOMPENSATED PEX GLAUCOMA WITH DISPERSIVE PIGMENT SYNDROME IN A MALE PATIENT

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Purpose: Pseudoexfoliation syndrome is an age-related systemic disorder, characterized by progressive chronic deposition and accumulation of grayish-white extracellular material in several organs and characteristic ocular manifestations. PEX can lead to secondary glaucoma-pseudoexfoliative glaucoma (PEG) - leading cause of blindness worldwide. Pigment dispersion syndrome (PDS) is caused by the spontaneous dispersion of pigment from the iris into the anterior segment. PDS is often bilateral and appears at a young age. One of characteristic signs is deposition of pigment at the angle of the anterior chamber or corneal endothelium (Krukenberg's spindle). It could lead to pigmentary glaucoma (PG).

Methods: A 57-year-old male patient is monitored at the Clinic for Eye Diseases of the Clinical Hospital Center in Osijek for decompensate PEX glaucoma with dispersive pigment syndrome of the right eye and open-angle glaucoma of the left eye. In 2021, patient underwent selective laser trabeculoplasty (SLT) treatment of both eyes, while in April 2023, SLT of the right eye was performed. Patient regularly uses prescribed local anti-glaucoma therapy in both eyes: latanoprost, dorzolamide and timolol; additionally brimonidine in the right eye (since the second SLT). In September 2023, a Humphrey 24-2 visual field showed a decrease in retinal sensitivity with a discrete nasal step on both sides.

Results: In December 2023, the patient's visual acuity was sc 1.0/1.0. IOP values were 24/16 mmHg. Pachymetrically 4.0/3.5 mmHg were subtracted. Biomicroscopic, Krukenberg's spindle, PEX material on the lens, ectropion of the uveal pigment and posterior subcapsular opacities of the lens were recorded. Optic nerve (PNO) excavation (C/D) progression is observed (C/D right/left (R/L) 0.55/0.35) compared to September 2023 (C/D R/L 0.5 vertically and 0.35 horizontally with narrower neuroretinal rim at the upper pole of PNO/0.35). Patient was discharged with instructions to continue using previously prescribed anti-glaucoma therapy. Considering the progression of the disease, glaucoma surgery of the right eye is planned – trabeculecotmy as a gold standard, or microshunts.

Conclusion: Currently, there is no cure for PEX. Early diagnosis and treatment can prevent or slow the progression of vision loss. Likewise, since PDS has various clinical pictures that lead to misdiagnoses; we emphasize the importance of differential diagnosis and proper therapeutic strategy.

248 - P1.039

METFORMIN FOR GLAUCOMA TREATMENT

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Purpose: The objective of this study was to evaluate the potential beneficial impact of metformin on glaucoma and its risk factors and explore the underlying mechanisms. The goal was to contribute to the development of novel treatment strategies for glaucoma.

Methods: This review was conducted following the PICO framework, PRISMA check list, and was registered in PROSPERO. We searched for studies that assessed the effects of metformin on glaucoma risk factors and the associated underlying mechanisms. Our search included electronic databases such as PUBMED, EMBASE, and clinicaltrials.gov.

Results: Out of the 218 records identified, 10 studies on glaucoma and metformin were identified after screening titles and abstracts. These included two reviews of preclinical and clinical studies, four observational studies that assessed the association between metformin and glaucoma, one experimental study, two research protocols for ongoing studies, and one bioinformatic analysis study. We did not find any clinical trials that specifically investigated the impact of metformin on glaucoma. However, data from observational and experimental studies demonstrated the capability of metformin to modulate various pathways that could contribute to neuroprotection in glaucoma.

Conclusion: The rational exploration of metformin as a glaucoma treatment holds great promise, with the potential to provide new avenues for managing this complex ocular condition. In order to develop comprehensive treatment strategies that fully utilize the therapeutic potential of metformin in glaucoma management, rigorous clinical studies are imperative. These studies are necessary to establish both the safety and efficacy of metformin in the context of glaucoma treatment.

393 - P1.040

NGF INHIBITION IN GLIAL CELLS CONFIRMS NEUROPROTECTIVE ROLE IN RGC CO-CULTURE

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Purpose: We have reported that nerve growth factor (NGF) secreted from glial cells is involved in neuroprotection by co-culture system. In this study, we have explored using a applied co-culture system to study how suppressing NGF expression affects the neuroprotective effects on retinal ganglion cells (RGCs).

Methods: Primary retinal ganglion cells from 4-5days rats after birth and glia cells from rats were cocultured using 3D-transwell culture system. After a indicated period following co-culture, conduct expression absorption experiments using NGF antibodies. We examined the results using immunoblot, RT-PCR, and immunofluorescence analysis of the expression levels of the several survival markers of retinal ganglion cells (RGCs).

Results: Co-culture with glia cells was blocked the damage from oxidative stress (hypoxia, 1% O2), in retinal ganglion cells. These results are consistent with previously reported findings. In this experimental setup, the results indicated that in co-cultures with glia cells treated with NGF antibodies, the suppression of RGCs survival markers in response to oxidative stress (hypoxia, 1% O2), could not be halted.

Conclusion: Experiments using co-culture of glial cells and retinal ganglion cells (RGCs) suggest that nerve growth factor (NGF) plays role in protecting RGCs. Further research is needed to understand that specific mechanisms behind NGF's neuroprotective effects.

419 - P1.041

PGC-1α MEDIATED MITOCHONDRIAL BIOGENESIS PROMOTES RECOVERY AND SURVIVAL OF NEURONAL CELLS FROM CELLULAR DEGENERATION

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Purpose: Glaucoma is characterized by the progressive loss of retinal ganglion cells (RGCs). By removing the cell death stimulus, we showed previously that dying/injured RGCs could survive and recover from the process of regulated cell death, even when cells had already experienced various cellular injuries. In this study, we investigated the role of mitochondrial quality control (fission/fusion, biogenesis, mitophagy) in the process of neuronal degeneration and recovery.

Methods: Neuronal PC12 cells treated with ethanol (EtOH, 5%, vol/vol) were used as experimental model. Cell recovery was enabled by washing away EtOH and further culturing cells in fresh medium. Mitochondrial morphology and membrane potential were analyzed by Mito-tracker and TMRM staining with live cell imaging. Mitochondrial ultrastructure was analyzed by electron microscopy. Protein and mRNA expression were measured by Western blot and qPCR.

Results: EtOH induced loss of neurites ($p < 0.001$), along with mitochondrial fragmentation ($p < 0.0001$), mitochondrial membrane potential loss ($p < 0.001$), reduced ATP production ($p < 0.001$), and decreased total mitochondrial volume ($p < 0.0001$). After removing EtOH, all these mitochondrial parameters recovered to normal levels. Meanwhile, cells regrew neurites and survived. Study of the mitochondrial quality control showed that mitophagy was activated only during the cellular degeneration phase (EtOH treatment) but not in the recovery phase (EtOH removed). This activation did not depend on the Parkin/PINK1 mediated mitophagy pathway. Protein expression of phospho-Drp1Ser616 ($p < 0.01$) and S-OPA1 ($p < 0.001$), which are both involved in mitochondrial fission, increased during EtOH treatment and recovered to normal levels after washing EtOH, thus providing an explanation for the fragmentation and subsequent recovery of the mitochondria. Both mRNA ($p < 0.01$) and protein ($p < 0.0001$) expression of PGC-1α, regulator of mitochondrial biogenesis, were decreased after EtOH treatment and increased after removing EtOH. Incubation of cells with PGC-1α inhibitor SR-18292 after washing EtOH remarkably inhibited the recovery of mitochondrial damage, neurite regeneration, and cell viability in a concentration dependent manner.

Conclusion: We found reversible mitochondrial morphological and functional damage in the process of degeneration and recovery of neuronal cells and revealed that PGC-1α mediated mitochondrial biogenesis played a critical role in the cellular recovery. This molecular mechanism is a potential target for neuroprotection and neurorescue in glaucoma.

532 - P1.042

HYDROGEN SULFIDE PROTECTS RETINAL GANGLION CELLS AGAINST FERROPOTOSIS INDUCED BY MECHANICAL STRESS IN VITRO

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Purpose: Hydrogen sulfide (H2S) has been recognized as a third gas signaling molecule of great importance to the central nervous system. Retinal ganglion cells (RGCs) are highly sensitive to intraocular pressure (IOP). Elevated IOP leads to RGC loss by causing an imbalance in iron homeostasis in retina. This study aims to investigate whether elevated IOP causes changes in ferroptosis leading to RGCs loss in retina and whether H2S plays a protective role and its mechanism.

Methods: Retinal explants were harvested from age-matched male C57BL/6 mice (n = 24) and were cultured for 24 hours under elevated pressure with or without the addition of 100 nM H2S donor (GYY4137), or with 500 nM Hemin. RGCs were quantified by immunohistochemical staining against Brn3a in flat mounts. The expression and localization of iron regulatory proteins as well as oxidative stress and ferropotosis were analyzed. Statistical analysis and presentation was performed by GraphPad Prism. Statistical significance was determined by t-test and one-way ANOVA with Tukey-Kramer's post hoc tests for comparison between groups. Differences were considered statistically significant at $p < 0.05$.

Results: Compared to the control group, iron overload and elevated pressure led to significant loss of RGCs ($p < 0.05$). H2S protected the RGCs from loss due to elevated pressure. TfR, H-ferritin, L-Ferritin and Hepcidin were expressed in RGCs. Both iron overload and elevated pressure increased the expression of iron regulatory markers, NOX2 and oxidative stress as well as ferroptosis ($p < 0.05$). However, with additional H2S, the expression of NOX2 and ROS level were significantly decreased ($p < 0.05$).

Conclusion: RGCs are sensitive to iron toxicity and elevated hydrostatic pressure. H2S protects the RGCs against elevated pressure. At the same time elevated hydrostatic pressure induces ferroptosis and increased expression of NOX2 in retina. H2S precursor protects RGCs by inhibiting ferropotosis by regulating iron homeostasis as well as NOX2.

665 - P1.043

DENDRITIC PRUNING VERSUS SOMA LOSS IN A MOUSE GLAUCOMA MODEL

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Purpose: Animal model for glaucoma is achievable but varies with different species. B6 mice is known as a strain with highly resistant retinal ganglion cells to intraocular pressure (IOP) elevation. We aimed to compare the response of dendritic pruning and soma loss of retinal ganglion cells regarding different IOP levels in a mouse glaucoma model using microbead injection.

Methods: Mouse ocular hypertension was induced using an intracameral bead injection model as previously described. Mice were anesthetized with intraperitoneal injection of ketamine and medetomidine hydrochloride. IOP was measured in an awaken state at 1, 7, 10, 14, 21, 28 days after the injection then the retina was obtained. Soma loss was assessed through RBPMS labelling of flat mounts (n = 12 eyes). Images were acquired on an Olympus IX71 microscope (Olympus). Four images per retina (20x magnification) were taken equidistant at superior, inferior, medial, and lateral quadrant retina (n = 14 eyes). Images were cropped to 400 um2 and RBPMS+ cells were counted using the cell counter plugin for Fiji; counts were averaged across the 4 images. Dendritic pruning was assessed in flat mount retinas through DiOlistics labelling of individual RGC dendritic arbors.

Results: Approximately half of the eyes with polyurethane microbead (7/13) showed IOP elevation. RBPMS group were allocated to 6 retinas with low IOP (RBPMS low OHT; n = 3) and high IOP (RBPMS high OHT; n = 3) and DiOlistics group was allocated to 7 retinas with low IOP (DiOlistics low OHT; n = 3) and high IOP (DiOlistics high OHT; n = 4). RBPMS Cumulative IOP was checked according to each group. RBPMS+ count was not decreased in RBPMS low OHT group compared to the contralateral eyes, however, it was decreased in RBPMS high OHT group with statistical significance ($p < 0.001$, Mann-Whitney). Sholl graph showed downward shifts in DiOlistics low OHT and high OHT groups compared to control graph

Conclusion: In the mouse glaucoma model, assessment of dendritic pruning is more sensitive to detect RGC damage to IOP elevation compared to that of soma loss.

729 - P1.044

IN SILICO APPROACH TOMODULATING NAD+ SYNTHESIS THROUGH NAMPT INTERACTION WITH PYRROLOQUINOLINE QUINONE (PQQ): POTENTIAL IMPLICATION FOR NEUROMODULATION IN GLAUCOMA

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Purpose: Glaucoma is a progressive and multifactorial neurodegenerative disorder affecting retinal ganglion cells (RGC) and their axons. To date, intraocular pressure reduction remains the sole clinically validated intervention to preserve visual acuity, but it is not always enough effective. RGC are one of the most energy-demanding cells requiring a constant energy supply and bioenergetic homeostasis to preserve function. Nicotinamide adenine dinucleotide (NAD+) is pivotal for RGC bioenergetic supplies, as supported by experimental evidence, with its depletion implicated in most retinal neurodegenerative disorders, including glaucoma. Pyrroloquinoline quinone (PQQ) is a cofactor that may influence metabolism and mitochondrial mechanisms by regulating NAD+ content. The biochemical mechanisms underlying this capacity remain largely unknown. To this aim, this study investigated the potential modulatory role of PQQ on nicotinamide phosphoribosyltransferase (NAMPT), the enzyme primarily responsible for NAD+ biosynthesis in mammals.

Methods: NAMPT protein was retrieved from the Protein DataBank (ID:7ENQ) and prepared using the UCSF Chimera software (v.1.12). Molecular docking was performed using AutoDock Vina software. Density functional theory (DFT) computations were carried out using the Gaussian 09W program package and the theoretical results were visualized via GaussView 6.0.

Results: Molecular docking data indicated strong binding energy of PQQ to NAMPT (-9.4 kcal/mol). Multiple aminoacidic residues within NAMPT formed hydrogen and hydrophobic bonds, contributing to the stability of PQQ in the NAMPT binding pocket. Interestingly, this binding site is implicated in allosteric activation by known modulators. To confirm the potential intermolecular reactivity of PQQ, DFT studies revealed that PQQ has high kinetic and thermodynamic stability. The chemical stability of PQQ is reflected by its chemical potential (μ) = 5.343 eV, while its high electrophilicity index (ω) of 8.910 eV suggests that PQQ acts as a potent electrophile.

Conclusion: NAMPT may be positively modulated by PQQ, which confirms its positive role in NAD+ biosynthesis. Citicoline continues to be the primary neuromodulatory agent for glaucoma therapy. Given that a new fixed formulation of citicoline and PQQ is now available, based on our findings, clinical studies are both justified and necessary to evaluate the efficacy of this formulation in glaucoma neuromodulation compared to citicoline alone.

234 - P1.045

TOPICAL TREATMENT OF PRIMARY OPEN-ANGLE GLAUCOMA IN PATIENTS WITH THYROID EYE DISEASE

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Purpose: To study the approach regarding antiglaucomatos treatment of patients with a diagnosis of Graves Disease and Primary Open Angle Glaucoma and to evaluate the intraocular intraocular pressure at the one year follow-up

Methods: We performed a retrospective study, studying 63 cases in which complete ophthalmic examination was performed in patients with Graves disease (age range: 25 to 77 years, 60 women, 3 men). During the first examination, ocular hypertension was defined as an intraocular pressure greater than 21mmHg on either eye which required topical treatment. The patients were then divided into two treatment subgroups: subgroup I was administered brinzolamide twice a day; subgroup II was administered a combined preparation of brinzolamide and timolol twice a day. We reviewed the IOP 6 weeks after the first consult and one year after. We also categorized the patients depending on whether they received systemic treatment, intravenous corticosteroid therapy, according to the European Group of Graves' Orbitopathy (EUGOGO) guideline - Clinical Activity Score (CAS).

Results: On the final visit, the mean IOP value in both eyes was significantly lower in all treatment subgroups compared to the initial values. However, the combination of brinzolamide and timolol eye drops decreased intraocular pressure more effectively than drops containing brinzolamide . At the six-weeks follow-up a minority of patients presented with a non-significant IOP reduction, therefore received an additional antiglaucomatos eye drop. Moreover, after the one year mark, patients diagnosed with infiltrative orbithopathy, which required intravenous corticotherapy, remained with a higher IOP.

Conclusion: Topical ocular hypotensive treatment is effective in reducing intraocular pressure in Graves Disease, especially in the long-term. A minority of the patients will require more than one hypotensive eye drop in order to keep the IOP within the normal range.

245 - P1.046

EXAMINATION OF KEY OCULAR SURFACE DISEASE SIGNS AND SYMPTOMS IN PATIENTS WITH OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION TREATED WITH PRESERVATIVE-FREE LATANOPROST EYE DROP CATIONIC EMULSION OR PRESERVED LATANOPROST DURING A 12-WEEK, PHASE III, RANDOMIZED STUDY

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Purpose: Examination of ocular surface disease (OSD) signs and symptoms in open-angle glaucoma (OAG)/ ocular hypertension (OHT) patients treated with preservative-free latanoprost eye drop cationic emulsion or preserved latanoprost monotherapy.

Methods: Adults with OAG/OHT currently treated with topical intraocular pressure (IOP)-lowering monotherapy were randomized 1:1 to receive preservative-free latanoprost eye drop cationic emulsion or preserved latanoprost (both 50µg/ml, one drop daily) in a 12-week, Phase III, study. Pre-washout IOP was ≤ 18 mmHg (both eyes). Post-washout IOP was ≥22 mmHg (≥1 eye) and ≤ 32 mmHg (both eyes). Primary endpoint was the change from baseline in peak (9:00AM) and trough (4:00PM) IOP at Week 12. Current analyses included the change from baseline in the proportion of patients achieving corneal fluorescein staining scores (CFS; modified Oxford Grade Scale) of 0 and the change in severity score for key OSD symptoms.

Results: Analyses included 384 patients treated with preservative-free latanoprost eye drop cationic emulsion (n = 192) or preserved latanoprost (n = 192). Mean (standard deviation [SD]) age was 63.1 (11.16) years and 61.5% (n = 236) were female. At baseline, 174 patients (45.3%) had CSF scores ≥ 1, 213 (55.5%) had OSD symptom scores ≥ 0 and 117 (30.5%) demonstrated both (CFS ≥ 1 and OSD ≥ 0). The proportion with CFS scores of 0 rose from 30.2% at baseline to 43.6% at Week 12 with preservative-free latanoprost eye drop cationic emulsion and from 31.3% to 34.2% with preserved latanoprost. The least square (LS) mean change from baseline at Week 12 concerning burning/stinging/itching score was -0.16 with preservative-free latanoprost eye drop cationic emulsion and 0.01 with preserved latanoprost. The LS mean change from baseline in dry eye symptom score was -0.15 (preservative-free latanoprost eye drop cationic emulsion) and -0.13 (preserved latanoprost). The change in blurred/poor vision was also similar across groups at Week 12.

Conclusion: A higher proportion of OAG/OHT patients instilling preservative-free latanoprost eye drop cationic emulsion achieved CFS scores of 0 at Week 12, compared with preserved latanoprost users. Preservative-free latanoprost eye drop cationic emulsion provided improvements in burning/stinging/itching symptoms, while some worsening was seen with preserved latanoprost. Both treatments provided comparable improvements regarding dry eye and blurred/poor vision symptoms.

246 - P1.047

LONG-TERM EFFICACY AND SAFETY OUTCOMES WITH PRESERVATIVE-FREE LATANOPROST EYE DROP CATIONIC EMULSION IN THE TREATMENT OF GLAUCOMA AND OCULAR HYPERTENSION: OPEN-LABEL EXTENSION DATA FOLLOWING A PHASE III RANDOMIZED TRIAL

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Purpose: Reporting of data from an open-label extension study, which followed a 3-month randomized controlled trial (RCT) examining treatment outcomes with preservative-free latanoprost eye drop cationic emulsion and preserved latanoprost in open-angle glaucoma (OAG)/ocular hypertension (OHT).

Methods: Adults with OAG/OHT received 50 µg/mL (one drop daily) of preservative-free latanoprost eye drop cationic emulsion or preserved latanoprost during a 12-week, Phase III, RCT. At Week 12, all patients entering the open-label extension study (from either treatment group) were then treated with preservative-free latanoprost eye drop cationic emulsion for 12 months. Follow up was conducted at Months 6, 9 and 15. Efficacy endpoints included mean (standard deviation [SD]) change from baseline (RCT Day 1, post-washout) in morning IOP (9:00 ± 1 hour), corneal fluorescein staining score (CFS; modified Oxford Grade Scale; baseline CFS ≥1) and ocular surface disease (OSD) symptom score. Adverse events (AEs) were reported throughout the study period.

Results: Overall, 137 patients participated in both the randomized and open-label extension studies. Within this population, 71 used the preservative-free latanoprost eye drop cationic emulsion during the RCT and 66 used preserved latanoprost. At baseline (RCT Day 1), mean (SD) age was 63.6 (10.5) years, 61.8% were female and mean (SD) IOP was 24.12 (1.94) mmHg. At Months 6, 9 and 15, patients treated with latanoprost eye drop cationic emulsion during the RCT demonstrated respective mean (SD) IOP reductions from baseline of 8.94 (2.98), 8.99 (2.70) and 8.66 (2.33) mmHg and those switched from preserved latanoprost at Week 12 showed reductions of 8.25 (2.55), 8.15 (2.74), 7.54 (2.82) mmHg. Prior preserved latanoprost users showed further reductions in CFS score during the open-label study so that the mean change from baseline was similar across groups at Month 15. Average OSD symptom score continued to reduce from baseline through Month 15 in both groups. No serious treatment-related AEs were reported during the open-label study period.

Conclusion: Latanoprost eye drop cationic emulsion demonstrated dual benefit of sustained IOP-lowering efficacy and further improvements in OSD signs and symptoms over the 15-month study period. This innovative latanoprost monotherapy formulation provides a valuable option for OAG/OHT treatment.

295 - P1.048

IN VITRO EVALUATION OF THE PROTECTIVE EFFECT OF SODIUM HYALURONATE AGAINST TOXICITY INDUCED BY ANTI-GLAUCOMATOUS FORMULATIONS

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Purpose: Several studies have shown that topical anti-glaucomatous medication may reduce the viability of corneal epithelial cells. The purpose of this study is to assess the in vitro toxicity induced by anti-glaucomatous medication and to evaluate the protective effect of sodium hyaluronate (SH) in these cases.

Methods: The HEC-2 cell line (human corneal epithelium) was employed. Cell monolayers were exposed to twelve preservative-free (PF) anti-glaucomatous formulations and their vehicles for 30 minutes; we repeated this procedure and added previously PF-SH 0.4% for 30 minutes. Fresh culture media was included after washing and metabolic activity was evaluated by reducing resazurin after 3 hours. Subsequently, data were analyzed by one-way and two-way ANOVA and the results are shown as mean ± SD of 3-6 replicates each.

Results: Most anti-glaucomatous formulations significantly decreased cell viability (Figure 1). However, most vehicles didn't cause a significant cell viability reduction (Figure 2). In those cases, we attribute the toxic effect specifically to the active ingredients of each formulation.

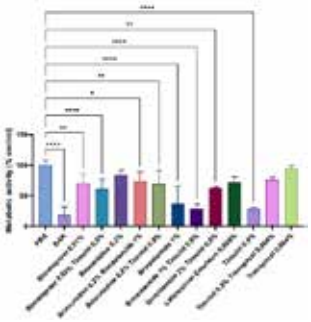

Figure 1. PF Anti-glaucomatous formulations. Cell viability significantly decreased vs PBS in presence of most of the evaluated formulations (*p < 0.05, **p < 0.01, ***p < 0.001, ****p < 0.0001).

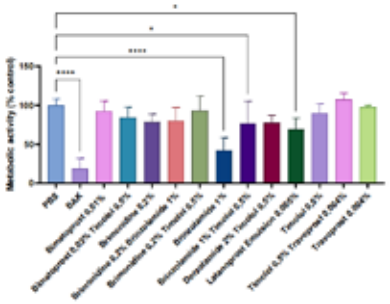

Figure 2. PF Vehicles of anti-glaucomatous formulations. No significant changes in cell viability vs PBS were observed after incubation with most vehicles (*p < 0.05, **p < 0.01, ***p < 0.001, ****p < 0.0001).

PF-SH 0.4% significantly counteracted the toxic effect induced by anti-glaucomatous formulations containing: Bimatoprost 0.01%, Bimatoprost 0.03% + Timolol 0.5%, Brimonidine 0.2% + Timolol 0.5%, Brinzolamide 1%, Brinzolamide 1% + Timolol 0.5% and Dorzolamide 2% + Timolol 0.5%.

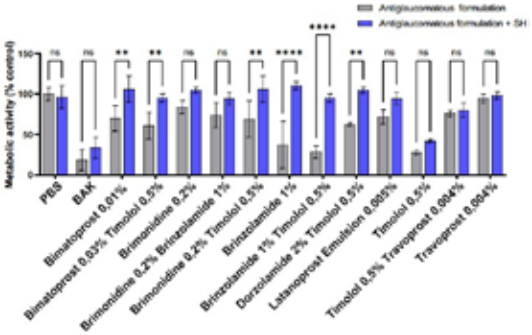

Figure 3. Anti-glaucomatous formulations with and without PF-SH. Cell viability increased significantly in presence of SH (*p < 0.05, **p < 0.01, ***p < 0.001, ****p < 0.0001).

Conclusion:
- Most of the evaluated anti-glaucomatous formulations decreased cellular viability.
- The fact that most of the vehicles did not cause toxicity suggests that anti-glaucomatous active ingredients may produce this effect.
- PF-SH 0.4% demonstrated a protective effect against formulation-induced toxicity containing the following drug classes: prostaglandins, β-blockers, α-adrenergic agonists and carbonic anhydrase inhibitors.

• The protection provided by PF-SH 0.4% could be the result of the improvement of the physiological conditions of the general cell culture, regardless of the drug class.

817 - P1.050

A 24-HOUR EFFICACY AND SAFETY STUDY OF SEPETAPROST VERSUS LATANOPROST IN PARTICIPANTS WITH PRIMARY OPEN-ANGLE GLAUCOMA OR OCULAR HYPERTENSION

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Purpose: Glaucoma is a 24-hour disease. Collecting day and night intraocular pressure (IOP) measurements and understanding the 24-hour efficacy and safety of a novel therapy option, sepetaprost ophthalmic solution 0.002%, versus latanoprost ophthalmic solution 0.005%, a gold standard in antiglaucoma therapy, may delineate their respective future positions in glaucoma care.

Methods: This exploratory, randomised, active-controlled, multicentre European study (EudraCT: 2020-004836-93) in participants aged ≥18 years with primary open-angle glaucoma (POAG) or ocular hypertension (OHT) assessed the IOP-lowering characteristics of sepetaprost versus latanoprost. Following a ≤ 35-day screening period, participants were randomised to receive sepetaprost or latanoprost for 3 months. Participants were followed up for 2 weeks post last study drug dose. The primary endpoint was mean 24-hour IOP at Month 3 with sepetaprost versus latanoprost. Secondary endpoints included mean 24-hour IOP at Week 6, mean IOP at individual timepoints at Week 6 and Month 3 (08:00, 12:00, 16:00, 20:00 hr [diurnal]; 00:00, 04:00 hr [nocturnal]), and mean diurnal (MD) IOP percent change post last study drug dose (36-48 hours for sepetaprost). Safety outcomes included incidence of adverse events (AEs) and suspected adverse reactions (SARs).

Results: Overall, 33 participants received treatment (sepetaprost, n = 17; latanoprost, n = 16). Mean 24-hour IOP was numerically lower with sepetaprost versus latanoprost at Month 3 (-0.88 mmHg; 95% confidence interval [CI]: -2.89, 1.14), and Week 6 (-1.15 mmHg (95% CI: -3.37, 1.06). Lower nocturnal IOP was observed with sepetaprost versus latanoprost at Month 3 (-1.61 mmHg difference; 95% CI: – 4.05, 0.83). Mean difference between groups indicated similar, or numerically lower, IOP with sepetaprost at individual timepoints at Week 6 and Month 3. A partial increase in MD IOP (1.93 mmHg, 12.0%) was observed following sepetaprost cessation. AEs occurred in 13 (76.5%) versus 11 (68.8%) participants with sepetaprost versus latanoprost. A similar SARs incidence was observed for both groups.

Conclusion: In participants with POAG or OHT, mean 24-hour IOP and nocturnal IOP at Month 3 were consistently numerically lower with sepetaprost versus latanoprost. Safety and tolerability profiles were similar between groups.

840 - P1.051

EFFICACY, TOLERABILITY AND SAFETY OF THE PRESERVATIVE-FREE TAFLUPROST 0.0015% AND TIMOLOL 0.5% FIXED-DOSE COMBINATION IN PATIENTS TREATED WITH PRIOR PROSTAGLANDIN MONOTHERAPY: RESULTS FROM A REAL-WORLD SETTING IN GERMANY

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Purpose: Efficacy, tolerability, and safety of the preservative-free tafluprost 0.0015% and timolol 0.5% fixed-dose combination (PFFDC) were evaluated in a multicenter non-interventional study in Germany (INSIGHT Study).

Methods: Patients with glaucoma or ocular hypertension (N = 117) previously treated with prostaglandin (PGA) monotherapy who required a change in medication were switched to once-daily PFFDC. Due to the non-interventional character of the study, the change in medical therapy was made solely at the discretion of the participating ophthalmologists. Intraocular pressure (IOP) readings were recorded at baseline and 4–8 months after changing medical treatment to PFFDC. Severity of conjunctival hyperaemia was evaluated using reference photographs. Corneal staining with fluorescein was also assessed. Subjective symptoms and tolerability were evaluated using a 4-step scale (0 = none, 1 = mild, 2 = moderate, 3 = severe). All adverse events and discontinuations were recorded.

Results: Overall, 110 patients were included in the efficacy analysis. Mean (treated) baseline IOP (± SD) for patients with prior PGA monotherapy was 19.7 ± 3.8 mmHg. Changing medication to PFFDC lowered IOP to 15.4 ± 3.2 mmHg (-21.7%; $p < 0.0001$) after 4–8 months of treatment. At the final visit IOP was ≤ 18 mmHg in 91 patients (82.7%). Corneal staining and conjunctival hyperaemia remained unchanged in 60.6% and 51.8% and improved in 31.7% and 34.2%, respectively. Subjective symptoms were also either unchanged or improved after the change of medication to PFFDC. Few adverse events and discontinuations occurred during the study period. In 3 patients (2.6%) an additional or alternative IOP lowering treatment regimen was needed. Three patients (2.6%) discontinued the study due to drug intolerance and 1 patient due to handling problems with the unit dose containers. In total, 94.0% of all patients completed the study period.

Conclusion: The PFFDC of tafluprost 0.0015%/timolol 0.5% was effective and well tolerated with a favourable safety profile in patients switched from prior treatment with PGA monotherapy. PFFDC provides an additional therapeutic benefit especially in patients treated with PGA monotherapy who require lower target IOP levels.

217 - P1.052

LOTEPREDNOL ETABONATE 0.5% FOR THE TREATMENT OF INFLAMMATION AFTER CATARACT SURGERY IN HIGH MYOPES: A STRATEGY FOR REDUCING INTRA-OCULAR PRESSURE ELEVATIONS

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Purpose: High axial myopia increases the risk of steroid-induced ocular hypertension following cataract surgery. One strategy to mitigate the risk of intra-ocular (IOP) pressure elevation is the use of a lower-potency postoperative topical steroid. This is the first study to assess the incidence of IOP rise after cataract surgery in high myopia comparing Loteprednol vs Prednisolone or Dexamethasone.

Methods: This was a retrospective study comparing long eyes (axial length ≥ 26 mm) that underwent routine cataract surgery between May 2020 and August 2023 at York Teaching Hospital, York, United Kingdom. One cohort was treated postoperatively with Loteprednol Etabonate 0.5%, and the other with either Prednisolone Acetate 1% or Dexamethasone Phosphate 0.1%. The primary outcome measure was steroid response defined as a postoperative IOP rise > 6 mmHg or > 25% from preoperative baseline. The secondary outcome measure was the presence of postoperative inflammation.

Results: We identified 254 cases with a preoperative spherical equivalent refractive error of less than or equal to -4 dioptres. The final analysis included 54 eyes of 45 patients. Of these, 26 eyes were treated with loteprednol, and 28 with Prednisolone or Dexamethasone. The Dexamethasone/Prednisolone cohort experienced three times more steroid responses than the Loteprednol cohort, (RR 0.35, 95%CI 0.11 – 1.18, p = 0.09). The incidence of postoperative inflammation was not significantly different (RR 1.4, 95% CI 0.35 – 5.81, p = 0.6).

Conclusion: Cataract surgeons may consider using postoperative Loteprednol Etabonate 0.5% for highly myopic eyes, to reduce the risk of IOP elevation. This study paves the way for future research investigating postoperative management in high myopia.

327 - P1.053

MANAGEMENT OF SECONDARY GLAUCOMA DUE TO TRAUMATIC CATARACT PATIENT, A CASE REPORT

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Purpose: Traumatic cataract (TC) that may occur after various types of ocular insult is a serious visually challenging sequel of trauma and can cause a secondary glaucoma. To report management of secondary glaucoma due to TC patient.

Methods: A case report study

Results: A 57 years old male came with a complaint of painful right eye (RE) since 1 weeks with a history of blurred vision since two years ago due to blunt trauma to his RE. The visual acuity(VA) on the RE was no light perception and on the left eye (LE) was 1/60 . The intra ocular pressure (IOP) on the the RE was 77 mmHg and on the LE was 12 mmHg. Van Herrick grade was I. Anterior segment examination showed a lens in the anterior chamber. Gonioscopic examination of RE is Grade 0 (Schaeffer). Posterior segment of RE are difficult to examined. Patient was managed by lens extraction with small incision cataract surgery and mannitol intra venous pre-operation then RE IOP lowered to 44 mmHg. The RE IOP post operation was 7 mmHg and on the LE was 10 mmHg.

Conclusion: TC can cause secondary angle closure glaucoma due to a close iridotrabecular contact by a lens. A lens extraxtion was needed to lower the elevated IOP. Antiglaucoma medication should be used early to help reduce the IOP for a safe lens extraction procedure.

Keywords: Secondary Glaucoma, Ocular trauma, Lens Extraction.

204 - P1.054

EFFICACY OF SELECTIVE LASER TRABECULOPLASTY AS AN ADJUNCTIVE TREATMENT IN OPEN-ANGLE GLAUCOMA

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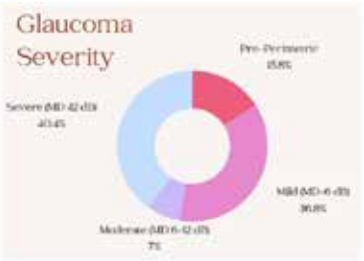
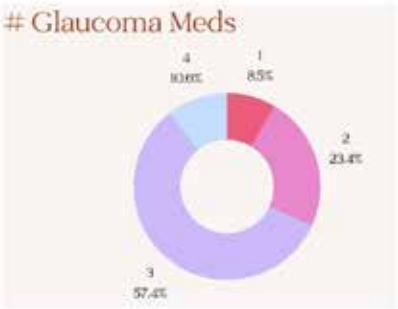
Purpose: The study aims to assess the efficacy of Selective Laser Trabeculoplasty (SLT) as an adjunctive therapy for patients with open-angle glaucoma (OAG) already on topical intraocular pressure (IOP)-lowering medication.

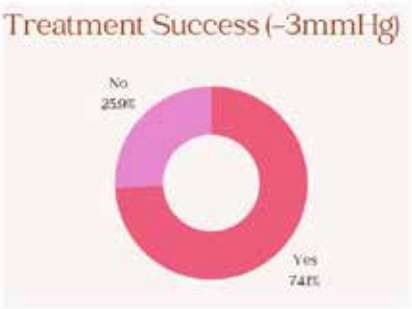
Methods: 57 eyes from OAG patients on IOP-lowering drops were treated with SLT using a Q- switched Nd:YAG laser, targeting 100 non-overlapping spots on the trabecular meshwork. Success was primarily measured by a reduction in baseline IOP of ≥3 mmHg at a 6-week follow- up, alongside secondary outcomes like the average IOP decrease, frequency of IOP spikes, and the number of required IOP-lowering medications.

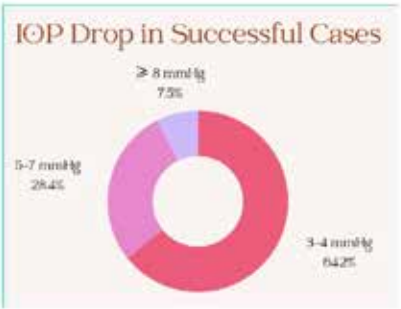
Results: The average age was 71.4 years with 44% male and 56% female, predominantly Caucasian at 91.2% and 8.8% Black. The baseline IOP was 19.2 mmHg. In terms of disease severity, 40.4% had severe glaucoma, 7% had moderate, 36.8% had mild, and 15.8% were pre-perimetric. Medication use varied, with 10.6% on four IOP- lowering agents, 57.4% on three, 23.4% on two, and 8.5% on one. Post SLT, a 6-week follow-up showed that 74.1% of patients met the treatment success criteria, with an average IOP reduction of 3.72 mmHg or 19.3%. Patients with mild glaucoma saw a 3.3 mmHg reduction, while those with severe glaucoma experienced a 4.4 mmHg reduction. IOP spikes occurred in 5% of cases, and the number of medications remained unchanged.

Conclusion: SLT is an effective adjunctive treatment for reducing IOP in patients with OAG who are already on topical medication, with significant IOP reduction noted at 6 weeks post-treatment and minimal complications. The results are particularly promising for patients with more severe cases of glaucoma, though the long-term sustainability of the IOP reduction warrants further study.









284 - P1.056

MINIMALLY INVASIVE NASAL TRABECULOSTOMY (MINT) FOR THE SURGICAL TREATMENT OF OPEN ANGLE GLAUCOMA - ONE YEAR RESULTS

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Purpose: To report 1 year results of MINT™ operation in open angle Glaucoma Caucasian patients.

Methods: The MINT™ device (Sanoculis, Israel) automatically creates round openings in the functional trabecular meshwork by an ab-interno approach. Sixty six operations were done, of which 58 cases have completed a 12 months follow-up period.

Results:

N	FU (months)	Duration of surgery [min:sec]	Preoperative IOP ± STDEV [mmHg]	Postoperative IOP ± STDEV [mmHg]	% reduction in IOP
58	12	3:00 ± 1:33	22.9 ± 1.6	14.6 ± 2.7	36.2%

Preoperative Meds ± STDEV	Postoperative Meds ± STDEV	% reduction in meds	% adverse events	Success rate with medication	Success rate with no medication
0.89 ± 0.8	0.26 ± 0.6	70.7%	22	91.3% (53/58)	75.6% (45/58)

Success rate (FDA definition): at least 20% IOP reduction on same or less medications.

Conclusion: The minimally invasive anti-glaucoma surgical procedure done with the new MINT™ surgical device was found satisfactory in open angle glaucoma patients. The efficacy and safety results were found similar to other trabecular by-pass procedures. However, the MINT™ procedure is simpler and faster than most other procedures.

319 - P1.057

INTRAOPERATIVE OCT IMAGING UTILITY FOR XEN 63 DEVICE IMPLANTATION: EFFICACY AND SAFETY

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Purpose: To evaluate the efficacy and safety of XEN 63 device (Abbvie) in glaucoma patients and the benefits of intraoperative OCT for device implantation.

Methods: We retrospectively investigate 20 eyes of 19 patients who underwent Xen 63 device implantation between November 2022 and December 2023 at University Hospital Trias i Pujol, Barcelona. Surgery was assisted with intraoperative OCT in all patients. Localization of needle injector in trabecular meshwork, Xen gel implanted in subconjunctival or subtenon's space and visualization of implant in anterior chamber with OCT was registered. Intraocular pressure (IOP) reduction, postoperative complications, number of needlings and glaucoma medications required were also registered up to 12 months after surgery.

Results: In terms of intraoperative OCT analysis, in all cases we could visualize tip of the needle in trabecular meshwork and subtenon's space properly. All Xen gel were implanted subtenon's and in just 5 cases was possible to visualize it in the anterior chamber angle. Mean IOP was reduced from 20.23 ± 4.15 to 13.83 ± 4.02 mmHg at 6-month follow-up ($p < 0.05$). Mean number of medications was reduced from 3 ± 0.83 to 0.33 ± 0.7 at the 6-month follow-up ($p < 0.05$). Needling revision was performed in 3 patients (15%). Surgical revision was done in one patient (5%). There were no cases of severe postoperative complications as hypotony, xen extrusion or endophthalmitis.

Conclusion: Xen Gel implant is a safe and effective technique for uncontrolled glaucoma. The use of intraoperative OCT might help to improve implantation technique, visualizing area of injection, implant localization in the subconjunctival or intracameral space.

321 - P1.058

EVALUATION OF OPTIC DISK MICROVASCULATURE FOLLOWING GLAUCOMA SURGERY: AN OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY (OCT-A) STUDY

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Purpose: To analyse the effect of glaucoma surgery on the vessel density (VD) of the optic disk and peripapillary region using OCT-A

Methods: 10 pseudophakic eyes of 8 patients with moderate-to-severe primary open-angle glaucoma (POAG) treated with anti-glaucoma drops received filtering surgery in a 1:1 (trabeculectomy TE: XEN) ratio. Intraocular pressure (IOP) measurements were performed before surgery and at each follow-up visit. Swept-source OCT scanning of optic nerve head (ONH) and OCT-A (DRI-OCT Triton; Topcon, Tokyo, Japan) of the treated and fellow eyes were performed before and one month after surgery.

Results: At one month postoperatively IOP was significantly decreased from 25 ± 8 mmHg to 15 ± 3 mmHg in the TE group and from 23 ± 4 mmHg to 17 ± 5 mmHg in the XEN group compared with baseline. At one month postoperatively an increase in radial peripapillary capillary plexus (RPC) density of about 15% was observed in 3 out of 5 eyes in the TE group and in 2 out of 5 eyes in the XEN group. This increase was greater in the inferior quadrant in both groups. VD remained stable in the rest of the treated eyes. No change was detected in the fellow eyes.

Conclusion: At one month following filtering surgery, an increase in RPC density was observed in about 50% of eyes. This may be due to the sudden IOP reduction following glaucoma surgery, which possibly results in better perfusion of the optic disk according to the vascular theory in glaucoma.

331 - P1.059

SELECTIVE LASER TRABECULOPLASTY AFTER MEDICAL TREATMENT IN THE LIGHT TRIAL EXTENSION

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Purpose: SLT is a safe primary treatment for OAG and OHT, providing long-term disease control and a reduced need for incisional glaucoma over 6 years compared to eye drops alone. The use of SLT as a second-line treatment is still not standardised.

Methods: Patients initially randomised to either primary SLT or primary eye drops remained on the allocated treatment pathway for 3 years. After 3-years patients on drops were allowed secondary SLT as either a treatment switch or an escalation. Patients continued to be treated and monitored according to the predefined LiGHT study protocol.

Results: 633 patients entered the LiGHT extension and 524 (82.8%) completed the full 6 years. Of 320 that initially received eye drops, 112 (35%) chose to receive SLT; 70 patients switched, 29 patients escalated and 13 patients had an escalation in one eye and a switch in the other eye. At 72 months 60.5% of eyes that switched to SLT were drop-free with no glaucoma surgery and the mean number of medications was significantly reduced after secondary SLT (1.38 to 0.59, $p < 0.001$). Eyes receiving secondary SLT as a treatment escalation had the highest overall trabeculectomy rate (18.6%, $p < 0.001$) (9.5% were drop-free, mean medication 1.94 vs 1.73).

Conclusion: Eyes with OHT or mild glaucoma and medically controlled IOP can successfully and safely reduce their medication load with SLT. Offering SLT to eyes progressing despite medical treatment is less likely to achieve adequate pressure control and prevent the need for surgery.

337 - P1.060

SHORT- AND LONG-TERM SAFETY PROFILE OF PRESERFLO MICROSHUNT IN PATIENS WITH OPEN-ANGLE GLAUCOMA: UP TO 5 YEARS INTERIM RESULTS OF A RETROSPECTIVE MONOCENTRIC OBSERVATION

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Purpose: The PreserFlo MicroShunt (Santen) is a glaucoma implant for subconjunctival drainage from an external approach. The surgical procedure is one of the new microinvasive bleb surgeries (MIBS) that developed the last decade for patients with open-angel-glaucoma (OAG).
To evaluate postoperative 5-year safety data, we analyzed our patient population according to the "New guide on surgical innovation for glaucoma" of the European Glaucoma Society. All patients were treated at Breyer Kaymak Klabe Augenchirurgie Düsseldorf, Germany.

Methods: The PreserFlo MicroShunt was implanted as a standalone procedure in 708 eyes of 473. We have currently analyzed the first 72 eyes. During surgery, mitomycin C (mmC) -soaked sponges withmmC concentrations of 0.02% were applied under the sub-tenon layer for 2 minutes. We regularly monitored intraocular pressure (IOP), the number of postoperative medications, visual acuity, visual field defects as well as complications and postoperative interventions.

Results: *Complications:* Microhyphaema (< 0.5 mm) occurred in 21% and visible hyphaema (> 0.5 mm) in 8% of the observed eyes up to one week after the surgery. Only 3% of our patients had clinical hypotony with an IOP < 6 mmHg up to 3 months. In 2%, anterior synechiae developed 0.5-1.5 years after surgery. Choroidal detachment was observed in 12% of eyes 1 week and in 2% up to 3 months after surgery. 3% of the eyes still had a flat anterior chamber after 1 week. 50% of the treated eyes were phakic. More than 60% of them developed a visible cataract after 1 to 2 years. *Postoperative interventions:* Due to the use of a low local dose of 0.02%mmC during surgery in our first patients, we observed a relatively high frequency of bleb revision of 34% (25 of 72 eyes) and a required postoperative treatment withmmC of 54% (39 of 72 eyes) in the first year The use of 0.04%mmC during surgery reduces these rates by a factor of around 3.5 and 2 respectively.

Conclusion: The PreserFlo MicroShunt shows a very effective reduction of intraocular pressure. The number of complications is significantly lower compared to trabeculectomy. After 2 years no more complications were observed.

382 - P1.061

EFFICACY AND SAFETY OF PRESERFLO MICROSHUNT IMPLANTATION AND ITS EFFECTS ON INTRAOCULAR INFLAMMATION THROUGH LASER FLARE PHOTOMETRY

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Purpose: The primary objective of this study is to evaluate the efficacy and safety profile of PreserFlo MicroShunt implantation in the medium to long-term follow-up of patients with open-angle glaucoma. The secondary objective is to analyze laser flare meter (LFM) values before and after PreserFlo MicroShunt implantation.

Methods: This prospective, observational, longitudinal single-center study included a total of 62 eyes from 54 patients. A subgroup of 27 eyes (26 patients) reached the 12-month follow-up. Success was defined based on three criteria: criterion A: IOP ≤ 21 mmHg and ≥ 20% reduction; criterion B: IOP ≤ 15 mmHg and ≥ 25% reduction; criterion C: IOP ≤ 12 mmHg and ≥ 30% reduction. Success was further categorized as complete if achieved without IOP-lowering medications, and qualified if achieved with medication administration. Other aspects evaluated included the number of IOP-lowering medications (baseline and postoperative), development of postoperative complications, 5-FU injections or implant revision, LFM values.

Results: Success rates at 12 months were as follows: 96% for criterion A, 67% for criterion B, and 30% for criterion C. 67% of the patients achieved complete success, 29% achieved qualified success, and one eye (4%) experienced failure. IOP decreased from 25.26 ± 1.67 mmHg at baseline to 14.81 ± 0.74 mmHg at 12 months. The number of medications decreased from 3.67 ± 1.30 at baseline to 0.48 ± 0.75 at 12 months. Complications were observed in 3 cases (11%): one case of hypotony and two cases of choroidal detachment. 13 eyes (48%) received 5-FU injections, while 7 eyes (26%) underwent implant revision. No significant increase in LFM values was observed. Eyes with a regular postoperative course and IOP ≤ 15 mmHg showed significantly lower LFM values than patients with unfavorable outcomes (IOP > 15 mmHg, development of complications, 5-FU injection, or implant revision).

Conclusion: PreserFlo MicroShunt showed a significant reduction in IOP and a decrease in the number of IOP-lowering medications. Complications occurred at a modest frequency. The implant provides a minimally invasive approach with no significant increases in LFM values postoperatively. Higher LFM values correlate with unfavorable postoperative outcomes.

399 - P1.062

CANALOPLASTY IN PATIENTS WITH ADVANCED GLAUCOMA: A 10-YEARS EXPERIENCE

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Purpose: To report our 10-year experience and to assess the safety and efficacy of canaloplasty, a procedure involving circumferential viscodilation and tensioning of the inner wall of Schlemm's canal to treat open-angle glaucoma, especially in patients with advanced glaucomatous loss of the visual field (VF)

Methods: This retrospective study included 24 adult open-angle glaucoma patients with advanced glaucomatous loss of the VF (MD > 12 Hodapp's classification) and comorbidity, that in the most cases need antiplatelet or anticoagulant drugs, who underwent canaloplasty or combined cataract-canaloplasty surgery. A flexible microcatheter was used to viscodilate the full circumference of the canal and to place a trabecular tensioning suture. Postoperative visits were conducted up to 3 years after surgery. Primary outcome measures included IOP, glaucoma medication use and adverse events.

Results: Canaloplasty led to a significant 42,7% reduction in IOP after 3 years (pre-op IOP of 23,5mmHg ± 8.1 SD vs. 13 ± 2 SD after surgery) and a reduction in medication use of 66.7 % (mean medication use 3 ± 1 SD vs 1 ± 1(SD) after surgery). The procedure failed in 20,8% of the cases (5/24). The main complication consisted in intraoperative macroperforation (2/24)

Conclusion: Canaloplasty led to a significant and sustained IOP reduction in adult patients with open-angle glaucoma and advanced glaucomatous loss with an excellent short- and long-term postoperative safety profile.

409 - P1.063

COMPARISON OF MICROSHUNT IMPLANT LOCATIONS IN PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA: POST-HOC ANALYSIS FROM A 2-YEAR STUDY

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Purpose: This was a post-hoc analysis from a 2-year, randomized study comparing safety and efficacy of MicroShunt versus trabeculectomy in participants with primary open-angle glaucoma (NCT01881425), to assess whether MicroShunt implant quadrant location impacted surgical success at Month 24. In the study, surgical success (≥ 20% reduction in intraocular pressure [IOP] from baseline without increasing the number of glaucoma medications) was observed in 50.6% and 64.4% of MicroShunt and trabeculectomy participants, respectively (p = 0.005). Adverse events (AEs) were similar between groups.

Methods: The primary post-hoc endpoint was to compare surgical success based on different MicroShunt quadrant locations: superonasal (right eye: 1 and 2 o'clock; left eye: 10 and 11 o'clock) versus superotemporal (right eye: 10 and 11 o'clock; left eye: 1 and 2 o'clock). The secondary post-hoc endpoint was to compare surgical success based on non-12 o'clock versus 12 o'clock locations. P-values were calculated using Pearson chi-squared test for MicroShunt, and non-inferiority Farrington-Manning test for MicroShunt versus trabeculectomy. Post-operative interventions were assessed, and safety outcomes were post-operative ocular AEs.

Results: In MicroShunt participants, the quadrant locations were: superonasal (n = 71), superotemporal (n = 99), non-12 o'clock (n = 170), and 12 o'clock (n = 225). At Month 24, a numerically higher proportion of participants achieved surgical success with superonasal (63.4%) versus superotemporal (54.5%); absolute difference, 8.9%, P = 0.2494. A significantly higher proportion achieved surgical success with non-12 o'clock (58.2%) versus 12 o'clock (44.9%); absolute difference, 13.3%, P = 0.009. Surgical success with trabeculectomy (n = 132) at all locations (64.4%) was numerically higher than with MicroShunt at non-12 o'clock (58.2%); absolute difference, -6.2%, P = 0.056. For MicroShunt, proportions of any post-operative interventions were similar for superonasal versus superotemporal (49.3% versus 51.5%), and non-12 o'clock versus 12 o'clock (50.6% versus 59.1%). Any post-operative AEs (incidence ≥ 5%) occurred in similar proportions of superonasal versus superotemporal participants (87.3% versus 90.9%), and non-12 o'clock versus 12 o'clock participants (89.4% versus 95.1%). The most common AE for all MicroShunt locations was increased IOP requiring treatment.

Conclusion: These data indicate that MicroShunt at superonasal and non-12 o'clock locations may result in higher surgical success (≥ 20% reduction in IOP without increasing glaucoma medications) at 24 months.

410 - P1.064

ENDOTHELIAL CELL LOSS WITH MICROSHUNT VERSUS TRABECULECTOMY IN PARTICIPANTS WITH PRIMARY OPEN-ANGLE GLAUCOMA: RESULTS FROM A 5-YEAR EXTENSION STUDY

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Purpose: This MicroShunt versus trabeculectomy trial was a pivotal, 2-year, randomised study (Clinicaltrial.gov: NCT01881425) comparing the safety and efficacy of MicroShunt (n = 395) versus trabeculectomy (n = 132) in participants with primary open-angle glaucoma. The extension phase (NCT04333433) collected safety data through 5 years' follow-up post-procedure. Endothelial cell (EC) loss was compared between procedure groups.

Methods: The extension phase was a prospective, concurrent controlled, open-label study. EC loss was investigated up to Month 60 post-procedure. Participants were eligible if they completed Month 24 and were able to complete the Month 60 follow-up visit (additional follow-up visits occurred at Months 36 and 48). EC loss was defined as losing ≥ 30% EC from screening to Month 60. Participants in either group in whom the anterior chamber was entered for non-MicroShunt-related indications (e.g., reoperation with trabeculectomy, implantation of other glaucoma drainage device, iridotomy/iridectomy, cataract extraction) or who had the entire MicroShunt explanted were censored from analysis after the qualifying event. No imputation was performed on censored EC data.

Results: Overall, 217 MicroShunt participants and 62 trabeculectomy participants were enrolled in the extension study. In the censored population at Month 24, 6/178 (3.4%) MicroShunt versus 3/53 (5.7%) trabeculectomy participants had experienced EC loss from screening (difference [MicroShunt–trabeculectomy], 95% confidence interval (CI): −2.3%, −12.2%, 3.0%; nominal p = 0.43). By Month 60, 17/119 MicroShunt (14.3%) versus 5/39 trabeculectomy (12.8%) participants had experienced EC loss (difference: 1.5%, 95% CI, −13.4%, 11.8%; nominal p = 1.00). Mean (standard deviation) EC density at Month 24 was 2188.9 (430.2) cell/mm2 in MicroShunt participants and 2105.8 (456.6) cell/mm2 in trabeculectomy participants (difference [MicroShunt–trabeculectomy]: 83.1, 95% CI, −57.1, 223.3; nominal p = 0.24). At Month 60, EC density was 2024.5 (533.0) and 1905.0 (574.4) cell/mm2 in participants with MicroShunt and trabeculectomy, respectively (difference: 119.5 cell/mm2, 95% CI, −88.7, 327.8; nominal p = 0.26). There was no difference between groups in terms of mean change (46.6 cell/mm2, 95% CI, −128.6, 221.9; nominal p = 0.60) or mean percent change (difference: 2.2%, 95% CI, −5.5%, 9.8%; nominal p = 0.57) in EC density from screening at Month 60.

Conclusion: This 5-year extension study demonstrates no difference in EC loss post-MicroShunt or trabeculectomy in the censored population.

411 - P1.065

A SERIES OF ACUTE CORNEAL EDEMA AND RESIDUAL SUBEPITHELIAL HAZE AFTER BILATERAL SELECTIVE LASER TRABECULOPLASTY

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Purpose: To report 3 cases of corneal edema and subepithelial haze soon after bilateral selective laser trabeculoplasty.

Methods: Selective laser trabeculoplasty was performed for the treatment of open-angle glaucoma on 3 female, middle aged patients who subsequently developed corneal stromal haze within 24 to 48 hours after the procedure.

Results: The patients were treated with topical steroids for several weeks. Due to uncontrolled intraocular pressure, one patient underwent a trabeculectomy. The corneal edema resolved. However, all three patients were left with a hyperopic shift.

Conclusion: Corneal edema and subepithelial haze after selective laser trabeculoplasty is an extremely rare event. Although certain causes are postulated to play a role in this complication, it is not yet understood what may predispose a patient to corneal changes as a result of this laser procedure.

413 - P1.066

COST AND SAFETY OF GLAUCOMA SURGERY: TRABECULECTOMY VS XEN GEL IMPLANT

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Purpose: To estimate and compare the actual costs of trabeculectomy and XEN-gel implantation also considering the follow-up and the complications.

Methods: Our study is a three years retrospective observational real-life study conducted on glaucoma patients treated by trabeculectomy or XEN implantation at the Genoa Eye Clinic. Twenty-six trabeculectomies and 92 XEN implants were included in the study. Only patients whose follow-up was performed in our clinic were included in the study. The cost of surgical treatment included in both types of surgery: fixed hospitalization costs, staff costs, disposable and reusable material, hospitalization costs, cost of XEN, postoperative follow-up costs. As part of the postoperative follow-up, we considered: the number of visits, revisions of the filtering draft by needling, mitomycin injections, injection of viscoelastic substances in case of hypotonicity, use of hypotonizing drugs, often predictive of surgery failure, treatment failure and possible reintervention.

Results: Based on the parameters considered, the average total cost per patient, according to the type of surgery received, was: 1913,60 euros for trabeculectomy and 2914,70 euro for XEN implantation. XEN gel implant required the important addition of the device, which cost 978.32 euro alone. Surgical time was around 17 minutes and 39 minutes for xen and trabeculectomy, respectively. Surgical complications were slightly higher in trabeculectomy group, while the number of visits during the follow-up was similar.

Conclusion: Penetrating surgery with trabeculectomy remains the gold standard because of the lower IOP target, few complication and failure rates, as well as the lower intra-operative cost that was maintained in follow-up. It would be interesting to assess which treatment in the longer term could help the National Health System to save money. This analysis can be carried out over the next few years, requiring a prolonged time of investigation.

421 - P1.067

COMBINED PHACO-ELIOS: FIRST EXPERIENCE IN FRANCE

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Purpose: To evaluate the effectiveness and safety of combined Excimer laser trabeculostomies with phacoemulsification (Phaco-ELIOS) in the management of patients with glaucoma.

Methods: Prospective, single-center study of patients undergoing combined Phaco-ELIOS surgical procedure since January 2023. To this day patients continue to be included. The main main outcome measures is the reduction in postoperative intraocular pressure (IOP) and number of postoperative hypotensive medications. Clinical data was collected on day 1, month 1 and every 3 months thereafter in the postoperative period. Intra- and postoperative events were also recorded.

Results: On the day of submission, 37 eyes of 20 patients were included for the analysis, with a mean age of 67.44 ± 9.19 years. The preoperative IOP was 16.35 ± 3.23 mmHg with an mean number of 1.81 hypotensive medications. Postoperatively, IOP was significantly reduced to 13.61 (SD 2.35) at M1, to 13.50 (SD 1.17) at M3 and to 15.63 (SD 2.84) at M6 ($p < 0.01$). The number of hypotonsive medications decreased to 1.50 (SD 1.06) at D7, then 1.86 (SD 1.10) at M1, then 0.83 (SD 0.93) at M3, and finally 0.63 (SD 0.80) at M6 ($p < 0.01$). No serious intra- or postoperative events were reported during this study. The results at M12 and M18 will be known during the presentation in June 2024.

Conclusion: Minimally invasive glaucoma techniques continue to grow, meeting a need for reliable and consistent therapeutic options in the management of glaucoma without the significant and sometimes severe complications associated with more invasive surgeries such as filtering procedures or valves. Combined phaco-ELIOS procedure showed a significant reduction in IOP and number of hypotensive medications with 6 months of follow up.

444 - P1.068

AQUEOUS MISDIRECTION FOLLOWING POST-XEN GEL INTERVENTION IN PSEUDOEXFOLIATION GLAUCOMA: A CASE REPORT

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Purpose: To report a case of Malignant Glaucoma subsequent to Xengel intervention in pseudoexfoliation glaucoma.

Methods: Case report

Results: An 84-year-old Thai male diagnosed with pseudoexfoliation glaucoma in both eyes, with a pseudophakic condition, displayed uncontrolled intraocular pressure despite medications in the right eye. His visual acuity was decrease, and intraocular pressures measured OD 44 mmHg and OS 22 mmHg. Opting for Xengel surgery with mitomycin in the right eye, the procedure proceeded without complications.On the seventh day post-surgery, the patient presented at the outpatient department reporting severe eye pain and reduced vision. His intraocular pressure had spiked to 44 mmHg, displaying microcystic edema in the cornea, and an anterior segment Optical Coherence Tomography(OCT) revealed anterior displacement of ciliary body processes without choroidal fluid, leading to a diagnosis of malignant glaucoma. Subsequently, an anterior vitrectomy was performed, and the anterior chamber was reformed. This resulted in controlled intraocular pressure with no recurrence of malignant glaucoma post-operation. However, inflammation led to the failure of the Xengel tube, causing a rise in intraocular pressure. Consequently, the patient underwent trabeculectomy withmmC for improved IOP control.

Conclusion: Xengel is a form of Minimally Invasive Glaucoma Surgery (MIGS) utilized for managing eye pressure in glaucoma patients. This procedure notably improves outcomes by minimizing complications compared to traditional surgeries. Consequently, the lower complication rate associated with minimally invasive glaucoma surgery has led to its increased utilization.The occurrsence of malignant glaucoma following Xengel intervention is a rare complication linked to this minimally invasive procedure. This case highlight the importance of postoperative monitoring, especially in managing intricate glaucoma cases, notably those involving pseudoexfoliation glaucoma.

521 - P1.070

SUCCESSFUL MANAGEMENT WITH PAUL GLAUCOMA DRAINAGE IMPLANT AFTER COMPLICATED BLEB NEEDLING WITH UVEAL PROLAPSE INTO THE BLEB TEN YEARS AFTER TRABECULECTOMY

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Purpose: Complications following needling after trabeculectomy are typically not severe. However, there is potential for sight-threatening issues, particularly in cases involving multiple prior surgeries and antimetabolite use. We aim to detail a previously undocumented sight-threatening complication arising after needling and outline the successful treatment approach utilizing the new Paul-GDI.

Methods: A 52-year-old Caucasian patient, with positive family history of glaucoma, presented a decade after bilateral trabeculectomy, with decompensated open-angle glaucoma, exhibiting an intraocular pressure (IOP) of 30 mmHg in the right eye (RE) and 42 mmHg in the left eye (LE). Multiple cyclophotocoagulations have been previously performed. Severe ocular surface inflammation (OSI) was observed due to eye drop intolerance. Comprehensive data, medical history, ocular examinations, surgical procedures, and subsequent follow-ups, were collected and analyzed.

Results: Both eyes exhibited scarred blebs without evidence of scleromalacia. Simultaneous bilateral bleb-needling was performed, resulting in IOP reduction to 7 mmHg (RE) and 12 mmHg (LE). However, IOP in the LE rose to 34 mmHg within 5 days, accompanied by scleral melting and uveal prolapse into the bleb; anterior chamber and vitreous bleeding were also present. Subsequent vitrectomy with a Tutopatch and anterior chamber washout was performed. After 10 days, IOP increased again to 42 mmHg and therefore a Paul-GDI was implanted at the inferior temporal quadrant. A subsequent rise in IOP to 25 mmHg within 10 days necessitated a revision with mitomycin C and IOP sank to 8 mmHg. All eyedrops, previously inducing OSI, were discontinued. After 5 months, no eyedrops were required, the patient exhibited no signs of OSI, and the IOP was stable at 14 mmHg (RE) and 11 mmHg (LE). Best-corrected visual acuity (decimal) remained good at 0.9 (RE) and 0.8 (LE).

Conclusion: To the best of our knowledge, this marks the first documentation of a choroidal prolapse into a filtration bleb. Application of cytostatic agents and multiple cyclophotocoagulations could be the catalyst for the ensuing scleral melting. The Paul-GDI has proven to be an efficient treatment option of such highly complex cases, characterized by significantly compromised sclera, prior scleral perforations, ultimately ensuring an acceptable IOP, while preserving good visual acuity.

525 - P1.071

THREE-YEARS EFFECTIVENESS AND SAFETY OF XEN45 IMPLANT: DATA FROM THE ITALIAN XEN GLAUCOMA TREATMENT REGISTRY

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Purpose: Evidence of long-term performance of the XEN45 implant is still limited. We performed a registry-based study to evaluate the 3-year effectiveness and safety of the XEN45 implant, either alone or in combination with phacoemulsification, in patients from the Italian XEN-Glaucoma Treatment Registry.

Methods: Data from patients affected by open-angle glaucoma who underwent XEN45 implant alone or combined with phacoemulsification was analyzed. We used repeated measures ANOVA to test changes in intraocular pressure (IOP) and number of ocular hypotensive medications (OHMs). Rates of eyes classified as complete or qualified success at 36 months (IOP < 18 mmHg and ≥20% IOP reduction from baseline, without or with OHMs) and pre- and intraoperative factors predicting surgery failure were explored with survival analysis and a multivariate Cox hazard model, respectively. Both last observation carried forward (LOCF) and per-protocol (PP) analysis were performed.

Results: A total of 239 eyes (239 patients) were analyzed: 144 (60.2%) in the XEN-solo and 95 (39.8%) in the XEN+Phaco groups. Overall success was achieved in 164 (68.1%) of eyes [113 (68.9%) complete and 51 (31.1%) qualified], with comparable success (p = 0.07) and survival rates (p = 0.46) between groups. Baseline IOP dropped from a median(IQR) of 23.0 (20.0–26.0) mmHg to 15.0 (12.0–17.5) mmHg at month 36 (p < 0.01), with an overall 34.1 ± 20.1% IOP reduction. The mean ± SD number of OHMs decreased from 2.7 ± 0.9 at baseline to 0.9 ± 1.1 at 36 months (p < 0.01). PP and LOCF analysis yielded analogous results. Neither pre- nor intraoperative factors were significantly predictive of surgery failure (Figure 1). At least one postoperative complication was reported for 91 (38.1%) and 57 (23.8%) eyes, respectively early (< month 1) and late (≥month 1) during follow-up, all self-limiting or treated without sequelae. During follow-up, 68 (28.5%) eyes needed at least one needling. Endothelial cells count only marginally decreased in the XEN+Phaco (p = 0.05), but not in the XEN-solo group (p = 0.06).

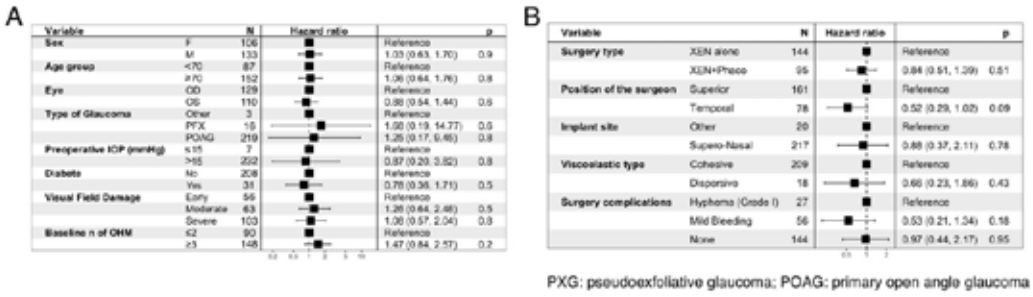

Figure 1. Cox hazard models for pre- (A) and intraoperative (B) factors predicting surgery failure.

Conclusion: At 3 years, the XEN45 implant, either alone or in combination with phacoemulsification, effectively and safely reduced IOP and the need for OHMs.

(Submitted to ARVO 2024)

529 - P1.072

SELECTIVE SUCCESS IN SELECTIVE LASER TRABECULOPLASTY

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Purpose: To assess SLT efficacy in our population and consolidate its role in our practice.

Methods: We prospectively analyzed 44 eyes of 24 patients with Primary Open Angle Glaucoma (POAG) undergoing 180° SLT. Patients were selected due to either inadequate IOP control despite medical treatment or medication intolerance. Patients were categorized by age, sex and race. IOP and number of hypotensive medications were analyzed preoperatively and at 1 week and 1, 2, 3 and 6 months postoperatively. Success was defined as an IOP reduction of at least 20%.

Results: Mean patient age was 66.2 years (range 37-86), 43.2% were male and 56,8% were female, 27.3% were black and 72.7% were white. Mean baseline IOP was 18.9 ± 4.7 mmHg and median number of hypotensive medications was 3. Mean follow-up time was 5 months (range 3-6). Mean IOP reduced significantly to 14.9 ± 3.8 mmHg at 6 months, with a success rate of 46.6%. Among success cases, mean IOP reduction was 35.5%. Mean IOP and success rate did not change significantly between 1 week and 6 months. Higher baseline IOP was associated with significantly larger IOP reduction (28.8% reduction with baseline IOP ≥ 21 vs 9.8% reduction with baseline IOP < 21, $p < 0.05$). Age, sex, race, and number of medications were not associated with significant differences in IOP reduction or success rate, although a statistically non-significant trend towards greater IOP reduction was noted with black individuals when compared to white (21.6% vs 14.8%, $p > 0.05$).

Conclusion: We observed significant mean IOP reduction with SLT, with a modest success rate of 46.6% at 6 months. IOP reduction among responders was clinically significant (mean IOP reduction 35,5%). Higher baseline IOP was the only factor predictive of higher success rates, in line with prior published work. Thus, our relatively lower mean baseline IOP may hamper our success rate. Despite not being effective in all patients, SLT achieved clinically relevant IOP reduction among responders, asserting its usefulness in clinical practice. Predicting responders for targeted patient selection remains a challenge in need of further investigation.

533 - P1.073

SAFETY AND EFFICACY OF MICROPULSE TRANSSCLERAL CYCLOPHOTOCOAGULATION IN EYES AFFECTED BY ADVANCED PRIMARY GLAUCOMA

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Purpose: To assess safety and efficacy of micropulse transscleral cyclophotocoagulation (MTS-CPC) in eyes affected by primary advanced glaucoma. Last innovations regarding MTS-CPC improved the reliability of this treatment and it could represent an interesting option.

Methods: In this retrospective study were included 63 eyes of 39 patients (mean age 67.84 ± 11.65 years) affected by advanced primary glaucoma. They were treated with MTS-CPC using a renewed, better fitting the sclera, probe using always same energy protocol. Glaucoma medications, intraocular pressure (IOP), visual acuity, mean deviation (MD) of standard automated perimetry (SAP) and any complications were recorded at 1, 3, 6 and 12 months follow up. Treatment success after treatment, was defined as following conditions: IOP of 9-20 mmHg, 20% reduction from baseline, oral acetazolamide suspension and/or reduction of the topical therapy with IOP in the 9-20 mmHg range.

Results: Before treatments, mean IOP was 22.12 ± 6.74 mmHg (ranging from 12 to 41 mmHg), mean drugs used was 2.95 ± 0.85 (ranging from 1 to 4), 8 of them were assuming oral acetazolamide. After 1 month no patients were assuming oral acetazolamide, no significant change in topical therapy whereas, a significant $p < 0.01$) reduction of mean IOP: 14.15 ± 2.2 mmHg (from 10 to 18 mmHg) was observed. After 1 year mean IOP was 13.2 ± 1.48 (from 11 to 15 mmHg) ($p < 0.01$) whereas mean topical drugs assumed was 2.52 ± 0.58 (from 2 to 3) ($p = 0.55$). After 1 year, no reduction in visual acuity and MD were observed ($p = 0.12$ and $p = 0.26$ respectively). Success rate at 12 months was 93.65%.

Conclusion: According to data observed in this study, MTS-CPC is able to provide an IOP reduction after 1 month and it remains stable at 12 months follow up, even if no significant reduction of topical therapy has been observed, this treatment allowed to definitely suspend oral acetazolamide treatment. Even if these data need to be confirmed in further studies with longer follow up and larger cohort, they suggest that MTS-CPC could represents an interesting option in treatment of advanced glaucoma eyes.

539 - P1.074

SHORT-TERM EFFICACY AND SAFETY OF ELIOS, AS STANDALONE OR IN COMBINATION WITH PHACOEMULSIFICATION, IN OPEN-GLAUCOMA

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Purpose: To assess efficacy and safety of ELIOS (Excimer laser trabeculostomy; Elios Vision, Los Angeles, California, USA) as a stand-alone procedure or in combination with phacoemulsification in a cohort of open-angle glaucoma patients at 12 months. We present here the preliminary results at 3 months.

Methods: We retrospectively included patients aged over 18 years with open-angle glaucoma undergoing ELIOS procedure, as a stand-alone or in combination with phacoemulsification (Phaco-ELIOS). The procedure was carried out by a single experienced surgeon and consisted of 10 laser impacts on the inferior trabeculum under gonioscopic visualization. The exclusion criteria were the need for further glaucoma surgery or laser to control intraocular pressure (IOP). The primary endpoint was the reduction in IOP at month 3 postoperatively. Mean change in number of IOP-lowering medications and safety were monitored throughout the 3-month follow-up period. Acute IOP elevation was defined as IOP over 30 mmHg occurring during the follow-up period

Results: A total of 31 patients were included for this analysis, 10 eyes for standalone ELIOS and 21 for Phaco-ELIOS. The mean preoperative mean deviation of visual field was -19.38 in the ELT group and -7.44 in the Phaco-ELIOS group. After 3 months, mean IOP decreased from 28.3 ± 9.17 at baseline (BL) to 15.0 ± 5.40 mmHg (mean reduction of 47%) for standalone ELIOS, and from 20.37 ± 7.49 to 14.50 ± 3.74 mmHg (mean decrease of 28.8%) for Phaco-ELIOS. The mean number of medications at 3 months decreased from 3.30 ± 0.95 to 2.0 ± 1.87 for standalone ELIOS, and from 2.68 ± 1.11 to 2.00 ± 0.71 for Phaco-ELIOS. One patient in the Phaco-ELIOS group developed hyphema which resolved spontaneously after 7 days of follow-up. Acute IOP elevation appeared in 5 patients (1 ELIOS, 4 Phaco-ELIOS) during the first 15 days of follow-up and resolved within 7 days.

Conclusion: ELIOS as standalone or in combination with phacoemulsification appears to be a viable option for lowering IOP in open-angle glaucoma with a good safety profile and no serious adverse events.

548 - P1.075

A MULTI-CENTRE STUDY OF A SUPRACILIARY GLAUCOMA DRAINAGE DEVICE IN PATIENTS WITH OPEN ANGLE GLAUCOMA: TWO-YEAR FOLLOW UP RESULTS

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Purpose: To describe the safety and efficacy profile of a novel, supraciliary, minimally-invasive glaucoma surgery (MIGS) drainage system, MINIject® (iSTAR Medical, Wavre, Belgium), in patients of non-Caucasian ancestry with medically-uncontrolled open-angle glaucoma up to 2-year follow-up.

Methods: The STAR-IV trial is a prospective, multi-centre, interventional, single-arm study at 2 sites in India and Panama. The MINIject® glaucoma implant is a 5mmlong network of hollow spheres made of soft, flexible silicone. The MINIject® device was implanted into the supraciliary space of 21 eyes in a stand-alone, ab-interno procedure. Intraocular pressure (IOP), medication use, and other ocular parameters were evaluated preoperatively and postoperatively through 24 months, at pre-specified timepoints. The primary endpoint of the study was IOP reduction at 6 months compared to baseline, analyzed with a paired t-test. Safety evaluation included the nature and frequency of adverse events. Preliminary study results at 24-months are reported here.

Results: Of 21 patients treated with MINIject, 38.1% were Hispanic, 28.6% were Indian-Asian and 28.6% were Black. One patient self-reported as Caucasian (4.8%). Baseline mean diurnal IOP was 24.2 ± 3.2 mmHg using 2.5 ± 1.1 IOP-lowering medications. At 6-month follow-up, mean diurnal IOP was reduced by 10.3 mmHg (-41.5%, $p < 0.0001$) to 14.2 mmHg. In 17 patients at 24-month follow-up, mean diurnal IOP was reduced by 10.2 mmHg (-41.4%, $p < 0.0001$) from baseline to 14.3 ± 4.0 mmHg. Furthermore, mean medication use at 24-months was 1.2 ± 1.0. An IOP ≤ 18 mmHg was achieved in 88.2% of eyes at 24 months and 94.1% of patients had at least a 20% reduction in IOP. The most frequently observed adverse events included transient anterior chamber inflammation (52.4%), pupillary deformation (19.1%), blurred vision (19.1%), visual acuity loss (14.3%), cataract progression (14.3%) and IOP decrease (14.3%). No eye exceeded 30% loss in endothelial cell density from baseline.

Conclusion: The MINIject implant effectively reduced IOP by 41.4% at 24 months post-operatively, while decreasing the need for medication. This study confirms the potential efficacy of a supraciliary MIGS to reduce IOP and decrease dependency on glaucoma medications up to 24-month follow-up.

595 - P1.076

MULTICENTER, PROSPECTIVE, LONG-TERM OUTCOMES OF CANALOPLASTY AND TRABECULOTOMY IN PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA (POAG)

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Purpose: Long-term follow-up to provide clinical safety and effectiveness results for subjects treated with ab-interno canaloplasty and trabeculotomy (OMNI Surgical System) either as a standalone procedure or in combination with cataract surgery.

Methods: Prospective, multi-center, IRB-approved studies. Included OMNI standalone (ORION) and OMNI combined with cataract surgery (GEMINI); subjects with mild to moderate POAG, a diurnal (DIOP) post washout of ≥22.5 mmHg and 21-36 mmHg, respectively, and on 0-4 topical IOP-lowering medications. Outcome measures included mean percent reduction in unmedicated DIOP, percent of eyes with ≥20% reduction in unmedicated DIOP ,percent reduction in number of IOP-lowering medications, and percent of subjects medication free.

Results: Mean (SD) baseline, unmedicated DIOP was 26.1 (4.0) mmHg and 23.0 (2.6) mmHg in standalone (n = 17) and combined with cataract (n = 65), respectively. At 24 months (standalone) mean percent DIOP reduction was 39%, 84.6% of subjects had a ≥ 20% reduction in DIOP from baseline, medication use was reduced 67%, and 67% of subjects were medication-free. At 36 months (combined with cataract) mean percent reduction in DIOP was 29%, 76% had a ≥20% reduction in DIOP, medication use reduced 82%, and 75% of subjects were medication-free.

Conclusion: Long-term durability of the treatment effect of canaloplasty followed by trabeculotomy with the OMNI device was observed whether combined with cataract surgery (36 months) or as a standalone procedure (24 months) for IOP and medication reduction in mild to moderate glaucoma.

597 - P1.077

HIGH-FREQUENCY DEEP SCLEROTOMY (HFDS) FOR TREATMENT OF PRIMARY OPEN-GLAUCOMA COMBINED WITH PHACOEMULSIFICATION AND AS STAND-ALONE PROCEDURE, A SOUTH AMERICAN EXPERIENCE

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Purpose: The present study aims at hypotensive effects in patients with mild to moderate glaucoma who underwent HFDS. We have 2 groups of treatment: HFDS plus phacoemulsification and HFDS as stand-alone procedure. And additional purpose of the study is to show the benefit of performing safe and effective glaucoma surgeries without the need for additional equipment or associated costs, others than the initial investment, the Oertli system can be used for both surgeries, these benefits are very important for our kind of population.

Methods: A total of 43 surgeries were performed, using the Catarhex 3 and OS 4 from Oertli, the same machine was used for both phacoemulsification and the glaucoma procedures. The procedures were performed for two different surgeons in two countries, Brazil and Chile. Of the 43 eyes that underwent surgery, 31 were HFDS alone and 12 associated with phacoemulsification. All patients had mild and moderate. The goniolenses used were Volk Transcend TVG Surgical and Swan Jacob. The ablation area performed was in the lower nasal region through a 1.2mmparacentesis in the nasal region. The HFDS was performed using a specific diathermy probe following the protocol suggested by Oertli in all patients studied. Follow-up of these patients was carried out on day 1, 7, 14, and monthly until 6 months.

Results: HFDS stand-alone had a IOP reduction of 45% and combined with phacoemulsification had a 42% reduction. All patients who had moderate glaucoma were using 3 eye drops. Of the 28 eyes, 26 eyes were without medication and 2 eyes were using one medication.

Conclusion: Surgery using HFDS (stand-alone or combined with phacoemulsification) is a simple, efficient and safe technique. It is quick to execute and has a relatively short learning curve. When we talk about the cost, it becomes inexpensive compared to other devices for minimally invasive surgeries. It is a safe and promising minimally invasive procedure with reduced risks of complications, effective IOP reduction and the option for combined surgery.

609 - P1.078

INFLUENCE OF BASELINE INTRAOCULAR PRESSURE OR MEDICATION ON TWO-YEAR OUTCOMES OF A SUPRACILIARY DRAINAGE DEVICE IN THE STAR-I,II,III TRIALS

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Purpose: Describe the influence of baseline intraocular pressure (bIOP) or number of medication classes used (bMed) in patients with open-angle glaucoma (OAG) on outcomes two years after implantation with a supraciliary, minimally-invasive glaucoma surgery (MIGS) device, MINIject® (iSTAR Medical, Belgium).

Methods: The implant was delivered in a standalone, ab-interno procedure in phakic and pseudophakic eyes with no medication washout in three trials (STAR-I,II,III). Data from 66 patients who completed two-year follow-up were pooled in a post-hoc analysis. Outcomes of patients with a high bIOP (> 24 mmHg) were compared to those with a moderate bIOP (21-24 mmHg). Outcomes were also compared between patients with higher bMed use (3 or 4 medication classes) and those with lower bMed use (1 or 2 classes). Success was defined as IOP >5 and ≤ 21 mmHg with ≥20% reduction in IOP, without (complete) or regardless of (qualified) glaucoma hypotensive medication use at follow-up.

Results: At two-years, the high bIOP group achieved a 41.8% IOP reduction (from mean bIOP 28.1 mmHg, n = 21) with 0.7 fewer medications compared to a 38.1% reduction (from mean 22.1 mmHg, n = 45)(p = 0.448) and 1.0 fewer medications in the moderate bIOP group. The high bMed group (mean bMed 3.3, n = 28) had a 34.6% IOP reduction compared to 42.7% (p = 0.076) in the low bMed group (bMed 1.5, n = 38). Medication was similarly reduced by 1.3 and 0.7 (p = 0.143) in the high and low bMed groups respectively. The likelihood of complete success was greater in the low bMed group (p = 0.003), but both groups had a similar qualified success rate (84.2%, 67.9%; p = 0.144).

Conclusion: Comparable levels of relative IOP reductions at two years were seen in patients regardless of a high (mean 28.1 mmHg) or moderate (mean 22.1 mmHg) baseline IOP prior to implantation of this supraciliary drainage device. Likewise, a comparable reduction in IOP was achieved despite the number of medications used pre-operatively.

622 - P1.079

FIVE-YEAR SAFETY AND EFFICACY RESULTS OF A SUPRACILIARY DRAINAGE DEVICE IN OPEN ANGLE GLAUCOMA PATIENTS (STAR-GLOBAL)

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Purpose: To describe the 5-year safety and efficacy of a novel, minimally-invasive glaucoma surgery (MIGS) device (MINIject; iSTAR Medical, Belgium) implanted ab interno into the supraciliary space in patients with medically-uncontrolled open-angle glaucoma (OAG).

Methods: In the STAR-I trial, the implant was inserted into the supraciliary space in a standalone procedure in phakic and pseudophakic eyes with no medication washout. The trial was completed 2 years post-implantation by 21 patients in 2 sites in Asia and Central America. Upon study completion, patients were invited to enrol in the STAR-GLOBAL study to continue follow-up annually from 3 until 5 years. Intraocular pressure (IOP) and IOP-lowering medication use were recorded annually, as well as a safety evaluation including adverse events and measurements of corneal endothelial cell density (ECD). Results from 14 patients who completed 5-year follow-up (67% of patients who completed the STAR-I trial) are reported here.

Results: Mean baseline diurnal IOP prior to implantation in the STAR-I trial was 23.2 ± 2.9 mmHg using a mean of 2.0 ± 1.1 IOP-lowering medications (n = 25). At 2-year follow-up (n = 21), mean diurnal IOP was 13.8 ± 3.5 mmHg (-9.6 mmHg, -40.7%; $p < 0.0001$) on 1.0 ± 1.3 medications. At 5-year follow-up (n = 14) in the STAR-GLOBAL trial, mean diurnal IOP was 17.2 ± 5.0 mmHg (-6.4 mmHg, -27.6%; $p < 0.0001$) on 1.7 ± 1.5 medications. At 5 years, 69% of patients achieved an IOP reduction of ≥ 20% from baseline, 69% achieved an IOP ≤ 18 mmHg, and 21% of patients were medication-free. The only adverse event since STAR-GLOBAL study enrolment was 1 case of ECD loss requiring implant trimming. The mean per-protocol reduction in central ECD since baseline was 9.3% at the 5-year follow-up.

Conclusion: In an ethnically diverse cohort of patients, meaningful efficacy up to 5-years post-implantation was achieved in the majority of patients. This supraciliary MIGS procedure offers a valuable bleb-free treatment option for patients with glaucoma requiring sustained, low target IOPs.

623 - P1.080

THREE-YEAR SAFETY AND EFFICACY RESULTS OF A SUPRACILIARY DRAINAGE DEVICE IN OPEN ANGLE GLAUCOMA PATIENTS (STAR-GLOBAL)

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Purpose: To describe the 3-year safety and efficacy profile in patients with medically uncontrolled primary open-angle glaucoma of a novel, minimally invasive glaucoma surgery (MIGS) device implanted ab interno into the supraciliary space (MINIject®; iSTAR Medical, Wavre, Belgium).

Methods: The MINIject device was implanted as a standalone procedure in phakic and pseudophakic eyes in 3 prospective trials (STAR-I,II,III). There was no medication washout. The trials were completed in 66 patients in 11 sites in Europe, Asia and Central America with 2-year follow-up. The STAR-GLOBAL study then continued follow-up annually from 3 until 5 years. Outcome measures were intraocular pressure (IOP), IOP-lowering medications, adverse events and corneal endothelial cell density (ECD).

Results: There were 48 patients who completed 3-year follow-up (72.7% of patients who completed the STAR I-III trials). Mean baseline diurnal IOP prior to implantation was 23.6 ± 3.4 mmHg with a mean of 2.2 ± 1.1 IOP-lowering medications (n = 48). At two-years, mean diurnal IOP was 13.5 ± 3.8 mmHg (-10.2 mmHg, -42.2%; $p < 0.0001$) on 1.1 ± 1.3 medications. At three-year follow-up, mean diurnal IOP was 15.1 ± 4.1 mmHg (-8.5 mmHg, -35.6%; $p < 0.0001$) on 1.4 ± 1.5 medications. There were 90% of patients who achieved an IOP reduction of ≥ 20% from baseline, an IOP ≤ 18 mmHg was achieved in 85% of patients, and 42% of patients were medication-free at three years. Adverse events since STAR-GLOBAL study enrolment were one case of ECD loss and one cataract progression. The mean per-protocol reduction in central ECD since baseline was 4.7% at the 3-year follow-up.

Conclusion: The MINIject achieved a significant reduction in IOP and hypotensive medications up to three-years post-implantation as a standalone procedure in an ethnically diverse cohort of patients. This supraciliary MIGS device offers a potential bleb-free treatment option for patients with medically uncontrolled primary open angle glaucoma requiring low target IOPs, irrespective of lens status.

627 - P1.081

REAL WORLD EFFICACY OF HYDRUS MICRO STENT IN GLAUCOMA PATIENTS: A RETROSPECTIVE STUDY

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Purpose: The study aim was to determine the real-world efficacy of phacoemulsification cataract surgery and Hydrus micro stent in patients with glaucoma.

Methods: A multi-centre retrospective noncomparative study of 70 eyes of patients with glaucoma who underwent phacoemulsification cataract surgery and Hydrus micro stent implantation for treatment of glaucoma in Australia.

Results: We reviewed a total of 70 eyes of patients who had minimal 6 months of follow up. The mean number of medications decreased significantly from 2.6 ± 1.5 preoperatively to 0.72 ± 1.4 in 6 months ($p < 0.0010$), while IOP decreased from 14.7 ± 3.7 to 13.9 ± 4.3 ($p = 0.25$). At 6 months 74% of patients were medication free. There was a significant improvement in visual acuity ($p < 0.00010$) and stabilization of mean deviation on visual field test (baseline −8.2; 6 months −8.1; $p = 0.23$). The most common adverse effect was a transient IOP spike and transient corneal oedema (n = 7, 10%; n = 7, 10%, respectively) with spontaneous resolution in all cases. No sight-threatening complications were reported in the study time frame.

Conclusion: This 6-month retrospective study demonstrated the efficacy of phacoemulsification cataract surgery and Hydrus micro stent in reducing the medication burden while maintaining lower IOP in patients with glaucoma.

639 - P1.082

TWO-YEAR SAFETY AND EFFICACY RESULTS OF A SUPRACILIARY DRAINAGE DEVICE IN PATIENTS WITH OPEN ANGLE GLAUCOMA - A META-ANALYSIS FROM STAR-I STAR - II, STAR-III AND STAR-IV TRIALS

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Purpose: Describe the safety and efficacy profile 2 years after implantation of a novel, supraciliary, minimally-invasive glaucoma surgery drainage device, MINIject® (iSTAR Medical, Belgium) in patients with medically-uncontrolled, primary open-angle glaucoma.

Methods: The STAR-I, STAR-II, STAR-III and STAR-IV trials are 4 prospective, multi-centre, interventional, single-arm, completed studies evaluating the safety and efficacy of MINIject in open-angle glaucoma patients. Across these trials, patients were treated at 11 sites in Germany, France, Spain, Colombia, India and Panama. The MINIject implant is a 5mmlong network of hollow spheres made of soft, flexible silicone. It was implanted standalone and ab-interno into the supraciliary space. Data up to 2-years after implantation were pooled in a meta-analysis. In each study, patients were seen at a preoperative baseline visit and were assessed at regular intervals until 2 years after device implantation. The efficacy of the device in terms of reducing intraocular pressure and hypotensive medication use was assessed, as well as the safety profile at each timepoint. Preliminary results from a total of 83 patients who received the implant and who completed 2-year follow-up have been pooled and are presented here.

Results At 2-year follow-up in 83 patients, mean diurnal IOP was 14.4 ± 4.4 mmHg, representing a 39.7% mean reduction ($p < 0.0001$) from preoperative baseline (23.9 ± 3.3 mmHg, n = 100). Similarly, medications were reduced from preoperative mean of 2.4 ± 1.0 (n = 100) to 1.3 ± 1.4 ($p < 0.0001$) at 2-year follow-up, with 39% of patients being medication-free. IOP ≤ 18 mmHg was achieved in 85.5% of patients and 90.4% patients achieved an IOP reduction of at least 20%. The most frequently reported adverse events included anterior chamber inflammation (30.1%), hyphema (11.7%), pupillary deformity (7.8%) and vision blurred (7.8%). The per-protocol mean reduction in central endothelial cell density was 4.3% at 2 years.

Conclusion: This meta-analysis strengthens the evidence for this supraciliary drainage device implanted in a standalone ab-interno procedure. The implant achieved meaningful efficacy and a reduction of hypotensive medications until 2-year follow-up, and may offer a valuable bleb-free treatment option for patients with glaucoma requiring low target pressures.

651 - P1.083

EARLY EXPERIENCE WITH SCHLEMMS CANALOPLASTY AND TRABECULOTOMY WITH OMNI SURGICAL SYSTEM COMBINED WITH CATARACT SURGERY IN MODERATE TO SEVERE GLAUCOMA IN A TERTIARY CARE EYE CENTER IN UNITED KINGDOM - A RETROSPECTIVE STUDY OF 12 MONTH OUTCOMES

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Purpose: The OMNI® Surgical System from Sight Sciences is indicated for canaloplasty followed by trabeculotomy for patients with primary open-angle glaucoma that performs two implant free MIGS procedures and targets three points of resistance to lower intraocular pressure. We aimed to Study 12 month Outcomes of Schlemms canaloplasty & trabeculotomy with OMNI surgical system combined with cataract surgery in eyes with moderate to severe open-angle glaucoma between August 2022 and December 2022 by a single surgeon (DM).

Methods: 20 eyes with moderate to severe glaucoma (mean deviation -3.68 to -29.73 dB) with coexistent visually significant cataract underwent Schlemms canaloplasty and trabeculotomy procedure combined with phacoemulsification and intraocular lens implantation through a temporal approach. The postoperative visits were at 1 day, 1 week, 1 month and every three months thereafter. The case notes were analysed retrospectively for pre and post op vision, pre and post op intraocular pressures and pre and postoperative number of medications at each visit . Any complications were also noted at each visit

Results: A total of 20 eyes were included in the study .The mean age was 77 years and both genders were equally represented.

	Preop (N=20)	1 month (N=16)	3 months (N=17)	6 months (N=19)	9months (N=24)	12 months (N=15)
Mean IOP	18.10 ± 5.51 mmHg	12.75 ± 3.56 mmHg	13.23 ± 3.40 mmHg	13.32 ± 2.70 mmHg	13.75 ± 3.67 mmHg	13 ± 2.97 mmHg
Percentage reduction		29.56%	26.85%	26.4%	24%	28.17%

The mean number of medications preop was 2.89 (range 2-4) which reduced to zero at 3 months and 6 months. Only one eye needed single medication at 9 months (p value < 0.05). Some intraoperative bleeding was observed in almost all patients with 3 having frank layered hyphaema in post op period. None needed any intervention. The incidence of hyphaema was not related to anticoagulant use. No significant vision threatening complications were observed. Limitations 1. Retrospective nature of the study 2. Loss of data at 12 months

Conclusion: Schlemms canaloplasty and trabeculotomy with the OMNI glaucoma device appears to be safe and effective in lowering the IOP and reducing medication load in moderate to severe open angle glaucoma with coexistent cataract.

676 - P1.084

FIRST IN HUMAN LASER TITRATION OF A NOVEL GLAUCOMA DRAINAGE DEVICE

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Purpose: Evaluate the feasibility of 532 nm green laser to titrate nitinol valves of a novel aqueous shunt to adjust outflow resistance.

Methods: Operability of the Calibreye System (Myra Vision, Campbell, CA) was assessed in a preclinical study in rabbit eyes and in a first-in -human study. The device communicates the anterior chamber with the subconjunctival space with three flow channels, two of which are controlled by nitinol valves which can be opened or closed using a slit lamp mounted green laser. After implantation, the feasibility of the laser to open the valves was assessed by visual inspection. Fluorescein egress through the channels was assessed in rabbit eyes. In human eyes, IOP was measured pre and post laser.

Results: In the postoperative period, the nitinol valves were clearly visible at the slit lamp. The 532 nm laser was able to open both the nitinol valves on the device. Furthermore, the laser was able to successfully close the valves after being opened. In rabbit eyes, flow through open channels was confirmed with fluorescein. In human eyes the laser was applied 4 times postoperatively and lowered IOP in all instances. The mean IOP prior to laser actuation was 11.4 mmHg ± 1.8 mmHg and 8.4 ± 0.9 mmHg ($p = 0.034$) after laser actuation. The rabbit and human eyes tolerated the procedure well and no serious adverse events related to the device and/or laser procedure were seen.

Conclusion: Laser titration of nitinol valves of a drainage device was successfully performed resulting in an IOP reduction. This has potential to provide adjustable outflow resistance during the early, mid, and late postoperative period depending on bleb resistance, target IOP and hypotony risk.

678 - P1.085

CHANGE IN CORNEAL ENDOTHELIAL CELLS AFTER GONIOSCOPY-ASSISTED TRANSLUMINAL TRABECULOTOMY

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Purpose: The aim of this study was to investigate the change in corneal endothelial cell density (ECD) after gonioscopy assisted transluminal trabeculotomy (GATT) surgery alone or in combination with phacoemulsification.

Methods: In this retrospective comparative study, consecutive patients with primary open angle glaucoma (POAG) treated with GATT or phacoemulsification+GATT, with at least 6 months of follow-up were included. Patients who underwent phacoemulsification surgery alone during the same period were recorded as the control group. The study included 56 POAG (40 in the GATT and 16 eyes in the phacoemulsification+GATT groups) and 30 control eyes (phacoemulsification groups). The main outcomes were ECD changes. To investigate patients with a > 20% reduction in ECD compared to baseline measurements was a secondary outcome.

Results: There was a significant decrease in mean ECD compared to baseline in the GATT, phacoemulsification+GATT, and phacoemulsification study groups ($p < 0.001$ for all). At the end of follow-up, percent cumulative ECD reduction values were 6.89%, 14.47% and 10.32% in the GATT, phacoemulsification+GATT, and phacoemulsification groups, respectively ($p = 0.01$ for all groups). The ECD reduction in the phacoemulsification+GATT group ($p = 0.02$) and the phacoemulsification group ($p = 0.04$) was significantly higher than in the GATT group. ECD reduction was similar in phacoemulsification+GATT and phacoemulsification groups ($p = 0.69$). The proportion of eyes that lost ≥ 20% of ECD was 7.5% (3/40), 12.5% (2/16) and 10.0% (3/30) in the GATT, phacoemulsification+GATT and phacoemulsification groups, respectively. There was no significant difference between three groups ($p = 0.08$).

Conclusion: A significant ECD loss was observed 6 months after GATT surgery compared to the baseline. The ECD reduction observed after GATT combined with phacoemulsification was greater than with GATT alone. There was no significant difference between GATT surgery combined with phacoemulsification and phacoemulsification alone. Although GATT is widely known to be minimally invasive, it's impact on ECD should be taken into consideration prior to surgery.

679 - P1.086

LONG-TERM OUTCOME FOLLOWING SURGICAL REVISION OF PRESERFLO MICROSHUNT IMPLANT

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Purpose: Data analysis after surgical revision of PreserFlo®MicroShunt in eyes with open angle glaucoma.

Methods: Consecutive series of patients with OAG underwent PreserFlo®MicroShunt implantation (+mmC 0.4mg/ml for 2 min) between 2019 - 2023 as a primary glaucoma surgery. Intraocular pressure (IOP), visual acuity, biomicroscopy, and number of glaucoma medications were retrospectively collected. Qualified success (QS) / complete success (CS) were defined as IOP ≤ 18 mmHg or > 30% IOP reduction respectively with or without glaucoma medication. Surgical revision (+mmC 0.2 mg/ml for 2 min) was performed when IOP was ≥ 18 mmHg or target IOP was not reached despite maximal therapy. Failure was defined when additional glaucoma surgery was needed. The pre-and post-revision IOP, time – laps after primary surgery, risk factors and post-revision outcome were recorded.

Results: 56 eyes of 49 consecutive patients were followed for a mean of 36 months (± 12.14). Mean IOP before the Preserflo®Microshunt was 21.88 mmHg (SD 7.44) with mean of 2.7 medications. At 12 and 48 months (56 and 35 eyes respectively) mean IOP was 12.5 mmHg (SD 3.4) and 11,27 mmHg (SD 2.5) respectively. CS occurred in 46%, QS in 93%, failure in 7%. Surgical revision was needed in 14 eyes (25%) (mean 21.34 months (SD 16.3) after primary surgery). Mean IOP before revision was 23.6 mmHg (SD 7.34). At last visit 9 eyes (64%) were considered CS and one eye QS. Five out of 14 eyes (36%) had axial myopia, five eyes (36%) of four patients were under age of 60, three eyes had Pseudexfoliative glaucoma. 4 eyes (28%) failed after revision needing additional glaucoma surgery at 3, 6, 13 and 24 months (2 high myopic eyes, 2 younger patient).

Conclusion: Preserflo® Microshunt provides a significant long term IOP lowering effect. However, when not reaching the desired target IOP, our data, suggest that surgical revision is a valuable approach and allows a high rate of complete success, regardless of the time-laps after primary microshunt implantation. Only a minority of revisions fail, requiring additional glaucoma surgery. In this relatively small cohort main risk factor for surgical revision were high myopia and younger age.

702 - P1.087

COMPARATIVE OUTCOMES OF SELECTIVE LASER TRABECULOPLASTY DELIVERED BY OPTOMETRISTS COMPARED TO OPHTHALMOLOGISTS: 12 AND 24 MONTH RESULTS OF A UK-BASED MULTI-CENTRE OBSERVATIONAL STUDY

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Purpose: Selective laser trabeculoplasty (SLT) is increasingly undertaken by optometrists (OPTs), but studies supporting changes in practice are lacking. This multi-centre observational study seeks to evaluate outcomes of SLT delivered by OPTs compared to ophthalmologists (OPHs), to support changes in practice.

Methods: Comparative study of adults (aged ≥ 40 years), with no previous laser or glaucoma surgery, receiving first treatment of SLT at three UK Northwest regional eye units (Aintree, Manchester, and Macclesfield) between 1st August 2018 and 1st August 2021. Outcome measures are reduction in intraocular pressure (IOP) at 12- and 24-months, changes in visual acuity (VA) and glaucoma drop burden, and composite treatment failures including repeat laser, glaucoma surgery, or increased medication. Safety outcomes are loss of ≥ 2 lines of VA or complications such as IOP spike. Eye-level outcome data was averaged to generate summative participant data, adjusting for inter-eye correlation. T-test was used to compare means and mean differences.

Results: 84 eyes (56 patients) treated by OPTs were compared to 123 eyes (75 patients) treated by OPHs. Baseline characteristics were well-matched between groups. Mean IOP in both groups was significantly reduced from baseline ($p < 0.05$) at month 12 and 24. Variance in mean IOP in the OPT-treated group was wider at month 24 compared to month 12, leading to a wider difference in mean IOP reduction comparing groups at month 24 vs month 12 (mean [95% confidence interval], 1.7 [-1.6 – 5.1] vs 0.22 [-2.2 – 2.6]), however neither difference was statistically significant ($p>0.05$). Eyes experiencing IOP spikes or meeting composite treatment failure at months 12 and 24 was similar between groups. More cataracts were reported in OPT-treated eyes.

Conclusion: Efficacy and safety of SLT treatment is comparable between optometrists and ophthalmologists up to 24 months post-treatment. The greater proportion of cataracts reported in OPT-treated eyes did not contribute to significant differences in VA, were not considered SLT-related, and may be attributed to more vigilant reporting. These findings support optometrist-delivered SLT in the context of UK-based hospital eye services, where optometrists (and non-consultant ophthalmologists) deliver SLT in consultant-led glaucoma services, aligned with National Institute for Health and Care Excellence guidance.

705 - P1.088

FIVE-YEAR OUTCOMES OF PHACOEMULSIFICATION COMBINED WITH ISTENT VERSUS PHACOEMULSIFICATION ALONE IN CHRONIC OPEN ANGLE GLAUCOMA: A TERTIARY CENTRE EXPERIENCE

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Purpose: Trabecular micro-bypass stents in combination with phacoemulsification (phaco) have showed to effectively reduce IOP & medication burden in open-angle glaucoma patients. The iStent's efficacious & safety profile has been proven in other studies. This study assessed the 5-year comparing combined phaco-iStent versus phaco alone in chronic open-angle glaucoma patients at a tertiary centre.

Methods: This is a retrospective cohort study conducted at Western Eye Hospital in London. We included data from 2012 assessing patient demographics, IOP, visual field (MD & PSD) and number of glaucoma medications. A cohort of 94 patients was divided into two arms: 48 phaco-iStent patients & 46 phaco only patients. Eleven patients from the phaco-istent arm & 14 patients from the phaco-only arm have been excluded due to insufficient data.

Results: The iStent group had 37 patients and the phaco group had 32 patients. All annual IOPs in both groups showed statistically significant reductions ($p < 0.05$) from pre-operative IOP, except the immediate post-operative IOP in the phaco group which was not significant ($p = 0.11$). The 5-years mean IOP was 13.8 mmHg in the iStent group whilst 14 mmHg in the phaco group. MD at 5-years post-operative was -5.9 dB in the iStent group and -7.2 dB in the phaco group, however this was not statistically significantly different ($p = 0.7$). At 5 years, the number of glaucoma medications was significantly reduced in the iStent group ($p < 0.05$), whilst significantly increased in the phaco group ($p < 0.05$). The 5-years median number of medications of the iStent group was 1 medication and in the phaco group was 2 medications.

Conclusion: Phaco-iStent demonstrated significant IOP & glaucoma medication reductions at 5 years post-operative in addition to stable visual fields in comparison to phaco alone. However, no significant difference in the MD was found between both groups.

720 - P1.089

ASSESSING THE EFFICACY AND SAFETY OF ISTENT INJECT IN A HIGH-VOLUME CATARACT PRACTICE AT A TERTIARY CARE UNIT: A COMPREHENSIVE STUDY OF OUTCOMES

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Purpose: This study aims to evaluate the effectiveness and safety of iStent Inject® in a high-volume cataract practice at a tertiary care unit.

Methods: We retrospectively analysed consecutive patients who underwent the iStent inject® procedure at Sunderland Eye Infirmary in Sunderland, United Kingdom between January 2021 and June 2023. We excluded patients who had follow-up periods of less than three months. The same surgeon performed a combined Phaco+iStent inject procedure on all patients during a typical high-volume cataract surgery list with around 10 cases per list. The main outcome measure was the percentage reduction in intraocular pressure (IOP). Secondary outcome measures included the reduction in eye drops burden, best-corrected visual acuity (BCVA), surgical complications, and the need for further procedures. Proper positioning of the iStent inject® was verified by gonioscopy examination, which was performed both during surgery and at clinical examinations during the follow-up period.

Results: The study involved a total of 60 eyes from 48 patients. The average follow-up period was 13.2 ± 7.5 months. The mean IOP reduced from 22.2 ± 4.5 mmHg prior to the surgery to 16.2 ± 3.7 mmHg at the final follow-up, resulting in a 27.5% reduction ($p = 0.006$). 41 out of 60 eyes(68.3%) maintained a 20 % or more reduction in IOP without the need for additional eye drops or any further intervention until the last follow-up. The average medication burden slightly decreased from 2.3 ± 0.9 before the surgery to 2.2 ± 1.0 at the final visit ($p = 0.08$). Moreover, the BCVA significantly improved from 62.8 ± 12.1 before the surgery to 77.1 ± 9.6 after the surgery ($P < 0.0001$). There were no complications during the surgery for any of the patients, and only one patient developed post-operative cystoid macular oedema, which was successfully treated with topical medication. Two patients required subsequent Trabeculectomy with mitomycin C, and two patients required PreserFlo® MicroShunt due to progressive glaucoma.

Conclusion: Our study proves that iStent inject reduces IOP safely and effectively. It can be easily incorporated into high-volume cataract surgeries delivering positive results with efficient execution.

724 - P1.090

"ESTIMATION OF PROCEDURAL FREE TIME INTERVAL IN A 6-YEAR RETROSPECTIVE COHORT OF PATIENTS BETWEEN COMBINED PHACOEMULSIFICATION WITH ISTENT(R) AND TRABECULECTOMY"

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Purpose: This retrospective study aims to explore the impact of a combined phacoemulsification with iSTENT® placement for glaucoma patients. The main objective is to retrospectively evaluate from 2018 to 2023 in a cohort of patients the time interval between combined phacoemulsification and trabeculectomy surgery in patients eligible for a conventional close trabeculectomy scheme after combined phacoemulsification.

Methods: We examined our medical files from 2018 to 2023, study criteria were defined. The inclusion criteria consist of the temporal criterion (2018-2023); of having undergone trabeculectomy and of having undergone a combined phacoemulsification and microinvasive glaucoma surgery (MIGS) with iSTENT® placement. Exclusion criteria included having undergone trabeculectomy prior to combined phacoemulsification; having undergone multiple MIGS procedures; and having received a stent other than iSTENT®. Finally, patients meeting the inclusion and exclusion criteria will be classified according to their biological sex and stratified according to their respective age class for each eye where applicable. Data processing will consist of calculating the cumulative number of patients in each age stratum who underwent combined phacoemulsification and trabeculectomy surgery; calculating the mean time between the two operations and finally the standard error.

Results: All patients included had moderate to advanced glaucoma with concomitant cataract. Only 22 patients (8 women and 14 men) with a mean age of 65 ± 2 years (64 ± 4 years in women and 65 ± 2 years in men) required trabeculectomy, with an overall mean interval of 23 ± 4 months (22 ± 5 months in men and 23 ± 7 months in women) between the two procedures.

Conclusion: In conclusion, our retrospective study enabled us to quantify, in a cohort spanning 6 years, a procedure-free time interval of 23 ± 4 months in patients who were eligible for conventional close trabeculectomy after combined phacoemulsification with iSTENT®. This result is of the utmost importance, particularly for moderate and advanced patients with progressive disease for whom direct trabeculectomy is required.

726 - P1.091

EVALUATION OF POSTURAL INTRAOCULAR PRESSURE CHANGES AFTER GONIOSCOPY ASSISTED TRANSLUMINAL TRABECULOTOMY

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Purpose: To evaluate the efficacy of gonioscopy-assisted transluminal trabeculotomy (GATT) for the intraocular pressure (IOP) postural spikes compared with medical treatment.

Methods: This prospective, controlled, and observational study included 60 eyes of 40 patients with open angle glaucoma. Three groups were formed in the study: (1) 20 eyes of 20 patients who underwent GATT surgery, (2) the fellow 20 eyes receiving medical treatment, (3) 20 eyes of 20 patients receiving medical treatment. IOP was measured using a rebound tonometer (Icare IC200, Finland Oy, Helsinki, Finland) in the sitting, supine, and dependant lateral decubitus position (DLDP) after a 10-minute rest at each position.

Results: The differences in IOP between the sitting vs. DLDP, sitting vs. supine and supine vs. DLDP were significantly lower in the group 1 compared with the group 2 and 3 (all $p < 0.001$). There were no statistically significant difference on all positional changes between group 2 and 3 (all $p > 0.05$).

Conclusion: This study showed for the first time that GATT surgery not only lowers IOP but also reduces IOP fluctuations. It can be a good alternative surgery for the management of postural IOP spikes.

727 - P1.092

INTRAOCULAR PRESSURE CHANGES AFTER COMBINED CATARACT SURGERY WITH ISTENT INJECT IMPLANTATION COMPARED TO CATARACT SURGERY ALONE IN PATIENTS WITH OPEN ANGLE GLAUCOMA

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Purpose: This study aims to compare intraocular pressure (IOP) changes after combined cataract surgery with iStent inject® implantation versus cataract surgery alone in patients with open-angle glaucoma.

Methods: Retrospective chart review of 150 patients (150 eyes) with different types of open-angle glaucoma, who were naïve to any previous ocular procedure and underwent combined cataract surgery with iStent® implantation (study group - 100 eyes) or cataract surgery alone (control group - 50 eyes), was performed. Study outcome was median IOP change in the operated eye at 3, 6 and 12 months after surgery.

Results: The mean age of patients in both groups was 74 ± 7.5 years and 71 ± 7.5 years. The median pre- and postoperative IOP in the study group at 3, 6 and 12 months were 18.5 (16-20) mmHg, 14.0 (12-16.75) mmHg, 14.5 (12-16) mmHg and 14.5 (12-16) mmHg, respectively. The median IOP change after combined surgery at 3, 6 and 12 months follow up was -4 (-6 to -2) mmHg ($p < 0.001$), -4 (-6 to -1) mmHg ($p < 0.001$), and -4 (-6.75 to -2) mmHg ($p < 0.001$), respectively. The median pre- and postoperative IOP in the control group at 3, 6 and 12 months were 17 (15-20) mmHg, 17.0 (14-19) mmHg, 16 (13-18.25) mmHg and 16 (13.75-19) mmHg, respectively. The median IOP change after cataract surgery at 12 months follow up was 0 (-2.5 to 3) mmHg. Thus, IOP reduction in the study group was statistically significantly larger than in the control group at 3 months (-5.97, $p < 0.001$), 6 months (-4.63, $p < 0.001$), and 12 months (-5.24, $p < 0.001$) follow up, respectively. The higher the preoperative IOP level, the larger was the IOP-lowering effect at different follow-ups after combined surgery (-0.57, $p < 0.001$; -0.58, $p < 0.001$; -0.6, $p < 0.001$; at 3, 6 and 12 months, respectively).

Conclusion: iStent inject® in combination with cataract surgery is associated with a statistically significant IOP reduction at 3, 6 and 12 months follow up compared to an insignificant IOP change after cataract surgery alone in glaucoma patients. The higher the preoperative IOP in the operated eye, the larger the IOP-lowering effect after combined surgery at all follow-ups.

728 - P1.093

EVALUATION OF VISUAL OUTCOMES AFTER IMPLANTATION OF AN EXTENDED DEPTH OF FOCUS INTRAOCULAR LENS (ACRYSOF IQ VIVITY) IN PATIENTS WITH MODERATE GLAUCOMA

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Purpose: To describe the visual, refractive, functional and patients' satisfaction outcomes of the AcrySof™ IQ Vivity™ EDOF IOL in patients with mild primary open angle glaucoma (POAG).

Methods: This was an ambispective, noninterventional, descriptive, cross-sectional study. Patients with mild (Hodapp-Parrish-Anderson classification), stable POAG for at least 6 months, and AcrySof™ IQ Vivity™ EDOF IOL were included. The Humphrey Field Analyzer III campimeter (Carl Zeiss Meditec, Dublin, CA, USA) and Triton optical coherence tomography (Topcon, Japan) were used to evaluate the inclusion criteria. In all cases, the formula used to calculate IOL power was Barrett Universal II. Ref4ractive outcomes and visual acuity at distance, intermediate, and near were evaluated from 3 months post-operatively onwards. Also, binocular contrast sensitivity (CSV-1000, VectorVision), binocular defocus curve, and patient satisfaction with the Intraocular Lens Satisfaction (IOLSAT) and Questionnaire for Visual Disturbances (QUVID) questionnaires were assessed.

Results: 72 AcrySof™ IQ Vivity™ from 36 patients were enrolled with a mean age of 71.45 ± 7.35 years, a mean thickness of the retinal nerve fiber layer of 77.32 ± 15.14 µm, a mean IOP of 16.29 ± 3.26 mmHg, and 0.84 ± 0.96 of active principles as topic treatment. Binocular corrected distance visual acuity (CDVA), distance-corrected intermediate visual acuity (DCIVA), distance-corrected near visual acuity (DCNVA) were -0.01 ± 0.08, 0.10 ± 0.12 and 0.24 ± 0.10 LogMAR respectively. Spherical equivalent was -0.27 ± 0.34 D. The 80.65% of eyes were within ± 0.5 D and 98.39% were within ± 1.0 D. The binocular defocus curve shows a peak of maximum VA at 0 D (0.00 ± 0.10 LogMAR) and smooth curve at intermediate (66 cm/-1.5D) 0.11 ± 0.09 LogMAR and near distance (40 cm/-2.5D) 0.35 ± 0.16 LogMAR. Binocular contrast sensitivity shows a decrease in high spatial frequencies. The IOLSat reveals that in bright light conditions, 93.55%, 100%, and 67.74% of patients "Never" or "Rarely" need glasses at far, arm's length, and near distances respectively and according to the QUVID, 96.77% of patients report no shadow areas.

Conclusion: The new AcrySof™ IQ Vivity™ EDOF IOL seems to provide good visual outcomes at distance, intermediate, and near vision, with an adequate contrast sensitivity and defocus curve and a low rate of visual disturbances in patients with mild POAG.

732 - P1.094

ELT (EXCIMER LASER TRABECULOSTOMY) COMBINED WITH PHACOEMULSIFICATION FOR OPEN-ANGLE GLAUCOMA: EARLY UK EXPERIENCE

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Purpose: Assess the effectiveness and safety of combined phacoemulsification and excimer laser trabeculostomy (phaco-ELT) in reducing intraocular pressure (IOP) and medication usage for patients with open-angle glaucoma and concurrent cataract.

Methods: A retrospective, observational review on 30 eyes undergoing combined phaco-ELT surgery between June 2023 and December 2023. Data on IOP, usage of IOP-lowering medications, best-corrected visual acuity, complications, and subsequent procedures at week 1, month 1, month 3, and month 6. Data from a single site in the UK.

Results: The study included 30 eyes from 25 patients. The mean IOP decreased from 18.4 mmHg on 1.6 drops at baseline to 14.3 mmHg on 1.6 drops at month 1 (n = 30) and 13.4 mmHg on 0.9 drops at 3 months (n = 23). (At six months IOP was 11.0 mmHg on 0 drops but n = 1 at date of submission). No significant complications were observed during or after the surgery. The most common complication was cellular/mild hyphema during and after the procedure, followed by mild unsustained IOP spikes in 4 cases. No subsequent surgeries were required for further IOP control.

Conclusion: The combined phaco-ELT procedure showed consistent and reproducible reduction in both IOP and medication usage at 3 months without significant adverse events or the need for additional surgery. Further data is required for comment on longer term UK outcomes.

736 - P1.095

COMPARISON OF MODIFIED IMPLANTATION TECHNIQUE XEN GEL STENT AND PRESERFLO IN PATIENTS WITH OPEN-ANGLE GLAUCOMA

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Purpose: To evaluate 1 year treatment outcomes of the XEN Gel Stent implantation (ab-interno) with fornix base conjunctiva incision and PreserFlo (ab-externo) in open-angle glaucoma patients.

Methods: Study was designed as prospective, interventional, single-center. Open-angle glaucoma eyes with insufficient control of intraocular pressure (IOP) or signs of glaucoma progression underwent XEN Gel Stent implantation with conjunctiva incision or PreserFlo. Mean decrease of IOP, reduction of number of IOP-lowering drugs and reoperation rate were analyzed.

Results: Thirty eyes of 30 patients were included into the study (11 women, mean age 61.3 years and 19 men, mean age 52.2 years). Baseline mean IOP was 33.8 ± 15.0 mmHg in XEN group and 32.3 ± 11.0 mmHg in PreserFlo group. Postoperative mean IOP was 19.8 ± 5.1 mmHg in XEN and 19.5 ± 4.2 mmHg PreserFlow in follow-up period 12. Mean number of IOP-lowering drugs was significantly reduced 12 months after the surgery from 2.7 ± 1.1 to 1.1 ± 1.2 ($p < 0.001$). Needling procedure had to be performed in 55% of patients.

Conclusion: In one year follow-up surgery achieved clinically and statistically significant reduction of IOP in both groups. The XEN Gel Stent implantation with conjunctival incision had a similar percentage of needling as PreserFlo surgery. Both techniques appeared as effective minimal invasive glaucoma surgery for open-angle glaucoma.

799 - P1.096

ENHANCING OPHTHALMIC SURGICAL TRAINING: INSIGHTS FROM TRAINEE ISTENT IMPLEMENTATION DURING CATARACT SURGERY

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Purpose: This study aims to evaluate the efficacy of Micro-Invasive Glaucoma Surgery (MIGS) using the iStent® Inject W device (Glaukos) during cataract surgery, exploring its impact on intraocular pressure (IOP) reduction. Additionally, we propose initiatives for integrating MIGS into ophthalmic residency education to foster understanding and proficiency among trainees.

Methods: In a retrospective analysis of 15 cases, we examined the outcomes of combined phacoemulsification and iStent implantation carried out by the author, a surgical trainee in Ireland. The average preoperative IOP was 18.6 mmHg. Two iStents were deployed in 14 cases, while one case involved a single iStent. Data collection included IOP measurements and evaluation of patient outcomes.

Results: Our findings revealed a significant reduction in average IOP by 5.4 mmHg postoperatively. The average number of drop medications was 1.9 preoperatively and 1.3 postoperatively. The cohort's outcomes underscore the potential of iStent as an effective MIGS device during cataract surgery. To enhance training, we recommend incorporating wet labs and device demonstrations, providing hands-on experience with various stents (e.g., iStent and Alcon's Hydrus® Microstent) and techniques like goniotomy.

Conclusion: This study advocates for the integration of MIGS education into ophthalmic residency programmes. Hands-on experience with MIGS devices and techniques, combined with a comprehensive study of literature and evidence-based data, can empower young ophthalmologists and prepare them for glaucoma fellowship and a career in glaucoma surgery. Such initiatives contribute to advancing surgical skills, fostering confidence, and ensuring the successful incorporation of innovative MIGS procedures into ophthalmic practice.

802 - P1.097

MODIFIED IMPLANTATION OF THE PRESERFLO MICROSHUNT

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Purpose: The PreserFlo MicroShunt represents an advancement in trabeculectomy. This study investigated the extent to which suturing the distal end of the stent and subconjunctival injection of OVD could enhance the primary success rate.

Methods: PreserFlo implantation was performed in 47 pseudophakic eyes of 36 glaucoma patients. Group 1 comprised 22 eyes where no subconjunctival OVD was injected at the end of the surgery. In 8 of these eyes, an additional suturing of the distal stent end was performed. In Group 2, the distal stent end was sutured to the sclera in 25 eyes, and OVD was additionally injected under the bleb. Evaluation criteria included intraocular pressure (IOP) development, the number of applied antiglaucomatous drugs, complications, bleb scarring, and the need for further interventions.

Results: A transient hypotony with self-limiting choroidal detachment was observed in a total of 4 out of 47 eyes (8.5%). Hyphema occurred in 7 eyes (15%), choroidal detachment in 2 eyes (4%), expulsive hemorrhage in one eye (2%), and pressure spikes in Group 1 (8 eyes, 36%) and Group 2 (4 eyes, 16%). In Group 1, preoperative IOP (mean ± standard deviation) was 21.2 ± 5.8 mmHg with an average of 2.3 ± 1.4 IOP-lowering drugs. In Group 2, preoperative IOP was 20.2 ± 6.8 mmHg (2.8 ± 1.3 drugs). After 6 months, IOP in Group 1 was 15.8 ± 6.1 mmHg (0.3 ± 0.8 drugs) and IOP in Group 2 was 16.3 ± 10.3 mmHg (0.2 ± 0.7 drugs). In Group 1, bleb revision was performed in 10 out of 22 eyes (45%), while in Group 2, this was done in 4 out of 25 eyes (16%). Failure requiring an alternative IOP-lowering procedure occurred in 6 eyes (27%) in Group 1 and in one eye (4%) in Group 2.

Conclusion: At the end of a Preserflo implantation, it is beneficial to apply subconjunctival OVD to increase the IOP lowering success rate. Choroidal detachment due to hypotony was self-limiting in all cases.

806 - P1.098

NON-PENETRATING DEEP SCLERECTOMY (NPDS) WITH ESNOPER CLIP OR INJECTABLE CROSS-LINKED HYALURONIC ACID IMPLANT: ADVANTAGES AND DISADVANTAGES FOR BEGINNERS. A PILOT STUDY

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Purpose: Non-perforating glaucoma surgery aims to create an intrascleral space that decreases conjunctival bleb dependence and its potential late fibrosis. Implants are designed to preserve this space, as well as potentially promoting the formation of new drainage pathways. To date, there is no multicentre study or meta-analysis that supports their use compared to not using them or comparing their use between them. The aim of the study is to review the advantages and disadvantages of two different implants in non-penetrating glaucoma surgery according to the existing literature and their usability by a novice surgeon.

Methods: 10 patients undergoing non-perforating deep sclerectomy (NPDS) surgery performed by the same surgeon were studied. One group used an ESNOPER clip® implant (AJL Ophthalmics) and the other group used a HealaFlow® resorbable implant. Changes in intraocular pressure (IOP), as well as the characteristics of the filtering bleb through anterior segment optical coherence tomography (OCT-SA), and usability for 3 months after surgery were analysed.

Results: There were no significant changes in IOP. More hypertensive peaks were associated in patients in whom the collagen matrix implant was used. This paper also shows the differences in the filtration bleb study.

Conclusion: Both implants are useful and safe, without added complications. The ESNOPER clip® allows the maintenance of a supraciliary flow, whereas the HealaFlow® makes it easier to be placed on the conjunctiva, keeping enough space to prevent fibrosis, as well as allowing its use if microperforations take place. In our experience, the use of HealaFlow® did result in a greater need for bleb checks and more hypertensive spikes compared to the use of the ESNOPER clip®. On the other hand, the use of the ESNOPER clip® allows for greater standardisation of the technique, as it does not depend on the amount and location of the product.

833 - P1.099

THREE YEAR FOLLOW UP OF COMBINED PHACOEMULSIFICATION, ISTENT AND ENDOCYCLOPHOTOCOAGULATION IN SURGICALLY NAIVE PATIENTS WITH PRIMARY ANGLE GLAUCOMA

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Purpose: To assess the efficacy and safety of phacoemulsification combined with endocyclophotocoagulation (ECP) and iStent implantation in surgically naïve patients.

Methods: Retrospective observational cross-sectional series of 82 surgically naïve eyes treated with combined phacoemulsification, ECP and iStent between January 2018 and July 2019 at a single centre facility.

Results: A total of 82 eyes underwent the procedure. Average age was 80.9 (± 6.4) years and 61% were female. Fifteen (18.29%) eyes had preperimetric glaucoma, the remaining were primary open angle glaucoma as follows: mild 32.92% (N = 27), moderate 35.37% (N = 29) and advanced 13.41% (N = 11). Baseline mean IOP was 19.5 (± 4.5) mmHg, falling to 14.4 (± 3.2) mmHg at 36-months ($p \leq 0.001$). 75.6% eyes achieved IOP of ≤ 18 mmHg with or without glaucoma medication. At baseline, mean number of medications was 2 reducing to 1.3 ± 1.1 at 3-years; Nineteen (23.2%) were patients medication-free. Best corrected visual acuity improved, increasing from 0.28 ± 0.2 LogMAR preoperatively to 0.10 ± 0.1 LogMAR at 36-months follow-up ($p \leq 0.001$). Two patients developed cystoid macular oedema that resolved with topical treatment. Average MD remained stable over 3-years ($p = 0.94$). Due to suboptimal IOP, 3 patients underwent selective laser trabeculoplasty (SLT). No patients required further glaucoma surgical intervention.

Conclusion: Combination of cataract surgery with iStent and ECP is a safe and effective procedure to lower IOP and medication burden. The procedure halted glaucoma progression and prevented further surgery over a 3-years follow up.

836 - P1.100

4 YEAR OUTCOME DATA FROM TRABEX PROCEDURES

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Purpose: TrabEx is an irrigating goniectomy device that is used to lower intraocular pressure (IOP) in patients with open angle glaucoma. It can be performed in combination with cataract surgery or as a standalone procedure. We have been using Trabex for cases of early uncontrolled POAG since 2018 in our large teaching hospital and here we present our 4 year outcome data.

Methods: A retrospective case series review was perfromed for all eyes that had Trabex alone and Trabex combined with cataract surgery from March 2018 to January 2020. Data was collected at 3, 6, 12, 24, 36 and 48 months post operatively. Primary outcomes were IOP and glaucoma medication reduction. Secondary outcomes were need for fuerther glaucoma surgery and operative complications.

Results: We present 4 year follow up data for 54 eyes of 47 patients (mean age 71.4). 61% were combined procedures with cataract surgery. 70% of patients who underwent Trabex had primary open angle glaucoma, 22% had open angle glaucoma secondary to uveitis and steroid use and 8% had peudoexfoliative or pigmentary glaucoma. Mean IOP decreased from 31.09 ± 7.4 mmHg pre operatively to 18.26 ± 3.30 mmHg at 48 months (41.3% reduction) ($p < 0.001$). Mean pre-operative medications decreased slightly from 2.9 ± 1.3 to 2.5 ± 1.1 but this was not significant. Post operative complications included hypehema 7.4% and recurrent uveitis 2% and 10 eyes (18.5%) required a further glaucoma procedure due to treatment failure.

Conclusion: We have shown that Trabex is a safe procedure that does reduce IOP significantly and this reduction is sustained up to 48 month follow up. However the medication burden for these patients remains high and 18.5% required further glaucoma surgery.

859 - P1.101

THE IMPACT OF MINIJECT DEVICE ON DIURNAL INTRAOCULAR PRESSURE CURVE IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA: INITIAL CASE SERIES

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Purpose: To investigate the variations in diurnal intraocular pressure (IOP) in patients who were implanted with MINIject for primary open angle glaucoma.

Methods: Three patients diagnosed with primary open angle glaucoma, who were treated with MINIject implants, were included in this case series. Home tonometry was performed 2-hourly for 24 hours pre-implantation (baseline) and for 24 hours at 1-month post-implantation. Using the iCare HOME2 tonometer. Measurements were made for the implanted eye to assess mean IOP, and peak and trough IOPs.

Results: Prior to surgery, Patient 1 (60 years, male, and on 3 IOP medications) had peak, trough and mean IOP values of 27 mmHg, 12 mmHg, and 20.9 mmHg, respectively. Following surgery, peak, trough and mean IOP values recorded were 16 mmHg, 8 mmHg, and 10.1 mmHg, respectively. For patient 2 (57 years, male, and on 1 IOP medication), peak, trough, and mean IOP values of 21 mmHg, 11 mmHg, and 15.6 mmHg, respectively, were recorded at baseline. Following MINIject implantation, peak, trough, and mean IOP values all decreased to 6 mmHg, 3 mmHg, and 4.5 mmHg, respectively. For patient 3 (72 years, female, and on 3 IOP medications), pre-operative values for peak, trough and mean IOP recorded were 19 mmHg, 11 mmHg, and 13.6 mmHg, respectively. After MINIject implantation, peak, trough, and mean IOP values recorded were 15 mmHg, 10 mmHg, and 12.2 mmHg, respectively. All 3 cases were free of medications at the 1-month visit.

Conclusion: MINIject implant appears to reduce IOP by reducing the peak and trough of the diurnal curve. Future studies with larger samples are warranted to confirm this finding.

876 - P1.102

COMBINED TECHNIQUE OF DRAINAGE DEVICE IN THE TREATMENT OF PRIMARY OPEN-ANGLE GLAUCOMA

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Purpose: To study the results of deep sclerectomy combined with suprachoroidal Esnoper clip implantation in glaucoma surgery.

Methods: In this work we used a combined surgical technique: deep sclerectomy with implantation of the drainage device Esnoper Clip (AJL, Spain). Using this technique there were operated 68 patients with developed open-angle glaucoma decompensation. All of them used intensive medical therapy (2 and more medications). Patients with congenital, neovascular and after glaucoma surgery were excluded. The main steps of the operation were performed by the technique, developed by of Dr. Jordi Loscos Arenas (Barcelona) usingmmC: dissection of the external scleral flap, 1.5-2 mm penetration into the transparent cornea, forming a deep flap of the sclera and the small choroidal space, revealing of the trabeculo-descemet membrane, deep flap resection, the insertion of the supraciliary part of the implant into the supraciliary space, bending the implant leaving one part at the supraciliary and the other - in the intrascleral space, sutures on the scleral flap and conjunctiva.

Results: The observation in 12 months demonstrated the clear structure of the outflow paths formation in the period from 2 weeks to 6 months (diffuse, cystic, encapsulated) and absence or weak expression of these formations in later periods (after 6 months). The use of Esnoper Clip involves the formation of 2 outflow paths: intrascleral with the formation of an intrascleral reservoir of intraocular fluid and the suprachoroidal space. We performed an OCT examination of the intervention area at 24 hours, 1 month, 3 months, 6 months, and 12 months. and 18 months. In 3 months it was revealed the clearly formed subconjunctival and intrascleral micro-reservoirs of IOF, which over time turn into small cystic formations with the disappearance of the filtration cushion, which gives grounds to assume the formation of a suprachoroidal outflow path and IOP compensation. There were any severe intraocular complications.

Conclusion: Deep sclerotomy with the using Esnoper clip implant is a safe and effective procedure for lowering IOP in patients with open-angle glaucoma by the activation of the suprachoroidal outflow pathway for a long postoperative (≥ 22 months) period.

877 - P1.103

RETROSPECTIVE ANALYSIS OF THE SAFETY AND EFFICACY OF THE MINIJECT IMPLANT AT 12 MONTHS

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Purpose: The surgical management of glaucoma has expanded with the provision of Minimally Invasive Glaucoma Surgery (MIGS). With an increasing number of MIGS devices being brought to market, the significance of measuring efficacy and safety should not be overlooked. One such device is the MINIject implant, which targets the supraciliary space. This study presents the intraoperative and postoperative safety and efficacy profile from a single surgeon dataset in patients with 12 month follow up.

Methods: Cases of standalone MINIject insertion and combined MINIject with phacoemulsification and intraocular lens insertion were identified via a retrospective analysis of records. These were all performed by a Consultant Ophthalmologist from March 2022 onwards. Data on pre-operative and post-operative intraocular pressure (IOP) was collected, as well as number of drops used and adverse events. The primary outcome was reduction in IOP.

Results: 2 standalone procedures were identified and 26 combined cases. Average IOP was reduced for patients who underwent the procedure across all time points (3, 6 and 12 months). At 3 months the average IOP reduction was 23.5%. Furthermore, there was an overall average drop reduction at 3, 6 and 12 months for patients who had received the implant. There were no intra-operative adverse events. However, most common post-operative adverse events included a gross hyphaema (7.1%) and microhyphaema (10.7%).

Conclusion: 1 year after implantation the MINIject can deliver and sustain IOP lowering and reduce drop dependence. This study adds further evidence for the modern surgeon to consider when managing patients with glaucoma.

881 - P1.104

MINIMALLY INVASIVE MICRO SCLEROSTOMY - REAL WORLD EXPERIENCE AND PRELIMINARY OUTCOMES

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Purpose: With an abundance of new MIGS devices on the market it is important to describe and assess real world performance and safety to better guide device selection in the future. Minimally Invasive Micro Sclerostomy (MIMS) is a novel surgical device which uses an automated micro trephine to create a sclerocorneal channel draining to a subconjunctival bleb to reduce intraocular pressure.

Methods: Patients who had received MIMS by a single consultant surgeon from August 2023 to December 2023 were identified from theatre logbooks in Colchester Eye Centre, United Kingdom. The intraocular pressure, visual acuity and number of glaucoma agents at pre-op, day 2, week 2, week 6 were recorded along with the presence of any complications. Cases were a mix of standalone and combined with cataract surgery.

Results: 14 cases (3 standalone and 11 in combination with cataract surgery) were identified with an average IOP of 17.64 requiring an average of 2.14 glaucoma agents at baseline. At 6 weeks, the average IOP was 15.09 requiring an average of 0.36 glaucoma agents. Representing an IOP reduction of 14.45% and 83.03% reduction in number of glaucoma agents. Cystic Macula Oedema occurred in 1 case and hypotony occurred in 1 case both of which resolved.

Conclusion: MIMS has promising results in the short term, and we anticipate positive outcomes for our cohort at 12 months.

886 - P1.105

COMPARISON OF PERIPAPILLARY AND SUBMACULAR CHOROIDAL CHANGES AFTER TRABECULECTOMY AND PHACOTRABECULECTOMY

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Purpose: To evaluate peripapillary and submacular choroidal changes in patients with open-angle glaucoma managed with trabeculectomy and phacotrabeculectomy.

Methods: Twenty-five patients who underwent phacotrabeculectomy and thirty patients who underwent trabeculectomy were included in the study. Nasal-Temporal peripapillary and submacular, choroidal thickness, luminal area (LA), stromal area (SA) and total choroidal area (TCA) were measured with Image J software on enhanced depth imaging-optical coherence tomography scans. The choroidal vascularity index (CVI) parameter is calculated as the ratio of LA to the TCA. Clinical findings and choroidal characteristics before surgery and one month after surgery were compared.

Results: Fifty-five eyes of 55 patients were included in the study. There was no significant difference between groups in terms of demographic and clinical characteristics. The difference between pre-surgery CVI values of the phacotrabeculectomy group was statistically significantly lower, but post-surgical TCA showed a statistically significant increase in the phacotrabeculectomy group ($p = 0.020$, $p = 0.037$ respectively). Submacular choroidal thickness, LA and TCA were significant difference in the trabeculectomy group, but there was no statistical differences between submacular CVI changes ($p = 0.007$, $p = 0.030$, $p = 0.014$ and $p = 0.254$ respectively). In the peripapillary choroidal measurements of the trabeculectomy group, only temporal CVI showed a significant difference. In the phacotrabeculectomy group, a statistically significant increase was detected in submacular choroidal thickness, submacular CVI, submacular LA and TCA ($p = 0.006$, $p = 0.39$, $p = 0.07$, $p = 0.03$ respectively). Temporal peripapillary LA, TCA and nasal peripaillary LA increased were found statistically significant in the phacotrabeculectomy group, but no statistically significant difference was observed in temporal CVI changes ($p = 0.030$, $p = 0.110$, $p = 0.13$, $p = 0.569$ respectively). No correlation of intraocular pressure measurements with choroidal changes was found between groups.

Conclusion: The TCA of phacotrabeculectomy eyes was significantly higer than the trabeculectomy eyes. In addition, choroidal changes were observed more frequently in the phacotrabeculectomy group. The role of inflammation occurring with cataract surgery may be the cause of choroidal differences between phacotrabeculectomy and trabeculectomy eyes.

Keywords: Choroidal Vascularity Index, trabeculectomy, phacotrabeculectomy

904 - P1.106

EVOLUATION OF THE ADDITIONAL EFFECT OF SELECTIVE LASER TRABECULOPLASTY TREATMENT ON INTRAOCULAR PRESSURE IN PATIENTS STARTING LATANOPROSTEN BUNOD THERAPHY

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Purpose: To investigate the effect of Latanoprosten Bunod (LBN), the first topical nitric oxide-donating prostaglandin analogue (PGA) therapy, on intraocular pressure (IOP) in eyes with ocular hypertension and open-angle glaucoma; and to examine whether there is an additional lowering effect of selective laser trabeculoplasty (SLT) on IOP in eyes treated with LBN

Methods: Twenty eyes of 20 patients who had not undergone any glaucoma surgery or laser treatment were included in the study. Ten patients had previously used medication (medicated patients), while the others had not started any medication (naive patients). Medicated patients were included in the study after a 2-weeks washout period. In all eyes, intraocular pressure (IOP) measurement (GAT), 24-2 visual field, RNFL thickness, macular GCC analysis, and pachymetry were performed. A single evening dose of LBN was administered. IOP was measured before LBN and 1 month after LBN. Selective laser trabeculoplasty (SLT) was applied to eyes deemed unsuccessful based on GAT values (IOP ≥ 20 mmHg). One month after SLT application, IOP measurements were repeated. During this period, all patients continued LBN therapy.

Results: The average age of the twenty patients (9 females, 11 males) was 63.85 ± 11.8 years (range: 38-84). Before and one month after LBN treatment, the average intraocular pressure (IOP) was 27.25 ± 5.7 mmHg and 22.05 ± 5.2 mmHg, respectively ($p < 0.05$). The decrease in IOP before and after LBN treatment was 5.4 mmHg in previously untreated patients ($p < 0.05$) and 4.9 mmHg in those who had received prior treatment ($p > 0.05$). In addition to LBN treatment, SLT was applied to 14 eyes one month after LBN treatment. IOP measurements were repeated one month after SLT treatment. A significant decrease of 3.79 mmHg in IOP was observed after SLT application ($p > 0.05$).

Conclusion: Despite the difference in IOP before and after LBN treatment in both medication-naive and medicated patients, the reduction in medication-naive patients was statistically significant. It was considered that LBN treatment might be more effective as a first-line therapy. We observed an additional pressure-lowering effect of SLT application. We believe that this additional decrease in IOP could be a result of the similar effects of LBN and SLT on the trabecular meshwork structure.

918 - P1.107

COMPARISON OF SURGICAL OUTCOMES BETWEEN HYDRUS AND I-STENT INJECT COMBINED WITH PHACOEMULSIFICATION IN PRIMARY OPEN ANGLE GLAUCOMA PATIENTS: 2 YEARS FOLLOW UP STUDY

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Purpose: To compare the safety and efficacy of two micro-invasive glaucoma surgery (MIGS) devices: Hydrus Microstent and i-Stent Trabecular Bypass in combination with cataract phacoemulsification in the treatment of open-angle glaucoma. This study compares Phacoemulsification with Hydrus stent versus phacoemulsification combined with i-Stent inject W in patients with medically uncontrolled primary open-angle glaucoma (POAG) over a period of 2 years.

Methods: A retrospective comparative case series.

Results: 100 eyes of 88 patients with 2 years completed follow-up after combined phacoemulsification with trabecular by-pass stent (s) were included. Fifty eyes of 45 patients received Hydrus stent (Hydrus Group-PH) and the other 50 eyes of 43 patients had I-stent inject W(I-stent Group-Pi) insertion combined with phacoemulsification and Intra-ocular lens implantation. Patient demographics and preoperative characteristics of the two groups studied are comparable. A post-operative decrease in the IOP of 20% or more was achieved in 42 eyes (84%) in PH group and 38 eyes (76%) in Pi group (p = 0.67). The PH group had a post-operative reduction in the mean number of medications in 28 eyes (56%) in comparison to 22 eyes (44%) in the Pi group (P = 0.8). Second stage trabeculectomy was avoided in 39 eyes (78%) in the Hydrus group and 34 eyes (68%). There was no significant difference in rate of complications between two groups.

Conclusion: Trabecular bypass surgery with Hydrus stent or I-stent inject W combined with phacoemulsification is efficacious and safe for treating patients with medically uncontrolled mild and moderate primary open-angle glaucoma (POAG). Our results show a better eye pressure reduction and reduced need of glaucoma medications after surgery in the Hydrus stent group than in I-stent inject W group but results were not statistically significant.

978 - P1.108

CONCEPT RANDOMISED CONTROLLED TRIAL - 1 YEAR OUTCOMES COMPARING THE EFFECTIVENESS OF PHACOEMULSIFICATION + ENDOSCOPIC CYCLOPHOTOCOAGULATION LASER AND PHACOEMULSIFICATION ALONE FOR TREATMENT OF PRIMARY OPEN ANGLE GLAUCOMA IN PATIENTS WITH CATARACT

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Purpose: To report 1 year outcomes of a randomised controlled trial comparing differences in intraocular pressure, medication use, refractive outcomes and adverse events between participants randomised to receive cataract surgery alone or cataract surgery with endoscopic cyclophotocoagulation (ECP).

Methods: Patients had a washout period prior to surgery and at 1 year post surgery in which all glaucoma medications were stopped. Intraocular pressure was measured at 9 and 11am. Randomisation occured at the point of uncomplicated cataract surgery. Patients and follow up investigators were masked to treatment allocation.

Results: 79 participants received cataract surgery with ECP and 83 were randomised to receive cataract surgery alone. 4 patients received filtering surgery prior to 12 months (4 in ECP group 1 in phaco alone) and the last IOP readings prior were carried forwards in these cases. Mean IOP reductions were higher with phaco ECP (-5.85 [SD6.75] versus -5.28 [SD5.38]). Median IOP was also calculated given non normal distribution of IOP outcomes, which also found a higher reduction for ECP (-7.5 versus -5.5). Success defined as IOP ≤ 21 and ≥ 20% reduction from baseline was seen in 41% of control cases and 54.4% of ECP cases. Medication reduction was similar in both arms (-0.7 control vs -0.8 ECP) as was divergence from intended refractive outcome (+0.18D [0.45] control vs -0.07D [0.58] ECP). Adverse events were monitored; higher rates of anterior uveitis were seen in the ECP arm compared to phaco (27% versus 6%). CMO rates were similar (9% versus 6%), more vitreous wicks were noted in the ECP arm (4% versus 0%) and fewer IOP spikes in the ECP arm (3% versus 5%).

Conclusion: ECP demonstrates a greater reduction in mean and median IOP as well as success rates, refractive outcomes and medication reductions were similar. Most adverse events seen with ECP were self limiting but higher rates of uveitis were noted compared to those receiving cataract surgery alone.

983 - P1.110

A COMPARATIVE STUDY OF THE EFFICACY AND SAFETY OF HYDRUS MICROSHUNT, ISTENT, PRESERFLO AND GATT IN REDUCING INTRA OCULAR PRESSURES WITH PRIMARY OPEN ANGLE GLAUCOMA

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Purpose: A comparative study of the efficacy and safety of hydrus microstent, istent, PreserFlo and gatt in reducing IOP in patients with primary open angle glaucoma.

Methods: The study utilized Ovid Embase and Ovid Medline to search for glaucoma-related literature, focusing on terms such as open-angle glaucoma (OAG), intraocular pressure (IOP), and minimally invasive glaucoma surgery (MIGS) techniques like iStent, Hydrus Microstent, Preserflo, and GATT. Boolean operators aided in search refinement for comparative efficacy and safety studies. Recent MIGS knowledge from publications post-2015 with an impact factor ≥ 2 was prioritized. EndNote's find duplicate function helped eliminate duplicate references, resulting in 47 selected references for thorough evaluation and inclusion.

Results: Studies show Hydrus Microstent with cataract surgery reduces IOP and medication usage in open-angle glaucoma, despite potential adverse effects. For iStents, Combined interventions in studies by Paletta Guedes et al., Samuelson et al., Kozera et al., and Ziaei and Au show significant reductions in IOP and medication usage, suggesting micro-bypass stent implantation and trabeculectomy efficacy in glaucoma management. Safety is promising, with minor complications effectively managed. Larger RCTs with extended follow-up are needed. Both PreserFlo and trabeculectomy lead to significant IOP reductions, with trabeculectomy consistently achieving higher reductions. Both interventions reduce medication usage, enhancing patients' quality of life. PreserFlo shows lower incidence of certain complications but higher hypotony rates. Long-term efficacy studies suggest PreserFlo as a viable, sustainable treatment for POAG. Retrospective case-series affirm GATT's efficacy and safety in OAG management, reducing IOP and medication usage with transient adverse effects. Comparisons with other techniques and combination surgeries highlight its versatility. Challenges include adverse effects and small sample sizes, requiring larger RCTs for clearer insights and bias reduction.

Conclusion: In summary, MIGS devices like Hydrus Microstent, iStent, and PreserFlo effectively reduce IOP and medication usage in POAG patients. While GATT shows promise, more research is needed. Overall, MIGS methods offer safe and effective options for mild to moderate POAG, with PreserFlo standing out for its efficacy and minimal adverse effects.

603 - P1.112

EFFICACY AND SAFETY OF MODERN MINIMALLY INVASIVE GLAUCOMA SURGERY - AB INTERNO CANALOPLASTY - IN 18 MONTHS OF FOLLOW-UP (OWN EXPERIENCE)

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Purpose: Canaloplasty is one of the minimally invasive surgical glaucoma treatment method. The aim of the study is to evaluate the efficacy and safety of ABiC for the treatment of open angle glaucoma in various patients in 18 month follow-up period.

Methods: Patients with diagnosed glaucoma and insufficiently regulated IOP despite maximally tolerable antiglaucoma medications were selected to the study. All of them underwent ABiC procedure between 2017 to 2021 and had at least 18-months of follow-up period. Patients were treated with the modern ab-interno surgical technique using the iTrack canaloplasty microcatheter (Nova Eye Medical). Patients with 360-degree successful catheterization only were selected for this study. After the procedure we assessed the post-operative data.

Results: After the procedure the mean IOP reduction and stabilisation was observed. The mean IOP was 25.21 ± 9.05 mmHg, 17.05 ± 7.37 mmHg, 17.18 ± 2.79 mmHg, 17.57 ± 1.71 mmHg, 16.5 ± 1.69 mmHg, 14.5 ± 5.05 and 14.42 ± 4.96 mmHg before, 1 day, 1, 3, 6, 12, 18 months after the surgery, respectively. The mean usage of the anti-glaucoma topical medications was 2.9 ± 1.02, 1.55 ± 1.39, 2.1 ± 0.74, 2.17 ± 0.75, 2.0 ± 1.2, 2.14 ± 1.07 and 2.08 ± 1.16, before, 1 day, 1, 3, 6, 12 and 18 months after the surgery, respectively.

Conclusion: Ab-interno canaloplasty appears to be a safe and effective treatment for glaucoma in all stages of the disease, although further studies are required to assess the long-term effect and late postoperative complication rate.

264 - P1.113

THREE YEAR OUTCOMES OF PRESERFLO MICROSHUNT WITH MITOMYCIN C AT MANCHESTER ROYAL EYE HOSPITAL FOR UVEITIC GLAUCOMA

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Purpose: To report efficacy and surgical outcomes of PreserFlo MicroShunt in patients with uveitic glaucoma at a tertiary centre.

Methods: Retrospective case series of consecutive patients with uveitic glaucoma who underwent presserflo microshunt surgery at Manchester Royal Eye Hospital with a minimum 1 year follow-up. Baseline characteristics, pre-operative and post-operative IOP, number of glaucoma medications, visual acuity, and adverse events were recorded.

Results: 48 patients with uveitic glaucoma underwent PreserFlo MicroShunt with 0.4-0.5mg/mlmmC were followed up at 1 year post-operation, 33 patients at 2 years and 29 patients at 3 years. The mean age was 51 ± 17 (21-84) years and 27 (56.3%) were female. 75% were Caucasian, 19% Asian and 6% Black. The mean baseline IOP of 29 ± 8 (range 14-45) mmHg was reduced at each year post-operatively ($p < 0.0001$). The mean post-operative IOP at 1 year was 12.5 ± 5.0, at 2 years 11.4 ± 4.8 and at 3 years 13.6 ± 6.8 mmHg. The mean number of pre-operative glaucoma medications was 3.2 ± 1.3 (range 0-5) compared with 0.4 at 1 year, 0.3 at 2 years and 0.6 at 3 years ($p < 0.0001$). Adverse events included hypotony (2 patients) required revision of PreserFlo MicroShunt (6 patients) and required secondary glaucoma surgery (6 patients). At last follow-up visit, complete success rate (IOP ≤ 21 mmHg without medication) was 65%. Qualified success rate (IOP ≤ 21 mmHg, with medication) was 15%.

Conclusion: Our study has shown good IOP control with PreserFlo MicroShunt surgery at 3 years for patients with uveitic glaucoma, which is comparable with studies in the literature.

278 - P1.114

SURGICAL RESULTS OF AB INTERNO TRABECULOTOMY IN PATIENTS WITH EXFOLIATION GLAUCOMA

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Purpose: To evaluate the intraocular (IOP)-lowering effect of ab interno trabeculotomy using Tanito-microhook (μLOT) in patients with exfoliation glaucoma (EXG).

Methods: This is retrospective study. μLOT alone or combined μLOT and cataract surgery were performed for the patients older than 60 years with EXG. The main outcome measures were postoperative IOP, number of anti-glaucoma medications, and predictive factors of surgical success. Kaplan-Meier analysis was performed using 2 criteria: criterion A (postoperative IOP < 20 mmHg and ≥ 20% reduction from baseline IOP); criteria B (postoperative IOP < 16 mmHg and ≥ 20% reduction from baseline IOP). Predictive factors were evaluated using Cox proportional hazard ratios.

Results: A total of 65 eyes of 65 EXG patients with a mean follow-up of 21.1 ± 10.3 months after surgery were included in this study (36 eyes; combined cataract and μLOT, 29 eyes; μLOT alone). Gender distribution were 34 males and 31 females. After surgery, the mean IOP was significantly reduced from 22.1 ± 5.8 mmHg at baseline to 13.9 ± 30. mmHg at 12 months, 13.6 ± 4.0 mmHg at 24 months ($p < 0.001$). There was no significant differences between the pre-operative number of medications (2.8 ± 1.4) and post-operative medications at all periods after surgery ($p = 0.306$). Cumulative success rates for all patients were 40.4% and 38.5% at 36 months after surgery by criteria A and B, respectively. The success rate was significantly higher for μLOT alone (50.0%) than for combined surgery (24.6%) by criteria B ($p = 0.034$). There were no significant risk factors associated with surgical failure in criteria A and B.

Conclusion: Ab interno trabeculotomy is effective in lowering IOP for 3 years. It is more effective to achieve long-term low target IOP control in combined surgery than μLOT alone.

385 - P1.115

BILATERAL PRESERFLO MICROSHUNT IMPLANTATION AFTER DESCEMET'S STRIPPING AUTOMATED ENDOTHELIAL KERATOPLASTY (DSAEK)

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Purpose: To describe a case of bilateral implantation of PreserFlo MicroShunt in both eyes of a patient with intraocular pressure (IOP) elevation after bilateral Descemet's stripping automated endothelial keratoplasty (DSAEK), with poor IOP control by medical treatment alone.

Methods: A female patient, previously diagnosed with primary open angle glaucoma (POAG) and Fuchs' corneal dystrophy in both eyes, developed bilateral bullous keratopathy in late 2021. The patient underwent combined DSAEK and cataract surgery in the right eye in December 2021 and in April 2022 in the left eye. After the surgical procedure, we observed an IOP rise not controlled by medical treatment. Bilateral PreserFlo MicroShunt implantation was chosen as the surgical option to reduce the IOP increase and was performed in June 2022 in the left eye and in July 2022 in the right eye.

Results: PreserFlo MicroShunt implantation was successful in reducing the IOP in both eyes after bilateral DSAEK without the need of any additional hypotonic medical treatment. We observed a good positioning of the device and the maintenance of corneal graft transparency and adhesion in both eyes after a 6 month follow up from the most recent procedure.

Conclusion: PreserFlo MicroShunt has the potential to be an effective and safe surgical option in case of IOP increase after endothelial keratoplasty. Further investigations with larger patient samples are needed to validate our findings.

422 - P1.116

CHALLENGING DIAGNOSIS AND REPAIR OF AN EXTENSIVE CYCLODIALYSIS CLEFT WITH NOVEL APPLICATION OF INTRAOPERATIVE ULTRASOUND BIOMICROSCOPY

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Purpose: To describe a challenging case involving the diagnosis and surgical repair of an extensive cyclodialysis cleft (CDC) in a young, phakic patient.

Methods: A 25-year-old man presented with ocular pain, visual impairment, eyelid hematoma, subconjunctival hemorrhage, and Berlin's edema following blunt trauma to the right eye. Initial conservative treatment with medications was converted to surgery due to hypotony-induced maculopathy.

Results: Ultrasound biomicroscopy (UBM) and gonioscopy revealed extensive supraciliary and suprachoroidal fluid and a CDC whose dimensions were inconclusive. Consequent intraoperative UBM, however, provided precise real-time anatomical evidence of an extensive CDC extending 8 clock hours and mandating closure with a direct cycloplexy approach. Layered scleral dissection and direct suturing of the ciliary body to the sclera was performed with 8-0 nylon sutures, resulting in CDC resolution, supraciliary and suprachoroidal fluid absorption, visual acuity improvement, and intraocular pressure stabilization

Conclusion: This case highlights the innovative use of intraoperative UBM as a critical tool, offering real-time guidance in managing an extensive cleft. The successful closure and improved visual outcomes in this case further validate the efficacy of direct cycloplexy for broad CDC

426 - P1.117

THE EFFECT OF ADDITIONAL PHACOEMULSIFICATION TO TRABECTOME AND TRABECULAR ASPIRATION AS A TRIPLE PROCEDURE FOR EXFOLIATION GLAUCOMA

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Purpose: To determine differing outcomes among pseudophakic patients with exfoliation glaucoma who underwent combined Trabectome surgery and trabecular aspiration, and phakic patients treated by a triple procedure with additional phacoemulsification.

Methods: This retrospective study involved 75 eyes of 75 participants, of which 25 eyes received combined ab-interno trabeculectomy and trabecular aspiration (Trabectome+TA group) and 50 eyes underwent a triple procedure with additional cataract surgery (Triple group). The groups were matched at a ratio of 1:2 based on the following criteria: preoperative IOP, maximum known preoperative IOP, preoperative medication score, cup/disc-ratio, follow-up time and age. Successful surgery was defined by three scores: IOP at longest follow-up < 21 mmHg (Score A) or < 18 mmHg (Score B), without re-surgery and an IOP reduction >20% or IOP ≤ 15 mmHg without re-surgery and an IOP reduction ≥ 40% (Score C).

Results: The preoperative IOP was 23.7 ± 5 mmHg respectively and decreased to 15.2 ± 4 mmHg in the Triple group, which is significantly lower than postoperative IOP in the Trabectome+TA group, being 18.6 ± 8 mmHg, during an average follow-up period of 33.4 ± 26 months. The success rate in the Triple group was significantly higher than in the Trabectome+TA group, according to Score A (78% vs. 40%) and Score B (70% vs. 36%). When aiming at a lower target IOP (Score C), the success rates did not differ significantly (36% vs. 24%). There was no significant difference in postoperative medication scores and side effects observed. Throughout the follow-up timeframes at 1, 6, 12, 24, and ≥36 months postoperative IOP values remained stable at significantly low levels in the Triple group. In contrast to this, there was a gradual increase of mean IOP in the Trabectome+TA group during the investigated timeframes, reaching significantly higher values than in the Triple group after 24, and ≥36 months.

Conclusion: Cataract extraction, as a part of a triple procedure, seems to contribute to more effective and longer lasting IOP-lowering than ab-interno trabeculectomy and trabecular aspiration alone in patients who underwent standalone cataract surgery previously. Therefore, if pseudophakic patients with exfoliation glaucoma are issued for IOP-lowering surgery, a more invasive technique is advisable.

454 - P1.118

POSTOPERATIVE COMPLICATIONS AND RISK FACTORS IN ADVANCED PSEUDOEXFOLIATIVE GLAUCOMA PATIENTS AFTER GONIOSCOPY-ASSISTED TRANSLUMINAL TRABECULOTOMY

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Purpose: The aim of study is to determine the frequency and risk factors of hyphema and intraocular pressure (IOP) elevation (IOP > 30 mmHg or > 10 mmHg above baseline IOP) in advanced pseudoexfoliative glaucoma (PXG) patients after gonioscopy-assisted transluminal trabeculotomy (GATT).

Methods: A prospective study included 70 eyes of 65 patients, with mean age of 69.0 (63.0-76.0) years, which underwent GATT with 5.0 polypropylene suture performed as a standalone procedure or combined with cataract surgery by a single surgeon between November 2022 and November 2023. Medical history, visual fields (VF), IOP, best corrected visual acuity (BCVA), number of glaucoma medication and ocular adverse events were analysed before operation, one week and one month after surgery. Patients were divided into two groups according to VF defect: mild to moderate PXG, mean deviation (MD) ≤ 12 dB and severe PXG, MD > 12 dB. The postoperative outcomes between groups were compared.

Results: A total of 33 (47.1%) eyes were included in the mild to moderate PXG group with a mean age 69.0 (63.0-76.0) and 37 (52.9%) eyes in advanced PXG group with a mean age 71.5 (64.8-79.0). In 32 (45.7%) of patients (14 (43.8%) with mild to moderate and 18 (56.2%) patients with advanced PXG a hyphema more than 3mmwas observed on the first post-operative day (p = 0.6018). After one week, hyphema was seen in 6 patients (4 in the mild to moderate and 2 in the advanced PXG group), one patient underwent an anterior chamber lavage. After one-month BCVA was restored to preoperative level, 0.8 (0.6-0.9) and 0.7 (0.6-0.9) (p = 0.6163) in the mild to moderate PXG preoperatively and one month later, 0.5 (0.4-0.7) and 0.5 (0.3-0.8) (p = 0.5903) in advanced PXG, respectively. No association was found between elevated blood pressure, duration of disease, age, number of medications, use of anticoagulants and incidence of hyphema. Only 2 patients, one in each group, had an increase in IOP on the first postoperative day.

Conclusion: Hyphema are common complication in PXG after GATT but does not affect visual outcome at one month. Postoperative IOP spikes after GATT in PXG are rare.

466 - P1.119

MICROPULSE TRANSSCLERAL CYCLOPHOTOCOAGULATION IN THE TREATMENT OF SECONDARY OCULAR HYPERTENSION IN EYES WITH VITREOUS HEAMORRHAGE

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Purpose: To report the efficacy of combined treatment of ocular hypertension with vitreous hemorrhage.

Methods: This is prospective study including 19 patients (19 eyes) followed for vitreous hemorrhage with uncontrolled ocular hypertension. 4 patients had hyphema from 1.0mmto 4.0mm. Visual acuity varied from pr.l.certae to 0.1. The pre-operative intraocular pressure (IOP) varied from 29 mmHg to 36 mmHg with hypotensive drops. The patients were treated using diod-laser with a micropulse infrared probe with a wavelength of 810 nm. The parameters for the procedure were an exposition 80 s with an energy of 2000 mJ with a duty cycle of 31.3%. All patients treated with local instillation of hypotensive drops and systemic hypotensive therapy, desensitizing, hemostatic and conservative therapy of vitreous hemorrhage.

Results: For the first day after the mTSCPC, there was a decrease in IOP by an average of 15%. The average value of IOP was 25.4mmHg. After 7 days, the value of P0 did not exceed 20mmHg. After 1 month in all patients the IOP level did not exceed 18 mmHg. There were normalized IOP level and positive dynamics of vitreous hemorrhage: vitreous hemorrhage was practically resorbed, an increase in visual acuity was achieved (from 0.4 to 0.8) in 7 patients (7 eyes). All patients underwent a successful vitrectomy with the achievement of a high functional result (from 0.4 to 0.8). Hemorrhagic, inflammatory complications were not observed in any patient after the mTSCPC.

Conclusion: Combination of mTSCPC with local instillation of hypotensive drops and systemic hypotensive therapy, desensitizing, hemostatic and conservative therapy of vitreous hemorrhage is efficacy and safety therapy of ocular hypertension with vitreous hemorrhage.

484 - P1.120

TWO CASES OF AQUEOUS MISDIRECTION FOLLOWING IMPLANTATION OF PRESERFLO MICROSHUNT

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Purpose: To describe a case series of aqueous misdirection (AM) following implantation of PreserFlo MicroShunt (PMS) in patients with pseudo-exfoliation glaucoma (PEG).

Methods: An 84-year-old Japanese female (case 1) and an 87-year-old Japanese male (case 2) with medically uncontrolled PEG, whose preoperative intraocular pressure (IOP) were 26 mmHg (case 1) and 39 mmHg (case 2) under maximal medication, were performed uncomplicated implantation of mitomycin C (mmC) augmented PMS.

Results: On postoperative day 1 (POD1) after the implantation of PMS, both cases presented hypotonic (case 1; 3 mmHg, case 2; 6 mmHg), deep anterior chamber (AC), and mild filtering bleb without any leakage. In the early postoperative period (case 1; POD4, case 2; POD3), both patients developed aqueous misdirection without any signs of choroidal effusion or hemorrhage. Conventional treatment with aqueous suppressants and atropine 1% proved ineffective, and the IOP increased significantly high when the inlet of the PMS was completely occluded with the iris (case 1; 58 mmHg, case 2; 19 mmHg). Surgical irido-zonulo-hyaloidectomy in combination with anterior vitrectomy (IZHV) were performed though peripheral corneal side port. On the next day, the AC was formed in both cases, and the inlet obstruction of the PMS were resolved. Unfortunately, case 1 developed further recurrence of AM, which was eventually resolved by a subsequent glaucoma surgery (trabeculectomy) in conjunction with wider vitrectomy. Subsequently, both cases remained stable, with deep AC. Case 1 kept a functioning bleb from trabeculectomy with IOP of 11 mmHg without any topical IOP-lowering agent, while case 2 kept a bleb of PMS with IOP of 13 mmHg after the initial IZHV.

Conclusion: The management of aqueous misdirection after PMS implantation and its subsequent clinical course is similar to cases due to other causes, except for marked IOP elevation with iris-related tube obstruction when the AC is shallow.

495 - P1.121

SURGICAL OUTCOMES AND PROGNOSTIC FACTORS FOR SUCCESS OF TRABECULECTOMY WITH INTRAVITREAL BEVACIZUMAB FOR NEOVASCULAR GLAUCOMA

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Purpose: To evaluate the 3-year surgical outcomes and the prognostic factors for success of trabeculectomy with intravitreal bevacizumab (IVB) (Avastin, Genentech) for neovascular glaucoma (NVG).

Methods: We retrospectively analyzed 26 eyes with NVG (21 patients) that underwent primary trabeculectomy with mitomycin C. All patients received IVB before trabeculectomy for NVG, and 25 eyes (96.2%) underwent panretinal photocoagulation. Fifteen eyes (68.2%) had a history of pars plana vitrectomy (PPV). The patients were followed for a minimum of 3 years postoperatively. We analyzed the success rates. Failure was defined as follows: definition 1, the need for additional surgery for intraocular pressure (IOP) reduction, loss of light perception vision, and IOP >21 mmHg and IOP reduction < 20%; definition 2, IOP >18 mmHg and IOP reduction < 30%; and definition 3, IOP >15 mmHg and IOP reduction < 40% at two consecutive follow-up visits with or without medication (qualified or complete success, respectively). The risk factors were analyzed by Cox's proportional hazard model.

Results: The complete and qualified success rates 3 years postoperatively were 42.3% and 73.1%, respectively, based on definition 1; 38.5% and 61.5%, respectively, based on definition 2; and 34.6% and 46.2%, respectively, based on definition 3. The incidence rates of early (occurring within 2 weeks) postoperative hyphema and vitreous hemorrhage were 15.4% and 0%, respectively. A history of PPV in eyes with NVG was associated with a significant risk factor for failure ($p < 0.01$).

Conclusion: The 3-year surgical outcomes of trabeculectomy with IVB for NVG were favorable. A history of PPV was associated with a high risk for trabeculectomy.

507 - P1.122

SURGICAL OUTCOMES OF AHMED VALVE IMPLANTATION IN PATIENTS WITH SECONDARY GLAUCOMA

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Purpose: To evaluate efficacy and safety profile of the Ahmed glaucoma valve (AGV) implantation in patients with secondary glaucoma.

Methods: This is a retrospective study of patients with secondary glaucoma who underwent AGV implantation in Pedro Hispano Hospital, Portugal, from July 2014 to July 2023. Demographic characteristics, the best-corrected visual acuity (BCVA), intraocular pressure (IOP), and number of antiglaucoma medications were investigated at baseline and follow-up. Success rate and complications according to the glaucoma type were evaluated at 1, 2, 3 and 6 months and then every 6 months. Success was defined as IPO 6 mmHg and 21 mmHg, without further glaucoma surgery and without loss of light perception. Patients with previous incisional surgery were excluded.

Results: In total, 95 eyes of 91 patients diagnosed with secondary glaucoma and submitted to AGV implantation were reviewed. Neovascular glaucoma was the most frequent etiology of secondary glaucoma. The mean IOP of all patients was 35.7 9.5 mmHg, with a significatively reduction to 10.4 4.6 mmHg at 1 week, 18.7 6.8 mmHg at 1 month, 17.2 5.9 mmHg at 6 months, 14.5 2.1 mmHg at 12 months, 16.9 6.2 mmHg at 24 months and 16.2 5.9 mmHg at 60 months after surgery ($p < 0.001$, respectively). The mean number of antiglaucoma medications was 3.6 1.2 before surgery, with a significantly reduction to 1.8 1.2 at 6 months and 1.7 1.3 at 60 months ($p < 0.001$, respectively). The surgical success was 81,5% at 60 months, with higher success rate in neovascular glaucoma (85,2%) and lower success rate in familial amyloidotic polyneuropathy glaucoma (40.0%). 49.1% of eyes showed postoperatively complications, being hyphema the most frequent one.

Conclusion: AGV implantation is a safe and effective procedure for lowering IOP and reduce antiglaucoma medications in secondary glaucoma. Surgical success is dependent on glaucoma type and patients' demographic characteristics.

560 - P1.123

MODIFIED EX-PRESS TECHNIQUE VERSUS AHMED GLAUCOMA VALVE AS PRIMARY GLAUCOMA SURGERY FOR HEREDITARY TRANSTHYRETIN AMYLOIDOSIS GLAUCOMA

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Purpose: To compare the efficacy of a modified Ex-PRESS technique (EP) versus Ahmed Glaucoma Valve (AGV) as primary surgery in hereditary transthyretin amyloidosis (hTTR) secondary open-angle glaucoma.

Methods: We conducted a retrospective cohort study enrolling consecutive patients who underwent primary glaucoma surgery from the outpatient clinic of the national amyloidosis referral centre. Patients were divided in two groups (EP vs. AGV) according to surgical technique. The Kaplan-Meier survival analysis was used to evaluate surgical success, defined as intraocular pressure (IOP) between 6 mmHg and 21 mmHg without need for further glaucoma surgery and without loss of light perception at 60 months follow-up. Secondary outcomes included surgical complications, need for further hypotensive drugs, endothelial cell count (ECC) and optic disk nerve fiber layer (OD-NFL) loss at time of last follow-up. Patients submitted to previous glaucoma surgery were excluded.

Results: We included 180 eyes of 150 patients, 121 in AGV and 59 in EP group. No significant differences were found between groups regarding age at onset of systemic disease, age and proportion of liver transplantation, and age at time of glaucoma surgery. There were no significant differences regarding preoperative BCVA, IOP, ECC, nerve fibre layer thickness (NFL), and number of glaucoma medications. At time of last follow-up, both groups exhibited significant reduction in IOP (28.2 ± 6.9 vs. 14.7 ± 6.4 mmHg, $p < 0.001$ for AGV and 28.4 ± 5.2 vs. 15.7 ± 8.7, $p < 0.001$ for EP, respectively) and number of glaucoma medications (3.9 ± 0.7 vs. 1.8 ± 1.5, $p < 0.001$ for AGV and 4.00 ± 0.5 vs 0.50 ± 1.0, $p < 0.001$ for EP. Kaplan-Meyer analysis showed a higher cumulative probability of success for AGV group (75.9% vs. 71.6%, $p = 0.011$), with a higher mean time to failure (53.6 vs. 45.8 months, respectively, $p < 0.001$) at 60 months follow-up. The AGV group showed lower hazard (HR 0.37, 95% CI [0.178-0.785], $p = 0.009$) for surgical failure than the EP group.

Conclusion: Secondary hTTR glaucoma is difficult to manage and frequently requires glaucoma surgery. Both AGV and EP are safe and effective techniques in the long-term, although AGV seems to exhibit higher probability of success.

579 - P1.124

TRANSCLERAL CYCLOPHOTOCOAGULATION FOR REFRACTORY INTRAOCULAR PRESSURE ELEVATION AFTER PENETRATING KERATOPLASTY

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Purpose: Transscleral cyclophotocoagulation (TSCPK) is an established procedure for lowering intraocular pressure (IOP). The aim of this study was to evaluate the therapeutic efficacy of TSCPK in eyes with refractory intraocular pressure elevation after penetrating keratoplasty (PKP).

Methods: TSCPK was performed in 52 eyes with inadequate pressure regulation despite maximal conservative therapy after PKP. Best corrected visual acuity, total TSCPK energy and IOP were evaluated preoperatively, on the first postoperative day and after six months. The number of antiglaucomatous medications, postoperative complications and new increase in intraocular pressure were analyzed retrospectively.

Results: The mean age of the patients was 58 ± 2 years. Keratoconus and post traumatic corneal decompensation were the most common indications for PKP. 25 (48.1%) patients had a previous PKP. The mean preoperative IOP was 29.2 ± 0.7 mmHg. On the first postoperative day, IOP was significantly reduced ($p = 0.01$) and averaged 16.4 ± 0.6 mmHg. After six months, the IOP (mean value: 18.3 ± 0.9 mmHg) remained significantly lower ($p = 0.01$). 42 (84%) patients had stable or even improved visual acuity four weeks after TSCPK. The number of antiglaucomatous medications was significantly reduced after TSCPK (2.9 ± 0.1 vs. 2.5 ± 0.1; $p = 0.03$). The overall complication rate was low. However, five (9.6%) patients developed persistent hypotension (< 5 mmHg). The time between the last PKP and TSCPK was 25.8 ± 5.1 months in all patients. In patients with hypotension, this time interval was significantly shorter (4.4 ± 1.7 months). Six months post-TSCPK, 27 (54%) patients had a new intraocular pressure increase (> 25 mmHg), with 24 (88%) of them requiring a second TSCPK.

Conclusion: TSCPK for refractory ocular tension elevation after PKP reduces IOP, the number of antiglaucomatous medications and has low complication rates. Patients should be informed about the potential risk of ocular hypotony before undergoing TSCPK, especially if the time interval between PKP and TSCPK is short.

596 - P1.125

INTRAOCULAR PRESSURE CHANGES AFTER ENDONASAL ENDOSCOPIC ORBITAL DECOMPRESSION IN PATIENTS WITH DYSTHYROID OPTIC NEUROPATHY

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Purpose: To evaluate intraocular pressure changes in patients with dysthyroid optic neuropathy (DON) who have been treated either with intravenous high-dose glucocorticoids (ivGC) in combination with surgical endonasal endoscopic orbital decompression (OD) or OD only.

Methods: From August 2007 to October 2023, a total of 73 operations in 42 patients (14 women, 28 men, age 35-74 years) were performed because of DON. In 31 patients, the surgery was performed on both eyes and in 11 patients, it was performed on one eye only. In 53 cases (group 1), ivGC was given as the initial treatment of DON, followed by OD. OD was performed in 20 cases (group 2) without previous ivGC. Preoperative and postoperative examination (1 month and one year after OD) included visual acuity, examination of the eyelids, cornea and optic nerve, ocular motility, Hertel exophthalmometry, Goldmann applanation tonometry, and ultrasound examination of the extraocular muscles (muscle thickness and reflectivity). In addition, the changes in clinical activity score (CAS) were determined.

Results: The mean (range) preoperative intraocular pressure values were 21.3 (11-40) mmHg in all patients; 21.0 (12-28) mmHg in group 1 and 22.0 (11-40) mmHg in group 2. Intraocular pressure decreased in all cases by 3.0 ± 3.4 mmHg after one month and by 4.7 ± 4.4 mmHg after one year. There was no significant difference between both groups. A reduction in proptosis of 2.0 ± 1.1mmwas achieved in all patients after one month and 3.0 ± 1.6mmafter one year. After one year, there was a significantly greater reduction in exophthalmos in group 1.

Conclusion: Endoscopic orbital decompression decreases intraocular pressure in patients with active Thyroid Eye Disease and DON. Proptosis was significantly more reduced after one year in patients who have been treated with ivGC in combination with OD.

Supported by Ministry of Health of the Czech Republic, grant nr. NU21J-01-00017. Supported by MH CZ – DRO (FNOL,00098892)

620 - P1.126

COMBINATION OF MICROSECOND PULSE CYCLOPHOTOCOAGULATION AND ANTI-VEGF INJECTIONS IN THE TREATMENT OF NEOVASCULAR GLAUCOMA

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Purpose: Neovascular glaucoma (NVG) is among the most difficult to manage and prognostically unfavorable types of glaucoma. This study aimed to evaluate the efficacy of a combined therapeutic strategy, incorporating intraocular administration of a VEGF inhibitor and microsecond pulse cyclophotocoagulation (μCPC), in treating secondary neovascular glaucoma.

Methods: The study encompassed 58 patients (67 eyes) with secondary neovascular glaucoma attributable to diabetes and/or thrombosis of the central retinal vein or its branches. Best corrected visual acuity (BCVA) ranged from hand motion to 0.4; the mean intraocular pressure (IOP) prior to the procedure was 42 ± 12mmHg. Participants received an intraocular injection of a VEGF inhibitor (Bevacizumab), followed within 5-7 days by application of an 810 nm infrared diode laser in microsecond pulse mode at 2000 mW, totaling an exposure time of 220-240 seconds (equivalent to 145 - 160 J) and a duty cycle of 33.3%. Success was defined as a reduction in the number of anti-glaucoma drops (AGD) and an IOP of 11-21mmHg at the last follow-up visit. Follow-ups were conducted at baseline, and at weeks 1, and months 1, 3, and 6 post-procedure.

Results: An average of 1.3 treatments were administered per eye, with 20 eyes (30%) requiring retreatment by continuous-wave CPC within the first month of follow-up. Mean IOP decreased to 28.5 ± 5.0mmHg at 1 week, 23.0 ± 5.3mmHg at 1 month, 19.5 ± 3.2mmHg at 3 months, and 18.5 ± 2.5mmHg at 6 months. A stable reduction in IOP was observed only after three months. The overall success rate was 74%. AGD usage decreased from an average of 2.0 ± 1.0 at baseline to 1.1 ± 1.2 at 1 month, increased to 1.7 ± 1.0 at 3 months, and further to 2.2 ± 1.2 by 6 months of follow-up. No instances of hypotony or other complications were reported.

Conclusion: This study supports the combination of VEGF inhibitor injection and μCPC as an effective, safe, and rapid treatment method for patients with NVG over a 6-month period.

631 - P1.127

PROGNOSTIC FACTORS OF EARLY INTRABLEB CHARACTERISTICS, ASSESSED USING SWEPT-SOURCE ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY, THAT PREDICT SUCCESSFUL TRABECULECTOMY IN PATIENTS WITH REFRACTORY GLAUCOMA

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Purpose: This study aimed to evaluate the prognostic factors of early filtering bleb using swept-source anterior segment optical coherence tomography (SS AS-OCT) in patients with uveitic or neovascular glaucoma.

Methods: This retrospective cohort study included 22 eyes of 22 patients who underwent trabeculectomy (11 eyes each for uveitic or neovascular glaucoma). Intrableb parameters were assessed with SS AS-OCT at 1 month postoperatively. Surgical success was defined by the following criteria: intraocular pressure (IOP) ≤ 18 mmHg and IOP reduction ≥ 30% without medication at 6 months postoperatively. Logistic regression analyses were performed to identify prognostic factors associated with IOP control.

Results: Sixteen eyes (72.7%) were assigned to the successful group, while 6 eyes (27.3%) to the unsuccessful group. In eyes with successful IOP control at 6 months, thicker and less reflective bleb walls with microcysts were formed compared to eyes with unsuccessful IOP control in the early postoperative phase (all $p \leq 0.033$). However, the IOP at OCT time did not significantly differ between the groups ($p = 0.083$). In the multivariate logistic regression analysis, higher bleb wall reflectivity at 1 month post-trabeculectomy alone was significantly associated with a higher surgical failure rate at 6 month post-trabeculectomy (hazard ratio = 1.072, $p = 0.032$).

Conclusion: Early intrableb evaluation with SS AS-OCT might be beneficial for managing a filtering bleb after trabeculectomy in patients with uveitic or neovascular glaucoma. Higher bleb wall reflectivity in the early post-trabeculectomy phase might indicate poor features of the filtering bleb, necessitating appropriately planned subsequent interventions in these refractory glaucoma.

Keywords:
early filtering bleb, swept-source anterior segment optical coherence tomography, uveitic glaucoma, neovascular glaucoma

635 - P1.128

TRABECULAR MICRO-BYPASS STENT INSERTION TO TREAT MEDICALLY UNRESPONSIVE INFLAMMATOY GLAUCOMA: A CASE REPORT

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Purpose: To report a case where micro-trabecular bypass stent insertion was performed to lower uncontrolled intraocular pressure (IOP) in an eye with inflammatory glaucoma.

Methods: A 50-year-old female patient was referred due to uncontrolled IOP while being treated for left eye uveitis and inflammatory glaucoma. The patient was using brimonidine, dorzolamide/timolol, acyclovir and prednisolone eye drops in the left eye. Without recurrence of uveitis, the IOP of her left eye increased to 33 mmHg, and the best corrected visual acuity (BCVA) decreased to 0.1 due to cataract. Despite full maximum medical treatment, the IOP was not controlled. Therefore, we performed phacoemulsification and posterior intraocular lens implantation combined with trabecular micro-bypass stent insertion in her left eye.

Results: The IOP of the left eye was 19 mmHg, and BCVA improved to 0.5 on the postoperative day 1. However, the IOP rose to 30 mmHg at the postoperative week 1. Gonioscopy revealed the inlet of the stent was blocked by the inflammatory debris. The blockage of the stent was cleared using the Nd:YAG laser, and the aqueous drainage through the stent was successfully restored. At the postoperative 9 months, the IOP of her left eye was maintained at 14 mmHg.

Conclusion: The present case suggests that micro-trabecular bypass stent insertion combined with cataract surgery can be an effective surgical option to lower uncontrolled IOP in an eye with inflammatory glaucoma and visually significant cataract, and also that the postoperative blockage of the stent can be cleared using the Nd:YAG laser.

652 - P1.129

CHOROIDAL VASCULARITY INDEX CHANGES AFTER CATARACT SURGERY IN PATIENTS WITH PSEUDOEXFOLIATION SYNDROME

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Purpose: To compare the changes in subfoveal choroidal vascularity index (CVI) after cataract surgery between the eyes with or without pseudoexfoliation syndrome (PXS).

Methods: Thirty-three eyes with PXS and 43 normal eyes undergoing uneventful phacoemulsification were included in this prospective-comparative study. Swept-source optical coherence tomography examination was performed preoperatively and at first month and third months postoperatively. Niblack's image binarization of images was used to derive the subfoveal total choroidal area (TCA), luminal area (LA), stromal area (SA) and CVI. The subfoveal choroidal area was with width of 1500 µm (750 µm wide both nasally and temporally of the fovea). The parameters were compared between two groups after adjusting for age, gender and axial length. Multivariate linear regression analysis was used to determine the associations between CVI change and possible factors.

Results: The only significant difference in pre- and postoperative choroidal measurements between groups was in preoperative LA ($p = 0.04$). A significant increase in TCA and LA was observed at two postoperative visits in both groups ($p < 0.05$). The change in SA was significant only in the PXS group at first month ($p = 0.002$). The postoperative CVIs did not differ from baseline in either group ($p > 0.05$). At postoperative month 1 and month 3, the presence of PXS (unstandardized $\beta = -1.180$, $p = 0.03$ and unstandardized $\beta = -1.234$, $p = 0.01$; respectively) and preoperative CVI (unstandardized $\beta = -0.484$, $p < 0.001$ and unstandardized $\beta = -0.478$, $p < 0.001$; respectively) were associated negatively and capsule tension ring (CTR) implantation (unstandardized $\beta = 1.593$, $p = 0.01$ and unstandardized $\beta = 1.702$, $p = 0.006$; respectively) was associated positively with CVI change.

Conclusion: The presence of PXS may have a reducing effect on the increase in CVI after cataract surgery. A greater increase in CVI may be expected in eyes with a low baseline CVI and those with CTR implantation.

689 - P1.130

360° AB EXTERNO TRABECULOTOMY AS AN OPTION FOR THE MANAGEMENT OF SECONDARY GLAUCOMA

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Purpose: The purpose of this work is to present a modified technique of 360° ab externo trabeculotomy as a possible surgical approach in glaucoma therapy.

Methods: Case report.

Results: The patient (born in 2013) has been followed at our department since 2019 for chronic anterior uveitis in juvenile idiopathic arthritis. Secondary glaucoma and cataracts were already present at the first examination. The secondary glaucoma was well controlled with topical medication. There were no signs of inflammatory activity after long-term topical and systemic treatment (including adalimumab). Cataract surgery with anterior vitrectomy was performed in 2020 (right eye) and 2021 (left eye). The patient's overall condition was complicated in 2021 by the development of haemolytic uraemic syndrome with a subsequent need for renal transplantation (07/2023). Due to the systemic corticosteroid administration post-transplant, the intraocular pressure (IOP) of the right eye peaked at 50torr in October 2023. The condition was successfully managed with 360° ab externo trabeculotomy with subconjunctival application ofmmC. IOP of the right eye is now controlled without the need for local antiglaucoma therapy.

Conclusion: 360° ab externo trabeculotomy is another option for managing complicated secondary glaucoma with a steroid component. This technique can also be combined withmmC trabeculotomy.

719 - P1.131

COMBINED PHACOEMULSIPHICATION, POSTERIOR VITRECTOMY AND AHMED VALVE IMPLANT SURGERY FOR REFRACTORY MALIGNANT GLAUCOMA FOLLOWING IMPLANTATION OF A PRESERFLO MICROSHUNT

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Purpose: Malignant glaucoma (MG), or aqueous misdirection syndrome, is a rare form of secondary angle-closure glaucoma characterized by elevated intraocular pressure (IOP) and a shallow anterior chamber (AC) despite the presence of peripheral iridotomy (PI). It is an exclusión diagnosis. We present a clinical case of malignant glaucoma following Preserflo implantation, requiring surgical intervention.

Methods: A 40-year-old male diagnosed with primary angle-closure glaucoma (PACG) with PI in both eyes, refractory to medical and surgical treatment after phacoemulsification of the right eye (RE), despite achieving greater angle opening. Filtration surgery was proposed with Preserflo implantation in the RE. In the immediate postoperative period, the patient reported blurred vision, and examination revealed hyperemia, atalamia, and elevated IOP. With suspicion of MG, medical treatment was initiated.

Results: After 5 days, the examination remained similar, prompting posterior capsulotomy and Nd-YAG laser hyaloidectomy, deepening the AC but requiring maximum treatment to maintain IOP within normal values. Rescue surgery with Preserflo was attempted, but MG recurred in the immediate postoperative period. Finally, surgical management with pars plana vitrectomy (PPV) + Ahmed valve (AV) in the vitreous chamber was decided, leading to normalization of IOP and resolution of the condition. The contralateral eye also had elevated IOP, prompting consideration of the same procedure (Phacoemulsification + PPV + AV). Currently, the patient has controlled IOP in both eyes without medical treatment.

Conclusion: Despite Preserflo being a minimally invasive technique in filtration surgery, MG can develop after this procedure. Early diagnosis is crucial to prevent permanent visual loss. PPV with AV implantation in the vitreous chamber has proven to be an effective treatment in these challenging-to-control patients.

754 - P1.132

OUTCOMES OF TRABECULECTOMY IN PATIENTS WITH GLAUCOMA IN PHACOMATOSIS PIGMENTOVASCULARIS OVER THE LAST TWO DECADES: A SINGLE-CENTER EXPERIENCE

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Purpose: To report the outcomes of trabeculectomy in patients with phacomatosis pigmentovascularis (PPV).

Methods: In this retrospective cohort-study, medical records of 119-eyes of 60 patients (15 unilateral and 45 bilateral) with glaucoma in PPV, managed over 27-year period (1996 to 2023) were reviewed. We analyzed outcomes of 15 eyes (12 patients) who underwent trabeculectomy with or with out adjunctive antimetabolite. Success was defined as intraocular pressure (IOP) > 6 and ≤ 21 mmHg in the clinic or ≤ 16 mmHg under anesthesia.

Results: The median age at surgery was 6.2 years (range, 0.5-23 years) the youngest was 0.5 year child in whom schlemms canal could not be identified. 9/15 eyes had choroidal hemangioma. The mean CDR was 0.7 ± 0.2. The pre-operative IOP decreased from a mean of 30.5 ± 7.6 to 18.8 ± 8.7mmHg ($p < 0.004$). The median postoperative follow up was 3.25 years (1.03, 9.4). The median number of AGM decreased from 3 (1.4) to 1 (0.2) ($p = 0.34$). Complete success was noted in 46.6 %, qualified success in 80% and failure in 20%. Eight-eyes (53.3%) had postoperative complications, 2 had choroidal detachment (CD), 5 had CD with exudative retinal detachment (RD) out of which 1 eye required AC reformation and rest resolved with conservative managemnet including oral steroids and propranolol. One eye had RD and resulted in Phthisis despite surgical intervention. All eyes that had post operative complications had diffuse choroidal hemangioma.

Conclusion: Trabeculectomy in the management of glaucoma in PPV although performed with adequate preoperative precautions, more than a half of them developed postoperative complications and all these eyes had diffuse choroidal hemangioma.

785 - P1.133

FUNCTIONAL ASSESSMENT OF THE PRESREFLO MICROSHUNT IMPLANT IN SECONDARY GLAUCOMA

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Purpose: The primary objectives of this study are to assess the reduction in intraocular pressure and the decrease in topical hypotensive treatment after a Preserflo surgery in secondary glaucoma, pigmentary or myopic. Additionally, secondary endpoints include the evaluation of changes in visual acuity, papillary excavation, and visual field, as well as the presence or absence of complications.

Methods: Retrospective interventional evaluation of an institutional cohort of 83 patients who underwent Preserflo implant surgery between July 2020 and July 2022 at our hospital, which serves as a specialized center for managing complex glaucoma cases. We have selected to be studied only secondary glaucoma patients due to pigmentary glaucoma or high myopic glaucoma.

Results: Mean IOP SD was reduced from 23.8 ± 1.71 mmHg at baseline to 13.93 ± 1.24 mmHg at year 1 ($p < 0.001$) in pigmentary population, whilst mean IOP in the myopic population decreased from 22.3 ± 3.01 to 12.2 ± 0.8 ($p < 0.0083$). Mean SD number of glaucoma medications per patient decreased from 2.86 ± 0.13 at baseline to 0.93 ± 0.3 at year ($p < 0.0002$) in the pigmentary group and from 3 ± 0.21 at baseline to 0.4 ± 0.22 at year ($p < 0.0001$) in the myopic population. Overall success in the pigmentary group was 73,33% and in the myopic group was 90%.
We registered hyphema, flat anterior chamber, conjunctival fibrosis, choroidal detachment and macular aedeme as adverse effects. Intraoperative AE seemed slightly more frequent in pigmentary group that the myopic group. Regarding late adverse events, bleb encapsulation was most frequently observed in pigmented glaucoma, while a shallow anterior chamber and choroidal detachment were most frequent in the myopic group.

Conclusion: Our results appear to be concordant with the current data reported about POAG and secondary surgeries in literature, making Preserflo a safe and effective device for lowering IOP and the need of medications in secondary glaucoma, such as pigmentary and myopic population.

816 - P1.134

OUTCOMES OF GLAUCOMA SURGERY IN ADULT UVEITIC GLAUCOMA

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Purpose: To evaluate the treatment results of glaucoma surgeries in eyes with adult uveitic glaucoma (UG).

Methods: Adult uveitic eyes that underwent glaucoma surgery between 2008-2023 in Ege University Ophthalmology
Department were included. Patients who had childhood uveitis or were under 18 years old and patients who followed up for less than 3 months postoperatively were excluded. Patient demographics, types of uveitis, pre-operative intraocular pressure (IOP), iridocorneal angle, c/d ratio and pre-operative glaucoma medications, applied glaucoma surgeries, post-operative IOP and complications were recorded.

Results: A total of 67 eyes of 58 patients (25 F, 33 M) were included in the study. Mean age was 54.8 ± 17.1 years, mean follow up period was 75.1 months. Thirthy nine eyes (53.7%) had anterior uveitis (AU), 6 (8.9%) eyes had intermediate (IU), 8 (11.9%) eyes had posterior uveitis (PU) and 14 (20.9%) eyes had panuveitis (PaU). All eyes were under topical anti-glaucoma medications at the time of the surgery., Pupillary block was observed in 6 (8.9%) eyes, localized peripheral anterior synechia was observed in 8 (11.9%) eyes, iridocorneal angle was open in 53 (79.1%) eyes. One glaucoma surgery was needed in 52 (77.6%) of the eyes and 15 (22.4%) eyes had 2 or more operations. In 6 eyes, glaucoma surgery was combined with phacoemulcification cataract surgery. Trabeculectomy with mytomycin C (mmC) was performed in 52 eyes, deep sclerectomy in 9 eyes, ahmed glaucoma valve implantation in 7 eyes AND minimally invasive glaucoma surgery in 12 eyes . Mean pre-operative IOP was 38.0 ± 8.5 mmHg, c/d was 0.58 ± 0.2 and mean number of antiglaucoma agents was 3.1. Mean IOP at the last visit was 15.1 ± 0.9 mmHg, c/d was 0.68 ± 0.3 and number of antiglaucoma agents was 1.6 (p = 0.001 and p = 0.03 respectively). Most common complications were early hypotonia (18 eyes), choroidal detachment (3 eyes), hyphema (5 eyes) and fibrosis of the surgical bleb (10 eyes).

Conclusion: Glaucoma surgery is effective in UG but more than one glaucoma surgeries were needed in 22% of eyes. Trabeculectomy withmmC was the most commonly performed procedure and hypotony was the most common complication.

843 - P1.135

PRE-DESCEMET HAEMATOMA: A RARE COMPLICATION AFTER NON-PENETRATING DEEP SCLERECTOMY

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Purpose: To describe a case of an 82-year-old male with pre-Descemet haematoma (PDH) after non-penetrating deep sclerectomy (NPDS) and its management involving the injection of sulfur hexafluoride (SF6) gas into the anterior chamber.

Methods: A complete ophthalmological assessment was performed including visual acuity (VA), slit-lamp examination, intraocular pressure (IOP) measurement and anterior segment optical coherence tomography (AS-OCT)

Results: We report a case of an 82-year-old male, who was monitored in our hospital due to a pseudoexfoliation glaucoma. Despite maximal tolerated topical therapy, the patient's IOP remained elevated at 48 mmHg with progression on visual field. The decision was made to proceed with NPDS and phacoemulsification. Surgery and early postoperative period went uncomplicated. Four days after discharge, the patient came to the Emergency Room with decreased VA (hand motion) in his right eye (RE) and PDH with active bleeding in the anterior chamber. PDH was confirmed through AS-OCT. Initially, close monitoring of the PDH was carried out, but after three days of no improvement, ab-externo drainage and injection of SF6 gas into the anterior chamber was accomplished without complications. Trabeculo-Descemet membrane (TDM) was not perforated. After six months, the patient's VA is 20/30 in the RE with an IOP of 7 mmHg.

Conclusion: PDH is a rare, sight-threatening complication that can follow glaucoma surgery, particularly viscocanalostomy and canaloplasty. Few cases are described subsequent to deep sclerectomy. This condition may be caused due to blood reflux from Schlemm's canal consequent to hypotony. However, in our case the most plausible theory appears to be bleeding from the surgical bed itself, in light of the presence of active bleeding into the anterior chamber in the early postoperative days. In addition, the patient's antiplatelet medication, for hypertensive heart disease, could increase the haematoma. The treatment approach may vary depending on the severity of the haematoma and the patient's condition. In mild cases observation may be sufficient, whereas in more severe cases, with larger haematomas or significant vision impairment, drainage is indicated. The use of SF6 post-NPDS should be done cautiously, as the expansion of the gas bubble may rupture the TDM.

849 - P1.136

AB INTERNO CANALOPLASTY IN THE TREATMENT OF GLAUCOMA AFTER CORNEAL TRANSPLANT SURGERY

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Purpose: To evaluate the effect of ab intern canaloplasty reducing intraocular pressure (IOP), the number of glaucoma medications, and in addition to evaluate the security of the procedure in patients with glaucoma secondary to corneal transplant surgery.

Methods: This study is a retrospective review of patient data from consecutive patients with PKP, DSAEK, or DALK, who underwent ab interno canaloplasty as a stand-alone procedure. Patients were followed up for 6 months: regarding vision, intraocular pressure (IOP), and the number of medications. Endothelial cell density (ECD), coefficient of variation, and hexagonality were calculated using specular microscopy preoperative and postoperatively to evaluate the security of the procedure in these types of patients.

Results: 10 patients were included. All canaloplasty surgeries were performed by the same surgeon. Preoperative mean IOP was 35.1 ± 14.85; the number of preoperative glaucoma medications was 4 ± 0.93, after surgery the mean IOP was 12.0 ± 1.55 mmHg on 2.0 ± 0.67 medications. The preoperative mean endothelial cell density (ECD) was 1684 cells/mm2. Following surgery was 1497 cell/mm2. No significant endothelial cell lost was detected. No serious adverse events were recorded. No failure graft was reported after surgery.

Conclusion: Ab interno canaloplasty is and effective and safe procedure which successfully achieves a lower IOP in patients with glaucoma after corneal transplant surgery. In this study survival of the corneal grafts was high, therefore it should be considered as an alternative prior to drainage surgery. Further prospective studies with larger patient populations are needed to elucidate the utility of canaloplasty in this population.

854 - P1.137

PAUL GLAUCOMA IMPLANT IN GLAUCOMA SECONDARY TO IRIS PROSTHESIS

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Purpose: To describe the use of the Paul Glaucoma Implant® (PGI) in 2 patients with glaucoma secondary to iris prosthesis (IP).

Methods: A complete ophthalmological examination was performed including visual acuity (VA), slit-lamp examination, intraocular pressure (IOP), measured with iCare® tonometer, fundus exam, OCT and visual field.

Results: Patient 1. A 55 year-old female was being followed in our hospital for a perforating trauma (PT) in her right eye which required a penetrating keratoplasty (PKP) since 2001. Her past medical history was significant for asthma, hypertension and hypothyroidism. In August 2021, Reper® (intraocular lens and IP complex) with scleral fixation was placed. In April 2023, the patient showed corneal decompensation, and another PKP was performed, producing an uncontrolled IOP under maximal tolerated topical therapy. The decision was made to proceed with PGI in the superotemporal sector using a uniform standardised technique of 6/0 Prolene® intraluminal stent (PIS).
Currently, VA is 20/100 and IOP is 14 mmHg with PIS. Patient 2. A 49-year-old South American male was being followed in our hospital for a (PT) in his left eye which required a PKP since 2009. In July 2021, the patient was scheduled for sclera fixation of a Reper® with vitrectomy. In the following years, 2 additional PKP, a DMEK and a DSAEK were made. In February 2023, despite maximal tolerated medical management including oral acetazolamide, the patient's IOP remained elevated at 45 mmHg. The decision was proceed to trabeculectomy with mitomycin C. Four weeks after, surgery failed and PGI was performed with the same surgical technique. Currently, VA is 20/63 and IOP is 18 mmHg with topical combination and without PIS.

Conclusion: The treatment of these patients is particularly challenging due to their multifactorial glaucoma. PT and IP can damage intraocular structures. Possible causes of post-PKP glaucoma include anatomic distortion of the angle and collapse of the trabecular meshwork intraoperatively as well as postoperative inflammation with peripheral anterior synechiae formation, topical steroid use, and graft rejection. PGI is a promising alternative to traditional filtering procedures for the surgical management of patients affected by refractory glaucomas.

871 - P1.138

GLAUCOMA SURGERY SUCCESS AND CORNEAL GRAFT SURVIVAL IN PATIENTS WITH PRIOR CORNEAL TRANSPLANTATION: A RETROSPECTIVE COHORT STUDY

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Purpose: Glaucoma is a common complication following corneal transplantation (CT). Surgical intervention may be necessary to control intraocular pressure (IOP). Management of coexistent corneal graft and uncontrolled glaucoma is challenging. This study aims to evaluate different surgical strategies for treating glaucoma in patients with previous full-thickness and lamellar CT.

Methods: Retrospective cohort study was conducted on all patients who underwent glaucoma surgery following CT at our institution between 2020 and 2023. Corneal graft survival and glaucoma surgery success were the outcomes sought 6 months after glaucoma surgery. Patient demographics, cause and type of CT, history of previous graft rejection, history of previous glaucoma, cause of post-transplantation glaucoma, type of glaucoma procedure, pre CT and pre- and post-glaucoma surgery IOP at various intervals, reduction of hypotensive medication, complications, and cause of corneal graft rejection were other variables retrieved from medical records.

Results: From 308 eyes with CT surgery, a total of twenty eyes (6.49%) who had undergone the following subsequent glaucoma procedures were included: Ahmed valve (n = 4), trabeculectomy (n = 9), deep non-penetrating sclerotomy (DNPS) (n = 3), XEN stent (n = 2), Paul implant (n = 2). Causes for post-transplantation glaucoma surgery were pupillary block (15%), worsening of preexisting glaucoma (30%) and corticosteroid-responsive glaucoma (55%). At month 6, glaucoma surgery success was achieved in 16 eyes (80%) and corneal graft survival reached 55%. The most frequent cause of corneal rejection was secondary non-immune (6/9, 66%). Corneal graft survival was found to be significantly higher in the DNPS (3/3, 100%), XEN implant (2/2, 100%) and Paul implant subgroups (2/2, 100%) compared to subgroups Trabeculectomy (4/9, 44%) and Ahmed valve (0/4, 0%) (p = 0.014). No significant differences were detected in corneal graft survival between groups according to previous graft rejection, age or gender. Success rates for glaucoma surgery showed no statistically significant differences according to type of glaucoma surgery procedure (p = 0.84) and type of CT (p = 0.50).

Conclusion: In refractory glaucoma secondary to CT, success rates of 80% at 6 months can be achieved with either Ahmed valve, trabeculectomy, DNPS, XEN or Paul tube surgery. However, we found that graft survival appears to be greater in those patients undergoing DPNS, Xen stent or Paul implantation.

884 - P1.139

AB INTERNO ANGLE SURGERY IN CHANDLER SYNDROME - A CASE REPORT

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Purpose: Iridocorneal Endothelial (ICE) syndrome is characterized by aberrant corneal endothelial proliferation leading to progressive obstruction of the irido-corneal angle, resulting in corneal edema, secondary angle-closure glaucoma, and iris atrophy. Managing glaucoma secondary to ICE syndrome is challenging, with medical treatments often proving insufficient and filtering surgery exhibiting limited success. This report discusses a case of Chandler syndrome, where uncontrolled intraocular pressure (IOP) persisted despite maximum medical therapy, prompting the application of ab interno angle surgery based on promising outcomes associated with ab externo penetrating canaloplasty.

Methods: This is a case report of the use of ab interno angle surgery to treat ICE syndrome associated glaucoma.

Results: A 45-year-old woman presented with deteriorating visual acuity in the left eye, corneal edema with beaten bronze appearance, and corectopia, alongside uncontrolled IOP (45 mmHg) despite maximum medical intervention. Gonioscopy and anterior segment optical coherence tomography (OCT) revealed peripheral anterior synechiae (PAS), with ICE cell presence in specular microscopy confirming the diagnosis of Chandler syndrome. In pursuit of restoration of the natural outflow pathway, goniosynechiolysis, ab interno canaloplasty, and gonioscopy-assisted transluminal trabeculotomy (GATT) using iTrackTM were performed, concluding with the excision of a trabeculum segment with the Kahook dual blade. Postoperatively, the patient exhibited a round pupil, controlled IOP, and a clear cornea, accompanied by a significant improvement in visual acuity. However, after four months, IOP elevation and PAS recurrence were observed. Subsequent phacoemulsification surgery and Paul glaucoma implant insertion provided optimal IOP control without medication.

Conclusion: This case underscores the feasibility of ab interno angle surgery for ICE syndromes, emphasizing the advantages of sparing conjunctival and scleral incisions to preserve options for future bleb-dependent procedures. The transient nature of results in these patients necessitates vigilant post-operative management to minimize PAS formation, prompting consideration of additional procedures for sustained efficacy.

933 - P1.140

PRESERFLO MICROSHUNT IMPLANTATION IN GLAUCOMA SECONDARY TO VIRAL AND TO JUVENILE IDIOPATHIC ARTHRITIS-RELATED ANTERIOR UVEITIS

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Purpose: To investigate the difference in outcomes after PreserFlo MicroShunt (PMS) implantation in glaucoma secondary to different aetiologies of uveitis in a European population.

Methods: Consecutive eyes with uveitic glaucoma (UG) which had received the PMS. The primary outcome measure was 12 months success defined as lowering of intraocular pressure (IOP) of ≥ 20%, with a target IOP between 6–21 mmHg. Success was considered complete without anti-glaucoma medication or additional surgery other than needling. Qualified success (Category A) was considered irrespective of medication use, and (Category B) irrespective of medication and/or incisional bleb revision. The secondary outcome measures included changes in IOP, revision and complication rates.

Results: Twenty-five eyes [viral group: 10 with Fuchs uveitis syndrome and 6 with herpetic uveitis, and 9 eyes with juvenile idiopathic arthritis (JIA)-related uveitis] were included. Complete success after 12 months was significantly higher in the viral group compared to the JIA group (69% vs 11%; p = 0.0059, Log-rank test). Qualified rates for category A were 75% and 22% (p = 0.029), and for category B 94% and 56% (p = 0.0237), respectively. Rates for incisional bleb revisions within 12 months were 25% and 76%, respectively (p = 0.0131, Log-rank test). Complications were self-limiting with no uveitic activity observed.

Conclusion: The PMS is safe and effective for glaucoma secondary to viral anterior uveitis. After PMS implantation, development of subconjunctival scarring was highly probable in eyes with JIA-related UG. The PMS was at most moderately effective in these eyes as IOP control was slightly meliorated by incisional bleb revisions.

940 - P1.141

PARACENTRAL ACUTE MIDDLE MACULOPATHY (PAMM) FOLLOWING FILTRATION SURGERY

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Purpose: To present a case of unilateral paracentral acute middle maculopathy (PAmm) in a man with no cardiovascular risk factors after trabeculectomy.

Methods: A case report.

Results: A 63-year-old pseudophakic man with pigmentary glaucoma in his left eye and progression despite maximal medical treatment, underwent uncomplicated trabeculectomy with mitomycin C under sub-Tenon's anesthesia. His pre-operative best corrected visual acuity (BCVA) was 20/25 in his right eye and 20/40 in his left eye, while intraocular pressures (IOP) measured 14 mmHg and 17 mmHg, respectively. On the first post-operative day, visual acuity was counting fingers at 2 meters with an IOP of 24 mmHg. There was no relative afferent pupillary defect, the cornea was clear and the anterior chamber deep without evidence of microhyphema or significant cells or flare. On the second post-operative day, the patient was fixating eccentrically, his BCVA remained unchanged and IOP measured 20 mmHg. Fundoscopy of the left eye was unremarkable. Optical coherence tomography (OCT) showed a hyperreflective band-like area parafoveally. Fluorescein angiography revealed normal arterial filling. OCT angiography showed decreased vessel density of the deep capillary plexus in the left eye. These findings in optical coherence tomography were consistent with PAmm.

Conclusion: This is to our knowledge the first case of PAmmassociated with filtration surgery in the literature and may provide an insight into possible mechanisms that may account for diminished visual acuity after trabeculectomy.

944 - P1.142

MANAGING SECONDARY GLAUCOMA AFTER TWO TIMES DEEP ANTERIOR LAMELLAR KERATOPLASTY (DALK) SURGERY IN A JUVENILE CORNEAL DYSTROPHIES CASE

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Purpose: Secondary glaucoma may persist after DALK procedure. The inflammatory cells can be raised and cause trabecular meshwork obstruction. Inflammatory debris can accumulate in the trabecular meshwork area and cause narrowing of the anterior chamber angle. The rise of the intraocular pressure also can be caused by use of long-term steroid drops post keratoplasty. This case describes the management of secondary glaucoma with the tube implant in challenging case of juvenile corneal dystrophies.

Methods: A-15-year-old girl with bilateral corneal dystrophies which has been through DALK procedure on both eyes. The previous RE and LE DALK was done on 2021. But the LE was repeated DALK on 2022 due to graft rejection. 1 year after the second DALK she was consulted to our department with pain and redness of the left eye after she had two DALK procedures. The BCVA 0.2 and her IOP reached 31 mmHg with maximum tolerance of 3 glaucoma medications. The graft is clear and cell density was 1110 (cell/mm). We recommend to do tube implant with AADI.

Results: Glaucoma is a common complication that follows keratoplasty procedure. The tissue deformation induced inflammation and impeded the outflow system due to BAB disruption. The inflammatory cells aggregate with aqueous humor and may be entrapped to form PAS. This condition accelerates corneal endothelial cell loss and increases IOP and leads to graft failure. As the result, this pathological condition leaves no space for filtration surgery. GDD implants are one option that can lead to a better prognosis. In this case, one day after tube surgery, the IOP decrease to 14 mmHg with two glaucoma medication. After six months the IOP still stable at 16 mmHg with only one glaucoma drop and there were no sign of graft rejection, the cornea is clear with BCVA 0,2.

Conclusion: Glaucoma drainage device is safe and recommended in treating secondary glaucoma after DALK procedure.

984 - P1.143

GONIOSCOPY ASSISTED TRANSLUMINAL TRABECULOTOMY (GATT) IN THE MANAGEMENT OF UVEITIC GLAUCOMA - THE MEDIUM-TERM (3 YEAR) RESULTS

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Purpose: To evaluate the medium-term outcomes of Gonioscopy Assisted Transluminal Trabeculotomy (GATT) in the management of Uveitic glaucoma in a real-world setting.

Methods: A single centre, retrospective, consecutive case series (n = 14) of GATT with or without lens surgery in patients with uveitic glaucoma of heterogenous aetiology. All cases were performed between 01/2018 to 03/2019 under the care of three glaucoma consultants. Primary outcomes were as per WGA criteria: complete success (IOP ≤ 21 AND > 20% reduction WITHOUT medications), qualified success (IOP ≥ 21 AND > 20% reduction WITH medications), or failure (IOP more than the success criteria, further glaucoma procedures, NPL vison). Secondary analyses include: complications, additional procedures, visual acuity, intraocular pressure (IOP) and number of medications.

Results: In a cohort of complex patients (Pre-op: VA: 0.74 ± 0.66logMAR, IOP 32.6 ± 9.8 mmHg, number of medications 3.5 ± 1.4, MD -12.1 ± 7.8 dB), analysis suggests that by final follow-up (34.9 ± 24 months, range 0.5-71 months) complete success occurred in 4 cases (29%), however with medications, this improved to a 64% qualified success rate. Failure occurred in 5 cases (36%). Only 3 cases (21%) had simultaneous cataract extraction however a further 2 cases (14%) had IOL removal or exchange at the same time, leaving 65% stand-alone GATT cases. Secondary outcomes at final follow-up or censored at failure showed no significant change in visual acuity (0.01logMAR ± 0.6) from pre-operatively with a 14.9 ± 11.7 mmHg reduction in IOP and a 1.36 ± 1.86 reduction in number of required medications (Post-op: VA: 0.73 ± 0.89logMAR, IOP 17.71 ± 10.19 mmHg, Number of medications 2.14 ± 1.79, MD -12.89 ± 9.16dB).

Conclusion: In this consecutive retrospective case series, we demonstrated that GATT was effective in controlling severely unstable glaucoma in 64% of cases in the medium term. This suggests that GATT is a powerful MIGS procedure for lowering intraocular pressure in uveitic glaucoma.

646 - P1.144

OPTIC NERVE SUBARACHNOID SPACE POSTURE DEPENDENCY IN NTG COMPARED TO HEALTHY CONTROLS

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Purpose: To examine the differences of optic nerve subarachnoid space (ONSAS) volume in normal tension glaucoma (NTG) subjects and healthy controls in different body positions.

Methods: Eight NTG patients and seven healthy controls underwent magnetic resonance imaging (MRI) examinations in head-up-tilt (HUT)+11 degrees and head-down-tilt (HDT)-5 degrees positions according to a randomized protocol determining the starting position. The ONSAS volume in both body positions was measured and compared between the two groups. The results were analyzed using a generalized linear model.

Results: Between HDT and HUT, the postural ONSAS volume change was dependent on starting position ($p < 0.001$) and group ($p = 0.003$; NTG vs. healthy). A subgroup analysis of those that were randomized to HUT examination first, coming directly from an upright position, showed that the NTG subjects had significantly larger positional ONSAS volume changes compared to healthy; 121 ± 22 µl vs. 65 ± 37 µl ($p = 0.049$). Analysis of the ONSAS volume distribution showed different profiles for NTG and healthy.

Conclusion: There was a significant difference in ONSAS volume change between NTG and healthy subjects when subjected to posture changes, specifically when going from upright to head-down posture. This indicates that NTG subjects had been exposed to a lower ONSAS pressure when they came from the upright posture, which suggests an increased translaminar pressure difference in upright position. This may support the theory that NTG has a dysfunction in an occlusion mechanism of the optic nerve sheath that could cause abnormally negative ONSAS pressures in upright posture.

851 - P1.145

FUNCTIONAL MRI FINDINGS IN ASSOCIATION WITH OCT-A PARAMETERS IN PATIENTS WITH OPEN-ANGLE GLAUCOMA AS COMPARED TO HEALTHY SUBJECTS

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Purpose: To elucidate the correlation between the OCT-A of the optic nerve head (ONH) in open-angle glaucoma patients, and concurrent cerebral activity assessed through functional Magnetic Resonance Imaging (fMRI).

Methods: Prospective observational single-visit clinical study was conducted in the Department of Ophthalmology, Lithuanian University of Health Sciences (ClinicalTials.gov Nr. NCT04943458). This study was approved by Institutional Ethics Committee Nr. 19731714. A cohort comprising 63 individuals was enrolled, including 33 diagnosed with open-angle glaucoma and 30 control subjects. One eye per patient was chosen for evaluation using randomized selection. A full ophthalmological examination was conducted. Demographic variables, encompassing age, gender, and disease duration, were systematically gathered. Subsequently, Vascular Density (VD) in different regions of the ONH was measured, using a 3x3mmOCT-A scan (DRI-OCT Triton, TopCon). Functional Magnetic Resonance Imaging (fMRI) was performed for all investigatives using the Siemens Magnetom Skyra unit (Siemens Healthineers, Siemens AG, Erlangen). Brain activity in the visual cortex during stimulation and rest phases was collected and converted into brain activity units. The fMRI image preprocessing was performed by SPM8 software. Volumetric data postprocessing was performed using custom-made algorithms realized in MatLab computational environment (MathWorks, USA).

Results: In the whole image peripapillary region of the OCT-A, a statistically significant negative correlation was observed between the VD and brain activity units on fMRI ($r = -0.79607$ ($p = 0.00022501$)). A statistically significant negative correlation was also found in the superior temporal and inferior temporal quadrants of the OCT-A ($r = -0.6289$ ($p = 0.0090611$) and $r = -0.62153$ ($p = 0.010166$)). No statistically significant correlation was found within the other layers.

Conclusion:

1. We found a statistically significant inverse correlation between the thickness of the superficial capillary layer of the optic nerve head and cerebral activity as determined by functional Magnetic Resonance Imaging. This observation suggests the potential presence of compensatory mechanisms within the brain aimed at decelerating the progression of glaucoma, mechanisms that remain presently undisclosed.
2. Conversely, no analogous correlation was identified within other layers, with a lack of statistical significance.
3. Longitudinal studies are still needed to evaluate the structural and blood flow changes in relation to visual function in glaucoma.

899 - P1.146

DIFFERENTIAL EXPRESSION OF INFLAMMASOME EFFECTOR MOLECULES IN TEARS OF PATIENTS WITH GLAUCOMA AND DRY EYE

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Purpose: Dry eye disease (DED) is a multifactorial inflammatory process of the ocular surface, characterized by the loss of homeostasis of the tear film, and it frequently occurs in patients with primary open-angle glaucoma (POAG), particularly in relation to topical hypotensive treatment. The inflammasome, a multiprotein complex belonging to the innate immune system, has interleukins (IL)-1β and -18 as its main effector molecules. We aim to identify these cytokines in tears and analyze differences in expression between cases and controls.

Methods: We conducted a prospective longitudinal study of cases and controls with consecutive recruitment in the ophthalmology clinics involving 136 participants. After medical history and ophthalmological examination, participants were classified into control subjects (GC; n = 47), patients with DED (GDED; n = 37), with POAG (GG; n = 24), and with POAG and DED (GGDED; n = 28). We obtained reflex tears from the inferior tear meniscus by capillarity and analyzed the concentration of IL-1β and IL-18. Statistical analysis was performed using SPSS 26.0.

Results: The mean age and gender of the participants were similar in all groups. Expression levels of both cytokines IL-1β/IL-18 in tears were significantly higher in the GDED (28.98/159.19 pg/mL), GG (23.51/167.92 pg/mL), and GGDED (30.62/164.42 pg/mL) groups respectively, compared to the GC group (19.65/151.75 pg/mL). We verified the correlation of ophthalmological data with molecular data particularly for the GGDED group.

Conclusion: We suggest that tears are a very valuable biological sample for identifying inflammatory biomarkers associated with DED in individuals with POAG. We propose IL-1β and IL-18, inflammasome effectors, as potential diagnostic biomarkers for DED in glaucoma patients.

322 - P1.147

THE IMPACT OF BASELINE INTRAOCULAR PRESSURE ON TREATMENT RESPONSE IN THE LIGHT TRIAL - SELECTIVE LASER TRABECULOPLASTY VS MEDICATION

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Purpose: The 'LiGHT' trial demonstrated the efficacy and safety of selective laser trabeculoplasty (SLT) over topical hypotensive medication as 1st-line therapy for open angle glaucoma. The aim of this sub-study was to explore the impact of pre-treatment (baseline) intraocular pressure (IOP) on treatment response for SLT and drops.

Methods: This post-hoc analysis of LiGHT trial data compared baseline IOP with IOP 8 weeks following treatment initiation with either SLT or prostaglandin analogue eye drops (PGA). For this analysis adequate IOP reduction was considered to be ≥20% IOP lowering (not pre-set Target IOP). Logistic regression models were used to estimate probability of ≥20% IOP lowering at different baseline IOPs. Predictors were treatment (categorical) and baseline IOP (continuous): their interaction modelled the difference in relationship between success rate and baseline IOP for the two treatments.

Results: A total of 1146 eyes from 662 patients were included in this analysis. SLT and PGA achieved similar IOP lowering at the average baseline IOP of 24.4 mmHg ($p = 0.466$). Both treatments showed greater IOP lowering at higher baseline IOP and less at lower baseline IOP. There was a significant difference in the relationship between baseline IOP and probability of ≥20% IOP lowering between the two treatments ($p = 0.003$), with the SLT being more successful than PGA at baseline IOP ≥ 23.4 mmHg but achieving ≥ 20% IOP less often than PGA at baseline IOP < 23.4 mmHg.

Conclusion: These data confirm previous reports of greater IOP lowering with higher baseline IOP for both SLT and topical hypotensive medication. In treatment naïve eyes, at higher baseline IOP, SLT was more successful at achieving ≥ 20% IOP lowering than PGA, and at lower baseline IOP, PGA drops were more successful.

683 - P1.148

EVALUATING OUTFLOW FACILITY AND IOP CHANGES WITH OMNI SURGICAL SYSTEM (EVOLIOS STUDY)

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Purpose: OMNI is a microcatheter abinterno canaloplasty followed by trabeculotomy designed to address all three points of resistance to conventional outflow. Scarring through goniotomy is an integral issue affecting the efficacy of the procedure. This is the first wash out study assessing changes in outflow facility and intraocular pressure (IOP) for primary open angle glaucoma (POAG) or ocular hypertension (OHT) cases over 1 year.

Methods: Prospective pseudophakic patients between 2020 -2022 with POAG or OHT on 2-3 medication were recruited. Participants underwent medication washout lasting 28 days, IOP measurements were taken using ocular response analyser and tonographic outflow facility with Schiotz tonography at baseline, 3 months and 1 year after surgery. All participants received 360° viscocanaloplasty and 120-180° trabeculotomy with the OMNI system (Sight Sciences, Inc). Anterior segment optical coherence tomography (Anterion) was performed at all postoperative visits. Comparisons were analysed using a paired t-test.

Results: Twenty-six participants had washout IOP, and outflow facility measured. A statistically significant reduction in IOP was found from baseline mean of 27.25 mmHg to 23.99 mmHg at 3 months ($p = 0.035$) and 25.5 mmHg at 1 year ($P = 0.80$). IOP reduction of 20% was achieved in 31% (n = 8). Complete success achieved in 19% (n = 5) and qualified success achieved in 8 % (n = 2). A statistically significant increase in outflow facility was noted from baseline 0.07 µl/min/ mmHg to 0.14 µl/min/ mmHg at 3 months (0.07 µl/min/ mmHg $p = 0.002$) but was not sustained at 1 year 0.11 µl/min/ mmHg ($p = 0.07$). Mean medication reduction showed statistically significance from baseline 2.7 (± 0.9) to 1.2 (± 1.2) at 3 months ($p < 0.0001$) and 1.6 (± 1.2) at 1 year ($p = 0.0007$). Endothelial cell count showed a marginal reduction of 6% at 1 year from baseline. Adverse events include mild inflammation (11%), IOP spike (30%), hyphema (22%), one case of numerical hypotony and one patient requiring a secondary surgical intervention for raised IOP.

Conclusion: This is the first study to evaluate washout IOP and tonographic outflow facility with OMNI surgical system. The study highlights no significant change in IOP and tonographic outflow facility at 1 year suggesting very limited efficacy.

698 - P1.149

RISK FACTORS FOR FAILURE IN GLAUCOMA PATIENTS UNDERGOING MICROSHUNT IMPLANTATION

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Purpose: To evaluate risk factors for failure of Microshunt in glaucoma patients.

Methods: In a multicenter retrospective cohort study, 220 eyes from 220 consecutive glaucoma patients undergoing Microshunt implantation at six glaucoma units. We defined four intraocular pressure (IOP) success criteria: A) IOP ≤ 21 mmHg with ≥ 20% IOP reduction; B) IOP ≤ 18 mmHg with ≥ 20% IOP reduction; C) IOP ≤ 15 mmHg with ≥ 25% IOP reduction; and D) IOP ≤ 12 mmHg with ≥ 30% IOP reduction from baseline. Kaplan-Meier analysis estimated success rates according to the criteria above, and multivariable Cox models identified risk factors for failure according to criterion A.

Results: Success rates varied based on different criteria, ranging from 43.3% to 62.5% (overall success for criteria D and A, respectively) and from 35.3% to 44.4% (complete success for criteria D and A, respectively) at 1-year follow-up. Higher intraoperativemmC concentration was associated with reduced risk of failure to maintain complete (0.4 vs 0.2 mg/mL: Hazard ratio [HR]: 0.441, p < 0.001) and overall (0.4 vs 0.2 mg/mL: HR: 0.360, p = 0.004) success. For complete success, other risk factors for failure were pseudoexfoliation glaucoma/ pigmentary glaucoma (HR: 1.641, p = 0.004), primary angle closure glaucoma (HR: 1.611, p < 0.001), and previous non-glaucomatous ocular surgeries (HR: 2.301, p = 0.002). For overall success, other risk factors for failure were lower preoperative IOP (for 1- mmHg increase, HR: 0.934, p = 0.005), higher number of preoperative antiglaucoma agents (HR: 1.626, p < 0.001), and Microshunt combined with cataract surgery (HR: 1.526, p = 0.033).

Conclusion: This study identified risk factors for Microshunt failure, highlighting the importance of high intraoperativemmC dose and careful patient selection to optimize surgical success.

470 - P1.150

SURGICAL INTERVENTIONS FOR NEOVASCULAR GLAUCOMA: OUTCOMES FROM A TERTIARY CENTRE IN THE UNITED KINGDOM OVER A 13-YEAR PERIOD

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Purpose: Neovascular glaucoma is an uncommon form of glaucoma with the potential for devastating outcomes to a patient's vision. There are currently no agreed standard treatment algorithms and limited evidence on best management. We sought to audit outcomes from patients undergoing glaucoma surgery for neovascular glaucoma in our centre to better understand the impact of our treatments.

Methods: Retrospective review of the electronic medical record from 1st March 2010 to 1st December 2023 for patients with neovascular glaucoma who underwent glaucoma procedures. Data was collected on best corrected visual acuity (BCVA), intraocular pressure (IOP), glaucoma medications, aetiology, surgical procedure, complications and follow-up for pre-operative, day 1, week 1, month 1, month 6, year 1 and most recent time periods.

Results: 263 patients with neovascular glaucoma were identified, of which 57 eyes of 56 patients underwent glaucoma surgery; mean age was 66 ± 16 years and 68.3% were male. The majority had a diagnosis of central retinal vein occlusion or proliferative diabetic retinopathy (38.1% each). Mean time from diagnosis to surgery was 11.4 ± 26.9 months, with a mean follow-up period of 44.6 ± 40.0 months. Presenting BCVA was poor, with a mean of count fingers vision and a final BCVA of hand movements. 80% of eyes underwent cyclodiode; 15% glaucoma drainage device (GDD); and 5% trabeculectomy. For those that underwent cyclodiode, the mean number of diode procedures needed was 1.6 ± 0.8. Primary GDD was performed in 5 eyes, with 4 others following failed cyclodiode. Primary trabeculectomy was performed in 2 eyes, and 1 following failed cyclodiode. Mean IOP overall at presentation was 41.0 ± 12.0 mmHg (43.0 ± 12.0 cyclodiode; 32.0 ± 9.9 GDD; 41.0 ± 10.0 trabeculectomy). This improved at 1 year to 24.0 ± 15.0 mmHg overall (25.0 ± 15.0 cyclodiode; 22.0 ± 19.0 GDD; 12.0 ± 2.6 trabeculectomy). Medication use similarly reduced, from 3.5 ± 1.3 to 1.8 ± 1.5.

Conclusion: Neovascular glaucoma is difficult to manage, typically presenting with high IOP and poor visual acuity and often requiring multiple procedures. We have found good IOP reduction from cyclodiode, GDD, and trabeculectomy though unfortunately the majority of patients still progressed to lose BCVA.

353 - P1.151

MANAGING AGGRAVATING CHOROIDAL DETACHMENT POST TRABECULECTOMY IN PSEUDOEXFOLIATION SYNDROME

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Purpose: To report a challenging case of choroidal detachment (CD) complication after trabeculectomy in secondary open angle glaucoma (SOAG) due to pseudoexfoliation syndrome. CD is a common early post-trabeculectomy complication, an acute drop in IOP combined with an inflammatory process causes a sudden change in hydrostatic pressure; serum transudate crosses the choriocapillaries and accumulates in the suprachoroidal space, threatening ocular stability.

Methods: A case report of a Southeast Asian male undergone filtering surgery with CD in PS. Visual acuity (VA), intraocular pressure (IOP), slit lamp examination, posterior segment, gonioscopy, optical coherence tomography, endothelial cell density, laboratory test, and echocardiography were evaluated.

Results: A 65-year-old man diagnosed with PS planned for trabeculectomy for the left eye (LE). Prior to surgery VA right eye (RE) no light perception (NLP) IOP 18, LE 6/30 IOP 49 and gonioscopic revelaed open anterior chamber (AC), angle sampolesi line in 2 quadrants. 1 day after surgery IOP pressure LE VA 1/300, IOP 4 mmHg and 1 week after surgery a membrane like lesion with high hyperreflectivity and low mobility seen on B-scan ultrasonography. Choroidal detachment detected after trabeculectomy surgery patient prescribe anticholinergic agents, and reduced corticosteroids dose. 2 weeks after surgery LE VA 1/60 IOP 16 mmHg and the signs of choroidal detachment on USG were not visible. Patient returned 1 month post-operation with LE VA 6/20 IOP 15 mmHg without use of any topical glaucoma medication.

Conclusion: In overfiltration or bleb leakage, tapering steroids may be useful in accelerating healing and fibrosis. The scleral flap is often strengthened at the same time to increase resistance to outflow. Reduction in topical corticosteroid contributes to higher rate of bleb fibrosis and bleb failure. Treatment for choroidal detachment includes the use of cycloplegics to deepen the anterior chamber.

Keywords: pseudoexfoliation syndrome, choriodal detachment, trabeculectomy

POSTER SESSION 2

472 - P2.001

ACUTE ANGLE-CLOSURE GLAUCOMA AS A RARE OCULAR MANIFESTATION OF PUUMALA HANTAVIRUS: A CASE REPORT

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Purpose: To describe a distinctive case of acute bilateral angle-closure glaucoma associated with Puumala Hantavirus infection, emphasizing the rarity of this manifestation and highlighting the importance of timely ophthalmological assessment in recognizing and managing this infrequent ocular complication of the disease.

Methods: A 28-year-old female initially presented with symptoms resembling food poisoning, which progressed to systemic deterioration. On the third day of admission, the patient developed severe bilateral ocular pain, blurred vision, photophobia, headache, and recurrent vomiting. Subsequent serological and PCR analyses confirmed Hantavirus infection. Comprehensive ophthalmological evaluation during the onset of ocular symptoms revealed conjunctival hyperemia, chemosis, subconjunctival hemorrhage, and transient myopia. Elevated intraocular pressure (IOP) with 68 and 69 mmHg in the right and left eyes, respectively, and bilateral closed angles on gonioscopy. The patient was promptly started on IOP-lowering medication, and laser peripheral iridotomy (YAG LPI) at 8 spots, 2 in each quadrant, spot size 50 µm, energy 6.5 mj, 530 pulses were performed on both eyes.

Results: Post-YAG iridotomy, the patient showed reduced IOP, resolution of edema and transient myopia, and improved visual acuity. Follow-up assessments revealed a sustained reduction in IOP to 21 and 23 mmHg in the right and left eyes, respectively, stable vision, but persistently shallow anterior chambers.

Conclusion: This case underscores the rare occurrence of acute bilateral angle-closure glaucoma linked to Puumala Hantavirus and emphasizes integrating ophthalmological evaluations into the diagnostic algorithm for systemic diseases with ocular manifestations. As an inaugural documented case in Georgia and a rare instance globally, this highlights the under recognition of ocular manifestations of Hantavirus, urging further investigations into its mechanisms and predisposing factors for angle closure.

905 - P2.002

A CASE OF PRIMARY ANGLE CLOSURE GLAUCOMA IN A PATIENT WITH NANOPHTHALMOS

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Purpose: To report a case of a 31-year-old woman with previously undiagnosed bilateral nanophthalmos and primary angle closure glaucoma (PACG).

Methods: A 31-year-old woman reported low vision in both eyes since childhood. The best corrected visual acuity was 0.70 LogMAR in her right eye (RE) and 1.00 LogMAR in her left eye (LE) and the intraocular pressure (IOP) was 32 mmHg (RE) and 41 mmHg (LE). Refraction revealed high hyperopia namely; +8.25D (RE) and +10D (LE). Due to ethnic reasons (Roma) she never wore spectacles. Slit-lamp examination revealed a shallow anterior chamber and none of the angle structures were visible during gonioscopy in both eyes (due to iridotrabecular apposition). Visual field testing showed glaucomatous defects that were worse in the LE. The C/D ratio was 0.5/0.75 (RE/LE). The anterior segment optical coherence tomography (AS OCT) demonstrated a high lens vault and iridotrabecular contact in both eyes. The OCT of the macula was normal and the retinal nerve fiber layer (RNFL) OCT showed localized RNFL defects in both eyes. The fundus was otherwise normal, so we concluded that the patient has bilateral ametropic amblyopia, probably since childhood.

Results: Laser peripheral iridotomy was performed and local treatment of bimatoprost/timolol od was initiated in both eyes. Local pilocarpine 2% bd and brinzolamide/brimonidine bd were added to both eyes and the IOP decreased to 14 mmHg/16 mmHg (RE/LE). The therapeutic option of clear lens extraction was discussed with the patient. During biometry we encountered a couple of surprises; the patient had an axial length of 18.33 mm/17.91 mm (RE/LE) and the calculated IOL powers were +45D/+47.5D (RE/LE).

Conclusion: Nanophthalmos is an uncommon disorder of ocular development characterized by high hyperopia, short axial length (< 20 mm), high lens-eye volume ratio and a predisposition to angle closure. PACG in hyperopic eyes – and especially eyes with nanophthalmos – with small optic discs, is often underdiagnosed. High rates of intraoperative complications in patients with nanophthalmos (uveal effusion, aqueous misdirection) need to be taken into consideration and discussed with the patient before planning any surgical intervention.

522 - P2.004

PREDICTORS OF GLAUCOMA AFTER PEDIATRIC CATARACT SURGERY

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Purpose: To establish risk factors for developing glaucoma after pediatric cataract surgery (GFCS).

Methods: Single-center, retrospective, longitudinal study of patients who underwent lensectomy for pediatric cataract from 2008 to 2020. Included eyes presented congenital or acquired pediatric cataracts or an anterior form of PFV, and a follow-up of at least one year. Exclusion criteria were the presence of pre-existing intraocular pressure (IOP) elevation, congenital glaucoma, syndromic cataract, and history of trauma or uveitis. Demographic and clinical data were collected. Our primary outcome was the development of GFCS. Multivariable logistic regression with generalized estimating equations (GEE) was used to model the association between potential predictors and the risk of GFCS.

Results: 110 eyes from 74 patients were included, 38 with unilateral and 36 with bilateral pediatric cataract surgery. Average surgery age was 24.71 ± 37.26 months, with 74 eyes (67.3%) undergoing surgery ≤ 12 weeks of age. Patients were followed for 9.96 ± 3.64 years after surgery. 28 eyes (25.45%) developed GFCS, all requiring glaucoma surgery. In multivariable analysis, surgery before 12 weeks of age (OR 34.74; $p < 0.001$), presence of microcornea (OR 12.90; $p = 0.002$), and presence of other anterior segment (AS) abnormalities (OR 52.71; $p < 0.001$) were significantly associated with the development of GFCS.

Conclusion: The development of GFCS is a common and relevant adverse event after pediatric cataract surgery whose management is challenging. Age at surgery, presence of microcornea, and presence of other AS abnormalities can be used to identify those at greatest risk.

567 - P2.005

VISUAL FIELD PROGRESSION IN PAEDIATRIC GLAUCOMA

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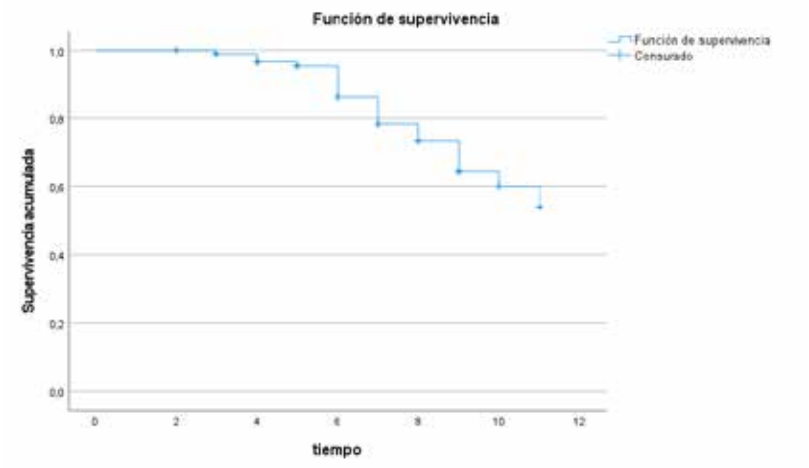
Purpose: The primary objective is to assess the perimetric progression rate of patients diagnosed with paediatric glaucoma with frequent follow-up visits in our centre. It is a single-centre, retrospective, observational study that analysed a total of 96 eyes from 48 patients diagnosed with paediatric glaucoma, with a mean age of 28.10 (12; 68).

Methods: The data on mean defect (MD) in the central 30 degrees of the visual field using the G grid, TOP strategy, were collected during a follow-up period scheduled according to the daily clinical practice, ranging from 2 to 11 years of follow-up, selecting one visual field per year. Progression was defined as a worsening of 0.6dB in MD between the initial and final visual fields of the patient.

Results: Survival analysis was performed to assess the progression rate of the sample. The mean age of the patients was 28.10 ± 14.02 years, with a gender distribution of 43.8% females and 56.3% males. The average follow-up for patients was 6.56 ± 2.53 years. Types of paediatric glaucoma included 81.3% congenital glaucoma, 8.3% infantile glaucoma, and 10.4% juvenile glaucoma. According to the survival analysis of the total sample of 96 eyes, 21 of them experienced visual field worsening at an average of 9.5 ± 0.2 years of follow-up.



Based on the survival function, 40% of patients who progressed did so at 9 years of follow-up. The progression rate at 6 years was 86.3 ± 4.1%, and at 9 years, the progression was 64.6 ± 7.1%, with a risk factor of 14.7% at 6 years and 43.7% at 9 years.

Conclusion: Not many studies related to the progression of paediatric glaucoma were found in the existing scientific literature, and a study of this nature could contribute to the daily clinical practice, providing more insights into the disease and enhancing its control. In conclusion, over time, it is more likely that the patient's visual field will progress, and the longer the time since diagnosis, the higher the percentage of progression.

751 - P2.006

DETECTION AND CHARACTERISATION OF VISUAL FIELD DEFECTS USING OCTOPUS PERIMETRY IN CONGENITAL GLAUCOMA

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Purpose: to detect and characterise visual field (VF) defects using static Octopus perimetry in patients with primary congenital glaucoma (PCG) and to determine VF quality and time duration.

Methods: 88 eyes of 70 patients diagnosed with PCG were included. Assessments were performed using an Octopus 900 and each eye was assessed with the tendency- oriented perimetry (G-TOP) algorithm. Quantitative VF data were collected: quality data (false positive and negative response, and time duration) and results of mean deviation (MD) and square root of loss variance (SLV). Qualitative data were collected: the presence of diffuse and localized defects, the affected hemifield and grade of defects using the Aulhorn and Karmeyer classification. Correlations between perimetric results and clinical variables were analysed.

Results: Median age was 11 (8-17) years. 65.9% (58/88) of PCG eyes showed VF defects. Diffuse defects were observed in 10/58 eyes (16.94%) (mean MD = 23.92 (SD 2.52) dB) and localized defects in 48/58 eyes (82.75%). The most frequent defect was spot- like/stroke-like/incipient paracentral scotoma (n = 15) nasal step (n = 8), adding arcuate defect (n = 2), half ring-shaped (n = 13) and concentric defect with a central island (n = 9). And the most frequent affected visual hemifield was inferior hemifield. Mean test duration was 2'12" (SD 21.6"). MD and sLV values were correlated with BCVA, cup to disc ratio and number of antiglaucoma surgeries (all $p < 0.001$).

Conclusion: A high number of diffuse and localized defects were identified using Octopus perimetry in PCG patients. The most frequent defect was paracentral scotoma and inferior hemifield was the most affected.

3 - P2.007

BIOMECHANICAL ANALYSIS OF CORVIS PARAMETERS IN PATIENTS WITH HYPOTONY

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Purpose: To investigate the possible correlation of hypotony with different corneal parameters obtained by Corvis.

Methods: Retrospective case control study (32 eyes) with chronic numeric hypothony (IOP ≤ 6 mmHg >1 month). In all patients, IOP (mmHg) and following parameters were obtained using the Corvis®ST device: deformation amplitude ratio(DA), Ambrósio's relational thickness(ARTh), stiffness parameter at first applanation(SPA1), Integrated radius(IR), Stress strain index(SSI) and pachymetry (µm). In patients with chronic hypotony also the presence or not of macular folds (clinical hypotony) was included.

Results: Values in eyes with hypotony after glaucoma filtering surgery (cases; n = 16) vs healthy eye (control ; n = 16). Pachymetry 526 ± 52.7 vs 541 ± 78.1 (p = 0.51). SPA1 63.2 ± 18.5 vs 111 ± 15 in controls (p < 0.01). ARTh 558 ± 203 vs 454 ± 193 (p = 0.99). IR 10.8 ± 2.22 vs 8.2 ± 1.15 (p < 0.01). DA 5.6 ± 0.7 vs 4.7 ± 0.5 (p < 0.01). SSI 1.01 ± 1.2 vs 1.1 ± 1.55 (p = 0.87). If we analyze only the cases, the results will be represented as value in eyes with macular folds (n = 9) vs controls (n = 7). Pachymetry 543 ± 24 vs 513 ± 19.1. SPA1 68.5 ± 9.8 vs 59.5 ± 5.8 in controls. ARTh 494 ± 62.7 vs 623 ± 87. IR 11.3 ± 1.25 vs 10.3 ± 0.6. DA 5.9 ± 0.8 vs 5.5 ± 0.3. SSI 1.6 ± 0.8 vs 0.7 ± 0.7 (p > 0.05 in all these groups).

Conclusion: SP-A1 is lower meanwhile IR DA is higher in patients with hypotony, suggesting that these values could increase the percentage of hypotony due to the different ocular biomechanical properties in these eyes. Finally, we suggest that in patients with numeric hypotony a lower value of ARTh and a higher value of SSI could be related to macular folds.

324 - P2.008

CONJUNCTIVAL EPITHELIAL INVASION OF CORNEAL SURFACE DUE TO CORNEAL LIMBAL DAMAGE IN DESCEMET'S STRIPPING AUTOMATED ENDOTHELIAL KERATOPLASTY (DSAEK)-PERFORMING EYES WITH GLAUCOMA

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Purpose: When performing DSEAK for bullous keratopathy in eyes with glaucoma, visual function can't always be restored as expected due to conjunctival epithelial invasion (CEI) caused by limbal stem cell deficiency (LSCD) despite resolution of corneal edema. We revealed the status of CEI in eyes after DSAEK for bullous keratopathy (BK) and investigated the relationship between CEI and history of glaucoma surgery (GS).

Methods: This retrospective study includes 16 eyes of 15 patients who had received DSAEK for BK (aged 76.4 ± 7.7 years). Eleven patients had glaucoma and 4 patients had no glaucoma. Causes of BK were GS in 11 eyes, Fuchs dystrophy in 2 eyes, laser iridotomy in 2 eyes, and shallow anterior chamber in 1 eye. There were no eyes with history of systemic chemotherapy, ocular disease associated with LSCD. CEI was evaluated by fluorescein staining pattern at 3-92 months (26.6 ± 23.6 months) after DSAEK. Area, location, and circumstantial range of CEI ware measured using Photoshop software after binarization of CEI area in schematic image. Visual acuity was not evaluated because of advanced glaucomatous visual field defect.

Results: CEI was observed in 11 of 16 eyes, and among them 10 eyes had glaucoma and had a history of GS. The remaining 1 eye had shallow anterior chamber but no other causes of BK. Eleven patients with CEI, aged 73.8 ± 8.1 years, include 10 males and 1 female. Causes of BK were GS in 10 eyes (9 eyes with previous trabeculectomy), and shallow anterior chamber in 1 eye. Mean number of GS was 3.3 ± 1.8. Mean CEI area (percentage of entire cornea) was 30.1 ± 20.3% (5-61%). Mean CEI range (percentage of entire circumference) was 38.6 ± 19.7% (12-68%). In 9 eyes, CEI lesion was compatible at the location of previous GS. Area and range of CEI lesion was associated with the number of GS ($p = 0.001$). Area of CEI lesion was associated with age $p < 0.0001$. Four eyes with Fuchs dystrophy or laser iridotomy demonstrated no CEI.

Conclusion: In DSAEK-performing eyes with previous history of glaucoma surgeries, a high rate of CEI is present and this may affect visual outcomes.

376 - P2.009

UNVEILING "GREEN DISEASE": OVERLOOKING EARLY GLAUCOMA WITH APPARENTLY "NORMAL" OCT RNFL - A CASE SERIES

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Purpose: This case series addresses "Green Disease," where early glaucoma may be missed due to misinterpreting "normal" optical coherence tomography (OCT) scans of the retinal nerve fiber layer (RNFL).

Methods: An observational case series examined and documented "Green Disease" cases.

Results: Four cases in the series showed normal OCT RNFL thickness in all quadrants. Close scrutiny revealed subtle early wedge defects corresponding to OCT ganglion cell layer (GCL) or Humphry Visual Field (HVF) early defects. Structure-function and/or structure-structure correlations were observed in all cases (Figures 1-4).

Conclusion: "Green Disease" deceives by presenting all RNFL quadrants as "green" on OCT. However, careful examination may reveal small wedge defects in the RNFL thickness map, indicating genuine glaucomatous damage. Thorough analysis of OCT scans is crucial for early glaucoma detection and intervention. Recognizing "Green Disease" enhances clinicians' vigilance, improving glaucoma diagnosis accuracy.

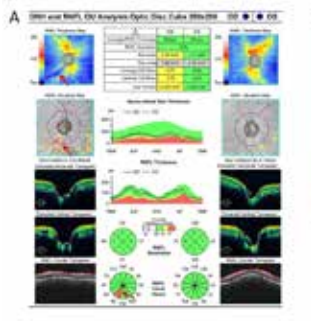

Figure 1. Retinal Nerve Fiber Layer (RNFL) wedge defect in the right eye is evident in the Optical Coherence Tomography (OCT) thickness map, but could be easily missed in the 4 quadrant pie chart (Panel A). Corresponding defects appear in the Ganglion Cell Layer (GCL) OCT and Humphrey Visual Field Test (Panel B, C).

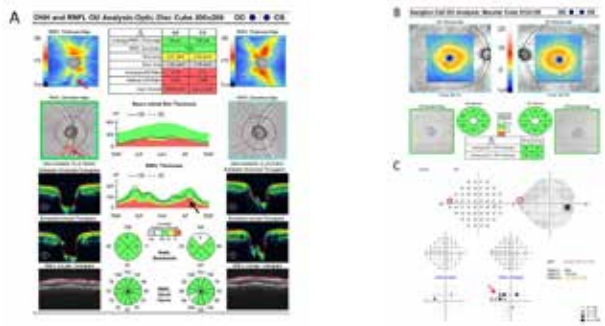

Figure 2. Retinal Nerve Fiber Layer (RNFL) wedge defect in the right eye is evident in the Optical Coherence Tomography (OCT) thickness map, but could be easily missed in the 4 quadrant pie chart and Ganglion Cell Layer (GCL) OCT (Panel B). Corresponding defects appear in the and Humphrey Visual Field Test (Panel C).

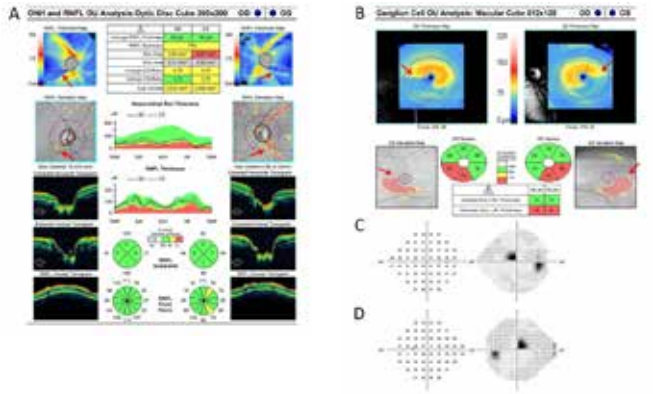

Figure 3. Retinal Nerve Fiber Layer (RNFL) wedge defect in the both eyes is evident in the Optical Coherence Tomography (OCT) thickness map, but could be easily missed in the 4 quadrant pie chart (Panel A). Corresponding defects appear in the Ganglion Cell Layer (GCL) OCT and Humphrey Visual Field Test (Panel B, C).

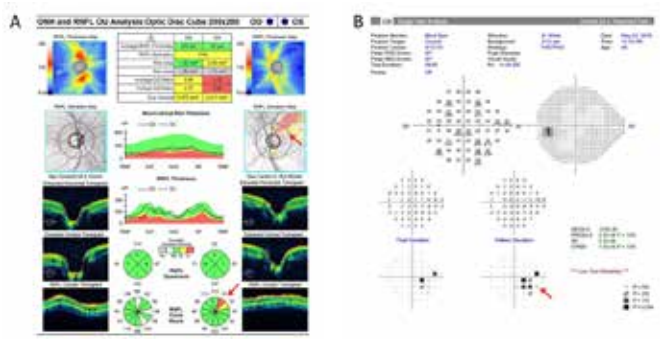

Figure 4. Retinal Nerve Fiber Layer (RNFL) wedge defect in the left in the Optical Coherence Tomography (OCT) thickness map, but could be easily missed in the 4 quadrant pie chart (Panel A). Corresponding defects appear in the Humphrey Visual Field Test (Panel B).

379 - P2.010

ATYPICAL GLAUCOMA PRESENTATION: EXPLORING NEURO-OPHTHALMOLOGIC OVERLAPS

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Purpose: Glaucoma is characterized by irreversible loss of retinal ganglion cells, elevated intraocular pressure (IOP), restricted visual field and neuro-retinal rim thinning. Atypical cases may mimic glaucoma, but it is important to exclude other causes of optic neuropathy. This study aims to characterize the clinical and ancillary tests findings in these patients to improve their recognition and treatment, minimizing the burden of a glaucoma diagnosis.

Methods: A retrospective observational study was conducted on patients referred from the Glaucoma Department to the Neuro-Ophthalmology Department at Hospital Egas Moniz between January of 2021 and December of 2023. Medical records were reviewed, and optical coherence tomography (OCT) and standard automated perimetry data were analyzed at time of referral. Analytical tests were performed using IBM SPSS Statistics® v.28.0, considering significant a p value < 0.05.

Results: Of the 4261 Glaucoma appointments reviewed, 29 patients were referred to Neuro-Ophthalmology. 22 patients were male (75.9%) and mean age was 65.3 ± 20.0 years. Mean IOP was 17.1 ± 5.9 mmHg on the right eye (RE) and 16.4 ± 4.7 mmHg on the left eye (LE), under and avarege of 1.7 ± 1.3 topical hypotensive medication. The average asymmetry of IOP between eyes was 1.8 ± 1.0 mmHg. Mean visual acuity was 0.69 ± 0.29 decimal scale for RE and 0.66 ± 0.34 decimal scale for LE. The average Ishihara plates read were 12.6 ± 6.3 and 12.5 ± 60 for RE and LE, respectively, a significant deviation from the expected value (p = 0.03 and p = 0.02). 7 patients (24.1%) presented relative afferent pupillary defect. 37.9% (n = 11) patients presented atypical perimetric defects (quadrantanopia, hemianopsia and altitudinal defects). OCT demonstrated typical glaucomatous pattern in 37 patients (63.7%). Final diagnosis was glaucomatous neuropathy in 5 patients (17.2%), 2 of which with normal-tension glaucoma. A secondary condition was diagnosed in 11 patients (37.9%), being ischemic optic neuropathy (n = 5), cortical stroke (n = 2) and toxic neuropathy (n = 2) the most common. Glaucoma diagnosis was excluded in the remaining patients (n = 13, 44.8%).

Conclusion: Our study emphasizes the importance of recognizing different patterns of neuro-ophthalmology entities in patients with atypical glaucoma. The significant overlap between these populations requires a comprehensive and multidisciplinary approach to ensure the best of care, ultimately improving outcomes in these complex cases.

418 - P2.012

REFINING GLAUCOMA DIAGNOSIS AND TREATMENT IN CATARACT SURGERY CANDIDATES: THE CONTRIBUTION OF PREOPERATIVE OCT RNFL

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Purpose: To evaluate the clinical significance of preoperative spectral domain optical coherence tomography (OCT) of the retinal nerve fiber layer (RNFL) thickness in identifying glaucoma and better managing patients scheduled for routine cataract surgery.

Methods: This is a retrospective cohort study. Consecutive patients scheduled for cataract surgery in the department of ophthalmology in Shaare Zedek Medical Center, Jerusalem, Israel, were enrolled from February 2022 to August 2022. Participants underwent routine OCT RNFL studies which were evaluated by a glaucoma specialist. Findings were compared with those of preoperative fundus biomicroscopic examinations conducted by the referring ophthalmologist. The main outcomes were the incidence of newly detected glaucoma based upon OCT RNFL findings and the consequent changes in patient management.

Results: In total, 503 patients met the inclusion criteria, of whom 129 (25.6%) had abnormal RNFL. Thirty-one patients (6.1%) had abnormal OCT RNFL findings attributed to comorbidities other than glaucoma, 17 patients (3.4%) had a pre-existing glaucoma diagnosis, and 81 patients (16.1%) were suspected to have glaucoma based upon their OCT RNFL findings, from which 44 patients (8.7%) were newly diagnosed with glaucoma or as glaucoma suspects , resulting in management modifications that included routine glaucoma follow-up (25 patients, 5%), initiation of intraocular pressure-lowering treatment (12 patients, 2.4%), and conversion to combined cataract-glaucoma surgery (7 patients, 1.4%).

Conclusion: OCT RNFL for cataract surgery candidates proved valuable in detecting glaucoma that had not been revealed by standard fundus biomicroscopic examination. The additional information provided by OCT RNFL can potentially enhance patient management and optimize outcomes.

425 - P2.013

COMPARING STRUCTURAL AND VASCULAR DAMAGE OF POAG AND PSEUDOEXFOLIATIVE GLAUCOMA USING OCT AND OCTA

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Purpose: To compare the structural and vascular characteristics of pseudoexfoliative glaucoma (PEX) and primary open angle glaucoma (POAG) patients using optical coherence tomography (OCT) and OCT angiography (OCTA) scans.

Methods: In this prospective, observational, cross-sectional study, 44 PEX patients (60 eyes) and 82 glaucoma patients (117 eyes) underwent 6x6mm² macula-centered OCT (200 A-scans x 200 B-scans) and 3x3mm² OCTA scans using the Cirrus AngioPlex HD-5000 Spectral-Domain OCT (Carl Zeiss Meditec, Inc, Dublin, CA, USA). The average thickness of 10 intra-retinal layers was automatically segmented using the Iowa Reference Algorithm (Retinal Image Analysis Lab, Iowa Institute for Biomedical Imaging, Iowa City, IA) and corrected for ocular magnification based on axial length measurements. Vessels within the superficial layer were segmented into large and small vessels (capillaries). Multivariable linear regression analysis with generalized estimating equations (GEE) was performed to assess differences in imaging parameters (dependent variable) between the diseased groups (independent variables).

Results: No significant variations were observed in age (62 ± 11 years old), gender (78% female), signal strength (8.4 ± 1.1), or axial length (23 ± 0.8mm) between the two patient groups. PEX eyes exhibited significant thinning in the ganglion cell layer (44.6 ± 1.5 µm vs 48.6 ± 1.0 µm; p = 0.030) and inner nuclear layer (38.2 ± 0.5 µm vs 39.9 ± 0.5 µm; p = 0.020) compared to POAG eyes. Additionally, PEX eyes manifested higher perfusion values, particularly in larger vessels (7.1 ± 0.1% vs 6.8 ± 0.1%; p = 0.007), while no discernible differences were observed in capillaries within the superficial layer (27.2 ± 0.3%; p = 0.780).

Conclusion: In this cross-sectional study PEX patients had thinner ganglion cell layers than POAG patients. Nevertheless, PEX patients showed higher perfusion values in larger vessels and comparable perfusion values in capillaries. This indicates that the loss of retinal vessels in glaucoma is not solely a consequence of retinal ganglion cell loss.

427 - P2.014

STRUCTURE-FUNCTION CORRELATION BETWEEN GCL AND THREE DIFFERENT RETINOTOPIC MAPS IN EARLY GLAUCOMA PATIENTS

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Purpose: To determine the structure-function relationship between the areas described in the Garway-Heath (GH), Hood and Iester-Tessitore retinotopic map obtained with the Humphrey Field Analyzer (HFA; Zeiss Humphrey Systems, Dublin, CA, USA) 24-2 SITA Standard and 24-2C SITA Faster and spectral-domain optical coherence tomography (OCT) measurements, in patients with ocular hypertension or early stage glaucoma (MD < -5 dB).

Methods: 42 eyes were prospectively recruited. To be eligible, patients had to have ocular hypertension or early glaucoma with MD < -5 dB assessed by HFA. All participants underwent two reliable HFA visual fields (VF) using the two different strategies. Optic nerve head and macula were analyzed with the Heidelberg Spectralis (Heidelberg Engineering, Heidelberg, Germany) OCT, ganglion cell layer (GCL) and retinal nerve fiber layer (RNFL) were obtained. For each VF test pointwise sensitivity was obtained for each patient, then the mean sensitivity was calculated for all the tested points. Pearson correlation was calculated between structure and function.

Results: Excellent ($p < 0.001$) correlations were observed between GCL thicknesses and both 24-2 and 24-2C VF points. All three retinotopic maps showed a correlation between the upper and middle visual field with the infero temporal GCL fibers ($p < 0.001$). The inferior region of the visual field correlated with the GCL fibres of the supero nasal sector ($p < 0.05$). The correlation between the 10 additional points of the SITA Faster was prevalent and statistically significant in the infero temporal quadrant of the GCL ($p < 0.001$). Mild to moderate ($p < 0.05$) correlations were observed between the peripapillary RNFL thicknesses and both the 24-2 and the 24-2C visual field regions.

Conclusion: Retinal sensitivity assessed with 24-2 and 24-2C HFA correlated well with GCC thickness measured by OCT. There was the presence of a good correlation between the GH retinotopic map and the GCL, particularly between papillo-macular bundle and the infero-temporal sector of the GCL. Thus, in early glaucoma the detection of the GCL might be more useful than the RNFL. The additional 10 points of the SITA Faster could allow a more comprehensive perimetric assessment of glaucomatous disease.

456 - P2.015

EVALUATION OF ANTERIOR SCLERAL THICKNESS AND ANGLE PARAMETERS IN CASES WITH PSEUDOEXFOLIATION SYNDROME AND PSEUDOEXFOLIATION GLAUCOMA

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Purpose: To evaluate the anterior scleral thickness (ST) in cases with pseudoexfoliation (PX) and to examine the relationship between the ST and Schlemm's canal (SC), trabecular meshwork (TM), and scleral spur (SS).

Methods: A total of 114 eyes of 38 subjects with PX syndrome (PXS), 38 patients with PX glaucoma (PXG), and 38 healthy subjects were included in the study. Using sweep source anterior segment optical coherence tomography, ST (0, 1, 2, and 3 mm, from the SS), SC, and TM were visualized in nasal and temporal areas, and measurements were compared between groups. Relationships between corneal thickness, TM, SS, SC, and ST measurements were evaluated.

Results: In all groups, ST, SC, and TM measurements were similar ($p > 0.05$). In the PXG group, SS thickness was thinner in the temporal and nasal areas than in the control and PXS groups, but this difference was significant only in the temporal area ($p = 0.012$). Corneal thickness showed positive correlations with ST measured at 0mmin the nasal and temporal areas ($R = 0.369$, $p < 0.0001$; $R = 0.30$, $p = 0.001$, respectively). In the comparison of the nasal and temporal areas, although 0, 2, and 3mmST measurements showed significant differences ($p < 0.05$), SS thickness was similar in all groups ($p > 0.05$). Scleral spur thickness showed moderately positive correlations with SC length, area, and mean TM thickness in both nasal and temporal areas ($p < 0.05$).

Conclusion: Measurements of ST were similar in all groups. Scleral spur thickness was thinner in the PXG group. Relationships were observed between SS, SC, and the TM. These relationships may indicate ultrastructural changes in cases with PXG.

467 - P2.016

ASSOCIATION BETWEEN FOUR-DOT ARTIFACT AND HUMPHREY VISUAL FIELD ALGORITHM

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Purpose: To study the frequency of appearance of the four-dot artifact and its possible association with the testing strategies or test grid used.

Methods: All visual fields (VF) performed in September 2021 at a tertiary hospital were included in this observational retrospective study. We recorded demographic characteristics, VF indices, test strategy, test grid, presence of four-dot artifact and recurrence. Four-dot artifact was defined by the presence of a threshold depression at least at three of the four primary test points compared with adjacent points. The association between four dot appearance and the VF strategy / test grid used, the demographic characteristics and the VF indices were evaluated.

Results: We analysed 782 VFs: 174 (22.2%) 24-2 SITA Standard, 140 (17.9%) 24-2 SITA Faster and 468 (59.9%) 24-2C SITA Faster. Four-dot artifact appeared in 43/782 (5.5%) VFs: 9 (20.9%) corresponded to 24-2 SITA Faster and 34 (79.1%) to 24-2C SITA Faster. Four-dot artifact was not found in 24-2 SITA Standard VFs. Four-dot artifact appeared more frequently using SITA Faster strategies than SITA Standard strategy ($p < 0.001$). An older age, a greater false-positive rate and the right eye were significantly associated this artifact. No statistically significant difference between the identification of the four-dot artifact in 24-2 grid compared to 24-2C grid was observed ($p < 0.735$).

Conclusion: Four-dot artifact is due to an inadequate response to the initial visual field stimuli. A significant association was detected between the four-dot artifact and the SFR strategy. No significant differences were observed between 24-2 and 24-2C test grids.

514 - P2.017

ROLE OF OPTICAL COHERENCE EN FACE IMAGING IN GLAUCOMA DIAGNOSIS

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Purpose: To analyse retinal nerve fibre layer (RNFL) defect measurements obtained from red-free fundus photography and optical coherence tomography (OCT) en face imaging, respectively, and to compare them for the strength of the structure–function association.

Methods: Two hundred and fifty-six glaucomatous eyes of 256 patients with localized RNFL defect on red-free fundus photography were enrolled. A subgroup analysis included 81 highly myopic eyes (≤ −6.0 dioptres). Angular width of RNFL defect was compared between red-free fundus photography (i.e., red-free RNFL defect) and OCT en face imaging (i.e., en face RNFL defect). The correlation between angular width of each RNFL defect and functional outcomes, reported as mean deviation (MD) and pattern standard deviation (PSD), were assessed and compared.

Results: The angular width of en face RNFL defect was measured smaller than that of red-free RNFL defect in 91.0% eyes (meandifference, 19.98°). The association of en face RNFL defect with MD and PSD was stronger (R2 = 0.311 and R2 = 0.372, respectively) than that of red-free RNFL defect with MD and PSD (R2 = 0.162 and R2 = 0.137, respectively) ($p < 0.05$ for all). Especially in highly myopic eyes, the association of en face RNFL defect with MD and PSD was much stronger (R2 = 0.503 and R2 = 0.555, respectively) than that of red-free RNFL defect with MD and PSD (R2 = 0.216 and R2 = 0.166, respectively) ($p < 0.05$ for all).

Conclusion: En face RNFL defect showed a higher correlation with severity of visual field loss than did red-free RNFL defect. The same dynamic was observed for highly myopic eyes.

569 - P2.018

SIGNAL/NOISE RATIO FOR AREA-MODULATED PERIMETRIC STIMULI OPTIMISED TO MEASURE CHANGES IN SPATIAL AND TEMPORAL SUMMATION IN GLAUCOMA

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Purpose: To compare novel area-modulated stimuli, designed to measure two functional biomarkers in glaucoma (spatial and temporal summation) with conventional luminance-modulated stimuli.

Methods: Disease signal, response variability, and signal/noise ratio (SNR) were determined for two area-modulated, fixed-luminance stimuli (AMS200 [ΔI: 5cd/m2, duration: 200ms] and AMS16 [ΔI: 9cd/m2, duration: 16ms]) and two luminance-modulated, fixed-area stimuli (Goldmann III [GIII] and Goldmann V [GV], both 200ms duration) at 4 locations (9.9° - 20°eccentricity) in 52 glaucoma patients (median [IQR] age: 69.1 [58.9, 75.3] years, median [IQR] MD: -3.1 [-1.3, -6.8] dB) and 53 healthy controls (age: 61.7 [51.9, 69.7] years, MD: 0.5 [-0.7, 1.5] dB). Stimulus levels were defined by a common energy scale (luminance x area x duration) and equated across all stimuli. Threshold (50% seen) and response variability (slope, 'noise') were derived from psychometric functions following a 3-step sampling process. Total deviation (TD, 'disease signal') was calculated as the difference between measured threshold and that predicted for an age-matched control. SNR was calculated as TD/response variability. The effect of stimulus form on SNR was analysed with a linear mixed effects model.

Results: AMS16 had the highest disease signal with a mean difference in disease signal from that of GIII (ΔDS) of 0.28 log Energy. AMS200 had the next highest disease signal (ΔDS: 0.15 log Energy), and GV had the smallest disease signal (ΔDS: -0.19 log Energy). Response variability was lowest for GV in early damage, but more uniform with depth of defect for area-modulated than for luminance-modulated stimuli. Compared to GIII, SNR was significantly higher for AMS16 (1.59 ± 0.40, $p < 0.0001$) and AMS200 (0.52 ± 0.23, $p = 0.02$), and lower (though not statistically significant) for GV (-0.33 ± 0.23, $p = 0.15$).

Conclusion: Area-modulated stimuli, designed to measure changes in spatial and temporal summation, have a higher disease signal, more uniform noise, and higher SNR than luminance-modulated perimetric stimuli. The AMS16, which exploits altered temporal summation, yields additional SNR compared to the AMS200. Despite low response variability, GV had the smallest SNR.

The scientific material was submitted to the ARVO 2024 meeting, Seattle, WA, USA (5-9 May 2024)

584 - P2.019

CORRELATION BETWEEN MARIX FDT AND SPECTRAL DOMAIN OCT

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Purpose: Visual field (VF)analysis is still the gold standard for glaucoma diagnosis. Frequency Doubling Technology (FDT) could detect earlier glaucomatous defects than Standard Automated Perimetry. The aim of this study was to evaluate structure-function correlations between both Humphrey Field Analyzer (HFA; Zeiss, Dublin, CA, USA) 24-2 SITA Standard and Matrix FDT 24-2 (Zeiss, Dublin, CA, USA) and Spectral Domain (SD) - Optical Coherence Tomography (OCT) images (Topcon DRI OCT Triton, Tokyo, Japan).

Methods: Forty-nine eyes of patients (mean age 72) with glaucoma history were included in this study. A comprehensive ophthalmological assessment was conducted, together with HFA and Matrix VF and SD-OCT. The two VFs were performed within three months. Mean Deviation (MD) and Pattern Standard Deviation (PSD) were used as values for visual field assessment, while peripapillary RNFL and macular GCL++ were used to quantify retinal ganglion cell layer damage.

Results: Four and 12 sectors of the 3D-Wide OCT scan detecting the nerve fiber layer thickness at the peri-papillary level were considered. A statistically highly significant correlation was shown between MD24-2 and RNFL4INF ($p < 0.01$) and between PSD24-2 and RNFL4SUP & INF ($p < 0.01$). There was a significant association ($p < 0.01$) between MD24-2 and RNFL12IT & ST, as well as between PSD24-2 and RNFL12I & IT. Regarding the data taken with Matrix FDT perimetry, moderately linear appears to be the correlation between Matrix PSD and RNFL12IT ($p < 0.01$). Fewer statistically significant correlations were found between macular ganglion cell layer thickness (GCL++) and functional parameters detected by the two different perimetry techniques. Furthermore, the decrease in RFNL thickness would appear to have greater predictive ability of the HFA MD than Matrix MD.

Conclusion: The results showed that there was a strong correlation with HFA MD and RNFL parameters, outlining the typical structure and function glaucoma relationship. Furthermore, OCT parameters were a better predictor of the HFA than FDT.

640 - P2.020

EFFICACY OF ISTENT INJECT W COMBINED WITH CATARACT SURGERY: A RETROSPECTIVE SINGLE-ARM STUDY

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Purpose: Retrospective single-arm study aimed to assess the intraocular pressure (IOP) lowering efficacy of iStent inject W combined with cataract surgery in a glaucoma population controlled with topical eye drops over a 12-month follow-up.

Methods: 113 eyes with glaucoma underwent iStent inject W procedures at the time of cataract surgery by one of three operating surgeons at Harrogate District Hospital. Predominant diagnoses (62.9% primary open-angle glaucoma, 12.1% normal tension glaucoma, 9.5% primary angle closure glaucoma, 9.5% ocular hypertension). Patients were followed up at baseline, 1 months, , 3 months and 6 months and 12 months. Treated baseline IOP determined three subgroups: low (≤ 15 mmHg), mid (> 15 mmHg but ≤ 18 mmHg), and high (> 18 mmHg). Key outcomes were changes in IOP and medication burden.

Results: Mean baseline IOP for the overall cohort was 18.5 ± 3.9 mmHg, decreasing to 14.0 ± 3.2 mmHg at 12 months ($p \leq 0.05$). Stratifying the 6-month consistent cohort by baseline IOP revealed IOP reductions in the low (12.4 ± 1.9 mmHg vs 13.8 ± 1.3 mmHg), mid (15.1 ± 2.6 mmHg vs 17.3 ± 0.8 mmHg), and high (15.5 ± 3.6 mmHg vs 22.4 ± 2.2 mmHg) baseline groups, ($p \leq 0.05$ in all cases). The medication reductions were significant only in the low baseline group; 1.8 medications at month 6 vs 2.3 at baseline ($p = 0.013$).

Conclusion: The study demonstrates statistically significant IOP reductions across all baseline IOP groups. Notably, despite varying baseline IOP levels, the final follow-up IOP was consistently low, indicating the predictable efficacy of iStent inject W regardless of starting IOP. Additionally, in a reduced cohort at 12 months (n = 31), visual field mean deviation (VF MD) was noted to be stable (-6.75 dB at baseline vs -5.78 dB at month 12), with no reported secondary surgical interventions throughout the follow-up period. This study underscores the effectiveness of iStent inject W in lowering IOP and maintaining stable visual function, suggesting its potential as a reliable treatment option for glaucoma, especially in conjunction with cataract surgery. Further prospective studies with larger cohorts and longer follow up are warranted to validate these findings.

708 - P2.022

OCTA "NORMATIVE-VALUE" RANGE IN HEALTHY SUBJECTS

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Purpose: To attempt to establish a "normative- value" range for OCTA in healthy subjects. OCTA is a relatively new diagnostic tool that reflects the vascular density of the optic disc and macula, both of which are important in the development of glaucoma. It also shows complete choriocapillaris loss in areas of localized peripapillary atrophy, the so-called deep microvascular dropout. OCTA values are biased and influenced by several systemic diseases and even by the quality and segmentation of the layers. With this study, we rather wanted to observe if there were physiological changes in vessel density by ageing and to guestimate a normative value.

Methods: 93 eyes of 51 healthy subjects were examined. The patients had no known or previous abnormal IOP > 21 mmHg and the aspect of the optic disc was normal with a healthy neuroretinal rim. OCT and OCTA images were captured by Solix Optovue. The en-face superficial, en-face deep and en-face choroid layers were examined. Vascular density was measured in the macula 6 x 6 mm and the peripapillary sector, 4.5 x 4.5 mm of the optic disc. Foveal avascular zone and the vessel density around it were measured as well. All the images with a quality score of < 6 or a SSI < 48 and all the images with an abnormality of the retina or disc (drusen, epiretinal membrane etc) were discarded from the calculation.

Results: Vascular density in macula decreased with age, this decline was more important after the 5th decade. The avascular zone became larger with age and its vascular density less important. Other parameters seem to be stable in our study.

Conclusion: This is important to know a range of the OCTA parameters in each decade to be able to recognize a neurodegenerative disease and its progression from the physiological progression.

721 - P2.023

HIGH RESOLUTION VASCULAR STRUCTURE - FUNCTION CORRELATION IN THE CENTRAL RETINA OF PATIENTS WITH CHRONIC OPEN ANGLE GLAUCOMA

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Purpose: This study aims to analyze the correlation of functional and vascular data within the central retina in chronic open-angle glaucoma (OAG). In employing microperimetry (MP) and conducting pointwise correlation, this investigation aims to examine the impact of high spatial resolution on the strength of structure-function-correlation.

Methods: A total of 89 patients (89 eyes) diagnosed with OAG were enrolled in this prospective cross-sectional study. Vascular parameters were obtained using Optical Coherence Tomography Angiography (OCTA; Zeiss PlexElite). Visual field data was collected with 10-2 MAIA microperimetry using a 68 point isometric grid, excluding the foveal region. Structural and functional data were registered and vascular parameters around each perimetry test point were determined using self-developed algorithms in Matlab software. Vessel distance (VDIS), vessel density (VD) and the largest intercapillary area (LICA) of the superficial vascular plexus were correlated with the MP threshold using linear regression analysis.

Results: Of the different vascular parameters tested, LICA and VDIS yielded the highest Spearman correlation coefficient (r). The correlation for the whole visual field (average of structure and function data) was r = -0.76 for LICA (other parameters: VDIS -0.75, VD 0.74). For the inferior macular hemifield r(LICA) was -0.83 (VDIS -0.82, VD 0.83), but for the superior hemifield r(LICA) was only -0.68 (VDIS -0.67, VD 0.65). Clustering the test points into 8 sectors resulted in a mean ± SD of r (LICA) = -0.69 ± 0.10 (VDIS -0.69 ± 0.10, VD 0.69 ± 0.10), with the nasal inferior sector showing the strongest correlation (r = -0.82 for all parameters). When examining the correlation for the individual 68 test points, we obtained an average r = -0.52 ± 0.13, maximum -0.76 for LICA (VDIS -0.53 ± 0.18, max -0.75; VD 0.52 ± 0.13, max 0.75).

Conclusion: The strength of correlation between the microvascular parameters and microperimetry threshold increased up to hemifield resolution, with the highest correlation in the inferior macula. A possible reason for the decrease of structure-function correlation at higher spatial resolutions could be the approximation to the size of the intercapillary areas and the variability of the vessel calibers.

723 - P2.024

COMPARISON BETWEEN GOLDMANN APPLANATION TONOMETRY AND ICARE REBOUND TONOMETRY

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Purpose: The objective of this study is to test the agreement between Goldmann applanation tonometry (GAT, Haag Streit AT900) and rebound tonometry (iCare IC200 and iCare Home2) and to assess the test-retest variability for each device.

Methods: 102 consecutive glaucoma and ocular hypertension patients were enrolled in our glaucoma service. For each participant, only one eye was randomly included in the study. Pressure was measured twice with GAT and iCare iC200 by the same operator, and twice with iCare Home2 by the patient after specific training. The agreement and the repeatability were analysed with Bland-Altman method.

Results: The measured mean intraocular pressure (IOP) was 16.81 ± 8.57 mmHg with GAT, 18.03 ± 8.67 mmHg with iCare, and 17.08 ± 8.74 mmHg with iCare Home2. The mean difference between GAT and iCare was -1.22 ± 1.63 mmHg ($p < 0.01$), 95%-Limits of Agreement (LoA): [-4.41, 1.97 mmHg] (figure1) and between GAT and iCare Home2 was -0.27 ± 1.56 mmHg ($p = 0.06$), 95%-LoA: [-3,32, 2,79 mmHg] (figure2). The mean difference between iCare and iCare Home2 was 0.95 ± 1.48 mmHg ($p = 0.01$), 95%-LoA [-1.95, 3.85 mmHg]. The mean test-retest variability with GAT, iCare, and iCare Home2 measurements was 0.24 ± 0.97 mmHg, 95%-Limits of Repeatability (LoR): [-1.66, 2.14 mmHg], 0.01 ± 1.11 mmHg, 95%-LoR [-2.17, 2.19 mmHg], and -0.25 ± 1.03 mmHg, 95%-LoR [-1.77, 2.27 mmHg], respectively. The central corneal thickness seems to affect the difference between GAT and iCare and between GAT and iCare Home2 (R = -0,23 and R = -0,22 respectively).

Conclusion: Compared to GAT, both iCare and iCareHome2 tend to overestimate the IOPs. Even though the mean difference between GAT and iCare was statistically significant, the value was slightly above 1 mmHg, which could be considered non-clinically relevant. The mean difference between GAT and iCareHome2 instead, was not statistically significant. All the instruments demonstrated a good repeatability, with a test-retest variability < 1 mmHg. iCare has the lowest test-retest variability, however the measurements with iCare differ more significantly from the ones taken with GAT.

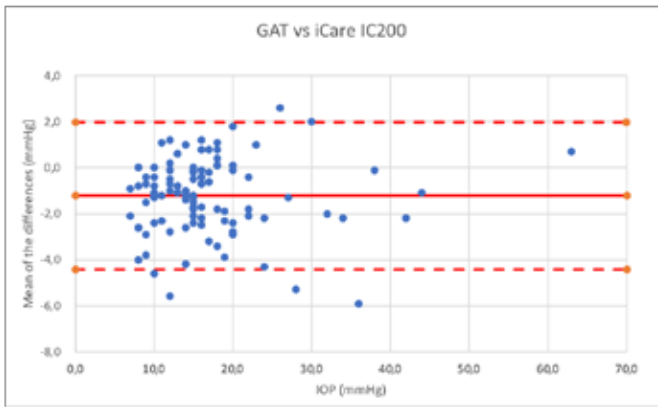

Figure1. Bland-Altmann plot for IOP measurements with GAT and iCare

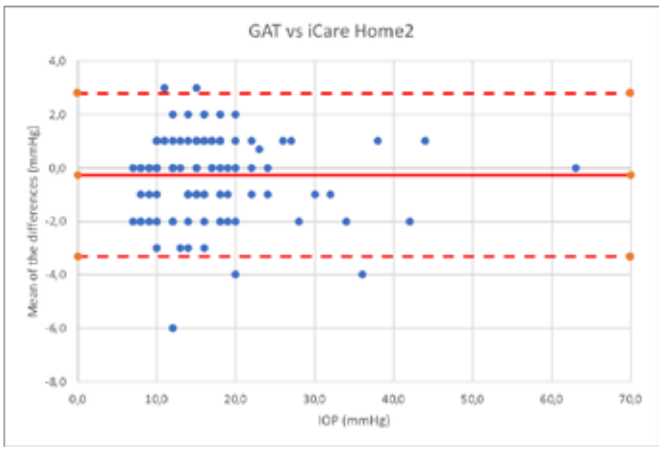

Figure2. Bland-Altmann plot for IOP measurements with GAT and iCare Home2

730 - P2.025

INVESTIGATING THE NUMBER OF RETINAL GANGLION CELLS UNDERLYING NOVEL AREA-MODULATION PERIMETRIC STIMULI EXHIBITING COMPLETE SPATIAL AND SPATIOTEMPORAL SUMMATION AT THRESHOLD IN GLAUCOMA

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Purpose: To investigate if a constant number of retinal ganglion cells (RGC) underlie perimetric stimuli scaled to exhibit complete spatial and spatiotemporal summation in patients with glaucoma.

Methods: Threshold was measured with a Method of Constant Stimuli (MOCS) for 2 area-modulated, fixed-luminance stimuli of 200ms (AMS200 [ΔI: 5cd/m2]) or 16ms (AMS16 [ΔI: 9cd/m2]) duration, and 2 luminance-modulated, fixed-area (control) stimuli of 200ms duration (Goldmann III [GIII] and Goldmann V [GV]) at 2 locations (9.9°, 13° eccentricity) in 37 glaucoma patients (median [IQR] age (years): 68.6 [58.0, 75.5], MD (dB): -3.3 [-1.3, -6.9]) and 53 control participants (age: 61.7 [51.9, 69.7], MD: 0.5 [-0.7, 1.5]). Thresholds were expressed on a common energy scale (luminance*area*duration). RGC layer thickness was extracted from 61 B-scans centred in the fovea with a Spectralis OCT (Heidelberg, Germany). For each stimulus, estimates of underlying RGC number at threshold were derived at 2 psychophysical test locations (9.9°, 13°) using the method of Raza & Hood (IOVS 2015), accounting for RGC displacement (Montesano et al, TVST 2020). Estimates were compared between stimulus forms.

Results: RGC number estimates underlying each stimulus at threshold are constant with eccentricity in healthy eyes for area-modulated stimuli. Estimates are smaller in glaucoma patients than in controls for luminance-modulated stimuli, but higher in patients than in controls for area-modulated stimuli. Overall, differences between by-location estimates in patients and the mean of controls was close to zero for the GIII, negative for the GV, but higher (with some very high) for the area-modulated stimuli, particularly the AMS16.

Conclusion: Results suggest that either more healthy cells contribute to detection threshold for area- modulated stimuli than expected from published models in controls or that RGC layer thickness to RGC number conversions can overestimate the number of functionally intact RGCs. Differences in RGC number between patients and controls with area-modulated stimuli, and also between AMS16 and AMS200, suggest that additional disease signal can be gained from these stimuli.

The scientific material was submitted to the ARVO 2024 meeting, Seattle, WA, USA (5-9 May 2024)

770 - P2.026

COMPARISON OF CLINICAL PERFORMANCE BETWEEN CENTRAL CORNEAL THICKNESS MEASUREMENT USING ULTRASOUND AND CORVIS ST

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Purpose: Evaluate the clinical relevance of central corneal thickness (CCT) measurements obtained by ultrasound (US) or Corvis in eyes with thick CCT and no associated ocular pathology.

Methods: A total of 114 healthy eyes were analyzed. CCT was measured using a contact US pachymeter (6 measurements, the mean considered for analysis) and Corvis (a single measurement). All dynamic corneal response parameters obtained by Corvis were also recorded. The influence of both US and Corvis CCT on uncompensated intraocular pressure (IOPnct) and compensated IOP (bIOP) was compared.

Results: The obtained values were CCT-US (583.7 ± 24.3 microns) vs. CCT Corvis (549.5 ± 31.3 microns), p 0.01. Linear regression between CCT and IOPnct was only significant when Corvis CCT was used (p = 0.04) and not with US CCT (p = 0.6). Regression for neither CCT values was significant with bIOP.

Conclusion: Contact US pachymetry has been considered the "gold standard" for measuring CCT. However, our results suggest that the intrinsic variability of this procedure makes measuring CCT with Corvis more clinically useful. In this small sample, Corvis CCT is significant in clinically relevant relationships, suggesting it may be closer to the true value than that obtained with US.

774 - P2.027

IDENTIFICATION OF ACTION AREAS TO MAKE ROUTINE CATARACT AND GLAUCOMA SURGERY MORE CARBON NEUTRAL

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Purpose: To identify opportunities to incorporate sustainable practices for routine glaucoma and cataract surgeries in a tertiary referral centre within the UK National Health Service and identify readily actionable strategies to implement them. The secondary aim is to generate awareness, build consensus and encourage dialogue amongst stakeholders (surgeons, nursing and administrative staff).

Methods: A routine cataract and trabeculectomy custom surgical tray was photographed and catalogued at the operating theatres at Moorfields Eye Hospital, London. Physical data was obtained by separating paper, plastic and metals and then photographed. Disposal streams of all items including single-use metal instruments (eg capsulorhexis forceps, phaco-chopper and phacoemulsification tip etc) were traced. Items were catalogued by manufacturer and place of manufacturing where possible. The study included data from medical equipment used. The timing of air ventilation operation within the theatre was noted. A discussion with the trust theatre manager followed to identify immediate, short and long-term steps to lower the impact of glaucoma and cataract surgeries upon the environment.

Results: Single use metal instruments were disposed in regular sharps bins, domestic waste went to a landfill, clinical waste was incinerated and three plastic sponge holders were found in each tray. Three primary action points were identified: Firstly, sponge holders currently made from virgin plastic can be replaced with autoclavable metal sponge holders. Secondly, air ventilation in theatres needs to be functional only 30 minutes before surgery, significantly reducing the carbon footprint from running when theatres are not in use. Thirdly, waste segregation and recycling were not undertaken. Discussions with the theatre manager were took place to inquire about getting access to more waste streams eg. the option of mixed recycling bags and single use instrument recycling boxes that are offered by some companies.

Conclusion: The increasing numbers of cataract surgery worldwide, combined with the increased frequency of minimally invasive glaucoma surgeries provides a unique opportunity for glaucoma surgeons to reduce their environmental impact. A more sustainable surgical approach will require identication of readily actionable items at each hospital as well as trust sustainability leads within institutions. Partnership with pharmaceutical and medical equipment industry will ultimately be essential in achieving carbon neutrality.

783 - P2.028

TEAR DERIVED EXTRACELLULAR VESICLES: A MINIMALLY SOURCE OF NOVEL BIOMARKERS FOR SUBCONJUNTIVAL GLAUCOMA SURGERY

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Purpose: Glaucoma is a highly prevalent pathology causing avoidable blindness. Topical treatments used to stabilize intraocular pressure (IOP) may produce several side effects including inflammatory reactions. Patients who fail to control IOP or suffer significant side effects undergo subconjunctival glaucoma surgery (SGS). Estimations point to 30–40% of these patients will develop local scarring and fibrosis, which are the main complications of SGS. Thus, predicting the surgical outcome and starting preemptively fibrosis treatment are crucial. The aim of this study was to determine whether tears, and specifically tear-derived extracellular vesicles (L-EVs), can be used as liquid biopsy source, as a previous step for identifying new biomarkers for SGS outcome

Methods: Tear samples were obtained from patients (no surgical treatment, n = 11) by Schirmer's test. L-EVs were enriched by size-exclusion chromatography. Protein quantification was measured by microBCA assay and miRNA extraction (both from whole tear and L-EVs) was performed using commercial kits.

Results: Whole tear samples displayed variable miRNA and protein concentrations among patients (range 222.0-1388.1 ng miRNAs and 5.6-27.2 µg protein). Levels of miRNA and protein were also highly variable but considerably reduced in L-EVS (0.14-46.78 ng miRNAs and 0.5-4.2 µg protein). Yet, in most patients, both types of samples (whole tears and L-EVs) rendered sufficient quantity of protein and miRNA to perform proteomic and transcriptomic analysis.

Conclusion: Concentration of miRNAs and Protein in tears and L-EVs is highly variable among patients. As expected by their higher enrichment, miRNA and protein concentrations in L-EVs are reduced compared to whole tears, yet quantities may be still enough to perform mic analyses. This higher purification of L-EVS may help identifying specific biomarkers related to SGS outcome in a minimally invasive manner.

812 - P2.029

PORTABLE DEVICES FOR THE DETECTION OF GLAUCOMA IN LOW AND MIDLE INCOME COUNTRIES (LMIC): A TRAINING MANUAL

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Purpose: To determine the ability of community health care workers with no previous specialised ophthalmic training to use portable diagnostic tests to identify people with possible glaucoma in a community clinical setting and refer appropriately to support earlier detection of glaucoma in adults in Abuja, Nigeria.

Methods: This was a feasibility study conducted between June – September 2024. It was carried out in 3 community health centres. Portable devices used were: PEEK acuity (smartphone), icare tonometer, Eyecatcher visual field analyser and Remedio hand-held fundus camera. Training was done in 3 days and was a combination of didactic lectures, practical demonstration, and hands on training. A pre and post assessment of the health care worker was conducted before and after training, respectively. A pass mark of 80% was set for the post training assessment at first sitting. A simplified scoring system was developed based on examination findings from the portable devices. This score was based on visual acuity, intraocular pressure, vertical cup disc ratio, and visual field analysis. The total individual score determined whether a patient needed to be either referred for further management in a specialised glaucoma centre, discharged, or invited for a repeat examination at 6 or 12 months.

Results: A total of fifteen (15) community health care workers were recruited in the three community health centres (14 females and 1 male). Hundred percent of the community health care workers passed with a score of 80 percent or more at first sitting. Challenges were mostly noted with Remidio fundus camera and icare tonometer and these improved with practice.

Conclusion: Portable devices have shown great prospects in the diagnosis. These devices have been shown to be efficiently used by the community health care workers who had no specialized training in eye care to detect and refer cases of glaucoma adequately. Thereby, contributing greatly in the fight against blindness due to glaucoma in LMICs.

832 - P2.030

ANALYSIS OF THE RELATIONSHIP BETWEEN ANGIOGRAPHIC OPTICAL COHERENCE TOMOGRAPHY AND STATIC AUTOMATED PERIMETRY PARAMETERS IN PATIENTS WITH GLAUCOMA

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Purpose: Glaucomatous optic neuropathy presents with several microvascular changes that are known to worsen as the disease progresses. Optical coherence tomography angiography (OCT-A) has recently emerged as a useful tool in characterizing the chorioretinal microvascular network. This work aims to evaluate a possible correlation between the percentage of peripapillary superficial perfusion (PPSP) and the peripapillary superficial flow index (FI) evaluated by OCT-A and visual field (VF) metrics evaluated by Static Automated Perimetry (SAP) in patients with glaucoma.

Methods: Retrospective cross-sectional observational study. Patients diagnosed with glaucoma who were consulted between February 2022 and September 2022 and who underwent OCT, OCT-A (Zeiss, Cirrus HD-OCT 5000), and SAP (Zeiss, Humphrey HFA II) in the same period were included. Patients with concomitant ophthalmological diseases, as well as patients whose OCT/OCT-A had signal strength below 7 or segmentation errors, were excluded. After consent from the participants, data were obtained regarding gender, age, peripapillary retinal nerve fiber layer (RNFL) thickness, macular ganglion cell layer (GCL) thickness, percentage of peripapillary superficial perfusion (PPSP), peripapillary superficial flow index (FI), Medium Defect (MD), Pattern Standard Deviation (PSD) and Visual Field Index (VFI).

Results: Of the available population, 88 patients met inclusion criteria. 16 patients were excluded according to the exclusion criteria. It was observed that there was a strong negative correlation between the upper and lower PPSP and the MD determined in SAP ($p = 0.004$, $R = -0.347$; and $p = 0.001$, $R = -0.407$ respectively). The superior, inferior, temporal and nasal FI also showed strong positive correlations with the VFI, and strong negative correlations with the MD and PSD. Despite the correlations found, the mean peripapillary RNFL thickness showed a statistically stronger correlation with the 3 SAP metrics analyzed (VFI: $p < 0.001$; $R = 0.413$. MD: $p = 0.001$; $R = -0.393$. PSD: $p < 0.001$; $R = -0.461$).

Conclusion: In the evaluated sample, a correlation was observed between the OCT-A metrics and the SAP metrics. However, no advantage was observed for these values in relation to the average RNFL thickness, as predictors of possible visual field defects.

841 - P2.031

STRUCTURE-FUNCTION RELATIONSHIP OF RETINAL NERVE FIBER LAYER THICKNESS SLOPE AND VISUAL FIELD SENSITIVITY IN EARLY GLAUCOMA

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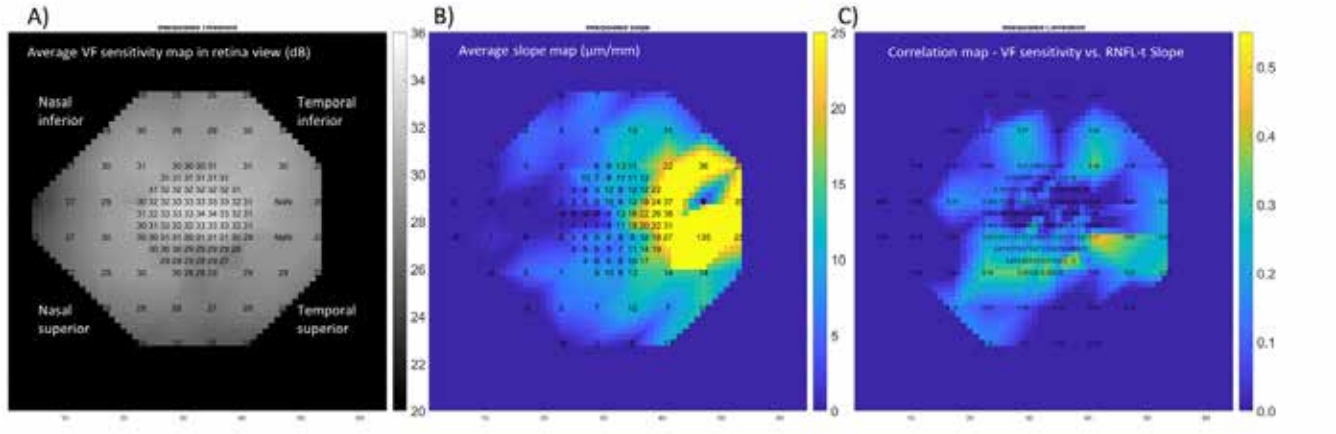
Purpose: To investigate the structure-function relationship between retinal nerve fiber layer thickness (RNFL-t) slope along retinal nerve fiber bundles (RNFBs) and visual field (VF) sensitivity in healthy and early glaucoma eyes using polarization sensitive-OCT.

Methods: This cross-sectional study assessed the RNFL-t slope to VF threshold relationship in early glaucoma (n = 44) and healthy eyes (n = 61). Virtual B-scans from stitched PS-OCT volumes were extracted along RNFBs traced from 24-2 and 10-2 VF points to the optic disc (Schwarzhans et al., 2021). RNFL-t slope was calculated from 1mmB-scan segments centered on each VF point. Merged and averaged visual field thresholds (two 24-2 and two 10-2 VF tests per patient) were correlated with RNFL-t slopes using Spearman coefficients. Left eye data was mirrored to match right eyes, and group average maps are presented in retinal view.

Results: The averaged VF mean deviation (24-2) was -2.97 ± 1.56 dB in glaucoma and -0.39 ± 1.04 dB in healthy eyes. The mean RNFL-t slope was less steep in glaucoma eyes compared to healthy (glaucoma: 8 ± 19 vs. healthy: 11 ± 20 µm/mm, p < 0.001). Figure 1 shows averaged maps (healthy and glaucoma combined) of VF threshold values (A), RNFL-t slope (B), and a correlation map in (C). VF defects were mainly observed in the paracentral superior hemisphere and in the nasal inferior visual field. The steepest RNFL-t slopes were observed near the optic disc, while they were close to zero on the more peripheral VF points and near the temporal raphe. The strongest correlations between RNFL-t slopes and VF sensitivity were observed in the paracentral inferior retina, reaching moderate correlation of up to r = 0.50.



Conclusion: Moderate correlations between VF sensitivities and RNFL-t slope were observed in areas with visual field defects. This suggests RNFL-t slope as a promising biomarker for focal glaucoma damage and predicting VF loss. However, larger cohorts and advanced analysis are needed for full evaluation.

924 - P2.032

THE IMPACT OF FLASH PHOTOPIC PANRETINAL RESPONSES ON THE PHOTPIC NEGATIVE RESPONSE WAVE AND ITS CORRELATION WITH RETINAL GANGLION CELLS FUNCTION

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Purpose: To characterize relation between the panretinal photopic responses, photopic negative responses, visual fields parameters and morphological OCT parameters of retinal ganglion cells.

Methods: The results of 475 eyes that were underwent static 24-2 Humphrey visual field (Optopol), OCT (Optopol) and PhNR (RETeval) were analyzed. From perymetry, the mean deviation (MD) and pattern standard deviation (PSD) were analyzed. From OCT, retinal nerve fibre layer (RNFL) thickness and ganglion cell complex (GCC) thickness were considered. From the PhNR test, the amplitudes of a-wave, b-wave and PhNR-wave were analyzed. For the correlation calculations, Spearman's test was used.

Results: We described following settings of electrophysiology results, photopic responses normal and PhNR wave normal (n = 269 tests), photopic responses normal and PhNR wave abnormal (n = 31 tests), photopic responses abnormal and PhNR wave normal (n = 110 tests), photopic responses abnormal and PhNR abnormal (n = 65 tests).
There was a significant correlation between PhNR wave and a, b waves ($r = 0.21$, $p < 0.0001$ and $r = -0.43$, $p < 0.0001$). In overall group, there was a weak correlation between MD, PSD from visual fields ($r = -0.1$, $p = 0.03$ and $r = 0.16$, $p = 0.0017$) and RNFL, GCC from OCT ($r = -0.2$, $p < 0.0001$ and $r = -0.16$, $p < 0.0001$). The correlation became stronger (except RNFL) in cases with impaired PhNR responses ($r = -0.31$, $p = 0.01$; $r = 0.5$, $p < 0.0001$; $r = -0.1$, $p = 0.2$; $r = -0.3$, $p = 0.01$; respectively). Abnormalities in a or b wave did not affect correlation between PhNR and MD, PSD and GCC.

Conclusion: Based on our analysis, it would be important to highlight that PhNR is more sensitive marker of RGC dysfunction than their function in healthy conditions and that photopic panretinal responses, if decreased due to other diseases, i.e., retinal dystrophies, do not reduce sensitivity of PhNRs as RGC representation in ERG.

925 - P2.033

COMPARISON OF INTRAOCULAR PRESSURE MEASUREMENTS OBTAINED USING THREE TONOMETERS AFTER DESCEMET MEMBRANE STRIPPING ENDOTHELIAL KERATOPLASTY

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Purpose: To compare the level of agreement between the Goldmann applanation tonometer (GAT), iCare IC200 rebound tonometer (IRT), and noncontact tonometer (NCT) in patients who underwent Descemet membrane stripping endothelial keratoplasty (DSEK), and to identify factors contributing to variations in intraocular pressure (IOP) measurements among the three tonometers.

Methods: We retrospectively analyzed the medical records of 41 patients who underwent DSEK. IOP was measured using NCT, IRT, and GAT, in this order. We evaluated the level of agreement among IOP measurements using the three tonometers, and analyzed whether clinical factors affected the results.

Results: We analyzed 49 eyes of 41 patients (average age: 62.0 years). The IOP values measured by IRT and NCT were lower than those measured by GAT, although the difference was not significant ($p = 0.098$ and $p = 0.320$, respectively). A Bland-Altman plot showed greater agreement between IOP measurements obtained by IRT and GAT than those obtained by NCT and GAT. In multivariate regression analysis, the IOP measured by GAT ($\beta = 0.215$, $p = 0.022$), corneal curvature ($\beta = -1.692$, $p = 0.037$), and postoperative duration ($\beta = 0.042$, $p = 0.018$) affected the difference in IOPs measured by GAT and IRT. The IOP measured by GAT ($\beta = 0.301$, $p = 0.013$) and corneal curvature ($\beta = -2.670$, $p = 0.010$) affected the difference in IOP measurements obtained by GAT and NCT.

Conclusion: In DSEK eyes, IRT showed good agreement and high correlation with GAT, suggesting that it is useful for IOP measurement. However, the IOP measured by GAT, corneal curvature, and postoperative duration should be considered when measuring IOP with an IRT.

975 - P2.034

COMPARISON OF AUTOMATED OPTICAL COHERENCE TOMOGRAPHY CUP-TO-DISK RATIO MEASUREMENT VERSUS STEREOSCOPIC OPTIC DISK PHOTOGRAPH EVALUATION

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Purpose: The optic disk cup-to-disk ratio (CDR) is one of the most important clinical indicators for glaucoma screening. We aimed to compare optical coherence tomography (OCT) automated CDR measurements, to that of two human graders of distinct clinical experience.

Methods: Healthy eyes, glaucoma suspects and eyes with glaucoma had OCT optic disk imaging and optic disk stereoscopic photographs taken. Eyes with significant media opacity were excluded. Optic disk photographs were independently graded by a senior glaucoma specialist (G1) and a second-year ophthalmology resident (G2), with respect to vertical and horizontal CDR. Automated OCT CDR measurement was performed through the manufacturer's software (OptoVue XR100 Avanti, Optovue Inc, Bayview Drive Fremont). Graders were compared relative to one another and with the OCT automatic measurement.

Results: Sixty-four eyes were included. Grader 1 estimates differed from G2 a mean of 0.05 ± 0.09 ($p = 0.05$) and 0.08 ± 0.11 ($p < 0.01$) in vertical and horizontal CDR respectively, resulting in a strong correlation coefficient ($r = 0.82$ and 0.81 respectively). Regarding the automated OCT measurement, G1 and G2 estimates differed by a mean of 0.07/0.13 and 0.03/0.06 for vertical and horizontal CDR respectively (all statistically significant [$p < 0.01$], except for vertical CDR between OCT and G2 [$p = 0.06$]). The correlation coefficient between G1 and OCT ($r = 0.92$ and 0.82 for vertical and horizontal CDR respectively) was superior to that of G2 and OCT ($r = 0.79$ and 0.77 for vertical and horizontal CDR respectively). The mixed correlation coefficient between both human graders and OCT was 0.91 and 0.83 for vertical and horizontal CDR respectively.

Conclusion: Automatic OCT CDR measurement very strongly correlates to the subjective CDR evaluation of an experienced grader. Despite this, these methods of measurement are not interchangeable, and specialist observation should be considered as the gold standard in glaucoma screening and follow-up.

988 - P2.035

COMPLYING WITH NICE GLAUCOMA GUIDELINES IN A BUSY TERTIARY CARE GLAUCOMA DEPARTMENT - WITH ALL THESE NUMBERS, IS IT DOABLE?

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Purpose: Assess the compliance and execution of NICE Guidelines for Glaucoma Management (NG81) in a tertiary care glaucoma service for tests offered for new patients at their first visit.

Methods: Electronic medical records were reviewed for all new patients presenting to the Glaucoma Service, at The Western Eye Hospital and Charing Cross Hospitals in London, for the period between 1st January 2023 and 31st of March 2023. A spreadsheet was used to confirm the data collection for each of these paramters for each new patient. Visual field assessment using central threshold testing, optic nerve assessment, IOP measurement using Goldman Applanation tonometry, gonioscopic angle examination and central cornal thickness measurements. Cases that were referred from the emergency department were excluded from this review, as often may not be stable enough for all the set of tests.

Results: A total of 246 patients were included, 109 males, 137 females, age range is 22-92 years with mean age of 63.6 years. Visual fields were done for 93.9% of the patients, and not done for 6.1% of patients. Gonioscopic angle examination findings were documented for 82.1% of patients, and not recorded for 17.9% of patients. Intraocular Pressure measurements were done for 100% of patients using rebound tonometry, and for 74% of patients with Goldman Applanation Tonometer, on top of the rebound tonometry results. Central Corneal Thickness was recorded for 75.2% of the patients, and not recorded for 24.8 % of patients. Disc assessment was done and recorded for 100% of patients attending the service.

Conclusion: Ovearall, the compliance rates were 100% for disc assessment, 93.90% for visual field examinations, 82.10% for gonioscopy findigs, 74.00% for measuring the Intraocular Pressure with a Goldman Applanation Tonometer and 75.20% for measuring central corneal thickness. We have no figures available from other tertiary care centers in the UK to compare with, but the benchmark is 100% compliance. Following this audit, we circulated a reminder and conducted teaching sessions for the nursing and support staff to enable more robuts date collection and entry for our patients, and we will re audit results soon.

998 - P2.036

CAN MACULAR OCT-ANGIOGRAPHY HELP DIFFERENTIATION AMONG PATIENTS WITH GLAUCOMA, OPTIC NEUROPATHY OR RETINAL ARTERY OCCLUSIONS?

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Purpose: To present characteristic cases of patients with glaucoma, optic neuropathy or retinal artery occlusions in which OCT-angiography of the macula contributes to the diagnosis of the condition responsible for the Retinal Nerve Fibre Layer (RNFL) thinning noted in the scan of the affected optic disc.

Methods: OCT-angiography module of Spectralis® OCT (Heidelberg Engineering GmbH, Heidelberg, Germany) was used to image the macula in patients with RNFL thinning presumed to be secondary to glaucoma. We present 3 characteristic cases (glaucoma, optic neuropathy and retinal artery occlusion) and the approach of macular analysis with the use of structural OCT imaging and OCT-angiography. These patients were examined at a tertiary referral hospital. Retinal scans were obtained and analysed with the Heidelberg Eye Explorer (HEYEX) programme.

Results: In retinal artery occlusions capillary drop-out of both superficial and deep capillary plexus is noted. In patients with glaucoma or optic neuropathy only the superficial capillary plexus is affected. Topographic analysis of the the capillary drop-out of the superficial capillary plexus allows differentiation between glaucoma and optic neuropathy.

Conclusion: OCT-angiography can aid the aetiological diagnosis of RNFL thinning in disc OCTs of patients with glaucoma, retinal artery occlusions and optic neuropathy.

8 - P2.037

PATTERN ELECTRORETINOGRAM AND VISUAL FIELD IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA

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Purpose: This study aimed to assess the amplitude and latency of pattern electroretinogram in patients with primary open angle glaucoma and to evaluate their correlation with visual field parameters.

Methods: The current study included 50 patients with primary open-angle glaucoma and 20 healthy control subjects attending to outpatient clinic of Mansoura ophthalmic center. The 50 glaucoma patients were divided into 3 groups (mild, moderate and sever). Ophthalmic examination included best corrected visual acuity, Gonioscopy, slit lamp biomicroscopy, intraocular pressure measurement using Goldmann applanation tonometry, visual field assessment by perimetry, and pattern electroretinogram was evaluated using RETI Port 21 (Electrophysiological Diagnostic System, Roland Consult; Brandenburg, Germany). Bivariate Correlations were assessed using Pearson's or Spearman's correlation coefficient depending on the nature of data.

Results: The mean age of the patients with POAG was 55.90 ± 8.839 years, while in the control group it was 52.75 ± 7.893 years. There were statistically significant differences between the two groups as regards the mean values of amplitude P50, latency P50, amplitude N95, latency N95, and latency N35.There were statistically significant positive correlations between cup/disc ratio and each of BCVA, UCVA, IOP, latency P50, latency N95, and latency N35 in glaucoma group. Statistically significant negative correlations were found between Cup/Disc ratio and each of amplitude P50, and amplitudeN95 in glaucoma group.

Conclusion: Pattern electroretinogram is a precise and objective detector of the electrical activity of the central retina's RGCs in patients with primary open-angle glaucoma.

227 - P2.038

CAN SITA FASTER ALGORITHM BE A FAST, RELIABLE AND ALTERNATIVE VISUAL FIELD METHOD IN PATIENT WITH GLAUCOMA?

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Purpose: The aim of this study is to compare the SITA Standard and SITA Fast tests commonly used in the diagnosis and monitoring of glaucoma with the SITA Faster algorithm and to evaluate them in terms of test time, Mean Deviation (MD), Pattern Standard Deviation (PSD) and Visual Field Index (VFI).

Methods: Thirty-two eyes of 32 patients with primary open-angle glaucoma with mild-to-moderate visual field defects according to Hodapp staging were included in the study. 24-2 SITA Standard, 24-2 SITA Fast and 24-2 SITA Faster tests were applied to the patients by using the Humphrey Field Analyzer 3 - 850 (Carl Zeiss Meditec - Germany). The patients' age, gender, test duration, MD, PSD and VFI values were recorded for each test. The results were compared statistically with SPSS 25.0.

Results: The mean age of the patients was 60.18 ± 10.94. 17 patients were female, and 15 were male. In terms of test durations, the mean for the SITA Standard group was 437.35 ± 47.05 seconds, SITA Fast group was 306.09 ± 28.99 seconds, and SITA Faster group was 206.62 ± 32.73 seconds. ($p < 0.05$) For MD values, the mean for the SITA Standard group was -4.46 ± 2.75, SITA Fast group was -4.37 ± 2.43, and SITA Faster group was -4.06 ± 2.36. ($p = 0.665$) Regarding PSD values, the mean for the SITA Standard group was 3.19 ± 1.75, SITA Fast group was 3.14 ± 1.68, and SITA Faster group was 3.23 ± 1.69. ($p = 0.142$) For VFI values, the mean for the SITA Standard group was 94.0 ± 4.45, SITA Fast group was 93.62 ± 4.76, and SITA Faster group was 93.53 ± 4.80. ($p = 0.269$).

Conclusion: The SITA Faster algorithm can provide quite faster results compared to SITA Standard and SITA Fast. SITA Faster test can be a good alternative to Standard and Fast tests as there is no statistical difference between the three tests in terms of MD, PSD and VFI. Larger case series are needed for more comprehensive results.

325 - P2.039

COMPARISON OF PATTERNS OF STRUCTURAL PROGRESSION IN PRIMARY OPEN-ANGLE GLAUCOMA AND PSEUDOEXFOLIATION GLAUCOMA

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Purpose: To compare the patterns of progression of retinal nerve fiber layer (RNFL) and macular ganglion cell-inner plexiform layer (GCIPL) thinning by guided progression analysis (GPA) of optical coherence tomography (OCT) in primary open-angle glaucoma (POAG) and pseudoexfoliation glaucoma (PXG).

Methods: The progression of RNFL and GCIPL thinning was assessed by GPA of Cirrus HD-OCT (Carl Zeiss Meditec, Dublin, CA, USA). By overlaying the acquired images of the RNFL and GCIPL thickness-change maps, the topographic patterns of progressive RNFL and GCIPL thinning were evaluated. The rates of progression of RNFL and GCIPL thinning were analyzed and compared between patients with POAG and those with PXG.

Results: Of the 248 eyes of 248 patients with POAG (175 eyes of 175 patients) or PXG (73 eyes of 73 patients) enrolled, 156 POAG eyes and 48 PXG eyes were included. Progressive RNFL thinning was significantly more common in PXG than in POAG ($p = 0.005$). According to the RNFL progression-frequency maps, progression appeared mainly in the superotemporal and inferotemporal areas in POAG, whereas it had invaded more into the temporal area in PXG. According to the GCIPL maps, progression was most common in the inferotemporal area in both POAG and PXG. The average progression rate of GCIPL thinning was faster in PXG than in POAG ($p = 0.013$), and when analyzed in 2 halves (superior/inferior), the progression rate of the inferior half was faster in PXG than in POAG ($p = 0.011$).

Conclusion: OCT GPA showed progression patterns of RNFL and GCIPL thinning in POAG and PXG. Understanding the specific patterns of progressive RNFL and GCIPL thinning according to glaucoma type may prove helpful to glaucoma-patient treatment and monitoring.

389 - P2.040

COMPARATIVE ANALYSIS OF CHOROIDAL VASCULARITY INDEX IN PRIMARY OPEN-ANGLE GLAUCOMA, NORMAL-TENSION GLAUCOMA AND HEALTHY INDIVIDUALS

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Purpose: This cross-sectional prospective study aimed to assess and compare peripapillary choroidal vascularity index (CVI) parameters in patients with primary open-angle glaucoma (POAG), normal-tension glaucoma (NTG), and healthy controls.

Methods: A total of 120 eyes from 120 participants were included, comprising (i) 40 eyes of 40 patients with POAG, (ii) 40 eyes of 40 patients with NTG, and (iii) 40 eyes of healthy controls. Peripapillary enhanced depth imaging optical coherence tomography images were processed using standard protocols with ImageJ software for binarization. CVI values were analyzed across all sectors of the peripapillary region.

Results: The study revealed a significantly lower peripapillary CVI in the POAG group (62.1 ± 2.45) compared to the NTG group (65.3 ± 3.02) and healthy controls (68.2 ± 2.56) ($p < 0.001$). Similarly, NTG patients exhibited significantly lower CVI values than healthy controls ($p < 0.001$). The detailed sectoral analysis demonstrated significantly lower peripapillary CVI values in the temporal, nasal, supratemporal, superonasal, inferotemporal, and inferonasal sectors of the POAG group compared to both the NTG group and controls ($p < 0.001$). Furthermore, NTG patients exhibited lower peripapillary CVI in all sectors than healthy controls ($p < 0.001$). Global peripapillary choroidal thickness was significantly thinner in the POAG group (135.8 ± 38.42 µm) than in the NTG (157.4 ± 35.29 µm) and control groups (160.2 ± 37.09 µm) ($p < 0.001$).

Conclusions: This study highlights a significant reduction in peripapillary CVI in POAG and NTG patients, with the most pronounced decrease observed in the POAG group. The findings suggest that CVI may be valuable for indicating vascular dysfunction in POAG and NTG. Further research is needed to validate these results and explore the clinical implications of CVI in glaucomatous optic neuropathy.

633 - P2.041

DIAGNOSTIC ABILITY OF HUMPHREY 24-2(SITA-STANDARD MODE) AND OCTOPUS PERIMETRY G1 PROGRAM WITH G-PERIPHERAL MODE FOR GLAUCOMATOUS OPTIC NEUROPATHY

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Purpose: To compare the diagnostic ability of the Humphrey Fiueld Analyzer(HFA 24-2 SITA-Standard) and the Octopus perimeter which is combined with G1 program(Dynamic strategy) and G-peripheral mode, in patients with glaucoma.

Methods: 25 eyes of open angle glaucoma patients and 18 eyes of normal control were underwent both HFA 24-2 SITA-Standard test and a combined test using the Octopus G1 program and G-peripheral mode within one month. Receiver operating characteristic(ROC) curves were plotted for the threshold values and main indices of the HFA and Octopus. Sensitivities and specificities were also calculated.

Results: In the glaucoma group, the HFA mean deviation was -3.72 ± 3.49 dB, the Octopus G1 mean defect (MD) was 5.99 ± 4.76 dB, and the G-peripheral MD was 6.07 ± 3.7 dB. There was no significant difference ($p = 0.272$) in the HFA test duration (5.87 ± 1.1minutes) and the Octopus (G1+G-peripheral) test duration (6.21 ± 1.25 minutes). There was no significant difference in the AUROC between the global indices of each perimeter ($p > 0.05$). In glaucoma diagnosis, HFA showed 80% sensitivity and 83% specificity, while the Octopus showed 92% sensitivity and 83% specificity.

Conclusion: The diagnostic ability of each global index in HFA and Octopus perimeters did not show a statistically significant difference. However, the combination of Octopus G1 program and G-peripheral mode evaluates a wider range of peripheral vision (30-60 degrees) compared to HFA SITA-Standard within the same test duration. This offers an advantage in early detection of visual field loss in patients with early stage glaucoma.

763 - P2.043

SEGMENTATION ERORRS IN MEASUREMENT OF PARAMETERS BY SWEPT SOURCE ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY

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Purpose: This study aims to investigate the type and rate of segmentation error encountered in automatic measurement of parameters by anterior segment optical coherence tomography (SS-ASOCT) in eyes with close-angle and open-angle.

Method: A total of 79 patients were recruited in this study, consisting of 60 with angle closure eyes and 19 with normal angle eyes. Retrospective review of data parameters including aqueous depth (AQD), lens vault (LV), lens thickness (LT), central corneal thickness (CCT), as well as type of segmentation error quantified as nonmarking, mismarking or pathology. Location of segmentation error was recorded and classified as scleral spur, angle recess, pupil margin, iris root and lens. AS-OCT examinations were performed and each AS-OCT scan was reviewed, with segmentation errors in automatic measurement classified and manually corrected. Segmentation error types and location was compared between the normal-angle and angle closure groups.

Results: Patients with angle closure exhibited higher segmentation errors compared to open-angle cases across all error types ($p < 0.05$). The predominant segmentation error was non-marking (83.3%), followed by mismarking (15.23%) and pathology (1.47%). Pathology included conditions such as dense posterior subcapsular cataract, pterygium, or corneal scar. The most common location for segmentation errors in both closed and open-angle groups was the scleral spur, accounting for 71.93% and 77.54%, respectively. Overall, angle closure patients had more segmentation errors, particularly at the scleral spur, iris root, and lens, although errors at the angle recess were more prevalent in the normal angle group (n = 12).

Conclusion: Segmentation error was more prevalent in angle closure group as measured by AS-OCT when compared to normal angle group.

823 - P2.044

CORRELATION BETWEEN MACULAR PERFUSION AND CEREBRAL BLOOD FLOW CHANGES OCCURRING WITH BRAIN ACTIVITY IN GLAUCOMA AND HEALTHY EYES

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Purpose: To assess the correlations between the macular capillary plexus vessel density (CP-VD) using Optical Coherence Tomography Angiography (OCTA) and cerebral blood flow changes occuring with brain activity using Functional Magnetic Resonance Imaging (fMRI) in open-angle glaucoma patients as compared to healthy subjects.

Methods: 33 glaucoma patients and 30 healthy controls were included in this prospective observational single-visit clinical study conducted in the Eye clinic of the Lithuanian University of Health Sciences (ClinicalTrials.gov. Nr. NCT04943458). Study was approved by Institutional Ethics Comitee (Nr. 1973714). Full ophthalmological examination was performed. One randomly selected eye per patient was chosen for evaluation. Vessel density (VD) values in the macular capillary plexus were assessed through 3x3mmOCT-A scans (DRI-OCT Triton, TopCon). Cerebral hemodynamic response to the visual stimulation and resting-state fMRI parameters were recorded (Siemens Healthineers, Siemens AG, Erlangen) $p < 0.05$ was the level of statictical significance.

Results: No statistically significant differences were found between the groups in demographic, perfusion pressure and body-mass index parameters. Intraocular pressure (IOP) in glaucoma patients with medication was similar to IOP in healthy subjects. A positive correlation between the macular superficial CP-VD in the nasal ($r = 0.53$, $p = 0.02$), inferior ($r = 0.48$, $p = 0.03$) quadrants and fMRI activity was found. A significant difference in macular superficial CP-VD within the circle was found between glaucoma and control eyes ($p = 0.01$).

Conclusions:
1. The reduced macular superficial capillary plexus vessel density in the nasal and inferior quadrants was associated with a decreased signal/perfusion area in the brain, assessed by fMRI.
2. The macular superficial capillary plexus vessel density within the circle was significantly lower in glaucomatous eyes compared to control eyes.
3. Further longitudinal studies are needed to evaluate the facts of structural and blood flow changes assessed with visual field changes of glaucoma.

989 - P2.045

DIAGNOSTIC PERFORMANCE OF PAPILLARY RETINOGRAPHY VS PERIPAPILLLARY VESSEL DENSITY IN OPEN ANGLE GLAUCOMA

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Purpose: The aim of this study is to evaluate the diagnostic performance of en face optical coherence tomography angiography (OCTA) and colorimetric assessment of papillary retinography in patients with glaucoma.

Methods: Prospective observational single-center, cross-sectional study including open angle glaucoma patients and healthy controls evaluated with papillary retinography, spectral domain optical coherence tomography (SD-OCT) and AOCT (HD-OCT 5000 software version 5.2). Areas under ROC curves (AUROC) were calculated for the most relevant parameters of each diagnostic tool.

Results: Papillary images, retinal vessel density and peripapillary retinal nerve fibre layer thickness of 213 subjects, 109 glaucoma patients and 104 healthy subjects, were analyzed. Glaucoma patients had lower peripapillary vessel density and flow indices than normal subjest except in the temporal (46.72 ± 2.63% in glaucoma vs 47.35 ± 2.99% in controls, p = 0.098) and nasal quadrants (42.79 ± 2.87% in glaucoma patients vs 43.28 ± 2.11% in normal subjects, p = 0.162) which showed similar vessel density in both diagnostic groups, although a lower blood flow index in glaucoma patients. The highest AUROC corresponded to peripapillary vessel density in the inferior sector (0.787; 95%CI 0.728-0.847, p < 0.001), followed by the papillary colourimetric indices Glaucoma Discriminant Factor, GDF (0.752; 95%CI 0. 686-0.817, p < 0.001), Glaucoma Individual Pointer, GIP (0.751; 95%CI 0.686-0.816, p < 0.001), cup-to-disk measurement (0.716; 95%CI 0.647-0.784, p < 0.001) and vertical cup-to-disk (0.717; 95%CI 0.649-0.785, p < 0.001). The vertical papillary cup-to-disk ratio had the best diagnostic performance of the parameters analyzed with SD-OCT (0.747 95%CI 0.680-0.813, p < 0.001). The retinal ganglion cell complex analysis showed a low AUROC with a value of 0.57 (0.571; 95%CI 0.494-0.648, p = 0.074). There was no significant difference in the AUROC of the parameters with the highest diagnostic performance, (Peripapillary vascular density in the inferior sector vs GDF p = 0.3849 and Peripapillary vascular density in the inferior sector vs GIP p = 0.3996; Macular vessel density vs GDF p = 0.742 and Macular vessel density vs GIP p = 0.7674). The highest kappa concordance index was found between the GDF and GIP indices (k = 0.848; 95%CI 0.768-0.928), followed by the SD-OCT values of papillary cup-to-disk and vertical cup-to-disk parameters (Concordance between vertical cup-to-disk and GIP K = 0.6593; Concordance between vertical cup-to-disk and GDF K = 0.6076).

Conclusion: In conclusion, the diagnostic performance of OCTA and papillary retinography is similar.

304 - P2.046

PREVALENCE, INCIDENCE AND RISK FACTORS FOR ELEVATED INTRAOCULAR PRESSURE IN VIRAL ANTERIOR UVEITIS

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Purpose: To assess the prevalence, incidence of and risk factors for the development of elevated intraocular pressure (IOP) in PCR-proven (Polymerase chain reaction) viral anterior uveitis (VAU).

Methods: Retrospective case-control longitudinal cohort study of patients with PCR- proven VAU between January 2001 and December 2018 was performed. Patients < 18 years of age, follow-up duration < 3 months and with posterior segment involvement were excluded. Two groups were compared: Group A (Cases); with elevated intraocular pressure (IOP > 21 mmHg) and Group B (controls); those with IOP < 21 mmHg during their follow-up period. Main outcome measures included prevalence, incidence of and risk factors for the development of elevated IOP in this cohort. Success was defined as same visual acuity (Log MAR 0.17 or better at baseline) or improvement in visual acuity by > 2 lines with inflammation < Grade 0.5+) at the final follow-up examination.

Results: Sixty-four patients with uveitis of viral origin were identified during the study period. Twenty five were excluded for the following reasons; 12 with acute retinal necrosis, 1 viral retinitis, one with pre-existing glaucoma and 11 who were lost to follow –up after 3 months. Thirty –nine eyes of thirty-five patients were included in the final analysis. Baseline demographics except for age (p = 0.02), laterality (p = 0.009), IOP at presentation (p = 0.01) and corneal involvement (p = 0.01) were similar in both groups. Onset of elevated IOP occurred at a mean of 11.9 ± 23.8 months following the first presentation. The highest IOP recorded was 36.5 ± 11.7 mmHg in the right eye and 21.2 ± 8.3 mmHg in the left eye. Prevalence of elevated IOP (10 eyes) was 32.3% (95% C.L 15.8%, 48.7%); incidence (21 eyes) was 67.7% (95% C.L 51.3%, 84.2%). Increasing age (O.R 1.07, 95% C.L 1, 1.15, p = 0.03) was a significant risk factor. Kaplan -Meier survival rates in terms of visual acuity and control of inflammation was 67.7% success at 12 months and 54% at 48 months in Group A and 63% success at 12 months and 7% at 48 months in Group B(p = 0.47), respectively.

Conclusion: Elevated IOP is a common complication of VAU. Increasing age at presentation was a significant risk factor.

542 - P2.048

A RARE CASE OF SHALLOW ANTERIOR CHAMBER FOLLOWING CATARACT SURGERY

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Purpose: To report a rare case of malignant glaucoma in a patient who underwent cataract surgery with a 3-piece IOL implantation in the ciliary sulcus and had no other risk factors apart from undergoing intraocular surgery.

Methods: A 70-year-old male patient visited our hospital complaining of low vision due to cataract in his left eye (LE). Patient history revealed that he underwent cataract surgery 5 years ago in his right eye (RE) and that "his vision did not improve sufficiently after surgery". He is on latanoprost q.d. and dorzolamide/timolol b.i.d. in his RE, all of which were initiated soon after cataract surgery. At the time of presentation his best corrected visual acuity was 0.20 LogMAR (-4.50D sph) RE, 0.60 LogMAR (-5.00D sph) LE and his IOP 18 mmHg RE, 16 mmHg LE. Slit lamp examination revealed a very shallow anterior chamber (AC), a non-visible angle and a 3-piece IOL in the ciliary sulcus in the RE, while in the LE the AC was deep, the angle was open and there was a nuclear sclerotic cataract. Visual field testing showed double arcuate scotomas in the RE and the UBM showed a narrow angle and a normal appearing ciliary body in the same eye. The axial length was 23.05mmin both eyes.

Results: The patient underwent uncomplicated cataract surgery in his LE. After performing Nd-YAG laser peripheral iridotomy the patient`s RE was treated with topical cyclopentolate and atropine but no improvement was noticed as far as AC depth is concerned. The patient denied any further intervention to his RE.

Conclusion: Malignant glaucoma or aqueous misdirection syndrome is a rare condition and it is a diagnosis of exclusion. It is a form of secondary angle closure and the pathophysiology of the disease is partially understood. It is more common in hyperopic/short axial length eyes and it is most commonly encountered after glaucoma surgery. Considering the fact that Nd-YAG capsulotomy with or without vitrectomy are primary steps for treating the above condition we assume that posterior capsule rupture should have minimized the risk for a long-standing aqueous misdirection syndrome in our patient`s RE.

670 - P2.049

NEVUS OF OTA ASSOCIATED WITH PRIMARILY OPEN ANGLE GLAUCOMA

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Purpose: To present a 69 years old female patient with Nevus of Ota and associated with open angle glaucoma.

Methods: Case report.

Results: We presented Caucasian female 69 years old patient with ipsilateral Nevus of Ota associated with open angle glaucoma Patient's best corrected visual acuity on the right eye was 0.8 and 1.0 on the left eye. Intraocular pressure was well controlled in the left eye with Bimatoprost but not in the right eye where intraocular pressure was 42 mmHg under maximum local therapy. Melanosis conjunctivae and sclerae was present on her right eye. Gonioscopy reveled excessive pigmentation in antherior chamber angle only on the right eye. Optic disc was totally excavated in the right eye while optic disc ratio in the left eye was 0.3 . Visual field demonstrated MD = -31.99 dB (Hymphrey visual field) on the right eye and -10.02 dB on the left eye. Because of extremely high preassure which can not be controlled by medication we decided to do filtration operation. Trabeculectomy was successfully done and intraocular preasure after the operation was 10 mmHg in the right eye without of medication.

Conclusion: The Nevus of Ota primarily afects Asian population. It is uncomon among Caucasians. One of complication of Nevus of Ota can be secundary glaucoma. There is little evidence of it in literature. Our presented patinet was diagnosed as open angle glaucoma patient 8 years before the presentation and developed another component of the disease because of ocular melanosis, especially high pigmentation in anaterior chamber angle which compromise aqueus outflow and leed to extremlly high intraocular preasure and end stage glaucoma.

680 - P2.050

PROGRESSIVE IRIS ATROPHY VERSUS RIEGER ANOMALY IN A PATIENT WITH SECONDARY GLAUCOMA AND INITIAL RESPONSE TO PHARMACOLOGICAL TREATMENT WITH LATANOPROST

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Purpose: To emphasize the importance of confocal microscopy in the differentiation between progressive iris atrophy and Rieger anomaly

Methods: Observational case report. We portray the findings of the fundus examination, slit-lamp examination and confocal microscopy. We also used the PubMed database to find other prospective or retrospective studies.

Results: A 50-year-old woman came to the ophthalmology clinic due to a sensation of blurred vision and photophobia in the left eye for two years. Slit-lamp examination of the left eye showed that corneal endothelium had the appearance of beaten silver and a corectopia towards the superior temporal was observed; In the lower nasal quadrant an absence of the iris could be seen and at 5 hours an area of iris atrophy. In gonioscopy there was SAP from 10 to 6 hours, in front of Schwalbe's line, revealing the trabecular meshwork only from 11 to 1 hour. The intraocular pressure was 16 mmHg in the right eye and 25 mmHg in the left eye. The fundus showed an asymmetry in the cup, which was greater in the left eye. It was decided to begin pharmacological treatment with latanoprost in the left eye, with good blood pressure control. Given the two most probable possible differential diagnoses that arose with this clinical picture—essential atrophy of the iris and Rieger's anomaly—it was decided to perform confocal microscopy of the corneal endothelium, which confirmed the presence of epithelioid cells, with loss of hexagonality and with hyperreflective nuclei in the left eye and a right eye with polymegatism and pleomorphism within normality. Thus, an ICE was confirmed in the left eye.

Conclusion:

- Confocal microscopy is very useful for diagnosing ICE, since it allows us to visualize the epithelioid cells characteristic of this disease.
- In the initial pharmacological treatment of ICE, facilitators of aqueous humor drainage through the trabecular meshwork should be avoided, since this route is non-functional.
- As it is a slowly progressive and degenerative entity, ICE may require combined therapy or even surgical treatment in the future.

779 - P2.051

IMPORTANCE OF MULTIDISCIPLINARY APPROACH IN THE DIAGNOSIS AND TREATMENT OF GLAUCOMA SECONDARY TO HIG-FLOW FISTULA

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Purpose: The objective of this study is to emphasize the importance of early diagnosis and multidisciplinary collaboration in cases of carotid and cavernous fistula secondary to facial and vascular malformations, with the aim of preventing the development of secondary glaucoma.

Methods: We present the case of a 20-year-old female patient from Peru who was diagnosed with a large facial vascular malformation.

Results: The patient was diagnosed with glaucoma secondary to high-flow arteriovenous fistula.

Conclusion: Treatment was initiated with dual pharmacological therapy, resulting in good blood pressure control and stability of the clinical condition.

790 - P2.052

UNRAVELING OCULAR TRAUMA: GONIOSCOPY'S INSIGHT INTO SECONDARY GLAUCOMA AND THE ENIGMA OF PERSISTENT CORNEAL EDEMA

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Purpose: To describe a clinical case of secondary glaucoma and persistent corneal edema following ocular trauma in the setting of a car accident with a window break. The authors aim to emphasize the importance of gonioscopy in routine ophthalmology practice, not only for diagnosis, but also for guiding the appropriate surgical interventions, and the need for imaging modalities after open globe injuries to exclude the presence of intraocular foreign bodies (IOFB).

Methods: Patient case report with history, clinical findings, best corrected visual acuity (BCVA) records, biomicroscopy, tonometry, gonioscopy and fundoscopy records, Computed Tomography (CT) and ocular ultrasound imaging.

Results: A 22-year-old male presented to the emergency department after being involved in a car accident. Biomicroscopy revealed a vertical scleral wound with iris prolapse left eye (OS). CT scan was unremarkable. The wound was surgically closed and after initially improving, he reported worsening VA and red eye of the left eye. Biomicroscopy revealed corneal edema and aqueous flare, intraocular pressure of 30 mmHg and a herpetic keratouveitis was hypothesized. One week later, vision improved but inferior and central corneal edema persisted. A gonioscopy was performed, revealing a millimetric IOFB in the inferior iridocorneal angle. After the IOFG was removed, the patient improved significantly, with BCVA of 20/25 one week after surgery.

Conclusion: The clinical presentation of intraocular foreign body injuries depends not only on the mechanism of the injury and type of foreign body involved, but also on the subsequent complications. Clinicians should always be alert to the possibility of an IOFB in a patient with an open globe injury and request imaging modalities to exclude its presence. In the presented case, a high index of suspicion after persistent localized corneal edema led to the identification of an IOFG in the angle with gonioscopy and its removal led to complete resolution of secondary glaucoma and corneal edema.

883 - P2.053

CASE REPORT: UVEITIS-GLAUCOMA-HYPHEMA (UGH) SYNDROME AFTER IRIS-CLAW IOL IMPLANTATION

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Purpose: To describe the clinical case of a patient who developed Uveitis- Glaucoma- Hyphema (UGH) Syndrome after Iris-Claw IOL implantation

Methods: A 62-year-old patient with chronic renal failure and hearing loss secondary to Alport syndrome. Ophthalmologically, he has secondary open-angle glaucoma in Pseudoexfoliation Syndrome (PEX) in the left eye treated with the association of Brinzolamide 10 mg/ml and Timolol 5 mg/ml eye drops with reported stability of the visual field over the years and good control of the eye pressure. He performed cataract surgery with the implantation of a 3-piece intraocular lens in the capsular bag in both eyes about 10 years ago. In May 2020 he underwent pars plana vitrectomy surgery with retropupillary iris-claw IOL implantation following the dislocation of the lens and the capsular bag in the vitreous chamber after a head trauma. In the following years he reported several episodes of visual blurring with redness and eye pain with progressive worsening of the visual field in the left eye. Our evaluation in Arpil 2023 highlighted mild anterior uveitis, marked iridodonesis with areas of iris atrophy, pigmented angle, and IOP of 13 mmHg. There were residues of vitreous hemorrhage In the vitreous chamber and epiretinal membranes, rare intraretinal cysts, and subfoveal subretinal fluid on optical coherence tomography (OCT).

Results: In December 2023, the patient underwent surgery to remove the retropupillary iris-claw IOL and implant an intraocular lens with scleral fixation using the Yamane technique. The surgery proceeded uneventfully and the patient is being followed up for glaucoma, the intraocular pressure remains at 7 mmHg without the use of IOP-lowering eye drops.

Conclusion: Only one case of UGH syndrome following retropupillary iris-claw IOL implantation in a patient with iridoschisis has been reported in the literature. This is the first reported case of UGH syndrome following retropupillary iris-claw IOL implantation in a patient without iridoschisis with PEX and post-traumatic dislocation of the IOL and capsular bag in the vitreous chamber.

937 - P2.054

EYE PROTECTION GOGGLES ARE NOT THAT UGLY

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Purpose: This article highlights the importance of protective eyewear in sports to prevent ocular trauma. A 12-year-old male patient who suffered the impact of a tennis ball and developed a 180° traumatic angle recession with and a smaller area of cyclodialysis (image 1 and 2). The patient felt remorseful because he had laughed about his opponent before the match because of the ugly eye goggles he was wearing.

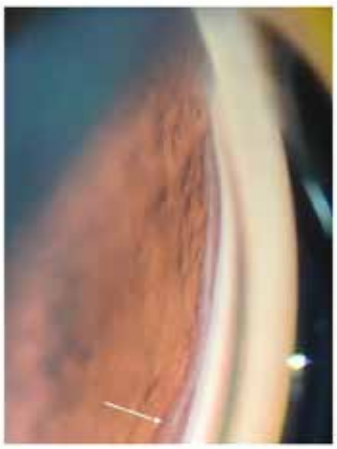

Image 1: angular recession

Image 2: iris tear

Methods: Detailed clinical history and high-quality photographic documentation of the patient's pathology are presented. A literature search was conducted in Pubmed combining the keywords: ocular protection, protective glasses, sport, ocular trauma, and gonioscopy. Full-text articles were analyzed when written in English, Spanish or French. Only the abstract was studied when the original articles were written in other languages.

Results: Like occupational eye injuries, most sport caused eye injuries are considered preventable. Protective eyewear is considered mandatory in the two sports associated with the greatest eye risk: paintball and air rifle shooting. However, in moderate-risk sports, such as tennis, football, badminton, and padel, the use of protective eyewear is notably sparse. This fact explain why ocular trauma is more common after practicing moderate-risk than high-risk sports. To make matters worse, sometimes people even look down on people who wear them because they are not aesthetically pleasing. It is essential after an ocular trauma to rule out all its possible complications, and for this it is necessary to have good technique using gonioscopy. In Angle-recession glaucoma will allow us to see the main signs: widening of the ciliary body band, torn iridian processes (photo), white and shiny scleral spur, angular hyperpigmentation. Also it helps us to perform a correct follow-up of possible long-term complications.

Conclusion: Absolute risk of eye injury is higher after other sports that are not percibed as risky by general population. This can be explained because the practice of this sports is more prevalent and protective garment is not perceived as necessary. Promoting a culture of safety in those who practice these sports may reduce the incidence and the complications ocular trauma. Gonioscopy is an essential part of eye examination after blunt trauma.

563 - P2.055

THE RARE MUTATION OF MFRP GENE AND ITS ASSOCIATION WITH PRIMARY CLOSED ANGLE GLAUCOMA

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Purpose: The purposeof this poster is to present a case of a patient heterozygous for the variant MFRP c.498dup, p.(Asn167Glnfs*34), described in only 16 other cases according to gnomAD. The patient is a 24-year-old man with primary angle-closure glaucoma (PACG), reduced visual acuity, high hyperopia and dystrophic changes in the macula.

Methods: Whole exome sequencing (WES) was performed on the affected individual. An in-depth analysis of MFRP genotype-phenotype correlations was performed by literature review and information retrieval from several databases to elucidate MFRP-related molecular pathogenic mechanisms.

Results: The WES analysis reveals a pathogenic variant in MFRP c.498dup, p. (Asn167Glnfs*34) and a heterozygous mutation in GUCY2D c.1717A>G, p. (Ile573Val), which is a variant of uncertain significance (VUS).

Conclusion: MFRP c.498dup, p.(Asn167Glnfs*34) is classified as pathogenic based on currently available evidence supporting its role as a cause of pathology. The disease caused by MFRP variants is transmitted in an autosomal recessive manner. The patient is homozygous for the variant, which is consistent with autosomal recessive inheritance and the patients' symptoms. This is a severe pathogenic mutation in terms of ophthalmic complications, and it is important not to be overlooked when searching for a PACG genetic link.

338 - P2.056

ANALYSIS OF THE INFLUENCE OF GENOTYPE ON THE RESPONSE TO PROSTAGLANDIN ANALOGUES, PROSTAMIDES, AND BETA-BLOCKERS IN PATIENTS WITH OCULAR HYPERTENSION AND GLAUCOMA

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Purpose: Analyse the genotype that predicts the phenotypic characteristics of a cohort of patients with glaucoma and ocular hypertension (OH), and its correlation with the individual pharmacological response to prostaglandin analogues (PGA), prostamides (PM) and beta-blockers (BB).

Methods: This is a prospective study that included 193 eyes of 109 patients with glaucoma or OH under monotherapy with PGA, PM and BB. Five single nucleotide polymorphisms were genotyped using real-time PCR assays: prostaglandin-F2α receptor (rs3766355, rs3753380); cytochrome P450 2D6 (rs16947, rs769258); and beta-2-adrenergic receptor (rs1042714). The main variables studied were previous ocular interventions, mean deviation of the visual field (MD), baseline (bIOP) and treated (tIOP) intraocular pressure, and the rate of variation of intraocular pressure (vIOP).

Results: From the total of eyes, 97 (50.3%) were right eyes. The main diagnosis was primary open angle glaucoma (56%). A total of 112 eyes (58%) were treated with PGA, 59 (30.6%) with BB, and 22 (11.4%) with PM. Additionally, 40 eyes (20.7%) had previously undergone a glaucoma procedure. The mean bIOP and tIOP were 23.57 ± 4.8 mmHg and 19.99 ± 4.87 mmHg, respectively. Significant differences in tIOP were found between heterozygous (HT) (23.11 ± 6.77 mmHg) rs769258 with respect to wildtype (WT) individuals (19.64 ± 4.50 mmHg) ($p = 0.049$), and also when considering only the PGA group ($p = 0.049$). For rs3753380, differences in vIOP were observed between HT (-2.99 ± 25.23 mmHg) and WT individuals (-15.94 ± 22.1 mmHg) in the PGA group ($p = 0.032$). Differences in vIOP were detected between HM (-9.9 ± 25.09 mmHg) and HT (-13.49 ± 22.57 mmHg) rs1042714 with respect to WT group (-25.64 ± 13.84 mmHg) ($p = 0.017$), and also for MD values ($p < 0.001$). Finally, a significant influence on vIOP ($p = 0.019$) was found for systemic treatment metabolized by cytochrome P450 2D6 (-9.45 ± 22.09 mmHg versus -26.19 ± 18.87 mmHg) among those patients treated with BB.

Conclusion: Being a carrier of these mutated alleles may be related to a poor response to treatment or further damage of the visual field. These preliminary findings might suggest the future potential of pharmacogenetic-based treatments to achieve personalized treatment and therefore optimal clinical management.

696 - P2057

GENETIC VARIABILITY IN BULGARIAN CHILDREN WITH PHENOTYPIC CHARACTERISTICS OF PRIMARY AND SECONDARY CONGENITAL GLAUCOMA

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Purpose: To identify potential pathogenic or likely pathogenic gene variants in children with congenital glaucoma.

Methods: Fifteen patients expressing phenotype of primary or secondary congenital glaucoma were selected from the clinical department after full ophthalmological exam. Blood samples were collected from probands and the genomic DNA was subjected to whole exome sequencing (WES) on NovaSeq6000 platform. Results were verified using Sanger sequencing. In some cases, a Multiplex ligation-dependent probe amplification (MLPA) was used. Candidate variants in selected genes associated with glaucoma and anterior-segment dysgenesis were filtered using systemic filtering pipeline and the American College of Medical Genetics (ACMG) criteria.

Results: Pathogenic variants (PVs) were found in five genes, including LTBP2 (1 patient), FOXC1 (3 patients), PAX6 (2 patients), CPAMD8 (1 patient), and CYP1B1 (1 patient). Likely pathogenic variants (LPVs) were identified in two genes - MYOC and SH3BP2. In five genes (GUCY2D, NF1, DDX58, B3GLCT, and ARHGEF12) variants of uncertain significance (VUS) were identified. In one proband the genetic test didn't find mutation. A novel PV, absent from the clinical and population databases, FOXC1-c.477CA (p.Tyr159Ter), was found in a patient with anterior segment dysplasia and phenotype of Axenfeld-Rieger syndrome. Another PV, CPAMD8–c.1881delG (p.Arg627Serfs*6), was found in a proband presenting with megalocornea and posterior embriotoxon. In two siblings with anterior segment dysgenesis and white matter lesions in the brain on MRI was found a heterozygous known pathogenic deletion in FOXC1, encompassing the region 6:1389938 bp – 1612117 bp, co-segregating with a newly found LPV, c.4166C>G (p.Ser1389Cys), located in COL12A1 which is associated with Ehlers-Danlos syndrome. To our knowledge, the two found LPVs, MYOC-c.928G>A (p.Gly310Ser) and SH3BP2-c.150delT (p.Phe50Leufs*26), are novel and do not present in the public databases.

Conclusion: Our study enriches the existing databases with newly found pathogenic and likely pathogenic variants that could lead to congenital glaucoma as well expand the possible associations between different gene variations and the disease. Our results contribute to the existing data about mutations in the LTBP2, FOX1C, PAX6, and CYP1B1 as causative for congenital glaucoma. Further functional analyses are necessary for assessment of the newly found VUS as possible causes for congenital glaucoma.

878 - P2.058

GLAUCOMA IN A PATIENT DIAGNOSED WITH KNOBLOCH SY

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Purpose: Knobloch syndrome is a rare recessive inherided disorder, characterized by high myopia, vitroretinal degeneration, occipital skull defect, glaucoma and with a high degree of phenotypic variability. Mutation in COL18A1 gene are causative for Knobloch syndrome, leading to the production of abnormal type XVIII collagen proteins.

Methods: The patient underwent a ophthalmological examination, including visual acuity testing, IOP measurement, OCT-A, gonioscopy, UBM, A-scan and B-scan,as well as neuro-ophthalmological and neurological examinations.

Results: A 14-years old female patient was examined at the Clinic for eye disease, UKCS due to a feeling of heaviness in both eyes. She had firs been noted to have poor vision age 8, and at the time was diagnosed within an unspecified retinal dystrophy.Subsequent genetic evaluation revealed a COL18A1 mutation, consistent with a diagnosis of Knobloch sy. She had been attending our centre for the past years. Over this period she maintained a relatively stable best corrected visual acuity od 0.2 in both eyes.Her refraction had also been stable at -5.00 DS in RE and -10.00DS in LE.Her IOP had also been stable over the years, but in the last month it has been registered 27mmHg in right eye and 24mmHg in left eye. A daily curve was also made , where an elevated IOP was noted. Performed bometry shows shallower AC, narrower angle, with axial length in right eye 21.35 mm, and left eye 24.31 mm. Retinal examination revealed bilateral chorioretinal atrophy at the ML, pigmented bone spicules and a waxy optic disc.

Conclusion: Everything indicated that there is a possibility of chamber angle closure despite high myopia and an eye with biometric parameters closer to a hyperopic eye.G. pilocarpine was then administered and a YAG laser peripheral iridotomy was performed.There is good evidence to attribute the pathophysiology of angle closure to the COL18A1 mutation.An analysis of the function of COL18A1 has demonstrated that it codes for collagen type XVIII, a colagen chain found in vascular and endotelial basement membranes.

216 - P2.059

THE ROLE OF FIBRINOGEN ELEVATED VALUES AS THE INDICATOR OF THE ACUTE PHASE OF INFLAMMATION WITH DIFFERENT TYPES OF GLAUCOMA

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Purpose: To investigate the role of fibrinogen elevated values in serum as a good indicator of the acute phase of inflammation at patients with different types of glaucoma that can be linked to pathogenesis and glaucoma progression.

Methods: Study included 180 eyes patients of both genders, ages 40 to 70 years old, in which diagnostic tests were found to suffer from glaucoma. Patients were divided into three groups based on the type of glaucoma: 60 eyes glaucoma simplex (GS), 60 eyes normotensive glaucoma (NG) and 60 eyes angular glaucoma (GA). The fourth group, as a control, made 60 eyes with a senile cataract without glaucoma. Examinations performed were: visual acuity measurement, applanation tonometry, gonioskopia, ophthalmoscopy, field of vision and OCT.

Results: The plasma concentration of fibrinogen in the control group was 3.55 ± 0.13, while in the group with NG was 3.57 ± 0.15. In the group with GS, the concentration was 3.20 ± 0.10, and in the group with GA was 2.10 4.02 ± 0.18. A statistically significant difference in plasma fibrinogen level was observed between patients with GS compared to the control group ($p = 0.039$), between patients with GS and patients with NG ($p = 0.045$), and between patients with GS and patients with GA $p < 0.05$). Also statistically significant difference in plasma fibrinogen level was observed between patients with GA compared to the control group ($p = 0.041$).

Conclusion: There was no statistically significant correlation between the concentration of fibrinogen in plasma and OCT in either glaucoma patients or in the control group. There was a statistically significant positive correlation between plasma fibrinogen concentrations and right eye PNO with GS ($rho = 0.375$, $p < 0.05$) (Graph 11) and statistically significant negative correlation between fibrinogen concentration and MDD values in patients with GA ($rho = -0.372$, $p < 0.05$).

519 - P2.060

GENETIC VARIANTS ASSOCIATED WITH TREATMENT INTENSITY IN JAPANESE PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA

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Purpose: To investigate genetic variants associated with treatment intensity (number of glaucoma eyedrops) in Japanese patients with primary open-angle glaucoma (POAG).

Methods: Japanese patients with POAG (n = 324), including normal tension glaucoma (n = 183) and high tension glaucoma (n = 141), and control subjects (n = 246) were genotyped for 18 genetic variants predisposing to POAG, which can be classified into those associated with intraocular pressure (IOP) elevation (IOP-related genetic variants) and optic nerve vulnerability independent of IOP (optic nerve-related genetic variants). The total number of risk alleles of the 10 IOP-related and 8 optic nerve-related genetic variants were calculated as the genetic risk score (GRS), and the association between the GRS and the number of glaucoma eyedrops was evaluated using a multiple linear regression analysis adjusted for age and sex.

Results: There was a significant association (Beta = 0.070, p = 0.033) between the IOP-related GRS and the number of glaucoma eyedrops. As the IOP-related GRS increased, the number of glaucoma eyedrops increased.

Conclusion: Treatment intensity is influenced by genetic variants predisposing to POAG in Japanese patients with POAG. IOP-related, but not optic nerve-related, genetic variants were associated with the number of glaucoma eyedrops. These results indicate that IOP elevation induced by IOP-related genetic variants rather than optic nerve vulnerability induced by optic nerve-related genetic variants may play an important role for treatment intensity in POAG.

826 - P2.061

CLINICAL FINDINGS OF CHRONIC OPEN-ANGLE GLAUCOMA IN A PERUVIAN FAMILY WITH GLC1B LOCUS RELATED-MUTATION

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Purpose: To describe the clinical and genetic findings of chronic open-angle glaucoma in a Peruvian family with a mutation related to the GLC1B locus.

Methods: A longitudinal research study was conducted in a Peruvian family. A subgroup with a diagnosis of chronic open-angle glaucoma related to a mutation in the GLC1B locus was identified. Data collection was performed by the research team through Goldman tonometry, Snellen chart, and optical nerve evaluation with a 78 D lens. A genetic linkage study was conducted using molecular markers from various familial open-angle glaucoma loci, using the patients' DNA and clinically unaffected adult family members as controls.

Results: A total of 40 members of a Peruvian family were evaluated between 2000 and 2023, including 21 women and 19 men. The patients' ages ranged from 10 to 94 years. Among the 40 members, 7 patients with OAG were diagnosed. Of these 7 diagnosed patients, 4 were diagnosed in juvenal age with an average age of 18.75 years. The other 3 patients were diagnosed in adult age with an average age of 65.75 years. Patients with juvenile-onset OAG presented with intraocular pressures ranging from 24 mmHg to 39 mmHg and an average intraocular pressure of 32.5 mmHg at the time of diagnosis. Patients diagnosed with OAG in adult age had intraocular pressures ranging from 21 mmHg to 52 mmHg and an average intraocular pressure of 27.17 mmHg. The genetic linkage study showed cosegregation with a region on the long arm of chromosome 2, which contains the causal gene for inherited glaucoma in this family and is consistent with the GLC1B glaucoma locus.

Conclusion: There is a direct relationship between the GLC1B mutation and the presence of OAG. The study shows that OAG, when it starts in youth, is associated with higher intraocular pressures compared to adult-onset cases.

977 - P2.062

GLAUCOMATOUS EXTRACELLULAR MATRIX DIRECTS INDUCED PLURIPOTENT STEM CELLS TO DIFFERENTIATE INTO TRABECULAR MESHWORK CELLS

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Purpose: The number of trabecular meshwork (TM) cells decreases with age and more so in the primary open-angle glaucoma. TM cell replacement by repopulating with induced pluripotent cells (iPSCs) has a therapeutic potential. Recently, extracellular matrix (ECM) derived from TM cells was used in a differentiation model to induce iPSCs into TM cells. However, several changes in the ECM have been detected in glaucomatous TM cells compared to healthy TM cells. Therefore, the purpose of this study was to investigate the impact of glaucomatous ECM on the differentiation process.

Methods: Human iPSCs were differentiated into TM cells via an intermediate neural crest cell (NCC) stage. After NCCs induction for 7 days, cells were cultured on ECM derived from healthy (NTM5) and glaucomatous (GTM3) cells in TM conditioned media for 14 days. Cell morphology was observed under a microscope and cells were characterised by immunofluorescent staining and RTqPCR for genes/proteins associated with TM (MGP, TIMP3, DECORIN, TAGLN, PDFRα) and glaucoma (FOXC1, GAS7). The functionality of the cells was tested through phagocytosis analysis and myocilin (MYOC) expression following treatment with dexamethasone (DEX).

Results: There was no apparent morphological differences between IPS cells plated on NTM5 cell-derived ECM (IPS-NTM) or those plated on GTM3 cell-derived ECM (IPS-GTM). Only one of the tested TM markers were expressed by GTM3 cells, MGP, whereas NTM3 cells expressed all markers. Moreover, only GTM3 cells expressed glaucoma associated genes. As expected, differentiating IPS cells on NTM5 derived ECM led to expression of all TM genes, at similar levels to NTM5. Surprisingly iPS cells plated on GTM ECM did not express glaucoma marker and did express TM markers, albeit a lower levels than IPS-HTM. Likewise, iPS-NTM and iPS-GTM cells showed functional activity as control NTM5 and GTM3 cells with phagocytosis and MYOC expression following treatment with DEX.

Conclusion: Intriguingly, our study demonstrates that iPSCs, when cultured on glaucomatous ECM, not only successfully differentiated into TM cells but also exhibited expression of TM markers and functional activities. This outcome suggests the therapeutic potential of iPSC-based approaches in overcoming the challenges posed by glaucomatous ECM alterations.

364 - P2.063

NO EYE EXAM NEEDED: USING ARTIFICIAL INTELLIGENCE FOR ELECTRONIC HEALTH RECORDS TO IDENTIFY PATIENTS AT HIGH RISK FOR GLAUCOMA

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Purpose: Screening can identify asymptomatic early stage glaucoma patients to enable early treatment and prevention of major vision loss. However, glaucoma screening requires specialized ophthalmic equipment and personnel, limiting its ability to scale. Efficient algorithms that identify patients at high risk for glaucoma without specialized ophthalmic data could facilitate the identification of candidates most in need of definitive glaucoma evaluation. This study aimed to develop artificial intelligence (AI) models to identify patients at high risk for glaucoma using non-ophthalmic electronic health records (EHR) data.

Methods: We identified participants with at least one ophthalmic diagnosis in the All of Us Research Program, a USA national multicenter cohort of patients contributing EHR data. To be useful as a tool for identifying glaucoma risk in patients without prior ophthalmic data, the model was constrained to use demographic and non-ophthalmic EHR inputs, encompassing diagnoses, medications, physical exams, and basic laboratory test results. We developed models predicting whether participants will have a glaucoma diagnosis in the EHR using the following approaches: 1) penalized logistic regression; 2) XGBoost, and 3) a custom 1D-CNN with stacked autoencoders. Evaluation metrics included area under the receiver operating characteristic curve (AUROC) and balanced accuracy on a held-out test set.

Results: Of 64,735 participants, 7,268 (11.31%) were diagnosed with glaucoma. Mean age was 63.0 yrs and 39,913 (61.7%) participants were female. Overall, the AUROC ranged from 0.69-0.87, with 1D-CNN performing the best with an AUROC of 0.87 and balanced accuracy of 75.4%. This model also has an AUROC range of 0.80 - 0.89 for subgroups stratified by race/ethnicity. Explainability analyses suggested that factors such as age, race, heart rate, body mass index, and hemoglobin A1c contributed most to the model predictions.

Conclusion: AI models using non-ophthalmic EHR data were able to predict glaucoma diagnosis with surprisingly high performance. Possible future uses include identifying patients without prior ophthalmic care who would benefit most from glaucoma screening. Further research is needed to ensure that such models are fair and trustworthy across different demographic subpopulations.

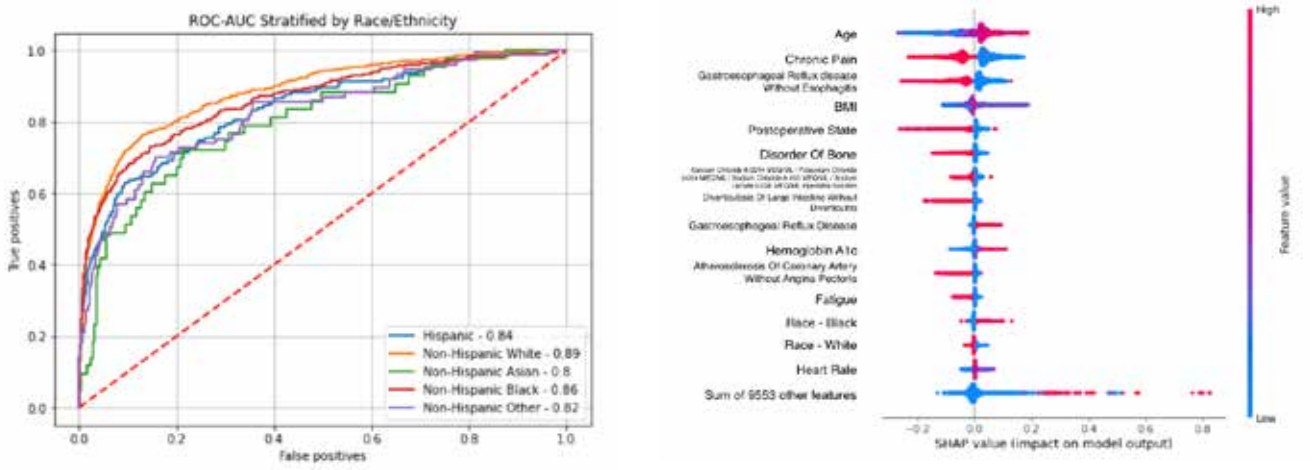

Figure. Performance and explainability of artificial intelligence models identifying patients with glaucoma using non-ophthalmic electronic health records data.

660 - P2.064

PREDICTING PERIMETRIC PROGRESSION IN OPEN-ANGLE GLAUCOMA PATIENTS WITH XGBOOST ARTIFICIAL INTELLIGENCE MODEL USING HIGH-SPEED CORNEAL IMAGING (CORVIS ST) MEASUREMENTS

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Purpose: Our research endeavors to craft an artificial intelligence (AI) model capable of predicting the probability of visual field (VF) progression in open-angle glaucoma patients using Dynamic Corneal Response (DCR) Corvis ST parameters registered before and one, three or six months after initiating therapy with prostaglandin analogues (PGs). Different AI models were assessed to attain optimal predictions, as measured by their accuracy and area under the curve (AUC, referring to ROC curve). Examination of predictive variables was conducted to identify which were relevant for final prediction of VF progression.

Methods: The study was carried out in University Hospital Príncipe de Asturias, Universidad de Alcalá, Alcalá de Henares, Madrid, Spain. An analysis was performed on a dataset that included 65 eyes. VF progression (the predictive variable) was determined through both event-based analysis and AGIS criteria, including visual fields collected in 6 years of follow-up. The AI training process to forecast the target involved an initial outlier removal, feature selection, and training utilizing leave-one-out (LOO) cross-validation. Boosting-based techniques employing decision trees, such as the Xtreme Gradient Boosting (XGBoost) algorithm, were applied. The objective was to optimize AUC, and outcomes were juxtaposed across different AI algorithms.

Results: The most precise predictors were data recorded at the 1-month follow-up, predicting glaucomatous progression with an accuracy of 86.2%. Key variables implicated in the prediction included the length of the arc at the moment of maximum concavity (B1-HC dArc length), the time from the onset of deformation to maximum concavity (B1-HC Deflection Time), and the length of corneal deflection at the time of maximum concavity (B1-HC Deflection Length). This consistency was observed across various algorithms, with no improvement noted including additional variables such as corneal hysteresis or IOP values.

Conclusion: Our findings indicate that glaucomatous VF progression can be anticipated with relatively high accuracy using Corvis ST measurements recorded one month after initiating PGs therapy. The moment of highest concavity of the cornea seems to be vital in estimating the risk of progression. Early identification of potential "fast progressors" leads to evident clinical benefits.

780 - P2.065

DIAGNOSIS AND GRADING OF GLAUCOMA WITH ARTIFICIAL INTELLIGENCE COMPARED TO THE CLINICAL DIAGNOSIS

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Purpose: To assess the compliance of routine follow-ups in the diagnosis and staging of patients with glaucoma who are being monitored with artificial intelligence (AI) measurements for both confirmed and suspected cases

Methods: A prospective case-control study was conducted at University of Health Sciences Ankara Bilkent City Hospital Glaucoma Department. This study included 177 fundus images of 111 patients under follow-up. After obtaining the participants' consent, routine unit check-ups were performed, and during their visits, OCT images, ganglion cell complex (GCC) and retinal nerve fiber layer thickness (RNFT), as well as VF analysis results, were obtained using the Carl Zeiss Humphrey Field and Topcon 3D-OCT-1 Maestro. Non-mydriatic fundus images were taken and evaluated by AI (EyeCheckup v2.0). Patients were staged as early, moderate, or advanced glaucoma according to the Hodapp-Anderson-Parrish criteria. Those with intraocular pressure >21 mmHg but normal anatomical and functional tests were classified as suspicious, and patients without glaucomatous findings were classified as normal. Vertical Cup/ Disc (VCD) ratios obtained through AI, color analysis maps, RNFT, glaucoma stages, VF tests, OCT results were compared.

Results: According to clinical staging, 33 eyes (18.6%) were classified as normal, 68 eyes (38.4%) as suspicious, 39 eyes (22%) as early, 25 eyes (14.1%) as moderate, and 12 eyes (6.8%) as advanced stage glaucoma. With AI, eyes without glaucoma and those with suspicious findings were detected with a sensitivity of 56.1%, early and moderate stage eyes with 95.9%, and advanced stage eyes with 100%, which was statistically significant ($p < 0.05$). According to AI and OCT, VCD ratios were 0.37 ± 0.1 and 0.65 ± 0.1, respectively, and were found to be statistically significant ($p < 0.05$). No correlation between the AI and OCT RNFT color analysis maps was observed ($p > 0.05$). It was observed that GCC and RNFT measurements were correlated with AI and clinical diagnosis grading, and a statistically significant agreement was found ($p < 0.05$).

Conclusion: Evaluation by a clinician is essential for glaucoma cases. However, the assessment of the presence and stage of glaucoma using AI could be a method applicable for glaucoma screening in the community.

810 - P2.066

CHATGPT'S COMPETENCY IN ADVISING ON LENS EXTRACTION FOR PRIMARY ANGLE CLOSURE SUSPECTS

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Purpose: This study assesses the guidance offered by ChatGPT on management of primary angle closure suspects (PACS), with a focus on the advisability of early cataract surgery. This study aims to determine how relevant ChatGPT's recommendations are, specifically in the controversial situations involving PACS with clear lens.

Methods: On February 6, 2024, we examined how ChatGPT (version GPT-4.0) responded to PACS cases with good vision. These cases were chosen to represent various factors that increase the risk of angle closure glaucoma (ACG). They included two 65-year-old Chinese women with different eye conditions and glaucoma family histories, a 40-year-old white man with clear lenses and no family history of glaucoma, and a 40-year-old Chinese woman with clear lenses but a strong family history of ACG. The study focused on how well ChatGPT could consider each patient's risk - like age, ethnicity, family history, lensand anterior segment condition - to offer personalized advice.

Results: ChatGPT suggested that the first patient should think about lens surgery to prevent future angle closure progression, noting her age, family history, and slightly cloudy lenses as key factors. For the second patient, already dealing with advanced glaucoma in one eye, the AI recommended early cataract surgery in the other eye to lower risk. The third patient, seen as low-risk, was advised to have regular eye check-ups and possibly undergo a laser peripheral iridotomy (LPI), rather than surgery. The fourth patient was advised to undergo LPI, stay alert and have regular check-ups, with surgery as an option for high lens vaults (LV) or shallow anterior chamber. The platform acknowledges no LV cut-off value for lens extraction. Nevertheless, the LV above average (e.g., > 600 µm) with additional risk factors could potentially justify a discussion on surgery.

Conclusion: ChatGPT's advice appears to recognize the individualized approach required in PACS management, suggesting strategies tailored to the distinct risk factors of each patient. Therecommendations seem consistent with current clinical practices. It is important to highlight that evidence supporting the benefits of clear lens extraction in PACS is still limited. Ophthalmologists should weigh ChatGPT's advice, updated evidence, and patient preferences before making decisions.

861 - P2.067

EXPLORING IMAGE AND METADATA FUSION FOR GLAUCOMA DETECTION WITH ARTIFICIAL INTELLIGENCE

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Purpose: The purpose of this study was to investigate the effectiveness of integrating both image data and metadata in the detection of glaucoma using artificial intelligence (AI). Glaucoma is a leading cause of irreversible blindness worldwide, and early detection is critical for effective management and prevention of vision loss. By combining image features with patient metadata, such as age, gender, and ocular measurements, we aimed to enhance the accuracy of glaucoma diagnosis.

Methods: We utilized a dataset comprising 331 images from the publicly available PAPILA database, with 298 images classified as normal and 33 diagnosed with glaucoma. Initially, we trained an AI model, specifically the EfficientNetV2B0 architecture, using only image data. Subsequently, we incorporated patient metadata, including age, gender, pachymetry, refractive error, and axial length, into the training process. The dataset was split into 70% for training, 15% for validation, and 15% for testing.

Results: Upon initial training with image data alone, the AI model achieved an area under the curve (AUC) of 79% on the test set, indicating moderate performance in glaucoma detection. However, upon integration of patient metadata into the training process, the AUC improved to 83%, suggesting a slight enhancement in diagnostic accuracy. Statistical analysis using the De Long Test did not reveal a significant difference between the two models, indicating that the addition of metadata did not significantly improve performance.

Conclusion: In conclusion, our study highlights the potential for integrating patient metadata with image data to improve the accuracy of glaucoma detection using AI. While the addition of metadata led to a modest improvement in AUC, the difference was not statistically significant. This suggests that while patient metadata may provide valuable contextual information, it may not substantially enhance the performance of AI models in glaucoma diagnosis. Further research is warranted to explore alternative approaches and optimize the integration of additional patient information for more effective glaucoma detection.

862 - P2.068

MAXIMIZING GLAUCOMA DETECTION ACCURACY THROUGH HIGH CONFIDENCE AI PREDICTIONS: A RIM ONE DATABASE STUDY

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Purpose: This study aimed to evaluate the performance of an artificial intelligence (AI) model in glaucoma detection using the RIM One public database. Specifically, we assessed the impact of considering only high-confidence predictions from the AI model on the overall diagnostic accuracy.

Methods: The RIM One database provided a total of 485 images, comprising 313 normal and 172 glaucomatous cases. Of these, 248 images were allocated for training the EfficientNetV2B0 model, 63 for validation, and 174 for testing. The model's performance was initially evaluated based on the entire test set, yielding an area under the curve (AUC) of 96%. Subsequently, we investigated the model's performance when restricting predictions to those with a certainty probability of over 95%, reducing the test set to 155 images.

Results: When considering all predictions, the AI model achieved an AUC of 96%. However, when focusing solely on high-confidence predictions (> 95% certainty), the AUC increased to 100%. This adjustment resulted in a reduced test set size from 174 to 155 images. Statistical analysis using the De Long Test revealed a significant difference between the two AUC values, highlighting the efficacy of high-confidence predictions.

Conclusion: In conclusion, our findings demonstrate that by considering only AI predictions with a certainty probability exceeding 95%, we can significantly improve the diagnostic accuracy of glaucoma detection. This approach resulted in a perfect AUC, indicating robust performance in identifying glaucomatous cases. The reduction in test set size suggests that 19 cases may require further evaluation through methods such as visual field testing or optical coherence tomography (OCT) to confirm or exclude the diagnosis of glaucoma. This selective approach not only enhances the efficiency of glaucoma diagnosis but also streamlines clinical decision-making by focusing resources on cases with the highest predictive certainty.

864 - P2.069

PREDICTING INTRAOCULAR PRESSURE USING NEURAL NETWORKS: INCORPORATING IMAGE DATA AND PATIENT METADATA FROM PAPILA DATASET

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Purpose: The purpose of this study was to investigate the feasibility of predicting intraocular pressure (IOP) using a neural network model incorporating both image data and patient metadata. We aimed to assess the potential utility of this approach in enhancing the understanding and prediction of IOP levels in individuals, leveraging data from the PAPILA public database.

Methods: We utilized a dataset comprising 331 images from the PAPILA database, with 298 images classified as normal and 33 diagnosed with glaucoma. Additionally, we incorporated patient metadata, including glaucoma diagnosis status, age, sex, refractive defect, pachymetry, and axial length. The dataset was split into 70% for training the neural network model, 15% for validation, and 15% for testing.

Results: Analysis of the predictive performance of the neural network model yielded the following metrics: Mean Absolute Error (MAE) of 2.515, Coefficient of Determination (R-squared) of 0.102, Root Mean Square Error (RMSE) of 3.131, and Mean Absolute Percentage Error (MAPE) of 16.611%. These results indicate a moderate level of predictive capability for IOP based on the input data.

Conclusions: In conclusion, our study suggests that while image data and certain patient metadata can be leveraged to predict intraocular pressure (IOP) to some extent, the predictive performance of the neural network model remains modest. The relatively low R-squared value indicates that a significant proportion of the variance in IOP remains unexplained by the model. Further research is needed to explore additional factors that may influence IOP levels and to refine the model for improved predictive accuracy. Despite these limitations, our findings contribute to the ongoing exploration of artificial intelligence in ophthalmology and highlight the potential of machine learning techniques in predicting IOP and enhancing glaucoma management strategies.

995 - P2.070

AI-POWERED GLAUCOMA SCREENING: CIRCUIT AND RESULTS

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Purpose: Report results of a novel AI-powered population-level glaucoma screening protocol.

Methods: Individuals aged 55-65 (mainly diabetic patients) were invited for glaucoma screening in a primary-care setting. The screening involved disc-centered fundus photography and intraocular pressure (IOP) measurement. Glaucoma risk was assessed by an AI tool, MONA G-Risk, using the images. A positive result was defined by either a risk score higher than 0.73 (range 0-1) or an IOP of ≥ 24 mmHg. Participants with positive results were referred to a glaucoma clinic for further tests, including OCT (Heidelberg Spectralis®) for peripapillary retinal nerve fibre layer (ppRNFL) and Bruch's membrane opening (BMO) evaluation, along with visual field (VF) testing using Humphrey 24-2 perimetry. VF analysis followed the ocular hypertension treatment study protocol, and structural assessments were deemed normal or abnormal based on the presence of any sector abnormality (< 1%) against the device's normative database. Clinicaltrial.gov: NCT05875090.

Results: Of the 727 patients invited for screening, 561 consented and attended the scheduled visit. An additional 113 subjects performed opportunistic screening while undergoing diabetic retinopathy testing. Most screened patients were diabetic (n = 567 out of 674 in total). Mean IOP, and risk scores were 14.3 mmHg (± 3.7); and 0.53 (± 0.11), respectively. 82 (12.1%) of subjects (diabetics: 65/567, or 11.5%; non-diabetics: 17/107, or 15.9%) met referral criteria: 66 for high AI risk (9.8%), 16 (2.3%) for high IOP-only criteria. As of February 2024, 69 subjects underwent glaucoma clinic evaluation (AI: n = 57; IOP: n = 12; AI+IOP: n = 4). Mean MD was -5.2 dB (± 6.0), ppRNFL was 91.9 mμ (± 13.4), global BMO was 265.0 mμ (± 56.6). There were no statistically significant differences in structural outcomes between diabetic and non-diabetic cohorts. More than half of the glaucoma clinic evaluations (37/69) resulted in continued follow-up in hospital setting, while the remainder were instructed to repeat screening in 1-5 years. Mean circuit time of screening was 48.7 days (± 24.3).

Conclusion: Our AI-powered glaucoma screening protocol appears effective in detecting referrable patients. IOP cutoffs-only appear insufficient for adequate glaucoma screening. Our protocol's circuit time demonstrates that glaucoma-related healthcare was provided in a timely manner.

339 - P2.071

PARS PLANA VITRECTOMY TO IMPROVE ACUTE PRIMARY ANGLE CLOSURE ATTACK MANAGEMENT

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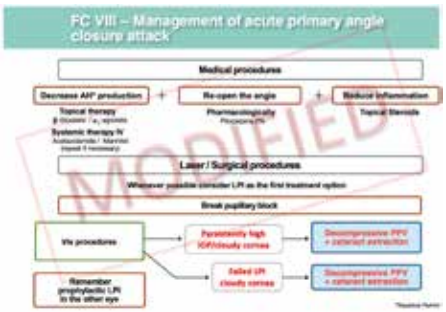
Purpose: To update Acute Primary Angle Closure Attack treatment guidelines performing decompressive Pars Plana Vitrectomy associated with lens extraction.

Methods: We selected patients with APACA presented at the emergency room of our clinic from February 2021 to October 2023. Standard management included 250 mL of 18% intravenous mannitol, topical beta-blocker, topical steroids and 2% topical pilocarpine. Laser Peripheral Iridotomy was attempted in all eyes. Patients with persistent IOP > 30 mmHg underwent decompressive 23 Gauge PPV (Centurion® Vitrectomy Probe) combined with lens extraction within two weeks.

Results: Ten eyes underwent decompressive PPV combined with lens extraction after standard management failure. The LPI was successfully performed in seven eyes but it failed to lower the IOP. The LPI was unsuccessfully performed in three eyes because of persistent cloudy cornea. Decompressive PPV combined with lens extraction failed to successfully control the IOP in two eyes (Table 1).

Patient	IOP during APACA	LPI	Preoperative IOP	Postoperative IOP	Additional interventions
1	-	yes	50	36	trabeculectomy
2	-	yes	40	15	
3	40	yes	32	10	
4	55	incomplete	30	10	
5	55	no	40	10	
6	30	no	30	13	
7	38	yes	30	10	
8	32	yes	32	10	
9 RE	55	yes	50	35	trabeculectomy
9 LE	40	yes	45	18	

Conclusion: The European Glaucoma Society guidelines suggest the lens extraction as a possible option in cases of standard management failure in APACA, highlighting the predisposition to complications because of the cloudy cornea, shallow AC, poorly dilatated pupil, and high IOP. We propose to simultaneously perform the decompressive 23 Gauge PPV to ease the lens extraction. The vitreous decompression allows to widen the anterior chamber keeping low pressure, to protect the corneal endothelium during the phacoemulsification and to reduce the capsulorhexis run out and the iris prolapse risk. In our case series the approach we propose failed to successfully control the IOP in two eyes, that afterwards required trabeculectomy. Both cases had had a previous APACA treated with the standard management and showed 360 degrees of anterior synechiae (Fig.1).



501 - P2.072

CHEMICAL BURN IN A PATIENT WITH ANGLE-CLOSURE GLAUCOMA

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Purpose: To present a case of angle-closure glaucoma after a chemical burn.

Methods: After a complete ophthalmological examinations in a 72-year-old female was established in both eyes: iris configuration - plateau, nuclear cortical cataracts and pseudoexfoliation syndrome. Visual acuity 1.0 bilaterally, IOP is normal. Pilocarpine therapy was prescribed and laser iridotomy was scheduled. Two days later, the patient came to the emergency room with acute pain, irritation, tearing. Anamnestically, it was established that instead of Pilocarpine, the patient had placed Pyoctanine. Pyoctanine is intended for topical treatment of infectious skin lesions. It contains Methylrosaniline hydrochloride - 1.0 g, ethanol 96%, purified water and has an antiseptic, astringent and antimycotic effect.

Results: Conjunctival hyperemia and blue pigmentation of the conjunctiva and cornea, corneal edema with single folds of Descemet's membrane were found. Punctate fluorescein staining of the corneal epithelium was observed. Vision was reduced to VOD = 0.1, VOS = 0.3 and pressure was TOD = 28 mmHg, TOS = 25 mmHg. Treatment was with profuse lavage, topical antibiotic, artificial tears, topical beta-blocker, oral acetazolamide, intravenous mannitol. However, the pressure did not normalize, and the cornea showed a trend toward worsening stromal edema and epithelization. Emergency laser iridotomy was performed. Drops of autologous serum were added. Within 14 days, the corneas completely epithelialized, and the pressure normalized.

Conclusion: Performing emergency iridotomy in the chemical burn setting is challenging. Timely treatment of chemical burns is necessary to prevent permanent damage to vision.

600 - P2.073

HYDRUS TRABECULAR BYPASS MICROSTENT WITH PHACOEMULSIFICATION IN PRIMARY ANGLE CLOSURE GLAUCOMA: 4 MONTH REVIEW OF EFFICACY AND SAFETY

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Purpose: To evaluate the efficacy and safety of Hydrus® Trabecular bypass Microstent in patients with primary angle closure glaucoma following visco-goniosynechialysis in cataract surgery. The focus being the IOP control, a number hypotensive medication before and after surgery, and complications.

Methods: Retrospective record review of patients with mild to moderate primary angle closure glaucoma who had cataract surgery and Hydrus® Microstent, after visco-goniosynechialysis, in Broomfield Hospital (Mid and South Essex NHS Trust, UK) between January 2022 and August 2023. Results included visual acuity and mean intraocular pressure (IOP) at baseline and at weeks 1,2,4, 8 and 16 following the surgery, number of hypotensive drops used, early post operative complication, or stent position.

Results: 22 eyes of 18 patients were reviewed. In one patient the Hydrus stent insertion was abandoned due to poor visualization of the trabecular meshwork. At week 16, the visual acuity improved from 0.42 (±0.18) to 0.15 (±0.13) logMar (p 0.03), while mean IOP dropped from 22.5 (±3.5) to 14.3 (±3.1) mmHg (p = 0.01). The average number of hypotensive drops decreased from 1.8 (±0.7) to 1.2 (±0.7) (p = 0.05). A mild anterior chamber rection was documented in four patients (16%), which resolved within 4 weeks. One patient experienced CMO, which resolved with topical treatment at week 16. There was one patient with moderate glaucoma who required trabeculectomy due to uncontrolled IOP at week 16. There were no IOP spikes recorded on any patients over observation period.

Conclusion: Based on the above review Hydrus® Trabecular bypass Microstent could be considered a safe and effective choice in patients with mild to moderate primary angle closure glaucoma, undergoing routine cataract surgery.

767 - P2.074

AUTOMATED DIRECT SELECTIVE LASER TRABECULOPLASTY IN PRIMARY ANGLE CLOSURE DISEASE

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Purpose: To measure the efficacy and safety of trans-limbal direct selective laser trabeculoplasty (DSLT) in reducing intraocular pressure (IOP) in subjects with primary angle closure (PAC) and primary angle closure glaucoma (PACG).

Methods: Eleven patients with a baseline diagnosis of PAC and PACG and who had received prior laser iridotomy were recruited in this prospective single arm pilot trial. Subjects were either treatment naïve or post-washout with an IOP ≥ 22 mmHg but ≤ 35 mmHg. One eye per subject received DSLT by non-contact limbal irradiation with power settings standardized at 2.2 mJ and 120 shots delivered over 360 degrees. Patients were followed up at week 1and month 2. All patients were prescribed nepafenac drops for a week after laser.

Results: The mean ± standard deviation baseline IOP (mmHg) in all eyes was 22.7 ± 1.0. At week 1 this value was significantly reduced to 18.0 ± 3.4 (reduced by 20.2%; p = 0.01) and at Month 2 it was 16.9 ± 3.1 (reduced by 25.4%; p = 0.004). One patient required a re-treatment at month 2 and one patient was started on topical beta blocker due to sub-optimal IOP. No serious adverse events occurred.

Conclusion: Over a short-term, automated DSLT appears to be an effective and safe noncontact modality for reducing IOP in patients with angle closure disease.

837 - P2.075

EFFECT OF CATARACT SURGERY ON THE RATE OF VISUAL FIELD PROGRESSION IN PRIMARY ANGLE CLOSURE GLAUCOMA

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Purpose: Primary angle closure glaucoma (PACG) is one of the leading causes of irreversible visual loss worldwide. Laser peripheral iridotomy was, until recently, the standard care to prevent intraocular pressure (IOP) build-up. Recently, lens extraction via cataract surgery has been shown to be a better approach to the management of PACG. However, it remains unclear whether cataract surgery reduces visual field (VF) progression in PACG. The aim of this study is to test the effect of cataract surgery on the rate of VF progression in eyes with PACG in a clinical setting.

Methods: An electronic medical record was used to extract data for eyes with PACG which underwent cataract surgery from January 2020 to December 2020 at Moorfields Eye Hospital. We analysed eyes with at least 2 reliable VF tests (false positive errors ≤ 15%) before and after surgery. We analysed the rate of progression (RoP) of the Mean Deviation (MD) using a linear mixed effect model of MD change over time, with random intercepts and slopes. A discrete effect indicated the pre- and post-operative period and its interaction with the time from surgery modelled the change in RoP after cataract surgery. We also analysed the change in Best Corrected Visual Acuity (BCVA) and the IOP. Estimates are reported as Mean [95%- confidence intervals].

Results: 139 eyes met the inclusion criteria. Descriptive statistics for the sample at surgery are reported in Table 1. The estimated pre-operative average RoP was -0.52 [-0.73, -0.30] dB/year ($p < 0.001$). There was a significant average change in the RoP after cataract surgery (RoP difference: 0.55 [0.21, 0.89] dB/year, $p = 0.002$, see Table 2). Both the average IOP was significantly reduced after cataract surgery (Table 1, $p < 0.001$) and BCVA significantly improved (Table 1, $p < 0.001$). Six patients (4.3%) underwent further glaucoma surgery after cataract surgery.

Table 1. Descriptive statistics for the analysed sample. SD = standard deviation; IQR = interquartile range

N = 139	Pee-operative*	Post-operative*	p-vale**
Age (years)	68 ± 9 (70 [64, 75])		
Laser peripheral idrotomy	90 (65%)		
Baseline glaucoma stage			
Early	86 (62%)		
Moderate	26 (19%)		
Advanced	27 (19%)		
Baseline MD (dB)	-7.16 ± 7.33 (-4.22 [-9.54, -2.20])		< 0.001
IOP (mmHg)	20 ± 6 (19 [16, 23])	17 ± 6 (16 [13, 18])	< 0.001
VA (logMAR)	0.22 ± 0.29 (0.18 [0.00, 0.30])	0.15 ± 0.25 (0.18 [0.00, 0.18)]	
Further glaucoma surgery		6 (4.3%)	

*Mean ± SD (Median [IQR]); n (%); **Paired t-test

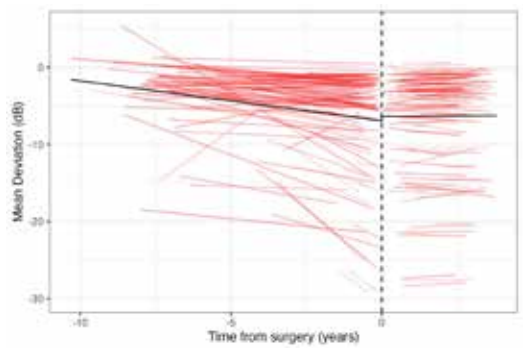

Figure 1. Estimates from the linear mixed-effect model showing the random effect estimates for infividual patients (red lines) and for the sample average (black line). The vertical dashed line indicates the time of surgery, wich was set to 0 for all patients.

Conclusion: We found a significant effect of cataract surgery on the RoP of VF loss in PACG.

460 - P2.076

AUSPICIOUS TRABECULECTOMY OUTCOME IN JUVENILE OPEN ANGEL GLAUCOMA: A CASE REPORT

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Purpose: To report a case of Juvenile open-angle glaucoma (JOAG) succesfully treated with trabeculectomy filtering surgery. JOAG is an atypical form of primary open-angle glaucoma (POAG), with onset from 3 to 40 years of age, higher IOP, and more severe visual field loss compared with adult-onset POAG.

Methods: A case report of a young Southeast Asian male with JOAG undergone filtering surgery. Visual acuity (VA), intraocular pressure (IOP), slit lamp examination (SLE), posterior segment, gonioscopy, optical coherence tomography, Ultrasonography (USG), endothelial cell density, laboratory test, and echocardiography were evaluated.

Results: A 12-year-old patient presented with pain on both eyes accompanied with worsening blurred vission for 3 years. Physical examination revealed right eye (RE) VA 2/60 IOP 46 mmHg, left eye (LE) VA Light Perception (LP) IOP 40 mmHg. SLE revealed dilatation on both pupil and gonioscopy revealed trabecular meshwork in all four quadrants on both eyes. RE and LECD ratio 0.8-09 on fundus examination. The Anterior Chamber Depth (ACD) obtained from ultrasonography revealed RE 3.99mmand LE 3.61mm. With axial length of RE 26.97mm, while LE 27.47mm. The others examination were normal. Patient underwent trabeculectomy for RE. Following the surgery RE IOP was 11 mmHg and the VA became 5/60 with Bleb (+) and Moderate-Severe Vascularization. One week after the surgery RE IOP was15 and the VA 6/60 improved to 6/9 with a pinhole with bleb (+) and Mild Vascularization.

Conclusion: An early diagnosis can provide effective treatment and yield good outcome, delay in diagnosis leads to advance glaucomatous damage to the optic nerve and cause worsening visual acuity. The first-line treatment of JOAG is medical therapy usually with refractory IOP increase, therefore trabeculectomy provides definite outcome of disease.

Keywords: juvenile open angel glaucoma, trabeculectomy, filtration surgery

479 - P2.077

THE PIRATE STUDY PROTOCOL: CONVENTIONAL PROBE TRABECULOTOMY VERSUS MICROCATHETER-ASSISTED 360° TRABECULOTOMY IN CHILDHOOD GLAUCOMA - A MULTICENTER PROSPECTIVE RANDOMIZED CONTROLLED TRIAL

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Purpose: To compare illuminated microcatheter-assisted circumferential trabeculotomy (MCAT) with conventional probe trabeculotomy in children with glaucoma.

Methods: 76 children (152 eyes) aged ≤ 12 years with primary or secondary glaucoma will be included in this multicentric, prospective randomized controlled study comparing MCAT with probe tabeculotomy. Primary endpoint is the complete surgical success at 24 months (intraocular pressure (IOP) < 18 mmHg without medication and revision surgery in the follow up). Secondary endpoints are incomplete surgical success (IOP < 18 mmHg, with medication and/or revision surgery), absolute and relative difference of intraocular pressure (IOP), axial length, visual acuity, refraction, corneal diameters, cup-to-disc ratio; presence of Haab striae, number of medication drugs, number of revision surgeries, number of intraoperative and postoperative complications. A paired eye design is used allocating experimental intervention to one eye and control intervention to the other eye. Treatment sequence will be randomized, observers are masked to the procedure. Primary analysis on intention-to-treat basis will be performed by means of McNemar test.

Conclusion: The PIRATE study is a multicentric, randomized controlled study comparing MCAT with conventional probe trabeculotomy in a large and heterogeneous childhood glaucoma population. It will provide data on success and safety of both techniques and clarify if MCAT is superior to probe trabeculotomy.

523 - P2.078

CONGENITAL GLAUCOMA ASSOCIATED WITH STURGE-WEBER SYNDROME: CASE REPORT

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Purpose: Report a case of congenital glaucoma in a patient with Sturge-Weber Syndrome (SWS), discuss the presentation, investigation and management.

Methods: We describe an infant who presented at birth with port-wine birthmark (PWB) in the territory of the right trigeminal nerve (V1 and V2), and associated right eye (OD) corneal edema and elevated intraocular pressure. He was subsequently diagnosed with glaucoma, submitted to OD trabeculectomy and started on topical therapy in both eyes.

Results: A 4-day-old newborn boy with right hemifacial PWB at birth, presented to the ophthalmology consult with OD corneal edema and elevated intraocular pressure (IOP). Pregnancy and birth were uneventful. Brain magnetic resonance imaging (MRI) performed 1 day after birth demonstrated venous congestion, slight increase in the size of the choroid plexuses; periventricular coagulative necrosis; vasogenic edema in left temporal lobe, mild asymmetry between the temporal lobes of both hemispheres with left sulcus enlargement, and enlarged right choroid plexus suggesting choroidal vascular malformation. Examination under anesthesia was performed at age 11 days, revealing axial length (AL) of 19,29mmand 17,25mmfor OD and left eye (OS) respectively; IOP was 31 mmHg in OD and 26 mmHg in OS, gonioscopy demonstrated presence of blood in Schlemm's canal and vascular tortuosity in both eyes, open angle in OS, but closed angle could not be ruled out in OD. Based on the exam findings, OD trabeculectomy with intraoperative application of mitomycin C, was performed, and topical ocular hypotensive medication was initiated in both eyes. Observation in the operating room at postnatal day 39, revealed normal IOP and mean axial lengths of 18,70mmand 18,32mmfor OD and OS respectively. Gonioscopy showed open angles in both eyes and fundoscopic examination revealed diffuse choroidal hemangioma in OD and tomato catsup fundus appearance in OS. Patient was then referred to dermatology, neuropediatrics, and genetic consultations.

Conclusion: We report a case of congenital glaucoma in a patient with SWS, which, to our knowledge, adds further evidence to the existing literature. Early diagnosis and management of SWS helps to improve quality of life of patients which have this condition.

842 - P2.079

BLEEDING FOLLOWING HYPOTONY - A CASE REPORT OF DECOMPRESSION RETINOPATHY

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Purpose: Decompressive retinopathy after filtering surgery is a rare benign and transient complication characterized by the presence of multiple retinal hemorrhages. It was initially described in 1992 in young healthy patients with juvenile glaucoma given the intraocular pressure (IOP) spikes characteristics of this type of glaucoma and the acute IOP lowering during filtration surgery. The purpose is to describe a case of 17-year-old female with a decompressive retinopathy following a filtration glaucoma surgery.

Methods: Case report of a 17-year-old female diagnosed with bilateral juvenile open angle glaucoma and surgical history of XEN gel stent implantation in her left eye (OS). She underwent OS ab externo trabeculectomy for refractory hypertonia. Pre-operative mannitol was administered and a decompression paracentesis was performed during surgery. The surgery went uneventful.

Results: In the immediate postoperative period she presented with a narrow anterior chamber without endothelial touch and a diffuse, functional and no-leaking filtration bleb. The IOP was 8 mmHg. Fundoscopy revealed multiple macular and mid-peripheral retinal hemorrhages with no evident choroidal detachment. Optical coherence tomography confirmed the presence of multiple intra and subretinal hemorrhages that faded spontaneously over time.

Conclusion: The authors present a case of a decompressive retinopathy after trabeculectomy in a teenage with juvenile open angle glaucoma. Although rare, this complication must be anticipated and avoided by gradually reducing IOP in the preoperative period and controlling intraoperative hypotony.

865 - P2.080

ADVANCEMENTS IN PAEDIATRIC GLAUCOMA SURGERY: INSIGHTS FROM A 5-YEAR RETROSPECTIVE STUDY IN MANCHESTER

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Purpose: This study aims to present and compare the outcomes of surgical interventions for paediatric glaucoma conducted at our paediatric ophthalmology department from 2018 to 2024.

Methods: We retrospectively analysed data from 51 children who underwent either 360 trabeculotomy or trabeculectomy or combined trabeculotomy and trabeculectomy, or goniotomy over the past five years. Preoperative, intraoperative, and postoperative assessments were conducted, encompassing visual function, intraocular pressure, refraction, and anterior and posterior segment examinations.

Results: The average age of patients was 2.5 years. Among them, 38% underwent 360 trabeculotomy, 45.2% received combined 360 trabeculotomy and trabeculectomy with antimetabolites, and 16.8% underwent goniotomy. Most patients exhibited significant postoperative improvement, with clinical findings returning to normal without additional pharmacological intervention.

Conclusion: Timely diagnosis and intervention led to significant improvement in the majority of patients. Our findings suggest that combined 360 trabeculotomy and trabeculectomy with antimetabolites emerges as the predominant surgical approach in managing paediatric glaucoma.

952 - P2.081

TWO-YEAR EFFICACY AND SAFETY OF PAUL GLAUCOMA IMPLANT IN PAEDIATRIC GLAUCOMA

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Purpose: The PAUL® glaucoma implant (PGI) is a novel glaucoma drainage device with a smaller diameter tube compared with standard alternatives. This study aims to evaluate the 2-year safety and effectiveness of the PGI in a paediatric cohort.

Methods: Retrospective, cohort study. All paediatric patients who underwent PGI surgery and completed at least 24 months of follow-up were included. Primary outcome was failure, defined as sustained intraocular pressure (IOP) > 18 mmHg or < 6 mmHg, less than 30% reduction of IOP from baseline, need for removal of the implant, additional glaucoma surgery or visual loss. Secondary outcomes included mean IOP, mean number of medications and complications.

Results: A total of 16 eyes from 13 patients fulfilled inclusion criteria. Median patient age at time of surgery was 3 years (range: 5 months to 14 years). A total of thirteen eyes (81%) achieved surgical success at 24 months, six of which (38%) with no medication. Three (19%) failures were observed, all due to IOP > 18 mmHg. The mean preoperative IOP was 27.3 ± 6 mmHg, which was significantly reduced to 13.0 (±4.5) mmHg at 12 months and to 12.8 (±4.5) mmHg at 24 months (both p-value < 0.001). The mean reduction in IOP from the preoperative visit to the 24-months visit was 14.4 (±7.4) mmHg. Mean number of IOP-lowering drugs was lowered from 2.4 (±1.3) pre-operatively to 1.0 (±1.0) at 24 months. Postoperative complications included tube synechiae (n = 2), strabismus (n = 1), hyphema (n = 1) and transitory hypotony (n = 1). No cases of hypotony requiring surgical intervention were recorded.

Conclusion: PGI appears to be a safe and effective glaucoma drainage implant for the treatment of refractory childhood glaucoma.

292 - P2.082

EARLY DIAGNOSIS OF PRIMARY OPEN-ANGLE GLAUCOMA AND PSEUDOEXFOLIATIVE GLAUCOMA THROUGH THE IDENTIFICATION OF METABOLIC MARKERS

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Purpose: To develop a strategy based on untargeted metabolomics analyzing the blood serum of patients with glaucoma, in order to identify predictive markers of this disease.

Methods: Metabolomics fingerprint analysis in the serum of 90 patients diagnosed with primary open angle glaucoma (POAG), 90 patients with pseudoexfoliative glaucoma (PXFG) and 90 control subjects, matched in sex and age, and who were distributed in two cohorts: discovery (20 POAG, 20 PXFG and 20 controls) and verification (70 POAG, 70 PXFG and 70 controls). Sample processing was optimized by evaluating organic solvent mixtures and adding internal standards. Samples were analyzed by liquid chromatography, using a C18 reversed phase column, coupled to a high resolution mass spectrometry instrument (Agilent 6560, LC-IM-QTOF), in positive and negative ion modes. Statistical analysis was performed using Mass Profiler Professional software.

Results: LC-IM-QTOF analysis provided 3698 common molecular characteristics, identifying 50% of small molecules using exact mass and MS/MS. Data was subjected to log2 conversion and scaling before unsupervised principal component analysis (PCA), explaining 45% of the variance. Unpaired t-test (with Benjamini-Hochberg correction) showed 212 distinct molecules when comparing control vs PXFG group and 13 altered molecules when comparing control vs POAG groups (p-value < 0.001, fold-change > 2) showing alterations of the lipid metabolism using KEGG pathways database. Venn diagrams provided 12, 10 and 8 unique molecules at control, POAG and PXFG groups, respectively. Candidate markers were validated in the verification cohort by LC-IM-QTOF analysis. A multivariate exploratory ROC curve analysis was performed, selecting 14 candidate metabolites, which provided an area under the curve of 0.94 and a prediction probability of 92%.

Conclusion: The untargeted metabolomics methodology developed has made it possible to identify systemic alterations of metabolites related to lipid metabolism in patients with POAG and PXFG, with a high probability of prediction. Although further research is necessary, this route could help in the early diagnosis of these types of glaucoma.

636 - P2.083

ANALYSIS OF OCTA FEATURES OF THE FOVEAL AVASCULAR ZONE FOR GLAUCOMA CLASSIFICATION

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Purpose: To investigate the use of Optical Coherence Tomography Angiography (OCTA)-derived features in the Foveal Avascular Zone (FAZ) for the characterization of glaucoma.

Methods: A cohort of the Leuven Eye Study (26 glaucoma patients - 12 moderate, 14 severe - and 33 controls) was used. Diabetic patients were excluded. Average age and sex (% male) distribution was 59.5 ± 13.8 (68.8%) and 61.5 ± 10.4 (53.85%), respectively for healthy and glaucoma groups. Fovea-centered 3 x 3 mm OCTA images of the superior vascular plexus were acquired using Cirrus HD-OCT 5000 (Carl Zeiss, USA). The area, circularity, perimeter, horizontal and vertical radius, axis ratio, and angle of maximum diameter were extracted from manually delineated FAZs. The ability of each feature to distinguish between groups was assessed using Wilcoxon rank-sum tests, and 95% confidence intervals were obtained using bootstrap resampling. The Benjamini-Hochberg method was used to correct for multiple testing. The correlation of the FAZ features with visual field mean deviation (VFMD) and retinal nerve fiber layer (RNFL) thickness was computed. The FAZ features that presented a statistically significant difference between groups (perimeter, horizontal radius), the vessel area density (VAD) and the vessel length density (VLD) were compared (AUROC of a logistic regression model) using each feature to distinguish glaucoma from controls. Each model was corrected for sex, age, use of anti-hypertensive medication, and mean arterial pressure.

Results: The perimeter and horizontal radius were significantly larger in glaucoma patients compared with controls (2.33 ± 0.41 vs. 1.94 ± 0.53 mm, and 0.35 ± 0.07 vs. 0.29 ± 0.08 mm). No significant differences were found between glaucoma groups. None of the FAZ features were correlated with VFMD or RNFL thickness. The AUROCS for glaucoma vs. healthy were 0.73, 065, 0.93, and 0.95 for the perimeter, horizontal radius, VAD, and VLD, respectively.

Conclusion: In this study, the FAZ of glaucoma patients was larger and more irregular compared to healthy controls. The microvasculature surrounding the FAZ showed highest performance to classify these same groups.

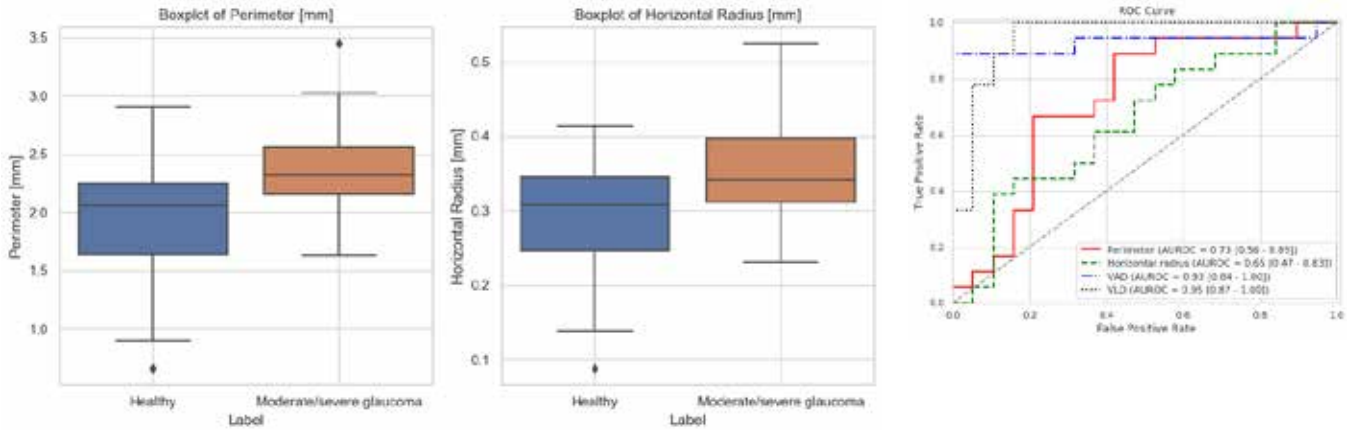

Figure. Comparison of moderate and severe glaucoma vs healthy controls. Top: differences between groups for FAZ features. Bottom: AUROC for logistic regression models.

POSTER SESSION 3

231 - P3.001

MICROPULSE LASER TRABECULOPLASTY IN OCULAR HYPERTENSION: VARIATION OF INTRAOCULAR PRESSURE, MULTIMODAL IMAGING AND FUNCTIONAL PARAMETERS

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Purpose: To assess the changes in intraocular pressure (IOP), functional parameters and multimodal imaging in patients with ocular hypertension (OH) after Micropulse Laser Trabeculoplasty (MLT).

Methods: We enrolled in a prospective study patients (≥ 18 years) with OH who require MLT. OH Patients who did not receive MLT were included as control group. Patients underwent visits at 3, 6, 12 months including diurnal IOP curve, retinal nerve fiber layers (RNFL) and ganglion cell complex (GCC) scans, OCT-angiography (OCT-A) of macula and optic disc, computerized visual field and microperimetry. One hour after MLT, IOP was measured to rule-out IOP spikes. Primary outcomes were the change in mean IOP from baseline and the percentage of patient with IOP reduction ≥ 20%. Secondary outcomes were changes of RNFL and GCC thickness, peripapillary vessel (ppVD) and perfusion density (ppPD), macular vessel (mVD) and perfusion density (mPD), mean defect (MD) with standard perimetry, macular sensitivity (MS) and relative scotomas (RS) with microperimetry, glaucoma conversion rate, adverse events. The study was approved by the local ethics committee. Written informed consent was obtained from each participant.

Results: We included 43 eyes in the MLT, and 27 eyes in the control group. Baseline IOP (21.9 ± 1.8 mmHg and 21.6 ± 1.9 mmHg, MLT and control group, $p = 0.48$) significantly decreased in MLT group (18.2 ± 2.2 mmHg at 12 months, $p < 0.001$) and remain unchanged in control group. Functional, structural and peripapillary OCT-A parameters remain unchanged in both groups, while macular OCT-A parameters significantly improved after MLT (baseline vs 12 months, mVD: 7.88 ± 1.79 vs 8.55 ± 1.93, $p = 0.04$; mPD: 0.301 ± 0.066 vs 0.325 ± 0.075, $p = 0.02$). No patients experienced serious adverse events and IOP spikes.

Conclusion: This is the first study reporting clinical and multimodal functional and imaging data after MLT procedure. Based on our data, serious events and IOP spikes are unlikely after MLT. A single MLT achieved a significant IOP reduction at 12 months and an improvement in macular perfusion parameter, supposedly due to the stable IOP decrease over the follow-up. The results of our preliminary work need to be confirmed by large, randomized studies with longer follow-up.

237 - P3.002

CHANGES IN OCULAR BIOMETRY FOLLOWING PRESERFLO MICROSHUNT IMPLANTATION AND TRABECULECTOMY: A PROSPECTIVE OBSERVATIONAL STUDY

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Purpose: To evaluate the postoperative changes in ocular biometry following initial PreserFlo MicroShunt implantation and trabeculectomy.

Methods: This was a prospective, observational study analyzing 27 cases of PreserFlo MicroShunt implantation and 29 cases of trabeculectomy performed by a single surgeon. Visual acuity, intraocular pressure (IOP), corneal astigmatism, central corneal thickness, anterior chamber depth, and axial length were assessed at baseline and postoperatively at 1 day, 1 week, 2 weeks, 1 month, 2 months, 3 months, and 6 months. Cases requiring additional surgery and those with missing data were excluded. Consecutive data were compared to baseline values using multiple comparisons.

Results: In both groups, IOP demonstrated a significant decrease from baseline at all postoperative timepoints (all $p < 0.01$). Central corneal thickness, corneal astigmatism, and axial length remained unchanged in both groups throughout the 6-month follow-up. Visual acuity was maintained in the PreserFlo group but showed a temporary decrease at 1 day postoperatively in the trabeculectomy group ($P = 0.04$). Anterior chamber depth exhibited a temporary but significant decrease at 1 week postoperatively in the PreserFlo group ($P < 0.05$) but remained stable after trabeculectomy.

Conclusion: Postoperative changes in ocular biometry following initial PreserFlo MicroShunt implantation and trabeculectomy were mild and parameters generally returned to baseline values within 2 weeks after surgery in both groups.

241 - P3.003

COMPARISON OF CHOROIDAL DETACHMENT WITH AND WITHOUT HYPOTONY AFTER AHMED VALVE IMPLANTATION

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Purpose: To compare the clinical manifestations of and risk factors for choroidal detachment (CD) with or without hypotony after Ahmed valve implantation (AVI).

Methods: This Retrospective, consecutive case series included patients with glaucoma who underwent AVI. We divided the patients into CD and non-CD groups. The patients with CD were divided into those with and without hypotony. Data collected from the chart review before and after AVI included patient demographics and ocular characteristics. We analyzed the risk factors for CD development. Moreover, the relationship between hypotony and CD development was analyzed.

Results: Among the 387 eyes, 63 developed CD. Among the 63 eyes, 42 had CD with hypotony and 21 had CD without hypotony. Multivariate logistic regression analysis revealed that age, lens status, history of diabetes mellitus (DM), and history of hypertension (HTN) were significant predictors of CD development. Neovascular glaucoma (NVG) showed 42.9% of CD cases without hypotony. This rate was higher than that of primary open angle glaucoma (POAG) and exfoliative glaucoma (XFG). Comparing the results of treatment outcomes between CD with and without hypotony, the rate of anterior chamber formation was significantly higher in CD with hypotony than in CD without hypotony.

Conclusion: Older age, pseudophakic eyes, DM, and HTN are significantly associated with CD development after AVI. NVG has higher incidence rate of CD without hypotony compared with POAG and XFG. Therefore, clinicians should pay attention to CD development after AVI especially in NVG, even if a patient is not in a hypotonic state.

253 - P3.004

BEVACIZUMAB ROLE AS MITOMYCIN- C ALTERNATIVE IN AUGMENTING TRABECULECTOMY PROCEDURE: SYSTEMATIC REVIEW AND META-ANALYSIS

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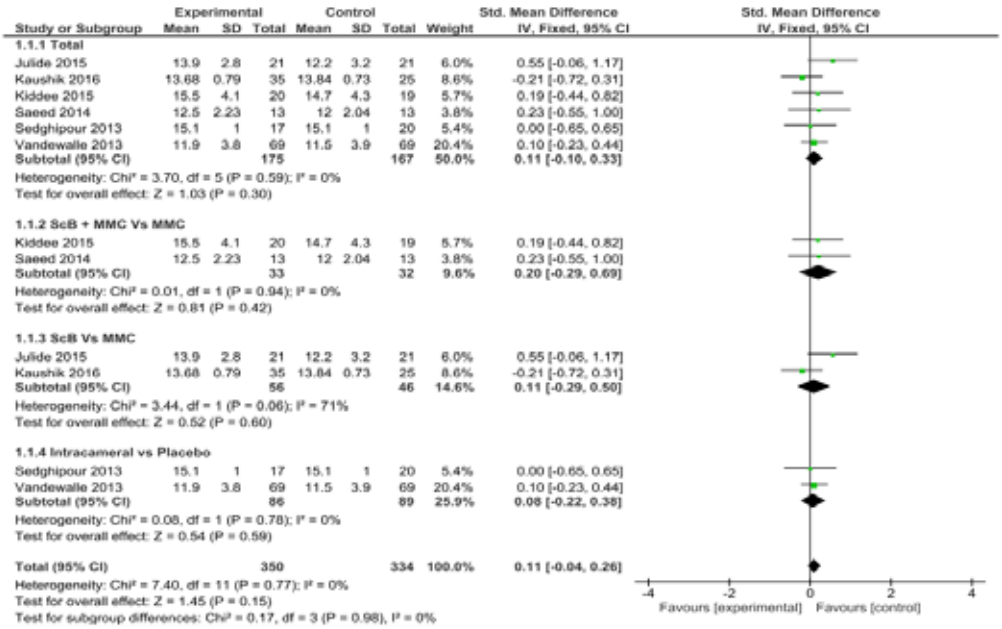
Purpose: Anti-vascular endothelial growth factor (AVEGF) agents have been used as an alternative to Mitomycin-c (mmC) in slowing healing response and excessive postoperative scarring in trabeculectomy. Determining effectiveness of adding AVEGF bevacizumab during trabeculectomy warrants for AVEGF future as an alternative tommC.

Methods: Searches conducted using keywords across several data sources, including Pubmed, Proquest and Cochrane library. The keywords searched for were "Bevacizumab", "Trabeculectomy" and "Glaucoma". Reviewed articles are Randomized Control Trial in English, conducted on humans in the last 15 years. The review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

Results: From a total of 353 articles, 6 chosen studies with 362 eyes of 352 patients been evaluated for the effectiveness of bevacizumab addition to trabeculectomy. The primary outcome assessed were Intra Ocular Pressure (IOP). No significant difference in IOP was found between the subconjunctival bevacizumab +mmC group andmmC alone group (MD 0.11 ; 95% CI -0.10 to 0.33), as well as subconjunctival comparison withmmC (MD 0.11 ; 95% CI -0.29 to 0.50). Similar results were also found in the intracameral and placebo groups (MD 0.08 ; -0.22 to 0.38). However, 3 articles reported significant differences in peripheral vascularity of bleb both by the Moorfields Bleb Grading System and by the Indiana Bleb Appearance System.



Conclusion: The addition of bevacizumab to trabeculectomy did not show any benefit in reducing IOP when compared withmmC, but resulted in in better bleb peripheral vascularity.

Keyword: bevacizumab, trabeculectomy, glaucoma

254 - P3.005

THIRD-GENERATION TRABECULAR MICRO-BYPASS IN EYES FAILING PRIOR SURGICAL AND/OR MEDICAL GLAUCOMA THERAPY

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Purpose: The newly-approved 3rd-generation three-stent trabecular micro-bypass device, iStent infinite, can be implanted either with or without cataract surgery. The current study assessed consecutive cases of standalone iStent infinite implantation from a U.S. glaucoma surgeon in patients who had failed prior surgical and/or medical intervention.

Methods: This non-randomized, retrospective, unmasked, consecutive study included all cases of standalone iStent infinite implantation in patients who had failed prior surgical and/or medical glaucoma treatment. Intraocular pressure, medications (meds), adverse events, and secondary surgeries were evaluated preoperatively and through 9 months postoperatively; 15-month data and a larger sample size will be available by the time of the conference.

Results: All patients (n = 31 eyes) were implanted with 3 iStent infinite stents, with no intraoperative complications. Most eyes (25/31 or 81%) had undergone one or more prior glaucoma surgery(ies), predominantly Xen, Durysta, and/or laser trabeculoplasty; the remaining eyes were using maximum-tolerated medical therapy (MTMT). Mean IOP reduced from 17.2 ± 5.8 mmHg preoperatively (n = 31) to 14.1 ± 3.9 mmHg at 9 months (n = 10) (18% reduction, p = 0.221); mean # meds reduced from 2.26 ± 1.32 to 0.60 ± 1.26 (73% reduction; p = 0.045). Nearly all MTMT eyes (5/6) were med-free at the time of last follow-up (ranging 1 week to 9 months). No postoperative adverse events or secondary surgeries occurred.

Conclusions: iStent infinite implantation yielded meaningful IOP and med reductions through 9 months in eyes that had failed prior glaucoma surgery(ies) and/or MTMT, with favorable safety.

258 - P3.006

10-YEAR OUTCOMES OF THE XEN GLAUCOMA GEL STENT IMPLANTATION

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Purpose: Very little long-term data on MIGS/MIGS+ has been published in the literature. The aim of the study is to investigate the effectiveness and safety of the XEN63 glaucoma gel microstent (XEN63, 63 µm inner diameter, AbbVie) over the first postoperative decade.

Methods: In this prospective monocentric study 28 eyes were included. Between 2009 and 2012, XEN63 implantations were performed as a solo procedure or in combination with cataract surgery for open-angle glaucoma without Mitomycin C. During the first 10 years, intraocular pressure (IOP), the number of IOP-lowering medications, visual acuity, visual field and secondary IOP-lowering procedures were analyzed annually. Surgical success was defined as IOP between 6 to 16 mmHg and IOP reduction of ≥20% without secondery IOP-lowering procedures.

Results: At baseline, the IOP was 23.5 ± 4.2 mmHg and the number of IOP-lowering medications was 3.1 ± 1.2. These were significantly reduced over the observation period (e.g. 10 years postoperatively: IOP 12.8 ± 2.7 mmHg, -41% and 0.9 ± 1.4 medications, -59%, n = 8). In 4 eyes, the patients could no longer be examined or had died in the meantime, 16 eyes no longer met the success criteria due to further glaucoma surgery. The surgical success rate was reduced to 50% after 8 years (12/24) and to 33% after 10 years (8/24). No significant deterioration in visual acuity or visual field was observed over a decade.

Conclusion: XEN63 implantation can reduce IOP and the number of IOP-lowering medications in the long term. The number of secondary IOP-lowering procedures is comparable with trabeculectomy data from the literature. The results show an early study population at the beginning of a learning curve without Mitomycin C.

261 - P3.007

LAMELLAR SCLEROCORNEAL TRANSPLANTATION TO CORRECT AN LATE-ONSET AGGRESSIVE BLEB LEAK

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Purpose: To report the successful clinical outcome of a lamellar sclerocorneal transplantation to correct a persistent, late-onset bleb leakage in an eye with chronic hypotony after trabeculectomy.

Methods: A 68-year-old male with primary chronic glaucoma presented to our clinic due to a fistulated conjunctival defect near the limbal edge of the bleb at 12 o'clock on his left eye, 12 years after a trabeculectomy with Mitomycin C. On examination, there was an extreme focal thinning of the sclera and conjunctiva. The bleb leak was persistent despite several external surgical revisions like excision of the Tenon cysts, bleb re-suturing and finally reconstruction with a Tutopatch- interpositioned graft. As a result, the eye was chronically hypotonic and had choroidal folds. Intraoperatively, there was a peripheral corneal und scleral melting at the bleb. The melted tissue was removed and a 6,0/6,5-mmeccentric lamellar sclerocorneal transplantation was performed.

Results: The eccentric transplant was successful in permanently sealing the bleb leakage. 6 weeks postoperatively the corrected visual acuity was 0.3 and the intraocular pressure stabilized at 16 mmHg without antiglaucomatous eyedrops. The slit lamp examination showed a Seidel-negative graft, with deep peripheral corneal neovascularization and no rejection signs (Figure 1c). The choroidal folds began to resorb. Postoperative management included topical steroids and artificial tears.

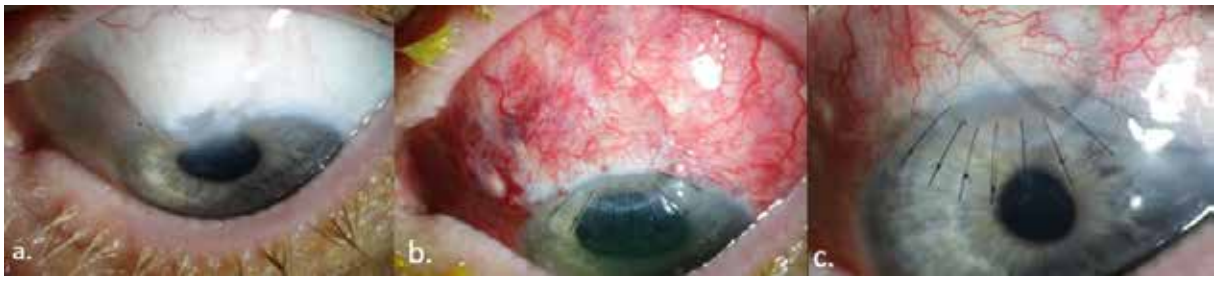

Figure 1. Slit-lamp findings of the bleb on the left eye at presentation (a), 1 day postoperatively (b) and 6 weeks postoperatively (c)

Conclusion: Eccentric corneoscleral transplantation can be a definitive solution to seal persistent, treatment-resistant bleb leaks. However, rigorous postoperative monitoring is essential to promptly detect recurrent leaks or recurrences of elevated intraocular pressure values.

263 - P3.008

THREE YEAR OUTCOMES OF PRESEFLO MICROSHUNT WITH MITOMYCIN C AT MANCHESTER ROYAL EYE HOSPITAL

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Purpose: To report baseline characteristics and surgical outcomes of PreserFlo MicroShunt in patients with glaucoma at a tertiary centre.

Methods: Retrospective case series of consecutive patients who underwent presserflo microshunt surgery at Manchester Royal Eye Hospital with a minimum 1 year follow-up. Baseline characteristics, pre-operative and post-operative IOP, number of glaucoma medications, visual acuity, and adverse events were recorded.

Results: 162 patients who underwent PreserFlo MicroShunt surgery with 0.4-0.5 mg/mlmmC were followed up at 1 year post-operation, 91 patients at 2 years and 69 patients at 3 years. The mean age was 66 ± 16 (21-91) years and 77 (47.5%) were female. 45.7% had POAG and 26% had uveitic glaucoma. The mean baseline IOP of 25.5 ± 7.6 (range 14-53) mmHg was reduced at each year post-operatively ($p < 0.0001$). The mean post-operative IOP at 1 year was 13.3 ± 5.0, at 2 years 13.3 ± 5.7 and at 3 years 12.8 ± 5.1 mmHg. The mean number of pre-operative glaucoma medications was 2.8 ± 1.1 (range 0-5) compared with 0.5 at 1 year, 0.8 at 2 years and 0.7 at 3 years ($p < 0.0001$). Adverse events included hypotony (3 patients), early hyphaema (3 patients), corneal oedema (1 patient), CMO (1 patient), required revision of PreserFlo MicroShunt (10 patients) and required secondary tube surgery (3 patients). At last follow-up visit, complete success rate (IOP ≤ 21 mmHg without medication) was 63%. Qualified success rate (IOP ≤ 21 mmHg, with medication) was 31%.

Conclusion: Our study has shown good IOP control with PreserFlo MicroShunt surgery at 3 years, which is comparable with studies in the literature. Appropriate patient selection was a key factor in success of surgery.

271 - P3.009

CLINICAL OUTCOMES OF THE PAUL GLAUCOMA IMPLANT: TWO-YEAR RESULTS

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Purpose: To report two-year outcomes from a single-center cohort undergoing PAUL® Glaucoma Implant (PGI) surgery.

Methods: Retrospective review of patients undergoing PGI surgery at the University Eye Hospital Bonn, Germany, from 04/2022 to 09/2022.

Results: 56 eyes of 53 patients were included. Complete and qualified success rates (95% CI) were 52% (37-66) and 89% (80-96) for Criterion A (IOP ≤ 21 mmHg), 48% (36-61) and 79% (67-88) for Criterion B (IOP ≤ 18 mmHg), 45% (32-57) and 64% (52-77%) for Criterion C (IOP ≤ 15 mmHg) and 27% (16-40) and 38% (25-50) for Criterion D (IOP ≤ 12 mmHg) respectively. Mean IOP decreased from 25.43 mmHg (7-48 mmHg) to 11.25 mmHg (3-24 mmHg) (50% reduction) after 24 months with a decrease in the need for IOP-lowering agents from 3.50 (1-5) to 0.46 (0-3). One eye needed an injection of viscoelastic due to significant hypotony with AC shallowing. Three eyes underwent a DMEK procedure due to persistent corneal decompensation. Nine eyes developed tube exposure which required conjunctival revision with additional pericardial patch graft, with 5 of these eyes eventually needing tube explantation. The routinely used intraluminal prolene stent was removed in 24 eyes (42.9%) after a mean time period of 5.67 months (2 – 15 m). Mean IOP before prolene removal was 21.4 mmHg (12-40 mmHg) and decreased to 11.15 mmHg (6-20 mmHg) without sequelae.

Conclusion: PGI surgery is an effective procedure for reducing IOP and pressure-lowering therapy. The use of an intraluminal prolene stent prevents hypotony in the early postoperative phase and enables further non-invasive IOP lowering during the postoperative course.

280 - P3.010

REAL-WORLD ANALYSIS OF HYPOTONY AFTER PRESERFLO MICROSHUNT IMPLANT SURGERY - PATIENT CHARACTERISTICS AND OUTCOMES

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Purpose:
1. Retrospectively study patient characteristics in eyes with and without clinically significant hypotony (CSH) to identify predictive factors for suitable follow-up planning.
2. Retrospectively analyse post operative management and recovery in eyes with clinically significant hypotony (CSH) post PreserFlo MicroShunt implant surgery and the association of hypotony with intraoperative 9-0 prolene stent

Methods: We included 47 cases of standalone PMS surgery, divided the eyes in 2 groups- group A with CSH and group B with no CSH. CSH was defined as IOP < 6 mmHg with choroidal effusion ± flat anterior chamber. Patient characteristics analysed included age, lens status, myopia, history of uveitis and use of intraoperative 9-0 prolene stent insertion. The variables studied in post operative follow ups were number of intracameral Healon injections needed, time to recovery of hypotony and visual outcomes.

Results: 16 out of 47 eyes had CSH (Group A, 34%, Caucasians). 31 eyes had no CSH (Group B, 65.9%, 1 Afro-Caribbean and 30 Caucasians. Mean age for group A was 77.5 ± 6.34 years and it was 73.48 ± 11.56 years for group B.

Age groups	50-60	61-70	71-80	81-90	> 90
Group A - N = 16	none	3 eyes, 18.7%	7 eyes, 43.7%	6 eyes, 37.5%	none
Group B - N = 31	5 eyes, 16.1%	8 eyes, 25.8%	7 eyes, 22.5%	10 eyes, 32.2%	1, 3.22%

Characteristics / risk factors	Uveites	Myopia	Stent	Phakic	Pseudophakic
Hypotony group - N = 16, Group A	1 (6.25%)	0	6 (37.5%)	8 (50%)	8 (50%)
Rest of cohort - N = 31, Group B	2 (6.45%)	4 (12.9%)	4 (9.67%)	16 (51.6%)	15 (48.3%)

Statistical analysis (Chi Square test) found no association between hypotony and age categories/lens status/ myopia/uveitis (p value > 0.05), presence/absence of prolene stent (unpaired t test, p value 0.0941). 6 of the CSH eyes (37.5% of hypotony cases) developed CSH despite intraluminal stent. Statistical analysis done using unpaired t test to compare the mean IOP on all post operative visits for stented eyes (6, 37.5%) versus non-stented eyes (10, 62.5%) was not significant (p value 0.0941).

PO visit	IOP for no stent group (mmHg) N = 10	IOP for stent group (mmHg) N = 6
Day 1	4.4	9
Week 1	5.7	11.5
Week 4	10.4	12

Stent / no stent	Needed 1 Healon injection	Needed more than 1 Healon injection (2-3)	Time period from hypotony to recovery vision to preoperative levels
With stent	4	2	16.25 days
Without stent	6	4	

Conclusion: Clinically significant hypotony is common after PreserFlo MicroShunt implant surgery (34% in our cohort). No statistical association was found between hypotony and any of the variables. Early identification of post operative hypotony and prudent intervention can help prevent vision loss and achieve excellent outcomes. Further studies are needed to understand the utility of prolene/nylon stent in Preserflo implant surgery.

281 - P3.011

SAFETY AND EFFECTIVENESS OF COMBINED PHACOEMULSIFICATION AND PRESERFLO MICROSHUNT IMPLANT (PMS) SURGERY- A REAL-WORLD DATA IN THE MEDIUM TO LONG TERM

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Purpose: To report the outcomes of combined phacoemulsification and PMS implant surgery using 0.05%mmC for 3 minutes and intracameral dexamethasone 0.3 mg/0.1 ml.

Methods: We retrospectively analysed outcomes in 7 eyes of 6 patients with open angle glaucoma who underwent combined surgery under sub tenon anaesthesia with superotemporal scleral application of 0.05%mmC. Phacoemulsification was performed through superior corneal incision followed by Preserflo implant insertion and conjunctival closure. Intracameral 0.3 mg/0.1 ml of dexamethasone was routinely used in these patients.

Results: The mean age in our cohort was 76.5 years and all were Caucasians. The diagnosis was POAG progression in 3 eyes, failed trabeculectomy with uncontrolled IOP in 1, Pseudo exfoliation glaucoma in 1 and pigmentary glaucoma in 2 eyes. The mean IOP on post op week 4 and 3 months was 10.28 mmHg (5-15 mmHg) and 11.57 mmHg (4-18 mmHg) respectively on no medications and the difference was statistically significant at these follow ups when compared to pre op values (paired t test, p value 0.0310). For the 3 eyes that completed 24 months follow up, the indication for surgery was POAG progression in 2 eyes and failed trabeculectomy (uncontrolled IOP) in the other.

Conclusion: Although our study size was small, the results of combined phacoemulsification and PMS surgery were reassuring in terms of safety and efficacy even in the long term. We recommend further studies in this area especially in more varied ethnicities.

285 - P3.012

LONG TERM RESULTS OF MINIMALLY INVASIVE MICRO SCLEROSTOMY (MIMS)

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Purpose: To provide three years follow-up data on superonasal MIMS® (minimally invasive micro sclerostomy) in open angle glaucoma Caucasian patients.

Methods: The MIMS® device (Sanoculis, Israel) automatically creates by an ab-interno approach, a circa 1mmlong drainage channel of circa 100 microns diameter at the superonasal (SN) sclera-corneal junction. It connects the anterior chamber with the subconjunctival space to perform a filtering operation. All patients who were termed successful at one year after MIMS® procedure or were termed a failure because of higher than target IOP however were not given a chance to add medication were invited to participate in a long term success evaluation study.

Results:

N	FU (months)	Duration of surgery ±STD (min:sec)	Preoperative IOP ±STD [mmHg]	Postoperative IOP ±STD [mmHg]	% reduction in IOP
37	≥ 36	2:01 ± 0:41	27.3 ± 3.7	16.9 ± 5.3	38.1%

Meds pre ±STD	Meds post ±STD	% reduction in meds	% adverse events	Success %	Success % no meds
1.84±0.8	0.5±0.95	72.8%	13	62.2%	48.6%

Success rate (FDA definition): at least 20% IOP reduction on same or less medications.

Conclusion: Minimally invasive anti-glaucoma surgical procedures done with the new MIMS® device was found satisfactory in open angle glaucoma patients after 3 years. The efficacy and safety results were found similar to other filtration procedures. However, the MIMS® procedure is simpler and faster than most other filtering procedures.

287 - P3.013

EARLY OUTCOMES AFTER THIRD-GENERATION TRABECULAR MICRO-BYPASS WITH/WITHOUT GONIOTOMY IN EYES WITH FAILED PRIOR GLAUCOMA INTERVENTION

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Purpose: The newest trabecular MIGS device, iStent infinite trabecular micro-bypass, contains three stents that can be implanted in a standalone procedure or in combination with phacoemulsification or other MIGS procedures. The current study evaluated consecutive standalone cases of a single surgeon in patients who had failed prior laser trabeculoplasty.

Methods: This retrospective, non-randomized, unmasked study included 14 eyes of 9 patients with mild to severe open-angle glaucoma who underwent iStent infinite implantation with or without iAccess Precision Blade goniotomy in one U.S. glaucoma private practice. IOP, meds, adverse events, and secondary surgeries were evaluated preoperatively and through 6 months of follow-up. Twelve-month data will be available by the time of the conference.

Results: All patients were pseudophakic and had undergone at least one prior laser trabeculoplasty. All were successfully implanted with three iStent infinite stents with no intraoperative complications. In 36% of eyes (5/14), goniotomy (iAccess Precision Blade) was also completed. Mean IOP reduced from 21.6 ± 3.0 mmHg preoperatively to 16.8 ± 2.6 mmHg at 6 months (22% reduction, p = 0.135); mean medications reduced from 1.1 ± 0.4 preoperatively to 0.2 ± 0.4 meds at 6 months (82% reduction; p = 0.013). No postoperative adverse events or
secondary surgeries occurred.

Conclusion: iStent infinite implantation with or without iAccess goniotomy yielded 6-month reductions in intraocular pressure and a significant reduction in medication burden in patients with failed prior laser trabeculoplasty, with favorable safety.

297 - P3.014

THE ISTENT INJECT IS SAFE AND EFFECTIVE FOR THE MANAGEMENT OF GLAUCOMA OF VARIOUS AETIOLOGIES: REAL-WORLD CLINICAL EFFECTIVENESS DATA FROM A LOCAL AUDIT OF 299 EYES

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Purpose: To assess the real-world efficacy of iStent inject® (Glaukos) in the management of glaucoma in comparison to the Investigational Device Exemption pivotal trial for iStent.

Methods: This retrospective case series analysed the medical records of patients with glaucoma of various aetiologies and severity who underwent iStent implantation at Epsom and St Helier Hospitals NHS Trust from January 2018 to December 2019; and at Peterborough City Hospital and North West Anglia NHS Foundation Trust from January 2021 to December 2022. The primary outcome measures were post-operative intraocular pressure and number of pressure-lowering eyedrops. This project was registered locally with the clinical governance department.

Results: A total of 299 eyes underwent iStent implantation, of which 285 underwent phacoemulsification and intraocular lens insertion simultaneously. In phase 1, mean intraocular pressure decreased from 19.32 ± 5.1 mmHg pre-operatively to 14.33 ± 2.86 mmHg (-26%) at 3 months and 14.36 ± 2.69 mmHg (-26%) at 12 months post-operatively. In phase 2, mean intraocular pressure decreased from 22.98 ± 6.8 mmHg pre-operatively, to 14.54 ± 4.77 mmHg (-33.1%) at 3 months and 14.58 ± 2.85 mmHg (-36.6%) at 12 months post-operatively. There was no statistically significant change in BCVA in either phase. Three months post-operatively, 92.5% and 77% of patients achieved a 20% or greater reduction in intraocular pressure compared to pre-operatively in phases 1 and 2 respectively. There was a 49% reduction in the mean number of topical pressure-lowering eyedrops. There were no post-operative complications.

Conclusion: iStent inject® is a safe and effective surgical treatment modality for the management of glaucoma of various aetiologies and severities. This data demonstrates its real-world efficacy in both lowering intraocular pressure and reducing polypharmacy. It is safe and effective to perform simultaneously with phacoemulsification and intraocular lens insertion.

299 - P3.015

NON-PENETRATING DEEP SCLERECTOMY SUCCES AFTER OPEN BLEB REVISION PRESERFLO MICROSHUNT FAILURE: CASE REPORT

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Purpose: To evaluate the outcome of non-penetrating deep sclerectomy as a secondary procedure following failed open bleb revision PreserFlo MicroShunt in patiens with uncontrolled pseudoexfoliative glaucoma.

Methods: Two patients with pseudoexfoliative glaucoma underwent non-penetrating deep sclerectomy (mmC 0.2 mg/mL) after two surgical attempts to resolve bleb fibrosis following PreserFlo MicroShunt implantation. In all cases, open bleb revisions were done when intraocular pressure was uncontrolled with maximum medication. All surgical procedures, including non-penetrating deep sclerectomy, were accomplished by the same glaucoma surgeon who initially performed PreserFlo MicroShunt implantation.

Results: Intraocular pressure, after two open bleb revision surgeries (mmC 0.4 mg/ml) spaced one month apart, was uncontrolled. Twelve months after non-penetrating deep sclerectomy surgery, patients are free of medications and intraocular pressure is under 18 mmHg.

Conclusion: Non-penetrating deep sclerectomy appears to be a safe and successful surgical alternative after open bleb revision PreserFlo MicroShunt failure in eyes with uncontrolled glaucoma.

305 - P3.016

POST-AHMED GLAUCOMA VALVE IMPLANTATION CHANGES IN ANTERIOR CHAMBER ANGLE ASSOCIATED WITH RAPID CORNEAL ENDOTHELIAL CELL LOSS

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Purpose: To characterize changes in anterior chamber parameters following Ahmed glaucoma valve (AGV) implantation using anterior segment optical coherence tomography (OCT), and identify post-operative changes associated with rapid endothelial cell loss.

Methods: A total 56 consecutive patients who underwent AGV implantation, preoperative and postoperative anterior segment OCT were retrospectively reviewed. A linear regression analysis was performed to calculate rate of endothelial cell density (ECD) change per year. The anterior chamber angles were measured using anterior segment OCT. Logistic regression analysis was performed.

Results: Out of 56 eyes, 24 eyes showed a rapid ECD damage rate (-34.0 ± 23.7%/year, 68.7 ± 8.7 years, 66.7% males), and 32 eyes showed a relatively slow ECD damage rate (8.2 ± 24.6%/year, 63.1 ± 13.4 years, 56.3% males; $p < 0.001$ for ECD rate). Both groups showed significant increases in angle opening distance (AOD; 0.622 ± 0.193 vs. 0.883 ± 0.274 mm, $p < 0.001$) 500 μm from scleral spur following AGV implantation. However, percent change in AOD from preoperative values was significantly bigger in slow ECD damage group (65.4 ± 64.4% vs. 28.6 ± 22.0%, $p = 0.045$). Visualization of AGV tubes by gonioscopy did not reveal discernible differences in tube insertion location between the 2 groups. Multivariate logistic regression analysis showed that large percent change in AOD was associated with slower ECD damage rates (OR 1.033, 95% CI 1.001-1.064, $p = 0.042$).

Conclusion: Post-operative increases in AOD were associated with slower rates of ECD damage following AGV implantation. Patients who do not show significant enlargement in anterior chamber angle depth should be closely monitored for corneal endothelial decompensation.

316 - P3.017

REAL WORLD OUTCOMES OF PHACO-ELIOS – RESULTS AT 12 AND 24 MONTHS

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Purpose: To describe the change in medication use and intraocular pressure in patients with glaucoma who have undergone phacoemulsification-ELIOS procedure at 12 and 24 months.

Methods: Retrospective, single-center chart review of adult patients diagnosed with ocular hypertension or glaucoma who underwent combined phaco-ELIOS in Spain. Preoperative and postoperative clinical data was collected and analyzed up to 24 months. The main outcome measure was the mean change in medication as compared to baseline. Intraocular pressure (IOP) was analyzed as a secondary outcome. Surgical approach consisted of routine cataract surgery combined with a 308 nm excimer laser delivered through an intraocular fiberoptic probe to create 10 microchannels through the trabecular meshwork up to the inner wall of Schlemm´s canal with postoperative management and follow-up comparable to routine standalone phacoemulsification.

Results: 126 eyes of 91 patients were included. Fifty-two (57.4%) were female and 39 (42.8%) were male, with a mean age of 72.4 years. This sample included patients with OHT (10.3%), primary open angle glaucoma (63.4%), chronic angle closure glaucoma (12.6%) and other types of glaucoma (4.7%). Mean number of medications at BL was 1.63, and 0.31 and 0.45 at 12 and 24 months, respectively, representing a mean medication change from BL of -1.31 and -1.17, respectively. At 12 months, 110 eyes showed reduction in number of medications with respect to BL, 93 of them were medication-free. At 24 months, 71 eyes showed a reduction in the number of medications with respect to BL, 61 of them were medication-free. 59.5% and 48% of eyes had a combined result of being medication-free with IOP decrease with respect to BL at 12 and 24 months, respectively. Mean IOP at BL was 20.7 mmHg, and 17.2 and 17.7 mmHg at 12 and 24 months, respectively, representing a mean percentage of reduction of 15.7% and 12.8% from BL at 12 and 24 months respectively.

Conclusion: Phaco-ELIOS in adult patients with OHT or glaucoma showed a significant reduction in medication use sustained at all timepoints of the 24-month follow-up period. Above 75% of eyes at 12 months and almost 60% of eyes at 24 months were medication-free.

317 - P3.018

GREATER OUTFLOW FACILITY INCREASE AFTER TARGETED TRABECULAR BYPASS IN ANGIOGRAPHICALLY DETERMINED LOW-FLOW REGIONS COMPARED TO HIGH-FLOW REGIONS

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Purpose: To investigate the impact of trabecular bypass surgery targeted to angiographically-determined high- versus low-aqueous humor outflow areas on outflow facility ex vivo.

Methods: From porcine (n = 14) and human (n = 13) post-mortem eyes, anterior segments were dissected, mounted onto a perfusion chamber, and perfused using DPBS at a constant-flow rate to achieve a stable baseline facility (C). Fluorescein was perfused into the anterior chamber and used to identify high- and low-flow regions of the conventional outflow pathways. A 5mmneedle goniotomy was performed in either baseline high- or low-flow areas. Subsequently, C was quantitatively re-assessed and compared between "high-flow" and "low-flow" surgery eyes.

Results: In all anterior segments, high- and low-flow regions could be identified. Performing a 5mmgoniotomy increased C to a variable extent depending on their baseline. In the porcine high-flow group (n = 8), C increased from 0.31 ± 0.09 to 0.39 ± 0.09 µL/ mmHg/min (p = 0.12). In the porcine low-flow group (n = 6), C increased from 0.29 ± 0.03 to 0.56 ± 0.10 µL/ mmHg/min (p < 0.001). In the human high-flow group (n = 6), C increased from 0.38 ± 0.20 to 0.41 ± 0.20 µL/ mmHg/min (p = 0.02). In the human low-flow group (n = 7), C increased from 0.25 ± 0.11 to 0.32 ± 0.11 µL/ mmHg/min (p < 0.001). There was statistically significant greater C increase comparing low- to high-flow groups in porcine (0.07 ± 0.09 vs 0.27 ± 0.13, P = 0.007 µL/ mmHg/min, high- vs. low-flow) and human (0.03 ± 0.03 vs 0.07 ± 0.02, P = 0.03 µL/ mmHg/min, high- vs. low-flow) eyes. In porcine eyes, there was a 27.83 ± 32.78% and 95.96 ± 56.65% (p = 0.02) increase in C for goniotomies in high- and low-flow regions. In human eyes, there was a 10.01 ± 13.63 % and 36.31 ± 21.71% (p = 0.03) increase in C for goniotomies in high- and low-flow regions (p = 0.02), respectively.

Conclusion: Targeting surgery to low-flow areas of the trabecular meshwork yields greater outflow facility (C) increase compared to surgery in high-flow areas. In-vivo studies are needed to confirm this finding and translate it to improved efficacy of MIGS procedures.

318 - P3.019

THREE-YEAR EFFICACY AND SAFETY OF THE PAUL GLAUCOMA IMPLANT USING A STANDARDIZED SURGICAL PROTOCOL

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Purpose: The aim of this study was to determine the 3-year efficacy and safety of the PAUL Glaucoma Implant (PGI)

Methods: Retrospective cohort study. Consecutive patients implanted with a PGI between December 2018 and September 2020 with a minimum follow-up of 36 months were included. Primary outcome was the reduction in intraocular pressure (IOP) at 36 months, with surgical success defined as ≤ 18 mmHg and >5 mmHg plus ≥30% drop in IOP from baseline. Failure was defined as not reaching the criteria for success for two consecutive observations after 3 months post-operative, need for further glaucoma surgery, or significant vision loss (2 or more Snellen chart lines or loss of light perception). Safety outcomes were also analyzed. A standardized surgical protocol was followed in all cases, which included augmentation with mitomycin C (0,4 mg/mL) and tube ligation with a polyglactin suture.

Results: A total of 33 eyes from 29 patients were implanted with the PGI in the studied period. Of these, follow-up was lost in 6 cases, resulting in the inclusion of 27 eyes from 23 patients in the statistical analysis. Both adult and pediatric forms of glaucoma were included. Mean age at the time of surgery was 36.1 ± 27.5 (5 months - 76 years) years. Two-thirds (n = 18) had a history of previous glaucoma surgery. IOP showed a statistically significant reduction at month 36 compared to baseline IOP [Pre-op IOP: 30.4 ± 10.5 vs. Post-op M36 IOP: 13.7.0 ± 4.7 mmHg; p < 0.001]. Surgical success was achieved in 67% of cases at 36 months. There was also a statistically significant reduction in the mean number of preoperative medications from 2.8 ± 1.4 to 1.0 ± 0.9 (p < 0.001). During the follow-up period, persistent hypotony requiring surgical intervention was observed in 1 patient. Revision surgery was necessary in 5 patients (18.5%).

Conclusion: The PAUL Glaucoma Implant is a novel posterior drainage device which shows efficacy and acceptable safety in the long-term treatment of refractory glaucoma.

326 - P3.020

THE EFFICACY OF 0.18% VERSUS 0.3% SODIUM HYALURONATE IN THE TREATMENT OF OCULAR SURFACE DISEASE AFTER TRABECULECTOMY WITH MITOMYCIN-C: A RANDOMIZED CLINICAL TRIAL

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Purpose: To compare the efficacy of 0.18% vs 0.3% sodium hyaluronate (SH) in treating ocular surface diseases (OSDs) during the 60 days post-trabeculectomy.

Methods: A prospective RCT of glaucoma patients who underwent trabeculectomy with mitomycin-C between May 2022 and June 2023. Of 40 cases, 19 eyes were randomized to receive 0.18% SH and 21 eyes to receive 0.3% SH one week after surgery.

Results: Both concentrations of SH cause significantly ($p < 0.05$) improved the mean OSDI score (5.54 ± 3.58 for the 0.18SH group vs. 4.22 ± 3.18 for the 0.3SH group) compared to the baseline values (34.02 ± 3.08 for the 0.18SH group vs. 38.11 ± 2.93 for the 0.3SH group). The improvement scores between groups were statistically insignificant.mmC-augmented filtering surgery causes a worsening in the corneal and conjunctival fluoresceine (CCF) staining scores, especially during the first week of postoperative. The baseline's CCF scores were 5.05 ± 1.12 for the 0.18SH and 4.43 ± 1.12 for the 0.3SH group. One week after trabeculectomy, the scores of the 0.18SH and the 0.3SH group were 9.19 ± 1.21 and 9.19 ± 1.12, respectively, $p > 0.05$). The 0.3SH group tended to have a lower CCF score than the 0.18SH group, but it was insignificant. The 0.18SH group shows a longer fluoresceine tear break-up time (FBUT) compared to the 0.3SH group during the first 30 days of the study, which reached the statistically significant at the 2-week follow-up; 7.16 ± 0.85 vs. 4.90 ± 0.77, $p = 0.049$). At 60 days, the 0.3SH group showed a significant improvement in FBUT compared to the 0.18SH group; 8.46 ± 0.85 vs. 4.00 ± 0.77, $p = 0.002$). Schirmer's I score improved, beginning two weeks after starting SH. No statistically significant difference in the Schirmer's I score of both groups was noted during the follow-up except at the last visit, which was 13.23 ± 2.49 and 5.08 ± 2.77 for the 0.3SH and the 0.18SH group, respectively, $p = 0.029$.

Conclusion: Both 0.18% and 0.3% SH preservative-free artificial tears effectively treated OSDs postmmC-trabeculectomy. 0.3% SH might have the better Schirmer's I score and FBUT at the end of the study. 0.18% SH has better FBUT in the first two weeks after surgery. The study has no data on tear osmolarity.

329 - P3.021

PRE-CLINICAL EVALUATION OF THE HYAGUARD SUB-CONJUNCTIVAL INSERT IN MAINTAINING POST-TRABECULECTOMY INTRA-OCULAR PRESSURE VSMMC AND PREDNISOLONE DROPS

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Purpose: HyaGuard™ is a proprietary biodegradable, sub-conjunctival drug eluting platform. Consisting of a drug-loaded, tapered mesh surrounded by a soft outer hydrogel, HyaGuard is designed to replace both Mitomycin C (mmC) and post-op steroid drops in glaucoma drainage surgeries. Herein, we describe its initial pre-clinical evaluation vsmmC-drops in a post-trabeculectomy rabbit model.

Methods: Pre-clinical evaluation was undertaken using 8–12-weeks old, normotensive, 50/50 male/female New Zealand White rabbits. Animals were anaesthetised and a 4x4mmtrabeculectomy from the fornix was performed in the left eye. All animals received Ofloxacin 3mg/ml drop wise (2 drops) 4 times per day for 1 week (Day 1-7). Neither control or 1% w/w prednisolone HyaGuard groups receivedmmC or Prednisolone drops. However, positive control animals received 4 min 0.04%mmC followed by Prednisolone acetate 0.5% (2 drops) 4 times per day for2 weeks (Day 1-14) into the operated eye. Intra-Ocular Pressure (IOP) was was measured using TonoVet® in week -1, on Day 1, Day 8, Day 15 and Day 29. In addition, both eyes of each animal were examined by direct ophthalmology (Ophthalmoscope WelchAllyn PanOptic) and slit-lamp. Following humane end-points, eyes were processed for histological staining using H+E.

Results: HyaGuard inserts were found to be well tolerated in the sub-conjunctival space. All inserts were retained for the full duration of the study without the need for tissue glue or additional sutures. Furthermore, no welfare concens were raised in any test group. Histological analysis demonstrated no fibrotic encapsulation and intact conjunctivas. From an average starting IOP of 11.5 (±1.0) mmHg, Day 29 ΔIOP (% of starting) formmC-drops, blank HyaGuard and 1% drug loaded HyaGuard were -35.38 ± 19.75% ($p < 0.01$), -8.61 ± 10.56% (non-significant) and -24.54 ± 10.20% ($p < 0.05$) respectively. Furthmore, 1% w/w prednisolone HyaGuard animals were found to be significantly ($p < 0.01$) better at maintaing a negative IOP than negative control animals and were statistically equivilent to postive control animals.

Conclusion: HyaGuard demonstrated high tolerability and safety following sub-conjunctival insertion in rabbits. Most promisingly, 1% prednisolone loaded HyaGuard maintained statistically significant < 20% decreases in post-trabeculectomy IOP without the need formmC or repeat drop administration.

ANTERIOR SEGMENT OCT FOR IMAGING PGI PATCH GRAFTS - A POTENTIAL TOOL FOR IDENTIFYING TUBE EROSION RISK

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Purpose: To evaluate a new method for the follow-up of tube function in patients undergoing PAUL® Glaucoma Implant (PGI) surgery using high-resolution anterior segment optical coherence tomography (OCT).

Methods: Prospective analysis of patch grafts implanted in patients who underwent PGI surgery at the University Eye Hospital Bonn, Germany, from November 2021 to August 2022. Anterior segment OCT examinations were performed periodically to measure the quantitative and morphological aspects of the patch grafts using the Heidelberg ANTERION® Swept-Source-OCT.

Results: Twenty-six eyes of 26 patients were included. In all patients, Tutopatch® pericardium was used as patch material to cover the implant. Five eyes (19.2%) developed implant exposure. Average thickness of the patch material was 1239 µm (SD 307 µm) directly after implantation and decreased over time to 1066 µm (SD 353 µm) after 3 months and 823 µm (SD 471 µm) after 6 months. When comparing patients with and without tube exposure, no significant differences were shown in average patch thickness directly after implantation ($p = 0.384$). However, significant differences in average thickness were observed after 3 months ($p = 0.008$) and 6 months ($p = 0.04$). No significant differences between groups were shown concerning gender ($p = 0.061$), ethnicity ($p = 0.635$), age ($p = 0.631$), glaucoma type ($p = 0.229$), other concurrent diseases ($p = 0.158$), former glaucoma surgeries ($p = 0.635$) and the quadrant of implantation ($p = 0.308$).

Conclusion: Anterior segment OCT is an effective and comparable method to follow-up patients who undergo a patch graft implantation during PGI surgery. It could potentially help to identify patients at risk for implant exposure and could lead to modification of patient management. A rapid decline in patch graft thickness at 3 months could be a risk factor for later implant exposure, and these patients could be monitored more closely to avoid a potential diagnostic gap between early and late exposure, the latter having a higher risk of blebitis and consequent endophthalmitis. Moreover, future studies could utilize specific anterior segment OCT protocols to evaluate different types of patch characteristics including new patch materials.

This abstract was submitted to 2024 ARVO meeting.

346 - P3.023

ANTERIOR CHAMBER VERSUS CILIARY SULCUS AHMED GLAUCOMA VALVE TUBE PLACEMENT: 8-YEAR LONGITUDINAL EVALUATION OF CORNEAL ENDOTHELIAL CELL PROFILES

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Purpose: Damage to the corneal endothelium (CE) is a concern when it comes to long-term complications arising from glaucoma drainage devices. However, there is a shortage of research that examines the ongoing alteration in CE cells over time. This study seeks to assess and compare changes in the corneal endothelium 8 year after the implantation of Ahmed Glaucoma Valve (AGV) devices in eyes where the tubes were placed either in the anterior chamber (AC) or the ciliary sulcus (CS).

Methods: This was a retrospective, nonrandomized longitudinal study involving pseudophakic eyes with glaucoma. We excluded cases where additional intraocular surgeries/laser were performed during the follow-up period. Regarding our original cohort, 12 eyes were lost to follow up. The primary outcome measure was the corneal endothelial cell density (ECD) at two time points: 1 year ± 2 months (serving as baseline) and 8 years ± 2 months postoperatively. Additionally, the study assessed the average endothelial cell size (AS) and the distance from the tube tip to the cornea (DTC).

Results: Fourteen eyes from 14 patients were included (8 in AC and 6 in CS), with a mean age of 75.07 ± 9.52 years. There were no significant differences at baseline between the two groups regarding ECD ($p = 0.631$). After 8 years, the AC group showed a significant ECD decrease ($p = 0.026$) and AS increase ($p = 0.025$), whereas the CS group had no significant AS ($p = 0.917$) or ECD ($p = 0.889$) change. The rate of ECD decline in the AC group was 435.8 cells/mm^2/year (3.44%/year), while in the CS group was 23.1 cells/mm^2/year (0.22%/year). No significant correlation was found between DTC and ECD or AS change.

Conclusion: In AGV, tube placement in the AC leads to significantly more long-term ECD loss when compared to tube placement in the CS.

352 - P3.024

COMPARISON OF OCULAR BIOMETRIC CHANGES AFTER TRABECULECTOMY BETWEEN PRIMARY OPEN-ANGLE GLAUCOMA AND PSEUDOEXFOLIATIVE GLAUCOMA

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Purpose: The axial length (AL) becomes shorter as intraocular pressure (IOP) decreases after trabeculectomy. We hypothesized that ocular biometric changes in response to decreased IOP after trabeculectomy could be different between primary open-angle glaucoma (POAG) and pseudoexfoliative glaucoma (XFG) due to the different properties of connective tissue and ECM in the sclera. Aim of this study is to investigate whether ocular biometric changes after trabeculectomy differ depending on type of glaucoma.

Methods: This retrospective, consecutive study included 38 phakic eyes with POAG, and 21 phakic eyes with XFG. All patients underwent baseline evaluation with Goldmann applanation tonometer, automated keratometer and laser interferometer before trabeculectomy. Postoperative evaluation was performed when subsequent cataract surgery was planned. Eyes that did not achieve complete success after trabeculectomy were excluded. Changes (Δ) in IOP, keratometric value (Kv), anterior chamber depth (ACD), and AL were compared within and between the groups. We also investigated the factors associated with the amount of AL reduction using logistic regression analysis.

Results: The mean IOP and AL was reduced by 9.2 mmHg and 0.14mmin POAG, and 10.8 mmHg and 0.07mmin XFG eyes after trabeculectomy. Although amount of IOP reduction after trabeculectomy was not different ($p = 0.385$), the AL decreased significantly in eyes with POAG ($p < 0.001$), but not in XFG ($p = 0.088$). The Δ AL were different between two groups ($p = 0.008$). The Δ ACD and Δ Kv were not significantly different between two groups. The linear regression analysis showed that preoperative IOP affected on Δ AL in POAG ($R = 0.232$, $p = 0.001$), but not in XFG ($R = 0.004$, $p = 0.347$). The Δ AL were correlated with the type of glaucoma (POAG/XFG; OR = 17.473, $p = 0.008$), and Δ IOP (OR = 1.324, $p = 0.009$) by multivariate logistic regression analysis.

Conclusion: AL reduction after trabeculectomy was smaller and less predictable in XFG than in POAG.When planning the combined trabeculectomy and cataract surgery, different AL responses depending on the type of glaucoma should be considered for optimal intraocular lens power calculation.

358 - P3.025

INITIAL RESULTS OF COMBINED PHACO-EMULSIFICATION WITH EXCIMER LASER TRABECULOSTOMY IN GLAUCOMA PATIENTS IN THE NETHERLANDS

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Purpose: This study investigates the effectiveness of Excimer Laser Trabeculostomy (ELT) as a surgical intervention in glaucoma patients undergoing phaco-emulsification with lens implantation.

Methods: A combined procedure of phaco-emulsification with lens implantation and Excimer Laser Trabeculostomy (ELT, Elios Vision Inc., Los Angeles, CA, USA) was conducted on patients with coexisting cataract and glaucoma. Data analysis included a minimum follow-up of one month.

Results: Twenty-two eyes from thirteen patients underwent treatment. The average preoperative intraocular pressure (IOP) was 14.3 ± 3.0 mmHg (n = 22). Postoperatively, the mean IOP at 1 week, 1 month, and 3 months was 13.4 ± 5.2 (n = 19), 13.0 ± 4.3 (n = 22), and 11.1 ± 1.6 mmHg (n = 8), respectively. The average number of glaucoma medications decreased from 2.5 ± 1.2 (n = 22) preoperatively to 2.1 ± 1.3 (n = 19), 1.7 ± 1.4 (n = 22), and 2.6 ± 0.7 (n = 8) at 1 week, 1 month, and 3 months postoperatively. Except for reversible microhyphaema in two eyes, no complications occurred during the follow-up.

Conclusion: In this limited patient cohort, Excimer Laser Trabeculostomy was demonstrated to be a safe treatment for patients with cataract and glaucoma. Further studies and long-term follow-up are necessary to evaluate the sustained effects of this treatment

362 - P3.026

TWELVE-MONTH EFFICACY AND SAFETY OUTCOMES OF THE FIRST UK SERIES OF MINIJECT SUPRACILIARY IMPLANT

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Purpose: This study evaluates the efficacy and safety of the MINIject (iSTAR Medical, Wavre, Belgium) supraciliary, microinvasive glaucoma drainage device in patients with progressive primary open angle, primary angle closure and normal tension glaucoma.

Methods: Consecutive patients received MINIject between 03/2022 and 12/2022. Primary outcome was reduction of intraocular pressure (IOP) at 12 months. Secondary outcomes included success at 12 months, defined as IOP ≤ 18 mmHg and reduction of at least 1 glaucoma medication. Other secondary outcomes included IOP at other follow-up time points, reduction in glaucoma medications, intraoperative and postoperative complications and need for further glaucoma surgery.

Results: Forty-one (21 male and 20 female) patients were included. Standalone MINIject was implanted in 11 eyes and in 30 eyes it was combined with phacoemulsification. Preoperative IOP was 18.23 mmHg on 2.26 medications and this was reduced by 2.91 mmHg to 15.31 mmHg ($p = 0.03$) on 1.69 ($p < 0.001$) medications. At 12 months, success rate was 80%. Regarding intraoperative complications, 2 patients had haemorrhage in the anterior chamber (AC) that was managed successfully without any intervention. Only one patient had significant postoperative hyphaema that needed AC washout the first week. No patients needed subsequent glaucoma surgery.

Conclusion: This first in the UK study shows promising IOP-lowering results and medication reduction over 12 months with few adverse events.

363 - P3.027

SAFETY AND EFFICACY OF ND:YAG GONIOPUNCTURE FOLLOWING NON-PENETRATING GLAUCOMA SURGERY

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Purpose: Nd:YAG goniopuncture (YGP) is an established adjunct to non-penetrating glaucoma surgery (NPGS). We report real-world efficacy and safety outcomes of YGP after deep sclerectomy (DS) and viscocanalostomy (VC) undertaken at two glaucoma subspecialty units in Liverpool, United Kingdom.

Methods: A retrospective case review of eyes undergoing YGP after NPGS between February 2013 and December 2022. Demographic variables, surgical particulars, underlying glaucoma diagnoses, intraocular pressure (IOP), glaucoma medications, best-corrected visual acuity and post-YGP complications were analysed. Kaplan-Meier survival curves were used to analyse the time-to-failure following YGP. Univariate and multivariate analyses with hazard regression models were used to identify risk factors associated with procedural success and failure. Data was collected from an ophthalmic electronic patient record (mediSIGHT) and statistics were undertaken with IBM SPSS 26.

Results: 109 eyes of 90 patients who underwent YGP were included in this study. The mean time interval from initial NPGS to YGP was 8.6 months (SD 7.1 months). Mean IOP was 24.4 mmHg prior to YGP; 16.1 mmHg, 14.0 mmHg and 14.7 mmHg at 6 weeks, 6 months, and 12 months respectively. Multivariate analysis identified high starting IOP > 30 mmHg (OR 5.5) and time between NPGS and YGP of less than 3 months (OR 3.0) as independent risk factors for failure at 12 months. Complications were generally infrequent and the majority were transient and mild; most commonly hyphaema and post-procedural inflammation responsive to drops. A transient IOP spike was seen in 15 cases (14%), iris incarceration in 12 cases (11%) and transient hypotony in 4 cases (4%). Complications overall were more frequent in cases with higher starting IOP of > 30 mmHg ($p < 0.05$).

Conclusion: YGP is a minimally invasive and safe adjunct in NPGS to augment IOP reduction. Further research is required to establish whether routine augmentation with YGP in cases of otherwise successful NPGS could further improve long-term outcomes. Whilst YGP did show an IOP reduction in 'salvage' cases of very high IOP > 30 mmHg, a higher incidence of overall complications were seen in such cases. Late-YGP (> 3 months) may have a more favourable course than early-YGP but further research is needed in this area.

368 - P3.028

IMPACT OF THE RESTRICTIVE TECHNIQUE ON OUTCOMES IN BAERVELDT-350 IMPLANT SURGERY

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Purpose: Our objective is to evaluate the benefits of a sequenced opening (achieved using the absorbable ligature combined with the ripcord technique) that could potentially avoid transitory hypotension after suture release, due to the potential relationship between low intraocular pressures and capsule fibroproliferative imbalance. 1,2 This investigation seeks to compare aqueous restriction in Baerveldt 350 Glaucoma Implant (BGI) between Tube Ligature (TL) and Tube Ligature with Rip Cord Stent (TLS). Figure 1

Methods: We performed a retrospective case-series observational study of 79 eyes undergoing BGI surgery from 2009-2023: 48 in the TL group and 31 in the TLS group. Efficacy was assessed by final IOP, success rates (complete, partial), and anti-glaucoma medication need.

Results: After 12 months, IOP decreased by 51.5% to 13.12 mmHg (SD 3.78) in TL group and 58.2% to 11.85 mmHg (SD 2.78) in TLS group ($p < 0.01$). No significant differences in glaucoma medication were observed throughout the follow-up period. By 2 and 3 years, TLS had lower IOP, with differences of 3.95 mmHg ($p = 0.01$) and 3.33 mmHg ($p = 0.02$) respectively. Table 1 and Figure 2. TL exhibited higher failure rate compared to TLS: 26.32% vs 7.69% ($p = 0.11$) at success criteria of [6-21] mmHg, 34.21% vs 7.69% ($p = 0.02$) at [6-18] mmHg, and 44.74% vs 26.92% ($p = 0.09$) at [6-15] mmHg. The TL group was highly associated with postoperative hypotension 93.75% versus 35.48% in TLS ($p < 0.001$), and the presence of hypertensive phase (HP): 56.25% in TL group vs 30% in TLS group ($\chi^2 = 5.12$, $p = 0.02$).

Table 1: Percentage decrease in IOP and usage of glaucoma medication during the follow-up period compared to preoperative levels.

F/U	↓IOP percentage (mean SD)			↓Number of medication percentage (mean SD)		
Years	TL group	TLS group	p	TL group	TLS group	p
1	51.5% (123.12 SD = 3.78)	58.2% (11.85 SD = 2.78)	< 0.01	78.3% (0.66 SD = 0.78)	83.5% (0.52 SD = 0.77)	< 0.01
2	46.8% (14.38 SD = 4.13)	61.6% (10.93 SD = 3.50)	< 0.01	75.3% (0.75 SD = 0.95)	83.0% (0.54 SD = 0.88)	< 0.01
3	46.6% (14.43 SD = 3.71)	61.3% (11.00 SD = 3.59)	< 0.01	75.0% (0.71 SD = 0.81)	68.4% (1.00 SD = 0.89)	< 0.01

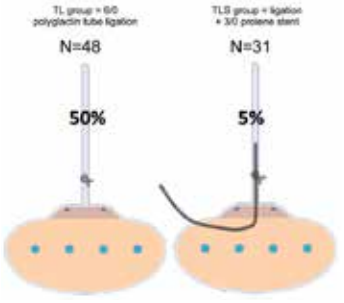

Figure 1. Scheme illustrating restrictive techniques applied on the Baerveldt-350 glaucoma drainage device.

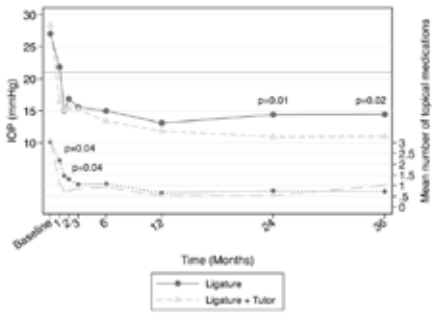

Figure 2. Mean IOP and glaucoma medication at post-surgery intervals categorized by the type of surgery: L and TLS.

Conclusion: The Baerveldt glaucoma implant proves both safe and effective at one, two and three years follow up. The rip cord stent technique with releasable ligature appears more effective in preventing early postoperative hypotony compared to the spontaneous ligature release alone. This approach also results in a decrease in HP, and lower long-term IOP.

369 - P3.029

POSITIONING OF THE PRESERFLO MICROSHUNT IN THE ANTERIOR CHAMBER AMONG DIFFERENT SURGEONS IN A GLAUCOMA SERVICE

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Purpose: To report the position of the PreserFlo MicroShunt (PMS) in the anterior chamber and the intraocular pressures (IOPs) pre- and post-implantation in a random sample of patients in a glaucoma service.

Methods: The CASIA-2 (Tomey Corporation, Nagoya, Japan) was used to acquire AC-OCT scans of 53 eyes (46 patients). The main outcome measures were the distance between the tip of the PMS and the corneal endothelium (P-CE) and the IOPs at baseline and follow-ups, among others. The time course of the IOP was analysed with linear-mixed models (Bonferroni-Holm correction for pairwise comparisons). The shunt position was compared with Ibarz-Barbera et al. (2022), who estimated no additional endothelial cell loss for P-CE ≥ 918.4 µm. A survey of 23 experienced surgeons from the same glaucoma service was taken, aiming to determine whether there is a theoretical optimal position of the PMS.

Results: The mean ± standard deviation P-CE was 1205.73 ± 570.6 µm (Figure 1). Of the implants, 13.2 % (7/53) had a P-CE < 600 µm, while 34% (18/53) of the implants had a P-CE < 918.4 µm. The survey showed that 30.4% of the surgeons would aim to put the device centered between the iris and cornea, 30.4% angled away from the cornea and 39.1% close to/touching the iris. The IOPs at 1 week, 6- and 12-months post-surgery were significantly lower than before surgery ($p < 0.001$, Figure 2). The IOP at 1 week was significantly lower than 6 and 12 months ($p < 0.001$), which were instead similar to each other ($p = 0.1266$).

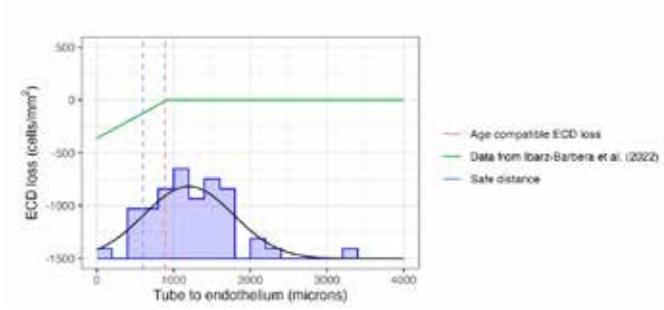

Figure 1. Distribution at PreserFlo to corneal endothelium (P-CE) distance compared to commonly assumed safe distance (600 µm) and the threshold reported by Ibarz-Barbera et al for no additional endothelial cell density (ECD) loss

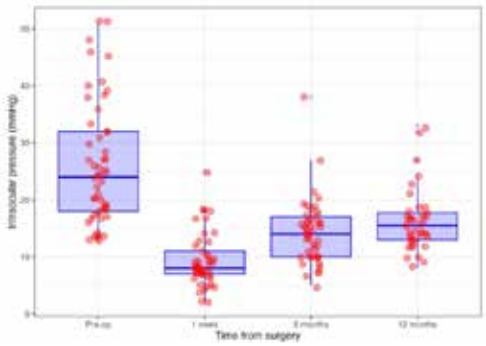

Figure 2. Boxplots of the intraocular pressure before and after surgery. The horizontal line indicates the median. The box includes the 25th and 75th percentiles. The whiskers extend from the 5th to the 95th percentile. Indivisual observations are showed as red dots.

Conclusion: Most of the shunts are placed at a safe distance from corneal endothelium. Greater consistency is required to reduce the proportion of the PMS implanted too close to endothelium. The IOP was the lowest at 1 week after surgery, stabilising to a slightly higher pressure at 6 and 12 months.

374 - P3.030

CLINICAL OUTCOMES COMPARISON OF PAUL AND BAERVELDT-350 GLAUCOMA IMPLANTS IN REFRACTORY GLAUCOMA: ONE YEAR FOLLOW-UP

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Purpose: This study aims to assess and compare the outcomes of the PAUL® (PGI) and Baerveldt-350 (BGI) glaucoma implants with a minimum six-month follow-up.

Methods: A retrospective review was conducted on 27 eyes with PGI implant and 28 in the BGI group, characterized by similar mean age and gender distribution, preoperative best corrected visual acuity (BCVA) and glaucoma medication use. Both groups were evaluated for intraocular pressure (IOP)-lowering efficacy, mean medication reduction, complete (without treatment) and parcial (with treatment) surgical success rates (defined as IOP within the range of 5-21 mmHg, at least a 20% reduction and higher than 5mmHg), failure rate and visual outcomes (logMAR) during 12 months following surgery.

Results: Eighteen eyes in the PGI group and 27 eyes in the BGI group completed a one-year follow-up. Over the 12-month period, both groups exhibited a significant reduction in IOP (Paul 23.9 (± 8) mmHg to 11 (± 3) mmHg, $p < 0.001$; Baerveldt 28.3 (±10) mmHg to 11.8 (± 3) mmHg, $p < 0.001$) and medication (Paul 3 (± 1) to 0.9 (± 1), $p = < 0.001$; Baerveldt 3.2 (±1.3) to 0.5 (±0.8), $p < 0.001$). Upon adjusting parameters and comparing PGI and BGI, no significant differences were observed for IOP control ($p = 0.68$), IOP-lowering medication ($p = 0.60$) and failure rate (Paul 17%; Baerveldt 8%, $p = 0.28$). Eighty-three percent of PGI and 92% of BGI surgeries were successful (Paul: complete 33%, partial 50%; Baerveldt: complete 58%, partial 34%), and no significant differences were found ($p = 0.28$). Between the two groups, seventy-five percent of eyes achieved an IOP of < 15 mmHg. BCVA showed improvement but was not significant in both groups (Paul 0.9 to 0.89, $p = 0.91$; Baerveldt 0.60 to 0.42, $p = 0.13$), and no statistically significant difference was observed between them ($p = 0.92$).

Conclusion: Both implants demonstrated comparable surgical success and efficacy in reducing IOP and glaucoma therapy.

377 - P3.031

COMPARISON OF CLINICAL OUTCOMES FOLLOWING AB EXTERNO XEN GEL STENT IMPLANTATION WITH(OPEN XEN) OR WITHOUT(CLOSED EXTERNO XEN) CONJUNCTIVAL INCISION IN PATIENTS WITH REFRACTORY GLAUCOMA

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Purpose: To compare clinical outcomes ab externo XEN® gel stent implantation with or without a conjunctival dissection in patients with refractory glaucoma.

Methods: Retrospective analysis on 42 eyes (39 patients) that were followed more than 6 months after undergoing XEN® gel stent implantation for refractory glaucoma. Patients were classified into Open XEN (n = 17, incision) and Closed Externo XEN (n = 25, non-incision) groups based on conjunctival incision. Clinical outcome measures including intraocular pressure (IOP) and numbers of IOP-lowering medications, postoperative procedures (5-Fluorouracial injection and bleb needling), and complications were collected.

Results: Both groups showed a significant reduction in IOP and the number of medications required after XEN® gel stent implantation at all postoperative time points. At postoperative month 6, the closed group had a significantly greater percentage of IOP reduction compared with the open group (53.8% vs 17.2%, respectively). At postoperative month 6, the open conjunctiva group was using fewer glaucoma medications than the closed group (0.33 vs. 0.77, respectively). Complete success was achieved in 40% and 36% of the open and the closed group, respectively. Qualified success was achieved in 53% and 48% of the open and the closed group, respectively. Postoperative needling rates were higher in the open group compared with the closed group (70.6% vs 38.5%, respectively). On the other hand, the closed group had a higher incidence of complications at early stage of postoperative period compared with the open group, including choroidal detachment (24.0% vs 11.8%, respectively) and macular changes (28.0% vs 11.8%, respectively).

Conclusion: Ab externo XEN® gel stent implantation, regardless of whether conjunctival incision was performed, effectively reduced IOP and dependence on topical medications in patients with refractory glaucoma. Non-incision approach (Closed Externo) demonstrated a comparative advantage in bleb manipulation, while incision approach (Open) resulted in a lower rate of complications. Further prospective evaluations are necessary to determine the best approach for XEN® gel stent implantation to achieve the desired IOP reduction while minimizing complications and postoperative procedures.

387 - P3.032

LONG-TERM SAFETY AND EFFICACY OF SUPRACHOROIDAL ESNOPER CLIP IMPLANTATION IN NON-PENETRATING DEEP SCLERECTOMY

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Purpose: To evaluate the long-term hypotensive efficacy and safety of the Esnoper clip® implant in non-penetrating deep sclerectomy (NPDS) in patients with open-angle glaucoma (OAG) or ocular hypertension (OHT).

Methods: Patients who underwent NPDS and suprachoroidal Esnoper clip® implantation (AJL, Vitoria, Spain) with follow-up ≥ 5 years were analysed in a retrospective and multicentric study. Preoperative and postoperative best corrected visual acuity (BCVA), intraocular pressure (IOP), visual field mean deviation (MD), number of topical hypotensive medications, and intra- and postoperative complications were registered. Surgical success was defined as IOP≤ 21 mmHg and a reduction of IOP≥20% compared to the preoperative value. Patients without postoperative antiglaucoma medications were classified as complete success, and those with medications were classified as qualified success.

Results: 139 eyes of 139 patients (mean age: 68.8 ± 8.9 years) were included in the study. 47.5% were diagnosed with OAG, and 52.5% with OHT. BCVA remained similar after surgery: 0.7 ± 0.3 (decimal) preoperatively and 0.7 ± 0.3 after 5 years (p = 0.94). Preoperatively, DM was -13.5 ± 8.1 dB, and at the last follow-up visit it was -12.4 ± 8.4 dB (p = 0.37). IOP experienced a significant improvement compared to the preoperative values: from 20.8 ± 7.8 mmHg to 12.9 ± 4.2 mmHg (reduction: 38%; p < 0.001), with a mean number of topical hypotensive medications of 2.7 ± 0.8 and 0.7 ± 1.0 (reduction: 74%; p < 0.001) pre- and postoperatively (5 years), respectively, and a reduction of cases with treatment of 61.2%. Four micro-perforations (2.2%) were registered as intraoperative complications. The most frequent postoperative complications were hypotony (3.6%) and the presence of early hypertensive peaks (2.9%). Throughout the follow-up, 6 patients (4.3%) required cataract surgery and 49 patients (35.3%) needed laser goniopuncture. The needling rate was 23%. The final complete success rate was 57.6%, with a qualified success rate of 84.9%.

Conclusion: The use of Esnoper clip® implant in NPDS resulted in a significant reduction of IOP and hypotensive medications in the long term, with a favourable safety profile. Therefore, this device may be considered as an alternative option to achieve high surgical success rates in this filtering procedure.

390 - P3.033

TUBE EROSIONS FOLLOWING GLAUCOMA DRAINAGE DEVICE IMPLANTATIONS

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Purpose: Glaucoma drainage devices (GDD) are an important treatment option for advanced and complex glaucoma patients with well-described outcomes. A specific complication is tube erosion with the associated risk of hypotony and endophthalmitis. To prevent that, different measures are usually taken, and different materials are used to patch the tube. To date, the durability and safety of different patch materials as well as erosion rates following different GDD are still unclear. The aim of this study was to compare tube erosion rates of allogenous fascia lata versus corneal stromal patches relating to Ahmed® glaucoma implant (AGI) and PAUL® glaucoma implant (PGI) surgeries.

Methods: In this retrospective study, 84 patients were included. The tube was covered with either allogenous fascia lata (n = 43) or a corneal stromal patch (n = 41). 32 eyes of 31 patients underwent AGI and 52 eyes of 52 patients underwent PGI surgeries. The number of tube erosions was evaluated during 18 months of follow-up. Continuous variables were compared using independent-group t-tests and categorical variables were compared using the chi-squared test.

Results: Tube erosions occurred in 4 patients with fascia lata patches (9.3%) and 1 patient (2.4%) with a corneal stromal patch (p = 0.184). In the superior quadrants, tube erosions were significantly more frequent with fascia lata (n = 4) compared to corneal (n = 0) patches (p = 0.045). There were no differences in the number of tube erosions between the AGI (n = 2, 6.3%) and PGI (n = 3, 5.8%) group (p = 0.928).

Conclusion: Tube erosions after GDD are rare. Fascia lata patches were more frequently associated with tube erosions than corneal stromal patches. There were no differences in erosion rates comparing AGI and PGI.

391 - P3.034

SEQUENTIAL GLAUCOMA DRAINAGE DEVICE RESULTS

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Purpose: To evaluate postoperative complications, intraocular pressure (IOP) control and number of glaucoma drops in patients following a second glaucoma drainage device (GDD) implant for inadequate IOP control.

Methods: Retrospective review of patients that underwent second GDD implant between 2016 and 2021. IOP and the number of glaucoma drops before the second GDD implant and at last follow up were analyzed. Major complications and additional surgeries were registered.

Results: 23 eyes of 21 patients were included. Median follow up was 36 months (12 - 90). The mean preoperative IOP was 29.5 ± 6.7 (sd) mmHg. At last follow up IOP had a 53.2% reduction to 13.8 ± 3.1 (sd) mmHg ($p < 0.001$). The average number of glaucoma drops was reduced from 3.5 ± 0.5 (sd) to 2.3 ± 1.1 (sd) ($p < 0.001$). Failure at last follow up, defined as IOP > 21 mmHg or less than 20% IOP reduction, additional glaucoma surgery, loss of light perception or removal of implant, was 26% (6), of which 5 had loss of light perception and 2 removal of implant (1 patient had both). The proportion of patients requiring additional surgeries during follow up was high 60.9% (14). The most frequent complication requiring surgery was tube exposure 43.5% (10), followed by tube reposition/trimming 34.8% (8), hypotony 8.7% (2), device unroofing 8.7% (2), cyclodestructive procedure 8.7% (2) and implant removal 8.7% (2). 17.4% (4) of patients developed corneal endothelial failure.

Conclusion: A second GDD provides significant IOP and glaucoma drops reduction in patients with previous GDD implant, but with a high rate of additional surgeries.

395 - P3.035

RISK FACTORS FOR TRANSIENT CILIOCHOROIDAL DETACHMENT AFTER GONIOTOMY WITH THE KAHOOK DUAL BLADE

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Purpose: To investigate ciliochoroidal detachment (CCD) frequency and risk factors after performing goniotomy with the Kahook Dual Blade (KDB).

Methods: The presence of CCD was examined using anterior-segment optical coherence tomography at postoperative day (POD) 1, month 1, and month 2 in 91 patients who underwent goniotomy with KDB. Intraocular pressure (IOP) was also measured at POD1, POD7, month 1 and month 2. A univariate generalized linear mixed model analysis was used to compare the age, gender, axial length, central corneal thickness, surgical procedure (combined or single), operators (K.H. or H.O.), glaucoma type and preoperative IOP between the groups. Multivariate factors were selected from the variants when there was a probability value of less than 0.05.

Results: CCD was detected in 18 patients (19.7%) at POD 1. For postoperative IOP, no significant differences were observed between the CCD and non-CCD groups. However, the IOP on POD 1 in the CCD that was associated with the anterior chamber group (7.7 ± 3.0 mmHg) was significantly lower than that in the non-CCD group (15.3 ± 0.9 mmHg) ($p = 0.02$). Multivariate mixed-effects model analysis demonstrated that the surgical procedure (combined) and operator (H.O.) were significantly associated with the higher incidence of CCD.

Conclusion: Approximately one-fifth of all patients exhibited CCD after goniotomy with KDB. Combining cataract surgery and goniotomy with KDB and the intraoperative procedure during the goniotomy with KDB were all found to be risk factors for developing CCD.

398 - P3.036

SURGICAL RESULTS AFTER PAUL GLAUCOM IMPLANT SURGERY USING TWO DIFFERENT TUBE COVER TECHNIQUES: SCLERAL FLAP VERSUS COLLAGEN MATRIX PATCH

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Purpose: The aim of this study was to compare the differences between two techniques for tube covering during implantation of the Paul Glaucoma implant (PGI): scleral flap versus collagen matrix (Tutopatch® bovine pericardium and Tutoplast® processed fascia lata), in patients with refractory glaucoma.

Methods: A retrospective, single-center and comparative study conducted on patients that underwent PGI implantation from November 2021 to August 2023. Intraocular pressure (IOP), number of antiglaucoma medications, intraoperative and postoperative complications, were evaluated.

Results: Seventy-six eyes (76 eyes; 58 PGI+Matrix and 18 PGI+Scleral flap) were included. The mean follow-up was 7.50 ± 6.3 months for the scleral flap and 4.2 ± 3.6 months for the collagen matrix group (p = 0.052). Preoperative intraocular pressure was 33.2 ± 7.9 mmHg and 31.1 ± 9.1 mmHg respectively (p = 0.347 intergroup). The average number of preoperative glaucoma medications was 4 ± 1.1 and 4 ± 1.2 respectively (p = 0.192 intergroup). The IOP was 13.3 ± 4.2 mmHg in the scleral flap group and 14.2 ± 5.2 mmHg in the collagen matrix group (p = 0.332 intergroup) at the last visit. The average number of postoperative glaucoma medications was 0.9 ± 1.1 in the flap group and 0.5 ± 1.0 in the matrix group (p = 0.133 intergroup). 16/58 patients in the matrix group and 4/18 patients in the scleral flap group required intraluminal suture extraction. There was no statistically significant difference in the postoperative complications between both groups, however, the matrix group tended to have more postoperative complications (13/58 vs 1/18). Device exposure and suspected rejection reaction only occurred in the matrix group (4/58 and 3/58). More reoperations were performed in the matrix group (7/58) than in the flap group (1/18) (p = 0.389 intergroup).

Conclusion: Both procedures achieve similar IOP and the number of antiglaucoma medications reductions. The PGI Implantation combined with scleral flap tended to present a better postoperative safety profile regarding possible exposure of the tube. Potentially, Tutoplast and Tutopatch trigger a stronger immune reaction and disintegrate faster during the postoperative period.

417 - P3.037

DOES CATARACT EXTRACTION SIGNIFICANTLY AFFECT INTRAOCULAR PRESSURE OF GLAUCOMATOUS/HYPERTENSIVE EYES?

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Purpose: This study aimed to evaluate the effect of cataract extraction on intraocular pressure at 6, 12, and 24 months and their difference compared to the baseline in diverse glaucoma subtypes.

Methods: We carried out research in the MEDLINE, Cochrane Library and EMBASE databases, as of April 2022 for relevant papers, filtered according to established inclusion and exclusion criteria. The meta-analysis evaluated the Mean Reduction and relative Standard Error in these subpopulations at predetermined times. A total of 41 groups (2302 eyes) were included in the systematic review. Due to the significant heterogeneity, they were analysed through a Random Effects Model.

Results: We obtained these differences from baseline:
1) Open Angle Glaucoma at 6, 12 and 24 months, respectively: -2. 44 mmHg, -2.71 mmHg and -3.13 mmHg;
2) Angle Closure Glaucoma at 6, 12 and 24 months, respectively: -6.81 mmHg, -7.03 mmHg and -6.52 mmHg;
3) Pseudoexfoliation Glaucoma at 12 months: -5.30 mmHg;
4) Ocular Hypertension at 24 months: -2.27 mmHg.

Conclusion: Despite a certain variability, the reduction in ocular pressure was statistically significant at 6, 12 and 24 months in both Open Angle Glaucoma and Angle Closure Glaucoma, the latter being superior. Data for Pseudoexfoliation Glaucoma and for Ocular Hypertension are available, respectively, only at 12 months and at 24 months, both being significant.

420 - P3.038

BLEB VESSEL DENSITY AS A PREDICTIVE FACTOR FOR SURGICAL REVISIONS AFTER PRESERFLO MICROSHUNT IMPLANTATION

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Purpose: The filtration bleb configuration plays a central role in sustained reduction of intraocular pressure (IOP) after glaucoma filtration surgery. While the pathophysiological basis for bleb failure is only partly understood, increased vascularity is an established clinical sign of fibrosis and wound remodelling, which both occur during bleb failure. Various bleb classification schemes (e.g. Moorfiels Bleb Grading System, Indiana Bleb Appearance Grading Scale) incorporating bleb vascularisation have been proposed, but correlation with IOP has been variable, possibly because of subjective vascularisation grading. Anterior segment optical coherence tomography angiography (AS-OCTA) allows for objective imaging and quantification of bleb vascularisation. Therefore, the aim of the study was to evaluate AS-OCTA measured bleb vascularisation after PreserFlo MicroShunt (PM) implantation as a biomarker for bleb failure.

Methods: Twenty-three eyes of twenty-three patients with progressive open angle glaucoma under maximal tolerated medical therapy underwent PM implantation. PM scleral passage-centred AS-OCTA measurements (PLEX Elite 9000) were performed up to 12 months after surgery and IOP as well as necessity for surgical revisions (needling and open revision) were documented. After multi-step image analysis including region of interest definition (400px diameter around PM scleral passage), artifact removal, binarization and bleb vessel density (BVD) calculation the predictive value of early postoperative BVD for surgical revisions was assessed using logistic regression modelling.

Results: Baseline IOP (23.57 ± 7.75 mmHg) decreased significantly to 8.30 ± 2.12, 9.17 ± 2.33 and 11.70 ± 4.40 mmHg after 1, 2 and 4 week(s), and 13.48 ± 5.83, 11.87 ± 4.49, 12.30 ± 6.65, 11.87 ± 3.11 and 13.05 ± 4.12 mmHg after 2, 3, 6, 9 and 12 month(s), respectively ($p < 0.001$). Nine patients (39%) needed surgical revisions after a median time of 2 months with earliest interventions after 4 weeks. Bleb vessel densities at 2 and 4 weeks were significantly associated with future surgical revisions upon logistic regression analysis (2W/4W likelihood-ratio test p-value: 0.0244/0.0098; 2W/4W area under the receiver operating characteristics curve: 0.796/0.909).

Conclusion: To the best of our knowledge, this study is the first report of bleb evaluation using AS-OCTA after PM implantation and bleb vessel density in the early postoperative period was found to be predictive for future bleb failure.

438 - P3-039

THE FREQUENCY OF EARLY COMPLICATIONS AFTER AB EXTERNO SIBS MICROSHUNT WITH MITOMYCIN C

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Purpose: To investigate the frequency of early complications ab externo poly(styrene-block-isobutylene-block-styrene) (SIBS) microshunt implantation with Mitomycin C.

Methods: We retrospectively reviewed 41 consecutive eyes of 39 patients who had undergone ab externo SIBS Microshunt and were followed up for at least 1 month. Mean age (SD) was 68.0 (12.5) and there were 29 eyes of primary open-angle glaucoma (including normal tension glaucoma), 6 eyes of exfoliation glaucoma, 4 eyes of other types of secondary open-angle glaucoma, and 2 eyes of primary angle closure glaucoma.

Results: Mean operation time (SD) was 22.8 (5.2) minutes and there were 2 cases with intraoperative bleeding during insertion of the device. Mean preoperative intraocular pressure (SD) and medication score (SD) were 21.1 (8.1) mmHg and 3.9 (0.9), respectively, and they significantly decreased, respectively, to 9.3 (2.6) mmHg ($p < 0.01$) and 0.0 (0.2) ($p < 0.01$) at 2 weeks after surgery, to 10.8 (3.2) mmHg ($p < 0.01$) and 0.0 (0.2) ($p < 0.01$) at 1 month after surgery, and to 11.1 (2.4) mmHg ($p < 0.01$) and 0.1 (0.7) ($p < 0.01$) at 3 months after surgery. Postoperative complications included 10 eyes (24.4%) with hypotony (< 6 mmHg), 8 eyes (19.5%) with choroidal detachment, 7 eyes (17.1%) with a shallow anterior chamber, 6 eyes (14.6%) with hyphema, 3 eyes (7.3%) with bleb leaks, 1 eye (2.4%) with vitreous hemorrhage, and 1 eye (2.4%) with malignant glaucoma.

Conclusion: Although ab externo SIBS microshunt is considered to be a “minimally invasive glaucoma surgery”, postoperative complications associated with hypotony seem to occur in about 20% of cases, and severe complications specific to filtration surgeries can occur in rare cases.

440 - P3.040

REAL-WORLD SURGICAL OUTCOMES OF AHMED GLAUCOMA VALVE IMPLANTATION IN ASIAN EYES

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Purpose: Glaucoma is the leading cause of irreversible blindness worldwide. Intraocular pressure (IOP)-lowering is effective in reducing glaucoma progression and remains the main therapeutic target in treatment. Surgical filtering procedures such as trabeculectomy surgery and glaucoma drainage device (GDD) implantation are required in more advanced or refractory cases of glaucoma. The Ahmed Glaucoma Valve (AGV) is one such GDD that has demonstrated good overall safety and IOP-lowering efficacy. This study aims to evaluate long-term outcomes after Ahmed Glaucoma Valve (AGV) implantation in refractory glaucoma in Asian eyes.

Methods: Retrospective review of 150 eyes which underwent AGV implantation from 2001-2017. Multivariate regression analyses were performed adjusting for age, gender, ethnicity, glaucoma type, history of trabeculectomy surgery, intraoperative mitomycin-C use, pre-operative IOP and number of pre- operative glaucoma medications.

Results: 150 AGV implantations were included. Mean follow-up period was 67.5 ± 47.6 months. At 10 years post-operatively, median IOP reduced from 25.0 mmHg to 15.0 mmHg ($p < 0.001$) and number of medications decreased from 4.0 to 1.0 ($p < 0.001$). The cumulative probability of success was 46.5% at Year 5 and 38.1% at Year 10. Increased age was associated with less failure at Year 2 (HR 0.98, $p = 0.046$) and Year 5 (HR 0.98, $p = 0.032$) and higher pre-operative medicated IOP was associated with less failure at Year 5 (HR 0.97, $p = 0.022$) and Year 10 (HR 0.97, $p = 0.023$). Intra-operativemmc was associated with a higher qualified success at Year 5 (HR 2.73, $p = 0.041$) and Year 10 (HR 2.75, $p = 0.012$). Upon removing percentage IOP reduction from success criteria, previous trabeculectomy was associated with less failure at Year 5 (HR 0.39, $p = 0.023$) and Year 10 (HR 0.35, $p = 0.009$).

Conclusion: AGV implantation is effective in achieving long-term, sustained IOP-lowering in Asian eyes. Previous trabeculectomy surgery, older age,mmC-use and higher pre-operative medicated IOP may be associated with a lower risk of surgical failure.

443 - P3.041

EFFICACY AND SAFETY OF ISTENT INJECT W IMPLANT COMBINED WITH FEMTOSECOND LASER ASSISTED CATARACT SURGERY

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Purpose: To evaluate the efficacy and safety of the insertion of iStent inject® W implants combined with femtosecond laser assisted cataract surgery (FLACS), in patients with glaucoma previously treated pharmacologically.

Methods: In this prospective study, 85 eyes of patients with primary open-angle glaucoma (64%), pseudoexfoliation glaucoma (21%), pigmentary glaucoma (5%), ocular hypertension (5%) and others (5%) were included, in whom iStent inject® W (Glaukos Corporation, Aliso Viejo, CA, USA) was implanted in combination with FLACS. The effectiveness of the treatment was assessed by analyzing the differences in the average values of the intraocular pressure (IOP) and the number of ocular medications used, before and at follow-up visits up to one year after surgery. Functional tests were compared before and one year after the intervention, and included best-corrected visual acuity (BCVA) and mean deviation (MD) of the visual field test.

Results: There was a statistically significant reduction in IOP between the mean pre-surgical values (17.62 ± 4.43 mmHg) and the mean values at 1 day (13.94 ± 5.80 mmHg), 1 month (16.03 ± 5.02 mmHg), 3 months (13.55 ± 2.52 mmHg), 6 months (14.39 ± 2.89 mmHg) and 12 months (15.10 ± 3.75 mmHg) after surgery ($p < 0.05$). The number of hypotensive medications used was significantly reduced from 2.19 ± 0.81 before surgery to 0.38 ± 0.62 after one year ($p < 0.01$). BCVA improved from mean values of 0.13 ± 0.11 LogMAR before surgery to 0.07 ± 0.11 LogMAR and 0.05 ± 0.08 LogMAR after 1 month and 12 months since surgery, respectively ($p < 0.01$). In relation to visual field outcomes, MD values ($p = 0.10$) did not undergo significant changes. No complications were found intraoperatively or during follow-up after 1 year.

Conclusion: The results of this study suggest that iStent inject® W implantation can be combined with FLACS, constituting an effective and safe option to reduce both, IOP and the number of hypotensive medications requiered. The use of femtosecond laser did not interfere with this device, and offers an alternative and safe management option for cataract surgery in glaucoma patients, even in cases with pseudoexfoliation.

TISSUE REACTION AFTER MINIJECT IMPLANTATION IN HUMAN EYES

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Purpose: Novel approaches such as minimally invasive glaucoma surgery (MIGS) provide safer and less invasive options to lower the intraocular pressure (IOP). Trabecular MIGS devices are designed to increase trabecular outflow. The suprachoroidal space offers another compelling approach for outflow enhancement via uveoscleral outflow. The MINIject® stent (iStar Medical, Wavre, Belgium) is such a device with an ab interno supraciliary approach. In November 2021 medical approval for patients with open-angle glaucoma within the EU followed prospective multicenter STAR-I and Star-II trials. This is to best of our knowledge the first report and case series of foreign body reactions towards MINIject® only one to three months after implantation. Data in humans were up until now unavailable.

Methods: Case series. Following our explantation technique three stents were processed for further histopathological examination (hematoxylin and eosin (HE) and immunofluorescence (IF) staining).

Results: With hematoxylin and eosin staining, infiltration within the MINIject ® was most prominent at the margin of the MINIject ® creating a sheath around the stent and disappeared towards the center. Further IF staining showed increased CD68 marking macrophages, increased vimentin marking the cytoskeleton and increased CD34 marking the T- lymphocytes within the stent tissue. Immunoreaction of MINIject® one to three months after implantation has been observed. However there was no obvious difference after 1, 2 or 3 months.

Conclusion: Foreign body reaction takes place after MINIinject® implantation within the first weeks after implantation. Future histopathological evaluation of further explanted stents could provide better insight into possible therapeutic failure.

462 - P3.043

EVALUATION OF DIRECT SELECTIVE LASER TRABECULOPLASTY TO TREAT EYES WITH OPEN ANGLE AND NARROW ANGLE GLAUCOMA

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Purpose: Purpose of this study is to assess safety and efficacy of no-contact direct selective laser trabeculoplasty (DSLT) in patients affected by open angle (OAG) and narrow angle (NAG) glaucoma.

Methods: Retrospective chart review of 77 eyes of 41 patients, undergoing DSLT were performed, 56 of them were affected by OAG whereas 21 had NAG diagnosis. Patients underwent a complete eye visit before treatments and after 1 week, 1, 3 and 6 months. Treatment success was considered as IOP of 10-20 mmHg or 20% reduction from baseline or a reduction of the number of glaucoma medications assumed.

Results: At 3 months follow up, OAG eyes showed a significant ($p < .001$) reduction of both IOP (-4.02 ± 1.02 mmHg) and medications (-0.26 ± 0.17) with a success rate of 94.64%. These values were stable at 6 months follow up with a reduction of both IOP (-3.89 ± 0.78 mmHg) and medications (-0.21 ± 0.15) with a success rate of 94.64%. At 3 months follow up, NAG showed a significant ($p < .001$) reduction of both IOP (-3.19 ± 0.7 mmHg) and medications (-0.44 ± 0.02) with a success rate of 90.47%. These values were stable at 6 months follow up with a reduction of both IOP (-3.03 ± 0.18 mmHg) and medications (-0.36 ± 0.06) with a success rate of 90.47%. No serious complications have been observed in both groups.

Conclusion: According to observed data, DSLT could be a safe and effective treatment option for either OAG or NAG showing very promising, early, results in treatment of these glaucoma eyes at 6 months follow up. In particular, it could be an interesting and promising tool to manage NAG eyes in which it is always more difficult to avoid the disease progression.

468 - P3.044

PRESERFLO MICROSHUNT IN SECONDARY OPEN ANGLE AND ANGLE CLOSURE GLAUCOMA

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Purpose: PreserFlo MicroShunt is an alternative to trabeculectomy and its use is currently licensed for Primary Open angle Glaucoma. However, in our institution, we use high dosemmC for 5 minutes in all our Preserflo surgery and we therefore speculate that this technique may make Preserflo successful in 'refractory' glaucoma, where traditionally a glaucoma drainage implant may have been indicated. This study aims to investigate the efficacy and safety of PreserFlo MicroShunt surgery in the management of patients with uncontrolled secondary open angle glaucoma (SOAG) and angle closure glaucoma (ACG) (primary and secondary).

Methods: This is a retrospective case series of consecutive patients with SOAG and ACG who underwent MicroShunt surgery.mmC dose was 0.4 mg/mL for 5 minutes. The primary outcome measure was the proportion of eyes achieving complete success at 12 months, defined as intraocular pressure (IOP) < 18 mmHg and ≥ 20% reduction of preoperative IOP without medications. Secondary outcomes were qualified success (with medications), mean IOP, number of medications, complications, and re-operations.

Results: 19 eyes of 18 patients were included. Mean age was 65 years with 72.7% males. Diagnoses varied and included primary angle closure (8), neovascular glaucoma (2) and open angle glaucoma secondary to: uveitis (4), silicone oil (2), angle recession (1), steroid use (2). Mean preoperative IOP was 27.2 mmHg and mean number of glaucoma drops was 3. At 12 months, 67% achieved complete success and 89% achieved qualified success. Mean IOP at 1 year postoperatively was 13.21 mmHg ($p < 0.0001$) and the mean number of drops decreased to 0.95 ($p < 0.0001$). Preserflo failure requiring subsequent tube surgery was observed in 2 patients. One patient needed revision for hypotony (with insertion of intraluminal stent).

Conclusion: PreserFlo MicroShunt is promising and effective for the management of patients with SOAG and ACG, offering substantial reductions in IOP and number of glaucoma medications, with a good safety profile. To our knowledge, this is the first study of PreserFlo MicroShunt in this patient population.

476 - P3.045

TWO-YEAR OUTCOMES OF XEN 45 GEL STENT IMPLANTATION IN PATIENTS WITH OPEN-ANGLE GLAUCOMA: REAL-WORLD DATA FROM THE FIGHT GLAUCOMA BLINDNESS REGISTRY

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Purpose: To evaluate efficacy and safety outcomes of the Xen 45 gel stent implant over 24 months of follow-up.

Methods: A retrospective analysis of prospectively collected data from the Fight Glaucoma Blindness (FGB) observational registry. Complete success (CS) was defined as intraocular pressure (IOP) reduction ≥ 20% from baseline and an IOP ≤ 18 mmHg and ≥ 6 mmHg with no secondary procedure at 2 years and without IOP-lowering medications. Qualified success (QS) was defined similarly, allowing the use of IOP-lowering medications.

Results: The Xen 45 gel stent implant was implanted in 646 eyes of 515 patients. Baseline IOP was 21.4 ± 7.6 (mean ± standard deviation) mmHg on 2.7 ± 1.3 IOP-lowering medication and mean deviation (MD) was -10.2 ± 8.4 dB. After 24 months follow-up, IOP was 16.8 ± 7.3 mmHg (mean reduction of 21.7%) on 1.2 ± 1.4 IOP-lowering medications. CS and QS rates at 24 months were 26% and 48%, respectively. CS and QS were higher in the Xen stand-alone group (33% and 52%, respectively) than in the Xen+Cataract group (16% and 42%, respectively). Bleb needling was performed in 28.4% of cases, and 18% underwent a secondary procedure.

Conclusion: The Xen 45 gel stent implant offers acceptable long-term efficacy for the treatment of open-angle glaucoma. However, there is a significant rate of reoperation and needling, and outcomes are less effective if combined with cataract surgery.

478 - P3.046

INTRAOCULAR PRESSURE CHANGES DURING THE FIRST 24 HOURS AFTER TRANSSCLERAL CYCLOPHOTOCOAGULATION

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Purpose: To investigate the changes in intraocular pressure (IOP) during the first 24 hours after transscleral cyclophotocoagulation (TCP).

Methods: A prospective single-center study, where glaucoma patients destined for treatment with TCP were asked for participation. The IOP was measured prior to TCP and at 1, 2, 4, 6 and 24 hours after TCP. An IOP spike was defined as an IOP elevation of ≥ 5 mmHg compared with baseline. The visual acuity (VA) was assessed at baseline and at the 24-hour examination.

Results: The mean IOP prior to TCP in 58 eyes of 58 patients was 26.2 (± 8.9 SD) mmHg. Twenty-three eyes (40%) experienced an IOP spike at some examination time point during the first 24 hours, with a mean value of the IOP spike of 12.1 (± 6.9) mmHg. Fifty-six percent of the eyes with pseudoexfoliation glaucoma (PEXG) displayed an IOP spike, and 16% had an IOP spike of ≥ 20 mmHg. The IOP was significantly reduced at the 24-hour examination by 8.1 (± 7.8) mmHg (n = 58). The VA was unchanged during the 24-hour period.

Conclusion: Clinically significant IOP spikes were common in the first 24 hours post-TCP. Almost one in five eyes displayed an increase of 10 mmHg and in almost one in ten eyes the IOP increase was 20 mmHg or higher. Eyes with PEXG had a higher occurrence of IOP spikes and experienced greater magnitude of IOP elevation. Prophylactic postoperative IOP-reducing medication should be considered to prevent further glaucoma progression.

481 - P3.047

OUTCOMES OF MICRO-BYPASS STENT IMPLANTATION (ISTENT INJECT) COMBINED WITH PHACOEMULSIFICATION SURGERY IN VARIOUS GLAUCOMA SUBTYPES

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Purpose: Istent inject® is used to control intraocular pressure (IOP) in glaucoma patients as a minimally invasive glaucoma surgery (MIGS) device. The use of istent inject® combined with phacoemulsification was analysed in patients over a 6-year period across an NHS Hospital Foundaition Trust Ophthalmology department (01/09/2017 to 01/07/2023). This study was carried out to assess the efficacy and safety of istent inject® combined with phacoemulsification in our patient cohort.

Methods: This retrospective single arm study included 464 patients undergoing istent inject® combined with phacoemulsification, each with a minimum of 12-month post-operative follow-up data. Inclusion criteria was symptomatic cataract in addition to uncontrolled IOP on ≥ 2 IOP lowering agents or contraindication and/or intolerance to IOP lowering medication. Patients all had a diagnosis of ocular hypertension, primary angle closure or a subtype of glaucoma. Patients with a history of previous invasive glaucoma surgery were excluded.

Results: Mean age was 78 years (45-97), baseline IOP was 18 mmHg (8-50), baseline best corrected visual acuity (BCVA) was 0.38 (-0.20 – 2.00), baseline number of IOP lowering agents were 2.5 (0-4). There was a 19.1% mean IOP reduction at 12 months post-surgery, which was maintained at 24 and 36 months ($p < 0.001$). The mean number of medications was 1.8 post-operatively (at 12, 24 and 36 months) vs 2.5 medications pre-operatively ($p < 0.001$). 22% of eyes were medication free post-operatively (at 12 months), 25% (at 24 months), 24% (at 36 months) vs 3% of eyes medication free pre-operatively ($p < 0.001$). There was a sustained post-operative improvement in BCVA (0.38 pre-op vs 0.19 post-op at 12 months) ($p < 0.001$). There were no cases of endophthalmitis or hypotony. 6% of patients required further glaucoma procedures in the form of selective laser trabeculoplasty, trabeculectomy, presserflo or cyclodiode.

Conclusion: This large, real-world cohort demonstrates a significant and sustained IOP reduction with a marked improvement in medication burden 3 years after iStent inject® and phacoemulsification. An excellent safety profile was displayed.

489 - P3.048

COMPARATIVE STUDY IN PHACOEMULSIFICATION COMBINED WITH ISTENT INJECT W IMPLANTATION FOR GLAUCOMA PATIENTS

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Purpose: To compare the intraocular pressure (IOP) and the efficacy of medication reduction between phacoemulsification combined with either the first-generation drainage device (iStent™) or the third-generation drainage device (iStent™ inject W) in patients with glaucoma.

Methods: The first-generation drainage device (iStent™) is a single device with a long blade-shaped structure measuring 1000 µm in length and 300 µm in height. In contrast, the third-generation drainage device (iStent™ inject W) is smaller compared to the first-generation drainage device, measuring 360 µm in length and 360 µm in width. It is designed for simultaneous insertion in pairs. We compared the IOP and the number of glaucoma eye drops (preoperatively and at 1, 3, and 6 months postoperatively) in 15 cases with iStent™ and 15 cases with iStent™ inject W. These surgeries are performed by the same surgeon who conducfted cataract surgeries combined with intraocular drainage procedures over one year in glaucomatous eyes.

Results: In the iStent™ group, a significant difference was observed at 3 months postoperatively (14.58 ± 1.98 mmHg) compared to the preoperative IOP (16.33 ± 3.33 mmHg) (p = 0.003), but no significant difference was found at 6 months postoperatively or in the preoperative IOP (15.50 ± 1.23 mmHg, p = 0.257). In the iStent™ inject W group, significant differences were observed at 3 months postoperatively (13.47 ± 2.39 mmHg, p = 0.0003) and at 6 months postoperatively (15.35 ± 2.23 mmHg, p = 0.047) when compared to the preoperative IOP (16.71 ± 3.098 mmHg). The number of glaucoma eye drops decreased significantly in both groups postoperatively (iStent™: 0.29 ± 0.73 drops p = 0.004/ iStent™ inject W:0.69 ± 1.55 drops p = 0.002) compared to preoperatively (3.20 ± 1.42 drops). However, there were no significant differences between the two groups in terms of the IOP (p = 0.713) or the number of glaucoma eye drops (p = 0.969) postoperatively compared to preoperatively.

Conclusion: A significant reduction was obtained in both groups concerning the number of glaucoma eye drops.

492 - P3.049

PRESERFLO MICROSHUNT IMPLANTATION IN ATYPICAL SITUATIONS

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Purpose: To present six cases of preserflo® microshunt (PM) implantation in atypical situations.

Methods: We reviewed six cases conducted at our hospital from December 2021 to November 2023.

Results: Case 1: Patient with a history of blebitis in a cadaveric bleb with leakage after xen 45® surgery. Once the infection was resolved, reconstruction of the bleb and PM implantation adjacent to the preexisting xen, which was damaged during surgery, were performed. Case 2: Inferotemporal MP implantation in a patient with multiple previous surgeries in upper quadrants. Case 3: Bilateral PM implantation in a patient with a history of chronic granulomatous uveitis and patchy peripheral anterior synechiae (PAS). Case 4: PM implantation after intraoperative rupture of the superficial flap of a non-penetrating deep sclerectomy. Case 5: PM implantation in a patient with neovascular glaucoma and open angle after regression of neovessels following complete panphotocoagulation and intravitreal anti-VEGF injection. Case 6: PM implantation in a patient with a history of high myopia, radial keratotomy, and previous retinal detachment surgery with silicone in the vitreous chamber. All cases were performed under subtenon anesthesia, following the standard technique recommended by the commercial company, with prior application of Mitomycin C for 3 minutes. All showed good postoperative intraocular pressure control without serious complications.

Conclusion: The PM is a minimally invasive implant originally designed for the treatment of primary open-angle glaucoma (POAG) ideally located at 11 and 1 o'clock positions. It has proven to be a simple, effective technique with a rapid recovery time in patients with POAG. Consequently, its interest has increased as a potential surgical option for other types of glaucoma beyond the original indication. As observed in the presented case series, the PM implant could be a suitable option for these cases, although more evidence demonstrating its efficacy and safety will be necessary.

493 - P3.050

CYCLO MIX - A COMBINED APPROACH FOR TRANSCLERAL CYCLOPHOTOCOAGULATION IN ADVANCED GLAUCOMA

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Purpose: To present the short-term outcomes of the Cyclo Mix technique in uncontrolled advanced glaucoma.

Methods: A combined technique for the application of transscleral cyclophotocoagulation (TS-CPC) was performed using the micropulse mode (subthreshold) in one hemifield, and the continuous-wave mode (thermal) in the other hemifield. Patients were followed for up to 12 months. The primary outcome was the probability of failure; secondary outcomes were the mean change in intraocular pressure (IOP), change and number of glaucoma medications, and complications.

Results: Eleven eyes of 8 patients with uncontrolled advanced glaucoma treated with Cyclo Mix between 3/2021-12/2021 were included. Mean age was 62.4 (range: 24-86), with a baseline IOP of 34.516.2 (range: 21-65 mmHg) and a mean of 3.9 glaucoma medications. The cumulative probability of failure was 27%. Mean IOP reduction was - 25.6%. No statistically significant changes in the number of glaucoma medications and in the mean BCVA were found.

Conclusion: Cyclo Mix appears to be effective in reducing IOP in patients with uncontrolled advanced glaucoma. However, most of our patients still needed to continue taking most of their glaucoma medications. Further studies with a larger population and a longer follow-up are needed to evaluate this combined technique.

502 - P3.051

RETROSPECTIVE REVIEW TO ASSESS THE CHANGE IN INTRAOCULAR PRESSURE FOLLOWING CATARACT SURGERY IN EYES WHICH HAVE PREVIOUSLY UNDERGONE GLAUCOMA SURGERY

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Purpose: Cataract surgery puts previous trabeculectomy surgery at risk of failure and increasing the intraocular pressure (IOP). It is assumed that this risk is lower in eyes with glaucoma drainage devices (GDD) however there is little evidence for this. This retrospective review is to assess the change in IOP following cataract surgery in eyes with previous glaucoma surgery at Manchester Royal Eye Hospital (MREH).

Methods: Data was retrospectively reviewed and collated on all patients who had cataract surgery done at MREH under the glaucoma team from January 2021 to December 2022, who had undergone previous glaucoma surgery. IOP and number of glaucoma agents was collated prior to cataract surgery, 1 month post, 3 months post, 6 months post and 12 months post cataract surgery. 80 eyes were completed during this time frame, with 71 eyes having 12 month follow up data.

Results: Previous glaucoma surgery included 44 trabeculectomies, 17 GDD (14 PAUL and 3 Baervedlt), 13 preserflo and 6 xen. 12 months post cataract surgery the mean change in IOP compared with mean pre-cataract surgery was +0.9 in trabeculectomy group (N38), -2.3 in GDD group (N16), +3.0 in preserflo group (N11) and -3.0 in xen group (N6). Mean change in glaucoma agents 12 months post cataract surgery was +0.3 in trabeculectomy group, -0.2 in GDD group, +0.5 in preserflo group and -0.2 xen group. 8 (21%) eyes with previous trabeculectomy and 1 eye with previous preserflo required needling within this period and 3 eyes with previous PAUL had the prolene stent removed. 2 (5.3%) eyes with previous trabeculectomy, 2 (13%) previous GDD, 1 (9%) previous preserflo and 1 (16%) previous xen were listed for further glaucoma surgery within this period.

Conclusion: The GDD had a mean reduction of IOP of -2.3 at 12 months following cataract surgery and a mean reduction in glaucoma agents, whereas the trabeculectomy group had a slight increase in mean IOP and glaucoma agents. The GDD group had a higher percentage requiring further surgery compared to previous trabeculectomy, however this group contained eyes more likely to fail, such as a previous failed trabeculectomy and secondary glaucoma.

503 - P3.052

MEDIUM AND LONG-TERM SURGICAL OUTCOMES OF THE PRESERFLO MICROSHUNT

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Purpose: To evaluate the clinical profile and the mid and long term surgical outcomes of the PreserFlo MicroShunt.

Methods: Retrospective review of Preserflo implant surgeries performed between december 2019 and september 2021 in a Barcelone public hospital (Spain). 95 eyes of 87 patients were included with a minimum follow-up of 6 months. Data collected from the patient history included clinical profile, surgical technique characteristics, intraocular pressure (IOP) measurement, and postoperative complications.

Results: Thirty-eight of 87 patients were men and 49 women, with a mean age of 74 years. Primary open-angle glaucoma was the most common glaucoma diagnosis (78%), followed by pseudoexfoliation glaucoma (10%). The 90.5% of eyes (n = 86) had no previous glaucoma surgeries. Mean baseline IOP was 21 mmHg with a mean 2.3 hypotensive medications. Preoperative lens status was phakic in 14 eyes and a Phaco+Preserflo combined procedure was performed in 5 of them. Adjunctive mitomycin C was used in all microsunt surgeries (0.2 mg/mL in 85 eyes and 0.4 mg/mL in 10 eyes) and Ologen collagen matrix in 95 eyes. The mean IOP at 6, 12 and 24 months postoperatively was 12.8, 13.8 and 13.0 mmHg respectively. Only 20 eyes (21.1%) needed to associate 2 IOP-lowering medications, 11 eyes of whom finally required surgical revision of the implant and 6 eyes a new glaucoma surgery. Most of postoperative complications were mild, being hypotony (< 6 mmHg) the most frequent (34.7%) followed by hyphema (7.4%). Malignant glaucoma in the early postoperative period of 2 eyes was registered as a serious adverse event.

Conclusion: PreserFlo implant is safe and effective in open-angle glaucoma patients. Its hypotensive effect remains stable during the first two years, approaching the results of classical filtering surgery. The IOP drop makes early hypotony frequent, usually transient and without structural changes limiting the final visual function.

504 - P3.053

12-MONTH OUTCOMES OF A SINGLE SURGEON PRESERFLO MICROSHUNT COHORT AND FACTORS FOR SUCCESS

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Purpose: This is a retrospective, single surgeon, single centre cohort study assessing the efficacy of PreserFlo MicroShunt surgery and factors influencing success.

Methods: Inclusion criteria included patients who had undergone PreserFlo MicroShunt surgery with a minimum of 12 months follow-up. Success was defined as post-operative IOP being within an IOP threshold (Criteria A: 21 ≥ IOP ≥ 6, Criteria B: 18 ≥ IOP ≥ 6, Criteria C: 15 ≥ IOP ≥ 6, Criteria D: 12 ≥ IOP ≥ 6) and reduction ≥ 20% in IOP compared with baseline with (qualified) and without medication (complete). Failure was defined as hypotony with loss of ≥ 2 lines of visual acuity, loss of perception of light, further medication, needling or surgery. A posterior box suture was placed in some eyes with a 10/0 nylon near the distal end of the Microshunt to align the shunt closer to the sclera.

Results: 114 eyes of 97 patients were included with a mean follow up of 1.33 ± 0.74 years. Complete success rates at 12 months were 64.0%, 64.0%, 60.0% and 43.0% for Criteria A, B, C and D respectively. Qualified success rates at 12 months were 69.3%, 67.5%, 62.3% and 44.7% respectively. Subgroup analysis revealed a greater decrease in IOP in the box suture cohort compared to the no box suture cohort at 12 months (-13.0 vs -9.6 mmHg, p = 0.034) but there were no differences in change in medication usage. A multivariate Cox regression analysis (n = 88) revealed presence of box suture significantly increased complete success for Criteria A (p = 0.036, HR = 0.281), B (p = 0.036, HR = 0.281) and D (p = 0.025, HR = 0.366); additionally, there was a trend for higher complete success with Criteria C (p = 0.064, HR = 0.352). Other significant risk factors for failure/success include use of stent suture (p = 0.044, HR = 5.507), while there was a trend (p values between 0.05-0.10) towards non-Caucasian ethnicity, shorter axial length, higher pre-operative medication usage and combined surgeries being risk factors for failure.

Conclusion: PreserFlo MicroShunt is an effective surgery with good success rate at 12 months. The use of a box suture to align the shunt closer to the sclera significantly reduces the rates of failure.

505 - P3.054

TWO-YEAR OUTCOMES OF PAUL GLAUCOMA IMPLANT SURGERIES IN REFRACTORY GLAUCOMA MANAGEMENT

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Purpose: Glaucoma is a significant contributor to global irreversible blindness and is expected to increase with an aging population. Elevated intraocular pressure (IOP) is a key risk factor, requiring IOP reduction through medical or surgical means, such as glaucoma drainage implants (GDIs). The Baerveldt® implant was previously favored for its higher efficacy in the Ahmed versus Baerveldt study and the Ahmed Baerveldt Comparison study. However, the Baerveldt was also found to have a significantly higher risk of hypotony in these studies. The PAUL® glaucoma implant (PGI) (Advanced Ophthalmic Innovations, Singapore, Republic of Singapore), a medical-grade silicone, valveless aqueous tube shunt. It has a comparable plate area to the Baerveldt with smaller tube diameter and lumen. This theoretically mitigates postoperative hypotony risk and minimizes complications such as conjunctival erosion and tube endothelium damage. This study aims to assess describe the surgical technique the safety and efficacy of the PGI at Mater Misericordiae University Hospital.

Methods: The PGI insertion technique at Mater Misericordiae University Hospital involves creating a conjunctival peritomy, exposing the sclera, followed by placement of the PGI plate in the superotemporal quadrant underneath the recti muscles. No antimetabolites are used when creating the bleb. The plate is secured to the sclera using ethibond sutures, and a luminal prolene suture is passed through the tube to minimise hypotony risk. The tube is measured, bevelled, and inserted into the anterior chamber through a partial-thickness scleral tunnel. A scleral graft is used to protect the anterior sub-conjunctival portion of the tube, and the conjunctiva is then repositioned and closed. An audit of patient outcomes following PGI surgeries at Mater Misericordiae University Hospital, conducted between June 2021 and January 2024, included 42 eyes from 39 patients with a minimum 1-year follow-up. Primary outcome measures encompassed changes in IOP and the number of IOP-lowering medications taken by patients. Postoperative complications associated with the PGI, along with visual acuity, were also collected and analysed.

Results: All patients included had refractory complex glaucoma, with uveitic glaucoma and rubeotic glaucoma being predominant (30.95% and 19.05%, respectively). A significant mean IOP reduction of -14.09 mmHg was achieved from day one post-op (-49.39% from baseline, p = 0.000000000006), sustained at 2 years (-15.14 mmHg, -53.05% from baseline, p = 0.0000006). Medication burden decreased significantly from a mean of 3.62 ± 0.99 required medications pre-operatively to just 1.20 ± 0.79 at two years (p = 0.0003). Complications were rare, with one case of hypotony requiring intervention, one choroidal effusion, and two bleb leaks requiring bleb revision. Notably, no GDI failures occurred within the two-year follow-up.

Conclusion: The PGI achieved sustained IOP reduction and reducing medication burden for up to two years in patients with advanced complex glaucoma. This study highlights PGI as a viable alternative to address complex glaucoma, with a favourable risk-benefit profile over existing GDIs.

506 - P3.055

CONJUNCTIVAL AND TENON'S LAYER THICKNESS AS A PROGNOSTIC FACTOR IN NON-PENETRATING DEEP SCLERECTOMY EFFECTIVENESS

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Purpose: This prospective study aimed to assess the preoperative conjunctival and Tenon's (CTL) thickness using anterior segment OCT (AS-OCT) and its possible prediction of the non-penetrating deep sclerectomy (NPDS) effectiveness in the early postoperative period.

Methods: Forty-one eyes (38 patients; 20 females and 18 males) diagnosed with uncontrolled open-angle glaucoma (primary or secondary) were included in this study. In all cases, the NPDS augmented with mitomycin C (mmC) was conducted. The AS-OCT was used to assess the preoperative CTL and filtering bleb's parameters after the NPDS one week and six months after the surgery. After a 6-month observation period, all operated eyes were assigned into three groups. Group 1 included eyes that obtained target intraocular pressure (IOP) defined as IOP < 21 mmHg and the drop in IOP (at least 20%) without additional pharmacological, laser, or surgical treatment. Group 2 comprised eyes in which antiglaucoma eyedrops were implemented to support the hypotensive effect of the NPDS, whereas the eyes included in Group 3 underwent additional surgical or laser procedures during the observation period.

Results: The mean age of the study group was 66,54 years (SD 11.00, range: 30-86). 31,7% of the examined eyes were classified into Group 1, 43.90% into Group 2 and 24.39% into Group 3. The preoperative CTL parameter was statistically significantly lower in Group 3 (151.90 µm, SD 19,47) compared with Group 1 (211.08 µm, SD 38.35) and Group 2 (212.56 µm, SD 54.07) ($p = 0.0008$). Eyes with greater CTL parameter values also required fewer antiglaucoma eyedrops after NPDS ($p = 0.0264$).

Conclusion: Eyes with thinner preoperative conjunctival and Tenon's layer are at greater risk of possible NPDS failure. Therefore preoperative CTL thickness measured with AS-OCT should be considered as a prognostic factor in NPDS effectiveness in the early postoperative period.

517 - P3.056

LONG-TERM RETROSPECTIVE COMPARISON OF KAHOOK DUAL BLADE EXCISIONAL GONIOTOMY WITH TRABECULAR ASPIRATION IN OPEN-ANGLE GLAUCOMA AT THE TIME OF THE CATARACT SURGERY

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Purpose: To compare the efficacy and safety of combined cataract extraction with either Kahook Dual Blade Excisional Goniotomy (KDB) or trabecular aspiration (TA) in patients with open-angle glaucoma (OAG).

Methods: A retrospective analysis of all OAG patients who underwent cataract extraction combined either with KDB or TA between May 2017 and May 2023 at the Department of Ophthalmology, University Eye Hospital Düsseldorf, Düsseldorf, Germany. Demographic data, including age, sex, number of glaucoma medications, intraocular pressure (IOP) before and after the operation, complications, and reoperations were analyzed.

Results: This study included 113 eyes from 99 patients, with 71 undergoing KDB and 42 TA. Mean patient age was 77.5 ± 9.9 years, with 61.9% being female. The mean follow-up was 14.5 ± 5.5 months. The initial MD for the baseline visual field was 6.3 dB (IQR 3.6-12.7). The mean baseline IOP was 21.2 ± 7.0 mmHg for KDB and 19.0 ± 9.1 mmHg for TA. The mean postoperative IOP was 13.2 ± 4.6 mmHg and 12.5 ± 4.1 mmHg, respectively ($p = 0.33$). The change in IOP for KDB -7.9 mmHg ($p < 0.0001$) and for TA -6.6 mmHg ($p < 0.0001$). The number of topical glaucoma medication decreased from 2.5 ± 1.4 to 0.5 ± 1.1 ($p < 0.0001$) for KDB and 1.3 ± 1.5 to 1.2 ± 1.4 ($p = 0.25$) for TA. A total of 14 eyes required additional surgery to lower the IOP, with 9 undergoing trabeculectomy, 2 XEN-Implantation, 3 cyclophotocoagulation.

Conclusion: Both cataract extraction with KDB and TA proved to be effective procedures. However, goniotomy with the KDB resulted in a greater reduction in IOP and number of glaucoma medications compared to TA. Notably, one in five eyes required additional surgery to lower the IOP within the specified time frame.

518 - P3.057

THE PAUL GLAUCOMA IMPLANT (PGI) AS A FIRST-CHOICE GLAUCOMA DRAINAGE DEVICE: 12-MONTHS FOLLOW-UP

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Purpose: To evaluate the intraocular pressure (IOP) lowering effect of PGI.

Methods: A prospective study of glaucoma patients treated with PGI at a single Danish tertiary center from January 2022 to January 2024. The primary endpoints were IOP and success rate. Complete success was defined as IOP < 21 mmHg and > 20 % IOP reduction without additional IOP lowering medication, qualified as the same but with IOP lowering medication. Secondary endpoint was use of IOP lowering medications. A standard protocol with removal of the intraluminal stent (Prolene® 6-0) after 3 months was followed. All data are presented as mean (SD).

Results: A total of 57 eyes (57 patients) had surgery with PGI implantation. All eyes had previously undergone trabeculectomy or had other risks of failure (neovascular glaucoma, oil filled eye or uveitis). 46 eyes had the PGI placed in the anterior chamber, 10 in sulcus and 1 in pars plana. 53 had peroperative application of mmC 0.4 mg/ml on a wick for three minutes. At baseline mean IOP was 30.0 (8.3) mmHg and the mean number of topical IOP lowering medications used was 3.4 with 15 patients on systemic acetazolamide. 12 months after surgery IOP was reduced to 11.7 (2.7) mmHg. 43 % achieved complete success and qualified success was achieved in 95 % of the eyes. The number of topical IOP lowering medication was 0.9 (0.9). 43 % were medication free and none used systemic acetazolamide. 40 patients had the intraluminal stent removed; mean time from surgery to stent removal was 111 days (49, range 19-229), with a mean IOP decrease of 7.7 (6.5) mmHg.

Conclusion: This study indicates that PGI provides a good IOP lowering effect in a population with risk factors for failure.

520 - P3.058

24-MONTH OUTCOMES OF A PRESERFLO MICROSHUNT COHORT AND EFFECT OF INTRA-OPERATIVE SUBCONJUNCTIVAL MITOMYCIN ON SUCCESS

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Purpose: This is a retrospective, single surgeon, single centre cohort study assessing the 2 year survival of PreserFlo MicroShunt. Additionally, risk factors for failure were assessed, including effect of intra-operative subconjunctival Mitomycin-C injection.

Methods: Inclusion criteria included any patients who has undergone PreserFlo MicroShunt surgery with a minimum of 24 months follow up. Success was defined as post-operative IOP being 21 ≥ IOP ≥ 6, and reduction ≥ 20% in IOP compared with baseline with (qualified) and without medication (complete). Failure was defined as hypotony with loss of ≥ 2 lines of visual acuity, loss of perception of light, further medication or surgery. Due to surgeon preference, needling was often performed when there were early signs of encapsulation without significant IOP rise and therefore needling was not considered to be failure. For 33 patients, mmC was applied intra-operatively via a subconjunctival injection (dose varying between 0.2 to 0.4 mg/1ml) instead of the usingmmC soaked LASIK sponges.

Results: 74 eyes of 61 patients were included with a mean follow up of 2.15 ± 0.87 years. Success rates at 24 months were 53.7% and 61.2% for complete and qualified success respectively. At 24 months, mean IOP decreased from 21.7 to 9.9 mmHg ($p < 0.001$) and mean medication usage decreased from 2.85 to 0.19 ($p < 0.001$). Subgroup analysis revealed that the subconjunctivalmmC group had a greater decrease in absolute IOP (-15.6 vs -7.7 mmHg, $p = 0.001$) and relative IOP (-60.9% vs -36.4%, $p < 0.001$) at 24 months compared to the LASIK spongemmC group. There were no significant differences in medication usage. Chi-Square test revealed a significantly lower rate of failure in the subconjunctivalmmC group (32.1% vs 56.8%, $p = 0.049$). A multivariate binomial regression model revealed that subconjunctivalmmC application was a significant factor that reduced risk of failure ($p = 0.035$, HR = 0.228). Interestingly higher age (in years) was associated with higher risk of failure ($p = 0.021$, HR = 1.078). Rates of complication were similar in both subgroups.

Conclusion: PreserFlo MicroShunt is an effective surgery with good success rate at 24 months. Subconjunctival application ofmmC is safe and may be associated with greater IOP reduction and lower risk of failure.

527 - P3.059

COMPARISON OF 8-YEAR RESULTS OF 360-DEGREE SUTURE TRABECULOTOMY AB EXTERNO (S-LOTEX) AND GONIOSCOPY-ASSISTED TRANSLUMINAL TRABECULOTOMY (GATT) FOR OPEN-ANGLE GLAUCOMA PATIENTS

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Purpose: This study aimed to compare the 8-year surgical outcomes of two procedures, 360-degree suture trabeculotomy ab externo (S-LOTex) and gonioscopy-assisted transluminal trabeculotomy (GATT), in patients with open-angle glaucoma (OAG).

Methods: A retrospective study was conducted on Japanese OAG patients who underwent either S-LOTex or GATT at Keio University Hospital as a standalone procedure and were followed for at least 1 month. The study assessed intraocular pressure (IOP), the number of antiglaucoma medications used (eye drops: 1 point, oral use: 2 points), and the occurrence of complications. Failure was defined as meeting specific criteria, including inadequate IOP reduction (≥ 22 mmHg or < 20% reduction from the preoperative IOP), the need for additional glaucoma surgery, or loss of light perception vision.

Results: A total of 334 eyes from 281 patients were included in this study, with 195 eyes undergoing S-LOTex and 139 eyes undergoing GATT. The mean preoperative IOP (mean number of antiglaucoma medication use) values were 29.5 ± 8.5 mmHg (4.4 ± 1.4) for S-LOTex and 27.0 ± 10.1 mmHg (4.5 ± 2.2) for GATT. At 96 months postoperatively, the mean IOP (mean number of antiglaucoma medications) values were 13.9 ± 3.9 mmHg (1.4 ± 1.6) for S-LOTex and 13.7 ± 3.5 mmHg (2.4 ± 1.8) for GATT. Kaplan-Meier survival analysis showed similar survival rates at 96 months for S-LOTex (39.8%) and GATT (33.1%). The log-rank test showed that there was not a statistically significant difference between two groups ($p = 0.392$). Additional glaucoma surgeries were required in 67 eyes (34.3%) for S-LOTex and 48 eyes (34.5%) for GATT due to inadequate IOP reduction. The occurrence of complications was comparable between the two groups, such as hyphema with Neveau formation in 119 eyes (61.0%) for S-LOTex and 89 eyes (64.0%) for GATT ($p = 0.526$), as well as transient IOP elevation above 30 mmHg in 56 eyes (28.7%) for S-LOTex and 42 eyes (30.2%) for GATT ($p = 0.767$).

Conclusion: The study found no significant difference in postoperative outcomes between S-LOTex and GATT, suggesting the similar effectiveness of both surgical techniques in the long-term management of OAG.

531 - P3.060

ACCURACY OF INTRAOCULAR LENS CALCULATION FORMULAS IN COMBINED PHACOTRABECULECTOMY

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Purpose: To compare the accuracy of ten intraocular lens (IOL) power calculation formulas in eyes undergoing phacotrabeculectomy

Methods: In this retrospective cohort study, the charts of glaucoma patients who underwent uncomplicated phacotrabeculectomy with monofocal IOL implantation were reviewed. All ocular biometrics were measured using IOL Master. The predicted spherical equivalent (SE) was obtained from IOL Master 700 for SRK/T, Holladay I, Holladay II, and Hoffer Q formulas, and from the ESCRS IOL calculator for Barrett Universal II, EVO, Hill-RBF, Hoffer QST, Kane, and Pearl DGS formulas. Using a 6-month postoperative refraction, prediction error (PE), absolute prediction error (AE) and percentages within ± 0.25 diopters (D), ± 0.50 D, ± 0.75 D, and ± 1.00 D of predicted SE were calculated and compared among formulas. Subgroup analysis was conducted for primary open-angle glaucoma (POAG) and primary angle-closure glaucoma (PACG) patients.

Results: Data from 75 patients (25 POAG, 47 PACG, and 3 secondary glaucoma) were included. At 6-months postoperation, the mean refraction was -0.39 ± 0.79 D. The mean AE of ten formulas ranged between 0.548 D and 0.645 D. The Hill-RBF formula achieved the smallest mean AE of 0.548 ± 0.476 D, followed by Pearl DGS with the mean AE of 0.550 ± 0.476 D. The Hill-RBF yielded the highest proportion of errors within 0.25 D (35%) and the smallest proportion of errors exceeding 1.00 D (14%). For the subgroup analysis, Pearl DGS achieved the smallest mean AE (0.493 ± 0.534 D) in POAG, whereas Hill-RBF resulted in the smallest mean AE (0.538 ± 0.493 D) in PACG. There was a tendency toward myopic outcome in all formulas for PACG, whereas almost all formulas tended to result in a hyperopic outcome in POAG. There was no statistically significant difference across all formulas in terms of AE and proportions of prediction error (all $p > 0.05$).

Conclusion: All ten formulas achieved a high level of accuracy with no statistically significant difference. The Hill-RBF tended to have the lowest predictive error among all patients and the PACG subgroup. The Pearl DGS tended to have the smallest predictive error in POAG patients.

535 - P3.061

THE PAUL GLAUCOMA IMPLANT (PGI) AND ENDOTHELIAL CELL LOSS: 12-MONTH FOLLOW-UP

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Purpose: To evaluate endothelial cell loss following PGI surgery.

Methods: A prospective study including 57 glaucoma patients (57 eyes) treated with PGI in a Danish tertiary center from January 2022 to January 2024. Data collection is ongoing and 22 patients have attended one-year follow-up.
The primary outcome was endothelial cell density (ECD), secondary endpoints logMAR visual acuity and central corneal thickness (CCT).

Results: No major perioperative or postoperative complications were observed in any of the 57 patients. Perioperative swab withmmC 0,4 mg/ml was performed in 53 patients. 46 patients had tube position in the anterior chamber, 10 patients in sulcus, and 1 in the vitreous space. None of the patients had the PGI removed, and no patients had corneal transplantations done during the follow-up period. The postoperative visual acuity remained stable. Preoperative CCT was mean (SD) 555 (35) µm and 12 months postop CCT 554 (31) µm. Patients with tube position posterior to Schwalbe's line in anterior chamber had an average ECD loss of 55 (165) cell/mm2, with preop ECD of 2143 (349) cells/mm2 and 12 months postop. ECD of 2088 (413) cells/mm2, respectively. Patients with tube position in or anterior to Schwalbe's line had an average ECD loss of 194 cell/mm2, with preop ECD of 2093 (302) cells /mm2 and 12 months ECD of 1900 (441) cells/mm2, respectively. Two patients had a high ECD loss, 497 and 424 cell/mm2, at 12 months. The tube was positioned in the anterior chamber in both patients, either crossing or posterior to Schwalbe's line. The preoperative ECD was low in both cases, 1614 and 1514 cell/mm2, but with an average tip-to-cornea distance (1.4 and 1.6 mm). In the whole group, the tip-to-cornea distance was in the range 0.9-2.9 mm. The mean intracameral tube length was 3.8mm.

Conclusion: Preliminary data indicate that PGI has a good safety profile in terms of postoperative endothelial cell loss.

546 - P3.0612

THE EFFECTIVENESS OF ONE SESSION OF DIODE MP CYCLOPHOTOCOAGULATION IN GLAUCOMA PATIENTS

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Purpose: To evaluate the effectiveness of one session of micropulse transscleral diode cyclophotocoagulation (Diode-MP) in patients with uncontrolled glaucoma

Methods: 82 eyes (70 patients - 44 males and 26 females, mean age 75.93 ± 11.95 years), underwent a session of Diode-MP laser (duty cycle 31.3%, intensity 2500 mW, 90 seconds upper and lower limbus. 40.2% of them had undergone previous antiglaucoma surgery (POAG-46, NTG-2, PACG-8, PXG-19, other-7 eyes). Mean preoperative IOP was 20.26 ± 6.82 mmHg with 3.26 ± 1.07 medications and acetazolamide intake by 15.9% of the patients. 42% of the patients had IOP = 16-21 mmHg, 29.6% IOP < 16 mmHg and 28.4% IOP > 21 mmHg.

Results: There were no intraoperative or postoperative major complications. The mean postoperative intraocular pressure (IOP) at one month was 14.63 ± 4.18 mmHg with 3.15 ± 0.82 medications, whereas at three months it was 16.94 ± 5.56 mmHg with 3.16 ± 0.93 medications. The final mean postoperative IOP was 17.84 ± 6.04 mmHg ($p = 0.002$) with 3.06 ± 0.92 medications ($p = 0.594$), with 3.7% of patients receiving acetazolamide and a mean follow-up of 4.54 months (range: 3-6 months). Women had significantly ($p = 0.018$) lower final IOP (15.91 ± 3.60 mmHg) compared to men (19.13 ± 6.96 mmHg). From the analysis by Pearson, a significant linear correlation was found between preoperative IOP and the number of medications with their postoperative values at all time points of follow-up ($p < 0.001$). Higher age correlated with higher postoperative IOP values ($p = 0.007$). Furthermore, post hoc analysis revealed that patients aged 46-55 years and >85 years had the highest postoperative IOP values.. Overall, there was a reduction of 11.94% in IOP, 6.13% in medication usage, and 76.73% in the need for acetazolamide. The final IOP value and the number of medications seemed to depend on their preoperative values, with IOP decreasing by 21.45% in patients with preoperative IOP > 21 mmHg. There was no significant difference in final IOP or number of medications in patients who had previously undergone antiglaucoma surgery.

Conclusion: One session micropulse Diode laser cyclophotocoagulation is safe and effective in patients with elevated IOP and can be used as an intermediate solution till the preparation of their surgical treatment. Selection of patients and longer follow-up periods are needed to confirm our initial results.

549 - P3.063

OUTCOMES OF COMBINED BAERVELDT GLAUCOMA IMPLANT AND TRABECULECTOMY WITH MITOMYCIN C IN PATIENTS WITH ADVANCED GLAUCOMA

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Purpose: To describe the surgical outcomes of patients with advanced glaucoma and high risk of primary trabeculectomy failure who underwent combined Baerveldt glaucoma implant surgery (BGI) and trabeculectomy with mitomycin C (mmC).

Methods: This single centre, single surgeon consecutive case series included patients with advanced glaucoma (Hodapp classification) that are at high risk of primary trabeculectomy failure e.g. immobile conjunctiva, severe red eye, African-Caribbean descent with uncontrolled intraocular pressure (IOP) or glaucoma progression on maximally tolerated medical treatment. A combined BGI and trabeculectomy with mmC (0.4mg/ml) was performed with tube ligation (10.0 Nylon) and stent suture (3.0 Supramid). Outcome measures were reduction of IOP, antiglaucoma drugs (AGD) and surgical complications. Trabeculectomy provides early control of IOP. The Tube was opened once the Trabeculectomy failed, earliest at 3 months post surgery.

Results: Fifty-four eyes of 51 patients, with a mean age of 65.9 ± 13 (range 43.9 to 89.1) years were included. Most patients had POAG (81.5%), were Afro-Caribbean (80.9%), and had a mean preoperative MD of -21.4 ± 6.9dB. The mean preoperative IOP was 19.9 ± 7.0 mmHg at baseline and 10.9 ± 4.1 mmHg at last follow-up ($p < 0.001$). The mean duration of follow-up was 34.6 ± 19.8 months. The antiglaucoma medication was reduced from 3.4 ± 0.7 before surgery to 1.8 ± 1.4 post-surgery ($p < 0.001$). 2 eyes (7.1%) required cyclodiode for further IOP reduction. One eye developed late endophthalmitis. Temporary hypotony occurred in 2 eyes, and one had exotropia from muscle restriction. There was no loss of light perception in this cohort.

Conclusion: The technique of combined BGI with trabeculectomy withmmC significantly lowered IOP and reduced medication use. It provided good short and intermediate IOP control in eyes with advanced glaucoma, which are at higher risk of Trabeculectomy failure.

556 - P3.064

3 YEAR OUTCOMES FOR FEMTOSECOND LASER IMAGE GUIDED HIGH PRECISION TRABECULOTOMY

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Purpose: This study evaluates IOP reductions and safety at 3 years follow up from the first-in-human femtosecond laser guided high precision trabeculotomy (FLigHT) study.

Methods: A single 200 (H) x 500 (W) x 400 (D) m non-incisional laser trabeculotomy was created in the nasal quadrant of 18 eyes (12 patients) with mild to advanced open angle glaucoma and no prior glaucoma treatment (besides hypotensive medications) from September – October 2020 at a single investigational center in Budapest, Hungary. 400 femtosecond pulses at 1080 nm wavelength were used to create the trabeculotomy (ViaLase, Aliso Viejo, CA). Pre and post operative examinations included IOP (Goldmann), glaucoma medication status, ocular health, gonioscopy, visual field, BCVA and adverse event (AE) assessment. Follow up continued for 36 months.

Results: Mean patient age was 72.2 ± 9.7 years at enrollment. 92% of patients were female, allwere Caucasian, 89% were pseudophakic. Glaucoma severity was evenly distributed (33% mild, 28% moderate, 39% severe). Mean preoperative IOP was 21.4 ± 4.6 mmHg and patients were on 2.1 ± 1.0 glaucoma medications. 13/18 eyes completed 36 month follow up. 36 month IOP was 15.2 ± 2.5 mmHg ($p < 0.001$ vs. baseline, 2 sided t-test) and mean medications was 1.7 ± 1.3 ($p = 0.30$). Gonioscopic examination found 100% of the trabeculotomies were patent with no PAS or iris incarceration. There were no incisional glaucoma surgeries during the follow up period.Two eyes were treated for cataract at 27 and 35 months.

Conclusion: Non-invasive methods to control IOP that eliminate long term patient adherence and compliance to therapy regimens have the potential to improve patient outcomes. Femtosecond laser guided high precision trabeculotomy (FLigHT) creates a channel in the trabecular meshwork similar to surgical MIGS procedures, but is a non invasive procedure. .36 month follow up in this first-in-human study of 18 eyes suggests the FLigHT procedure has the potential to maintain IOP reduction for up to 36 months post procedure. Treated channels remained patent and showed no evidence of chronic inflammatory reaction in the form or PAS or iris adhesions. Further evaluation is warranted for both first and second line treatment in OAG.

557 - P3.065

ADHERENCE OF GLAUCOMA SURGICAL AND LASER STUDIES TO WORLD GLAUCOMA ASSOCIATION GUIDELINES

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Purpose: To investigate the rate of adherence of glaucoma surgical and laser studies to the World Glaucoma Association (WGA) guidelines for reporting glaucoma surgery studies.

Methods: A systematic review (Prospero #CRD42023394477) was conducted using MEDLINE® and EMBASE® to identify studies on glaucoma surgical techniques (any type) and laser treatments. The search was restricted to randomized clinical trials or non-randomized prospective studies including > 100 eyes and limited to articles published between January 2010 and January 2023. Two independent reviewers selected studies for inclusion and performed data extraction, evaluating 50 outcomes across five domains: methodology (n = 11), definition of success (n = 17), ethics (n = 10), complications (n = 6), and statistical reporting (n = 6).

Results: Out of 13,057 uniquely identified studies, 461 studies were reviewed in full text for eligibility. A total of 218 RCTs and 46 non-randomized studies were included for data extraction. Overall, 88 studies (33.3%) involved trabeculectomy, 46 (17.4%) laser procedures, 43 (16.3%) studies minimally invasive glaucoma surgeries (MIGS), 28 (10.6%) tubes, 27 (10.2%) non-penetrating surgeries, and 7 other surgeries (2.6%). The median (IQR) follow-up of the included studies was 12 (12-24) months, and the median (IQR) number of enrolled eyes was 80 (50-131). Adherence to WGA guidelines varied, with the median (IQR) percentage of compliance for each domain ranking highest in ethics with 78.8% (22.7% to 86.7%), followed by methodology at 66.7% (15.5% to 94.3%), complications at 31.4% (7.6% to 88.6%), success at 25.0% (7.9% to 47.7%); and statistical reporting at 24.2% (1.9% to 49.6%).

Conclusion: Published surgical studies demonstrated fair adherence to WGA guidelines in ethics and methodology reporting. However, adherence was poor in the areas of success definition, methodology and statistical reporting. These findings highlight the need for improved standardization and rigor in reporting practices to enhance the reliability and comparability of glaucoma surgery research.

Part of this work has also been submitted to the 2024 ARVO meeting.

562 - P3.066

COMBINED PHACOEMULSIFICATION AND AHMED GLAUCOMA VALVE IMPLANTATION IN THE CILIARY SULCUS IS SAFE AND EFFECTIVE

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Purpose: To report on efficacy and safety of Ahmed Glaucoma Valve (AGV) implantation with both anterior chamber (AC) and sulcus tube placement as well as with combined phacoemulsification.

Methods: We conducted a retrospective single-center study of 79 eyes of 66 patients undergoing AGV implantation from 2016 to 2022. Intraocular pressure (IOP) and number of hypotensive medications were analyzed preoperatively and at 1, 3, 6 and 12 months postoperatively and at every following year. Success was defined as IOP < 21 mmHg and ≥ 20% IOP reduction. Failure was defined as not meeting success criteria in two consecutive visits after at least 3 months of follow-up or the need for additional IOP lowering surgery. We further assessed complication rates.

Results: Glaucoma subtypes included primary open angle (34.2%), neovascular (24.0%) and inflammatory (17.7%). Tube was placed in the AC in 36 eyes and in the sulcus in 43 eyes, of which 31 were already pseudophakic and 12 underwent simultaneous phacoemulsification. Mean IOP reduced significantly from 31.9 ± 11.4 preoperatively to 13.7 ± 6.4 mmHg ($p < 0.05$), and the number of medications also reduced from 3.7 ± 0.7 to 2.2 ± 1.3 ($p < 0.05$). Mean follow-up time was 35,2 months. Total success rate was 87,1% and 67.5% at 1 and 3 years, respectively. Capsule trephination was required in 16 eyes (20.3%). Success rate did not differ significantly with glaucoma subtype, tube placement in AC or sulcus, and combination with phacoemulsification. Hyphema occurred in 15% of both AC and sulcus cases. Significant endothelial cell reduction occurred in 41,7% of AC tubes and resulted in subsequent tube repositioning to the sulcus. No cases of corneal edema were observed. Tube occlusion with vitreous occurred in 3 pseudophakic eyes (3.8%). Tube exposure occurred in 2 eyes (2.5%), one of which was further complicated by endophthalmitis requiring valve removal.

Conclusion: The AGV effectively lowered IOP and resulted in success rates comparable to published literature. Sulcus placement and combined phacoemulsification proved as effective as traditional AC tube placement without increased complication rates. Endothelial cell loss was observed in AC tube placement, and prompt tube repositioning may have prevented development of corneal edema.

565 - P3.067

12-MONTH COMPARATIVE OUTCOMES OF OMNI AND HYDRUS IMPLANT IN UNCONTROLLED GLAUCOMA

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Purpose: This study assesses the safety and efficacy of Hydrus implantation versus OMNI (viscocanaloplasty with trabeculotomy) in the management of uncontrolled glaucoma, providing insights into the effectiveness of these procedures over a 12-month period.

Methods: In this retrospective study, patients with uncontrolled glaucoma, defined as inadequate IOP control despite maximum tolerated medical therapy, were enrolled and underwent either Hydrus implantation or OMNI between April and November 2022. The cohort predominantly consisted of primary open angle glaucoma cases, with two primary angle closure glaucoma cases in the Hydrus group. Treatment allocation was based on surgeon preference. Efficacy and safety were evaluated at 12 months post-surgery, with primary outcomes including surgical success, defined as IOP between 5 and 21 mmHg, a reduction of more than 20% from baseline, and no need for additional glaucoma surgery. Secondary outcomes encompassed mean IOP reduction, decrease in glaucoma medication, and surgical complications.

Results: The study involved 35 eyes from 35 patients (20 female, 15 male), with 19 undergoing Hydrus and 16 OMNI. Phacoemulsification was combined in all Hydrus cases and in 8 cases with OMNI. In the Hydrus group, 4 patients (21%) achieved complete success, and 4 patients (21%) achieved qualified success. In the OMNI group, 4 patients (25%) achieved complete success, and 6 patients (37%) achieved qualified success. Mean IOP reduction was 20.9% in OMNI and 16.7% in Hydrus. Glaucoma medication reduction averaged 1.3 drops in OMNI and 0.9 in Hydrus. Complications included corneal oedema in 2 Hydrus patients, raised IOP in 10.5% of Hydrus and 37% of OMNI patients, low IOP with shallow anterior chamber in 1 OMNI patient, and hyphema in 2 OMNI patients.

Conclusion: This study offers valuable insights into the comparative performance of Hydrus and OMNI in uncontrolled glaucoma management, highlighting their potential in personalized glaucoma care. The promising results in terms of efficacy and safety, despite the limited sample size, underscore the need for further research with larger cohorts.

570- P3.068

LONG TERM OUTCOMES AND BASELINE PREDICTORS OF FAILURE IN PRIMARY STANDALONE XEN45 GEL STENT VS TRABECULECTOMY FOR GLAUCOMA

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Purpose: To compare long term outcomes and baseline predictors of failure in standalone, primary Xen45 gel stent (XEN) vs trabeculectomy (TRAB) in moderate to advanced glaucoma.

Methods: Retrospective study of eyes in the Fight Glaucoma Blindness international registry that underwent primary XEN or TRAB augmented by mitomycin-C with at least 12 months of follow-up. The primary outcome was failure defined as two consecutive intraocular pressure (IOP) readings above 15 mmHg and < 20% IOP reduction from baseline, hypotony with loss of ≥ 10 visual acuity (VA) letters or secondary glaucoma surgery (Criterion A), with (qualified) or without (complete) medications. Multivariate mixed effects cox regression models were used to identify risk factors for failure.

Results: 701 eyes (XEN, 308; TRAB, 393) of 596 subjects were included with baseline IOP being significantly higher (22.4 vs 19.9 mmHg, p < 0.001) and baseline medications significantly lower in the XEN vs TRAB group (2.9 vs 3.4, p < 0.001). Baseline visual field (VF) mean deviation (MD) was significantly better in the XEN group (-9.47 vs -13.04 dB, p < 0.001). The proportion of complete success was significantly lower in the XEN group at the 12- (32% vs 52%, p < 0.001), 24- (29% vs 42%, p = 0.003) and 36-month timepoints (22% vs 40%, p = 0.001); These findings were consistent across other definitions of complete success (Figure 1). In the XEN cohort, Asian ethnicity (HR, 1.97; 95% CI, 1.03-3.79) use of oral acetazolamide at baseline (HR, 1.74; 1.13-2.70), and diagnosis of open angle glaucoma suspect (HR, 0.52; 0.29-0.94) were significantly associated with failure. In the TRAB cohort, worse VF-MD (1.02; 1.00-1.04) and baseline IOP (HR, 0.98, 0.96-0.99) were corresponding risk factors for failure.

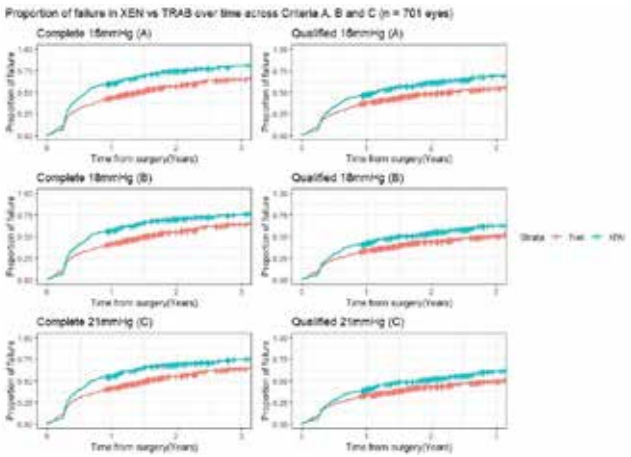

Figure 1. Cumulative incidence of failure over time in XEN vs TRAB cohorts

Conclusion: At 3 years, both procedures significantly lowered IOP with greater surgical success observed with Trabeculectomy. Asian ethnicity and use of oral acetazolamide in XEN and worse mean deviation in TRAB were associated with an increased risk of failure. Higher baseline IOP was associated with decreased failure in trabeculectomy. These baseline parameters may help guide patient selection for subconjunctival minimally invasive glaucoma surgery vs trabeculectomy in advanced glaucoma.

572 - P3.069

CLINICAL EFFECTIVENESS AND SAFETY OF PRESERFLO MICROSHUNT SURGERY: A STUDY

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Purpose: To study the clinical effectiveness and safety of Preserflo surgery at a tertiary care hospital in the UK over a 12-month follow-up period.

Methods: Retrospective clinical data was collected for 50 PreserFlo operations performed by two glaucoma consultants at University Hospitals Birmingham NHS Foundation Trust in the West Midlands, UK, from April 2022 to June 2023. Data was extracted from electronic medical records. Intraocular pressure (IOP) while listing for surgery and up to 12 months after surgery was noted. The average number of glaucoma medications patients were on before and after surgery was calculated. Any drop in best-corrected visual acuity (BCVA) possibly related to the surgery, and other complications were analysed.

Results: The study captured a total of 50 PreserFlo operations across 40 patients. The primary indication was primary open angle glaucoma (78%), followed by normal tension glaucoma (8%). Mean pre-operative IOP was 22.2 mmHg and mean number of glaucoma drops was 2.74, with 26% on concurrent oral acetazolamide. At 6 months, (n = 38 had completed follow-up by the time of data extraction) mean IOP was 11.3 mmHg. By 12 months (n = 23), mean IOP was 12.4 mmHg (44.1% reduction), and mean number of drops was 0.16. 44 eyes of 50 (88%) were not on any glaucoma medication up to their last follow-up. Acetazolamide was stopped in all patients. There were no major sight-threatening complications. Minor complications were transient such as hypotony (32%), microhyphema (14%) and choroidal effusion (24%). All of these resolved spontaneously. 1 patient required a return to theatre due to a persistent bleb leak after a fall which affected the eye and required re-suturing. 9 patients were noted to have a drop in BCVA by 1 line during follow-up. However, none of them were attributed to Preserflo surgery.

Conclusion: Our study found Preserflo surgery to be safe and effective, with results comparable/superior to trabeculectomy. Other studies have also shown similar encouraging results. Apart from lesser surgical interventions, other potential advantages include faster recovery and reduced risk of damaging other ocular structures. Evaluation of longer-term follow-up data is required to determine if the IOP reduction is sustainable.

574 - P3.070

EFFICACY AND SAFETY OF XEN63 GEL STENT IN GLAUCOMA SURGERY

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Purpose: To evaluate the efficacy and safety outcomes of XEN63 Gel Stent in glaucoma surgery.

Methods: This is a retrospective study where we present the results of 43 surgeries with XEN63 Gel Stent with at least 6 months follow up.

Results: 43 eyes of 42 patients were analysed. The mean pre operatory pressure was 19,8 mmHg (SD ± 7.22), the mean previous medication was 2.76 (SD ± 0.8), the 11.6% (5) of the patients were treated with 4 medications, the 62% (27) of the patients had 3 medications, the 18,6% (8) of the patients had 2 medications, the 4.65 (2) had one medication, and one patient didn't use any medication due to an intolerance to every glaucoma drop. The 23% of the surgeries were in combination with phacoemulsification, and the rest were stand-alone. After 6 months the mean pressure was 11.32 mmHg (SD ± 4.08) and the mean medications was 0,37 (SD ± 0.87) 35 patients were still without any medication. During the follow up we didn't have major complications, 1 patient required a needling, 4 patients needed a surgical revision, and we performed a new glaucoma surgery to one patient.

Conclusion: According to our experience, the new XEN63 Gels Stent device is safety and effective for glaucoma surgery.

576 - P3.071

OUTCOMES OF PRIMARY DEEP SCLERECTOMY WITH ESNOPER CLIP IMPLANT IN PATIENTS WITH UNCONTROLLED OPEN ANGLE GLAUCOMA

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Purpose: To evaluate the efficacy and safety of primary deep sclerectomy (DS) with the Esnoper Clip (EC) implant (AJL Ophthalmic, Alava, Spain) in uncontrolled open angle glaucoma (OAG) at one-year follow-up.

Methods: We prospectively investigated 52 eyes of 50 patients (25 ♀, 25 ♂) with uncontrolled OAG who underwent DS with EC implantation as their primary glaucoma procedure between 2017 and 2019. Intraocular pressure (IOP) and glaucoma therapy (GT) reduction, best corrected visual acuity (BCVA) changes, intraoperative and postoperative complications, as well as the number of goniopunctures and needlings required were noted. All measurements were performed at 1 day, 1 week, also 1, 3, 6, 9 and 12 months after surgery. In this study antifibrotics were not used either peri- or postoperatively.

Results: Mean IOP was 21.1 ± 7.8 mmHg preoperatively, and decreased upon follow-up, reaching 14.6 ± 4.0 mmHg at the 12-month follow-up ($p < 0.01$). Mean IOP reduction throughout the study was 9.1 mmHg, which represents a decrease of 43.1% ($p < 0.01$). The mean number of GT preoperatively was 3.2 ± 0.6, and this significantly decreased to 0.3 ± 0.8 at the last follow-up, representing a 91% reduction ($p < 0.01$). YAG-goniopuncture was performed in 34.6% of cases, and no needlings were performed during the study. Moreover, no significant BCVA changes were registered at the final follow-up. In terms of complications, we noticed a trabeculodescemet membrane microperforation perioperatively in one eye. At one week after surgery, we registered 2 cases of hyphema and 6 cases (11.5%) of reversible clinically significant hypotony (IOP≤ 5 mmHg). Among these cases, 5 were accompanied by small and peripheral choroidal detachment and 1 case by anterior chamber shallowing, which resolved within 2 weeks. By one month postoperatively, there were no signs of hypotony in any studied eye.

Conclusion: Primary DS with the Esnoper Clip implant significantly reduced IOP and decrease GT over a 1-year follow-up period in patients with uncontrolled OAG. The incidence of complications was relatively low and visual acuity was not affected by the surgery. The results of our study suggest that DS with the Esnoper Clip implant represents an effective and safe surgical option for uncontrolled OAG.

578 - P3.072

VEGF-C INDUCED LYMPHANGIOGENESIS PROVIDES NO BENEFIT IN A RABBIT GLAUCOMA SURGERY MODEL

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Purpose: We have previously demonstrated that conjunctival lymphangiogenesis can be induced using an adenoviral construct encoding vascular endothelial growth factor C (Ad-VEGF-C). The purpose of this study was to test if Ad-VEGF-C induced conjunctival lymphangiogenesis provides better outcome after glaucoma surgery in a rabbit model.

Methods: Six white New Zealand rabbits received a 50µl subconjunctival injection of Ad-VEGF-C (3.5x10^7 plaque forming units) in one eye and the same dose of an empty vector in the contralateral eye. Two weeks later the animals underwent conjunctival trypan blue lymphangiography and bilateral implantation of a 26G IV cannula, as a glaucoma tube-shunt. To prevent scarring mitomycin C 0.2 mg/ml was applied on a sponge on the scleral bed for three minutes and at the end of surgery triamcinolon (2 mg) was injected subconjunctivally in the adjacent quadrant. The animals underwent weekly examination with slit lamp and IOP and sacrificed four weeks after surgery. The eyes were harvested for histology. Inflammation and fibrosis around the bleb were graded (0-3) separately by two blinded pathologists and an average grade was calculated. All data are presented as means (SD). IOP data were analysed with a two-way ANOVA and all other data with a paired t-test.

Results: Trypan blue lymphangiography demonstrated successful induction of conjunctival lymphangiogenesis in the Ad-VEGF-C group at the day of glaucoma surgery: total lymphatic vessel length (arbitrary unit) 0.68 (0.32) versus 0.17 (0.04), p = 0.0078. Pre-operative IOP was 15.0 (1.4) and 14.2 (0.8) mmHg in Ad-VEGF-C and control group. Glaucoma surgery resulted in significant transient IOP reductions in both groups (< 0.0001) with the lowest IOP at 9.17 (1.4) and 9.25 (2.2) mmHg. There was no significant difference in IOP reduction between the two groups. Hyperemia on slit lamp examination was similar between groups. Histological analysis revealed mild inflammation around the blebs in both groups, with a significant higher score in the Ad-VEGF-C group: 1.00 (0.45) versus 0.58 (0.38), p = 0.0422. Fibrosis was classified as mild in both groups: 1.25 (0.27) versus 1.17 (0.26), p = 0.3632.

Conclusion: This preliminary study, limited by a small sample size, show no apparent advantage of inducing conjunctival lymphangiogenesis prior to glaucoma surgery.

586 - P3.073

OUTCOMES OF COMBINED PRESERFLO MICROSHUNT WITH BAERVELDT TUBE-350MM2 IMPLANT IN REFRACTORY GLAUCOMA

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Purpose: This study aims to introduce a new novel surgical technique of connecting a PreserFlo MicroShunt to a Baerveldt Tube-350mm2 Implant to treat complex glaucoma eyes.

Methods: A retrospective study was conducted in a district general teaching hospital in the United Kingdom looking at patients in whom a sequential surgery of connecting a Baerveldt implant to the pre-existing failed Preseflo to maintain a low targeted intraocular pressure.

Results: A total of 8 eyes (7 patients) with a mean age of 61.8 years were included in the study. The indications for the operation were: failure following the PreserFlo with high intraocular pressure (n = 7) and clinical hypotony following a Baerveldt implant (n = 1). 5 eyes (70%) achieved complete successes without the use of antiglaucoma medication. 3 eyes (30%) achieved qualified successes with the mean of 1 antiglaucoma drop used and no failure was identified at 12 months review postoperatively. Early numerical hypotony was found in 3 eyes which were resolved at 3-month post-surgery. No patient required further operations from this procedure within 1 year of follow-up.

Conclusion: Combining PreserFlo with Baerveldt implant was effective in lowering intraocular pressure in eyes with previous multiple intraocular surgeries and refractory glaucoma. The structural advantages of the large surface area of the Baerveldt silicone plate and the smaller calibre of the Preserflo implanted within the anterior chamber reduces the risk of complication and effectively maintains the intraocular pressure at a therapeutic range.

602 - P3.074

HYPHEMA AFTER COMBINED TREATMENT WITH DIODE TRANSSCLERAL CYCLOPHOTOCOAGULATION (TCP) AND TRANSSCLERAL SUBCYCLOPHOTOTHERAPY (TSCP): A CASE REPORT

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Purpose: To present a case about a complication after TCP and TSCP combined treatment in a refractory glaucoma patient.

Methods: An 80-year-old male patient with a diagnosis of refractory glaucoma who underwent a combined TSCP (360°, 2W and 31.3% duty cycle for 90 seconds) and TCP (180°, 2W for 2 seconds) with Vitra 810 Quantel Medical Equipment.

Results: An 80-year-old male patient with medical history of schizophrenia treated with clozapine and risperidone, exudative maculopathy in both eyes (OU) treated with vascular endothelial growth factors, glaucoma treated with maximal medical therapy and trabeculectomy OU and epiretinal membrane in the left eye (OS). Visual acuity was 8/10 in the right eye (OD) and 2/10 OS. Intraocular pressure (IOP) was 19 mmHg OD and 36 mmHg OS. A combined TCP and TSCP technique was performed in the left eye. The following day, slit lamp examination revealed in treated eye corneal folds, tyndall ++ and IOP dropped to 6 mmHg. Patient was prescribed moxifloxacin + dexamethasone every 6 hours and difluprednate every 8 hours. A week after the procedure, he presented inferior hyphema with an IOP of 9 mmHg. It was decided to increase the frequency difluprednate and after two weeks slit lamp examination showed no corneal folds, reabsorption of the hyphema and IOP of 9 mmHg.

Conclusion: Diode cyclophotocoagulation is considered to be effective in reducing IOP in refractory glaucoma patients. It has shown to be a safer technique with a lower complication rate compared to other cyclodestructive procedures such as cryotherapy. Most common complications are inflammation of the anterior chamber, hyphema, hypotonia and loss of corneal transparency. These tend to be infrequent and quickly resolved with medical treatment.

611 - P3.075

2 YEAR CLINICAL OUTCOMES OF PRESERFLOW MICROSHUNT DEVICE - A SINGLE CENTER UK STUDY

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Purpose: The PreserFlo MicroShunt is a relatively newer bleb based glaucoma treatment device. Large data is required to assess its long term effectiveness and success and to measure its' comparativeness to the conventional trabeculectomy surgery. The aim of this study is to assess the real world data of 2 year outcomes of the Preserflow implant surgery carried out in a single centre

Methods: A total of 74 eyes that underwent PreserFlo MicroShunt implantation in glaucoma patients of different sub types were retrospectively analysed in this study. 7 (9%) of the 74 cases were combined with Phacoemulsification surgery however majority (91%) of the cases were stand alone procedures. Patient characteristics, as well as success and failure rates, were assessed. The numbers of adverse events and revision procedures were recorded, along with any reduction in supplementary medication. The progression of intraocular pressure (IOP) was assessed over the period of 24 months at four post operative follow ups at 2nd day, 6 month, 1 year and 2 years

Results: The overall success rate was 60%. Mean IOP reduction achieved was 10.2 mmHg. IOP reduced from 22.5 mmHg preoperatively to 12.3 mmHg at 2 years postoperatively ($p < 0.01$). The reduction in mean number of glaucoma medication was 2.5 overall, reducing from 2.8 medication preoperatively to 0.3 postoperatively at the latest follow-up. Mean deviation on automated perimetry improved from -11.4db pre-operatively to -10.74db post operatively. Revision surgery was performed in 8% of cases and needling with 5FU injection was carried out in only 1% cases. 7% of all the cases had a surgical failure and required a subsequent glaucoma surgery either a further tube implant or trabeculectomy surgery. Significant hypotony occurred postoperatively in only 15% of patients in the initial phase and regressed after a week in 91% of all cases on its own

Conclusion: The PreserFlo MicroShunt device has demonstrated a significant reduction in IOP over the period of 2 years in our study with a good safety profile and a very low frequency of intra-operative or postoperative complications or failure overall

618 - P3.076

FACTORS ASSOCIATED WITH POSTOPERATIVE INTRAOCULAR PRESSURE SPIKE FOLLOWING MICROPULSE TRANSSCLERAL LASER THERAPY

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Purpose: To assess the incidence and contributing factors of postoperative intraocular pressure (IOP) spike following micropulse transscleral laser therapy (MPTLT)

Methods: This prospective observational study included 80 eyes from 80 glaucoma patients undergoing MPTLT under retrobulbar anesthesia. IOP spike was characterized as an increase in IOP of 5 mmHg or more relative to the initial baseline IOP, seen one hour after laser treatment. A total of fifteen potential factors, including demographic characteristics, glaucoma diagnosis, glaucoma severity, laser parameters, baseline IOP, and current medication, were investigated to determine their association with two outcomes: (1) the IOP change (1-hour IOP minus baseline IOP) and (2) the occurrence of 1-hour IOP spike. Multivariable backward stepwise regression models were constructed to identify factors that are significantly linked with a removal significance level of 0.1.

Results: The mean (standard deviation) IOP change was -0.16 (6.40) mmHg. Thirteen eyes (16%) met the criteria for the IOP spike. Among these, five eyes (6%) had IOP rising of greater than 10 mmHg. The univariable analysis showed that the diagnosis of childhood glaucoma (p = 0.30), a younger age (p = 0.01), and a larger cup-to-disc ratio (p = 0.007) had higher proportion of IOP spike. Stepwise linear regression identified that preexisting use of alpha2 adrenergic agonists (B -3.78, 95% CI -7.12 to -0.44, p = 0.027) and higher baseline IOP (B -0.12, 95% CI -0.24 to -.001, p = 0.048) were shown to be associated with lower IOP changes. Preexisting use of alpha2 adrenergic agonists and age were identified as protective factors for developing an IOP spike from the stepwise logistic regression with odds ratios of 0.17 (95% CI 0.31 to 0.93, p = 0.041) and 0.95 (95% CI 0.90 to 0.99, p = 0.022), respectively.

Conclusion: One sixth of the patients experienced a postoperative IOP spike. Patients with preexisting use of alpha2 adrenergic agonists tended to have a lower degree of IOP change and a lower IOP spike.

619 - P3.077

TREATMENT OUTCOMES OF UNCONTROLLED GLAUCOMA WITH THE MOLTENO3 IMPLANT VS THE BAERVELDT IMPLANT: A SINGLE-CENTRE EXPERIENCE

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Purpose: To compare the outcomes of the Molteno3 (M3) (Molteno Ophthalmic Limited, Dunedin, New Zealand) and the Baerveldt (BGI) (Abbott Medical Optics, Abbott Park, IL) glaucoma implants to treat uncontrolled glaucoma in patients with or without previous glaucoma surgeries.

Methods: Retrospective, nonrandomized, comparative chart review of patients who underwent implantation of the M3 or the BGI at a single centre in Barcelona. A total of 66 eyes from 61 patients were included. Outcome Measures: intraocular pressure (IOP), use of glaucoma medications, success (IOP ≤ 21 mmHg and reduced by 20% from baseline, IOP > 5 mmHg, no reoperation for glaucoma, no removal of implant, no loss of light perception), visual acuity and complications.

Results: Preoperative IOP (mean ± SD) was 27.5 ± 10.1 mmHg on 2.7 ± 1.2 glaucoma medications for the M3 group (n = 32) and 27.5 ± 7.3 mmHg on 3.1 ± 1.2 glaucoma medications for the BGI group (n = 34). Patients were followed for a median of 48 months. At the last follow-up visit, IOP (mean ± SD) was 14.4 ± 5.2 mmHg in the M3 group and 14.8 ± 5.4 mmHg in the BGI group (p = 0.73) and the average ± SD number of glaucoma medications was 1.4 ± 1.5 in the M3 group and 0.8 ± 0.8 in the BGI group (p = 0.04). Using Kaplan-Meier analysis, survival percentages at 48 months were 80.4% for the M3 group and 78.6% for the BGI group. Log-rank test for comparison of survival indicated no significant difference between the 2 groups (p > 0.5). Another incisional glaucoma surgery was required in 6,3% of the M3 group and 8,8% of the BGI group (p = 0.69). Failure due to hypotony only occurred in 2 eyes of the BGI group. One eye in each group lost light perception.

Conclusion: The M3 and the BGI both were effective at lowering IOP, but M3 implantation was associated with more glaucoma medication need in the postoperative period. Similar rates of surgical success were observed with both implants at 4 years.

630 - P3.078

PRELIMINARY REAL WORLD CLINICAL OUTCOMES OF COMBINED PHACOEMULSIFICATION AND ISTENT INFINITE TM BYPASS IMPLANTATION IN A HETEROGENEOUS POPULATION

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Purpose: To assess the short-term preliminary clinical outcomes and adverse event data of combined phacoemulsification and iStent® InfiniteTM TM bypass implantation in a heterogenous cohort of glaucoma patients.

Methods: Single-center, retrospective interventional case series of consecutive patients that underwent combined phacoemulsification with iStent® InfiniteTM between April 2023 and September 2023. All surgeries were performed by three attending surgeons and directly supervised clinical fellows practicing within an academic ophthalmology center in the Greater Toronto Area, Canada. The primary endpoint was the success rate defined as the proportion of eyes with either medication reduction and no increase in intraocular pressure (IOP) or 20% IOP reduction with the same or less medication. Secondary outcomes included the mean post-operative IOP and classes of drops at month 3 (POM3), the mean last recorded uncorrected visual acuity (VA) as well as any complications or re-operations.

Results: 23 eyes of 19 patients were identified. 53% were females. Mean age was 74.2 years. 39.1% of the eyes had a diagnosis of Primary Open Angle Glaucoma, 34.9% of Primary Angle Closure Glaucoma, 13% of Pseudoexfoliative Glaucoma and 13% of Ocular Hypertension. 47.8% were classified as having advanced glaucoma, that is a visual field mean deviation (MD) of less than -12db or presence of central defects. 30.5% had moderate disease (MD between -6db and -12db) and 8.7% had mild disease (MD more than -6db). Mean pre-operative IOP was 15.5 mmHg on 2.1 drops and mean pre-operative VA with the patients' habitual refraction was 0.5 (LogMAR). 78.6% of eyes achieved the primary endpoint. Mean IOP at POM3 was 12.6 mmHg on 1.1 drops ($p < 0.05$ for both IOP and medication reduction from preop) and mean uncorrected VA was 0.3 ($p < 0.05$). There were no intra-operative complications. One eye spiked to 24 mmHg on day 1 that resolved without treatment. One eye developed a neurotrophic ulcer at 6 weeks unrelated to the surgery. There were no re-operations.

Conclusion: Short-term outcomes of combined phacoemulsification with iStent® InfiniteTM in a heterogeneous population showed no serious adverse events with a high success rate along with a clinically and statistically significant reduction in IOP and number of drops used at POM3.

647 - P3.079

EVALUATING HIGH INTRAOCULAR PRESSURE CRITERIA USED TO DEFINE FAILURE IN GLAUCOMA SURGERY STUDIES AND THEIR IMPACT ON SUCCESS RATE OF GLAUCOMA SURGERY

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Purpose: To systematically review high intraocular pressure (IOP) cutoffs used as failure criteria in glaucoma surgical studies and to evaluate the impact of applying these criteria on the surgical success rates in two cohorts of glaucoma patients.

Methods: We conducted a systematic literature review (Prospero CRD42023460048) using MEDLINE to search for studies on glaucoma surgery techniques providing subconjunctival filtration. Two reviewers independently selected studies for inclusion and extracted high IOP criteria for surgical failure. Subsequently, variations of the "21 mmHg" criterion were applied as failure criteria in two geographically distinct retrospective cohorts of glaucoma patients: 1) 934 eyes (766 patients) undergoing trabeculectomy in a US institution; 2) 1,765 eyes (1,385 patients) undergoing deep sclerectomy (DS) in two UK hospitals. Additional failure criteria included reoperation for high IOP or hypotony, cyclodestructive therapy, and loss of light perception.

Results: Out of 2,503 identified studies, 277 met the eligibility criteria. We identified 147 different high IOP failure criteria. The most common criterion was 21 mmHg (67.1%), of which 46 variants were identified. The individual most frequent criterion was IOP > 21 mmHg at any visit, used in 61 studies (22%). Out of the 46 variants of the 21 mmHg criterion, 45 were applied as failure criteria in the two cohorts. Success rates greatly varied as a function of high IOP criterion used to define failure. Overall, the median (interquartile range) success rates calculated with the various criteria at 3 and 5 years were, respectively, 49.6% (33.6-70.7%) and 39.9% (25.9-64.0%) for trabeculectomy and 70.0% (56.2-87.1%) and 60.7% (50.0-80.5%) for DS. In comparison to IOP > 21 mmHg at any visit, various high IOP criteria led to different risks of failure, with hazard ratios ranging from 0.35 to 4.42 for trabeculectomy and from 0.22 to 3.88 for DS.

Conclusion: The criteria for defining high IOP failure in glaucoma surgery are highly heterogeneous in the current literature. This significantly impacts on glaucoma surgery success rates, underscoring the need for standardized failure criteria to enable consistent interpretation and comparison across studies.

654 - P3.080

EFFICACY AND SAFETY OF STENTED VS. NON-STENTED PRESERFLO MICHROSHUNT

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Purpose: To compare efficacy and safety of Preserflo Michroshunt (PMS) implantation with and without the insertion of 10-0 nylon suture as intraluminal stent.

Methods: This was a retrospective multicentric study involving consecutive adult glaucoma patients who underwent 0.4 mg/mL Mitomycin C augmented PMS implantation for uncontrolled intraocular pressure (IOP) with or without endoluminal 10-0 nylon suture. Congenital, juvenile and secondary glaucoma were excluded from the analysis. Surgeries were performed at Sant'Orsola Hospital and at Nuovo Ospedale Civile di Sassuolo. The decision to incorporate a 10-0 nylon intraluminal suture was at the discretion of each surgeon, patients were divided into two groups: non-stented PMS (nsPMS) and stented PMS (sPMS). Follow-up points were established at 1, 7, 14, 21, 30, 60, 90, and 120 days from surgery. The study defined overall success as an IOP >5 and ≤ 18 mmHg with a reduction of at least 20% from baseline at each follow-up point or after stent removal, achieving complete success without the need for glaucoma medications.

Results: Charts from 140 eyes, 75 in the nsPMS and 65 in the sPMS group, were reviewed. Baseline characteristics were comparable between the two groups. The proportion of patients that achieved overall and complete success was comparable (62.76 ± 6.68% and 61.76 ± 9.67% for overall success, and 56.61 ± 7.35% and 53.14 ± 10.28% for complete success in nsPMS and sPMS groups at 120 days, respectively, log-ranks: $p = 0.46$ and $p = 0.33$, respectively). IOP differed significantly ($p < 0.000$) between the two groups only on postoperative days 1 and 7. Mean IOP at 120 days was 12.84 ± 3.49 mmHg for nsPMS and 13.5 ± 4.38 mmHg for sPMS ($p = 0.64$). Seventeen nsPMS and 5 sPMS patients developed numerical hypotony ($p = 0.019$), and 16 and 3 patients, respectively, experienced hypotony-related complications (HRCs) ($p = 0.005$). Other adverse events and reinterventions were comparable.

Conclusion: While the two groups revealed similar success rates, the study underscores the advantage of the stented PMS approach in mitigating the risk of hypotony and HRCs. These findings emphasize the potential benefits of incorporating a 10-0 nylon suture as an intraluminal stent during PMS implantation to minimize adverse events.

659 - P3.081

EVALUATION OF AUTO-TONOMETRY IN PATIENTS WITH GLAUCOMA: POST-SURGICAL FOLLOW-UP

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Purpose: To evaluate the use of auto-tonometry with iCare Home2© to detect changes in intraocular pressure (IOP) in patients with recent glaucoma surgery.

Methods: Prospective study of patients with glaucoma who undergo a surgical technique (Deep Non-penetrating Sclerectomy: DNPS, trabeculectomy, ExPRESS©, PRESERFLO©, iStent©). Then, four to six weeks after surgery, self-tonometry (4 times a day) of your IOP is performed from home for 7 days. Changes in IOP value over seven days, response to surgical treatment, and visual acuity are evaluated.

Results: Eighteen patients were included (16 unilateral, 1 bilateral) with a diagnosis of glaucoma of different etiology (12: Primary Open Angle (POAG), 4: Pseudoexfoliative (GPSX), 1: Pigmentary, 1: Myopic). According to severity, the glaucomas were: mild (30.0%), moderate (25.0%), advanced (30.0%) and severe (15.0%). Ten men and 8 women were included. The presurgical values were: age 64.7 ± 11.2 years, distance visual acuity: 0.087 ± 0.136 (LogMAR), IOP 20.7 ± 5.6 mmHg, number of hypotensive eye drops 2.3 ± 1.0. The surgical techniques used were: EPNP (2, 11.1%), ExPRESS© (10, 55.6%), trabeculectomy (2, 11.1%), PRESERFLO© (3, 16.7%), iStent© (1, 5.6%); In 7 eyes (38.9%) lens phacoemulsification was associated. During home monitoring by auto-tonometry according to day, the number of measurements was: day 1 (3.4 ± 0.8), day 2 (3.8 ± 0.4), day 3 (3.7 ± 0.7), day 4 (3.8 ± 0.6), day 5 (4.0 ± 0.0), day 6 (4.0 ± 0.0), day 7 (3.3 ± 1.0). At the final consultation visit, the IOP was 16.0 ± 3.9 and the IOP on day 7 by auto-tonometry was 18.6 ± 7.3, with a correlation between these measurements (r = 0.598, p = 0.001). During follow-up, two cases of IOP peaks were detected that required new early surgical intervention.

Conclusion: Measuring IOP by auto-tonometry in patients with recent glaucoma surgery is a good option for clinical monitoring, allowing early surgical procedures to be taken. It was also observed that there is a correlation between IOP by self-tonometry and that recorded in the ophthalmological consultation.

664 - P3.082

HIGHER-ORDER ABERRATIONS AFTER 180-DEGREE SEGMENTAL SUTURE GONIOSCOPY-ASSISTED TRUNSLUMINAL TRABECULOTOMY COMBINED WITH PHACOEMULSIFICATION

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Purpose: To investigate the impact of 180-degree segmental suture gonioscopy-assisted transluminal trabeculotomy (GATT) combined with phacoemulsification (Phaco) (hemi-GATT + Phaco) on higher-order aberrations.

Methods: This study involved 89 eyes that underwent surgical treatment with either hemi-GATT + Phaco (n = 43 eyes) or Phaco alone (n = 46 eyes) by a single surgeon. In all 89 eyes, corneal higher-order, coma-like, and spherical-like aberrations at a 4-mmdiameter were measured at prior to surgery and at 1-, 2-, and 3-months postoperative using the KR-1W Corneal Wavefront Analyzer (Topcon). A paired t-test with P-values corrected via the Bonferroni method was then used to analyze and compare the values over the 3-month postoperative period.

Results: In the hemi-GATT + Phaco group at prior to surgery and at 1-, 2-, and 3-months postoperative, respectively, corneal higher-order aberrations were 0.170 ± 0.053μm, 0.230 ± 0.088μm, 0.222 ± 0.081 μm, and 0.211 ± 0.079 μm (all, $p < 0.01$), thus illustrating a significant increase post surgery, coma-like aberrations were 0.148 ± 0.049 μm, 0.212 ± 0.091 μm, 0.205 ± 0.082 μm, and 0.196 ± 0.083 μm (all, $p < 0.01$), also illustrating a significant increase post surgery, while spherical-like aberrations were 0.076 ± 0.039 μm, 0.078 ± 0.032μm, 0.078 ± 0.032 μm, and 0.072 ± 0.040 μm, illustrating no significant changes post surgery. In the Phaco alone group, no significant changes in corneal higher-order, coma-like, and spherical-like aberrations were observed between those at before and after surgery.

Conclusion: Corneal higher-order and coma-like aberrations increased over the 3-month postoperative period in the hemi-GATT + Phaco group, although higher-order aberrations remained stable in the Phaco alone group.

671 - P3.083

THE PILOT STUDY OF BELKIN LASER DIRECT-SLT IN GLAUCOMA

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Purpose: To assess the immediate effect, tolerance and perisurgical side effects of a direct selective trabeculoplasty (dSLT) procedure in moderate Glaucoma.

Methods: Prospective observation of 31 eyes 18 patients treated with direct selective trabeculoplasty (dSLT) with Eagle laser (Belkin Vision, Israel). After the brimonidine tartate (Alphagan, Abbvie, DE, USA) and proxymetacaine hydrochloride (Alcaine, Alcon, Fort Worth, TX, USA) eyedrops instillation, 360° trabeculoplasty of 120 impacts with average energy of 1.8 mJ was applied. After the procedure, tobramycine+dexamethasone (Tobradex, Alcon, Fort Worth, TX, USA) eyedrops were used. The intraocular pressure (IOP) was monitored before the procedure and 30 minutes after using Goldmann Applanatory Tonometer. Thirteen patients had both eyes treated and 5 underwent unilateral procedure. Patients' perspective of the procedure and side effects, such as anterior chamber flare and limbal microbleeding were recorded.

Results: The preoperative IOP was 17.5 ± 2.9 mmHg and 30-minutes IOP was 15.9 ± 3.8 mmHg. In 10 out of 31 eyes procedure induced perilimbal microbleeding (32.2%) and in 27 out of 31 eyes anterior chamber flare was observed (87.1%). During procedure in 11 eyes, patients reported mild pain sensation (35.5%) that was absent after several seconds after procedure.

Conclusion: A direct selective trabeculoplasty (dSLT) procedure in moderate glaucoma can be one of treatment options modulating IOP. Initial observations show that this procedure is burden with a low rate of possible immediate complications with very good tolerance. While dSLT safety profile appears appealing, comparative studies using traditional SLT and pharmacotherapy in different types of glaucoma are needed to confirm at least comparable efficacy in the long term.

677 - P3.084

A GUARDED FILTRATION IMPLANT, ASTREAM; THE FIRST CASE REPORT

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Purpose: Astream (Microt, Seoul, South Korea), the first glaucoma implant developed in South Korea, is a micro-sized glaucoma implant made of silicone with a length of 6mmand an inner diameter of 100μm. Intraluminal stent is embedded in the silicone tube being expected to play a role in the hypertensive phase as a key option in post operative management. We report a short-term result for the first time in the world.

Methods: Astream was implanted in patients with open-angle glaucoma whose IOP was not controlled even on MTMT. Surgery was performed by one skilled surgeon (S.R). After local anesthesia, the conjunctiva was incised with the limbal base to secure the subconjunctival space, and then the scleral flap was created. The 3 x 3mmtrapezoidal scleral flap was made with depth about 50% of the thickness of the sclera. After applying 0.04%mmC for about 2 minutes, A-stream was inserted at a distance of 1mmfrom the corneal limbus via a 30 G puncture. The implant was fixed with 10-0 nylon, and conjunctiva was sutured with 8-0 vicryl.

Results: The preoperative IOP was 25 mmHg, and the IOP decreased to 2 mmHg on postoperative day 1, but remained above 6 mmHg and below 10 mmHg until post-operative 2 week. During the follow-up period, the anterior chamber was kept deep during the first month. The anterior-segment OCT showed well elevated bleb.

Conclusion: Astream is a valuable option that can overcome cliché hurdles of conventional glaucoma surgery with safety and efficacy.

681 - P3.085

AUDIT OF THE SAFETY AND EFFICACY OF TRABECULAR STENT BYPASS MICROSURGERY

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Purpose: Glaucoma is a multifactorial optic neuropathy which can be slowed by reducing the intra-ocular pressure (IOP) [1]. One surgical option is the use of trabecular micro-bypass stents [2]. We present an analysis of the safety and efficacy of trabecular stent bypass microsurgery with comparison to data used in the development of NICE guidance [3,4].

Methods: Retrospective analysis of patients that underwent cataract surgery and the insertion of two iStents by an experienced surgeon over an 18-month period. Data was collected via online clinical notes. Primary outcome was IOP at 12 months, with secondary outcomes including change in medications, visual acuity and Humphrey visual fields.

Results: 24 eyes included. Average was 80 years, with 66.7% male and 33.3% female. The most common diagnosis was primary open angle glaucoma (58%). Average IOP pre-op was 18.1 mmHg, at 6months 13.7 mmHg and at 12 months 13 mmHg (Figure 1). 80% of patients were either on no drops (63%) or one drop (17%) at 1 year, with an average reduction of 1.5 drops per patient. 100% of patients had 6/12 or better at 1 year, and there was stabilisation in visual fields (Tab. 1). There were no intra-operative complications, and a post-operative complication rate of 4.2% (n = 1, cystoid macular oedema). Full efficacy and safety outcomes can be seen in Table 2.

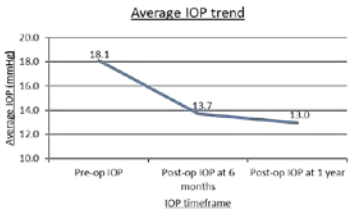

Figure 1

	Mean deviation	Pattern standard deviation
Pre-op	-4.99	3.73
Post-op	-4.65	3.85
Change from baseline	-0.34	-0.12

Table 1.

Table 2

Outcome aims		Standard	Audit
Efficacy	Unmedicated IOP < 21 mmHg at end of follow up	61%	63%
	Mean reduction in topical medications	1.1 per patient	1.5 per patient
	Vision 6/12or better 1-year post-procedure	96%	100%
Safety	Severe loss of visual acuity	0.4%	0%
	IOP spike (10 mmHg more then baseline)	4%	0%
	Cystoid macula oedema	1%	4.2%
	Iritis	1%	0%
	Stent malposition	2-18%	0%
	Further surgery neede (including stent repositioning, removal, replacement and trabeculoplasty)	4%	0%

Conclusion: Overall, after surgery patients had better IOP control, a reduced number of medications, improved visual acuity and stable visual fields at 1-year. It was a safe procedure with no complications resulting poor outcomes or return to theatre. Our outcomes were similar to or better than current research data.

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690 - P3.086

SUBFOVEAL CHOROIDAL THICKNESS CHANGES AFTER DEEP SCLERECTOMY WITH ESNOPER CLIP AND V2000 IMPLANTS - A ONE-YEAR PROSPECTIVE STUDY

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Purpose: To evaluate subfoveal choroidal thickness (SCT) changes after deep sclerectomy (DS) with drainage implants at one year after surgery.

Methods: We prospectively investigated 58 eyes (54 patients) with open-angle glaucoma who underwent DS with Esnoper Clip and V2000 implants between 3/2018 and 11/2023. The mean age of patients was 71 ± 10.7 years (42-92). We evaluated: intraocular pressure (IOP) and glaucoma medication (GM) reduction, choroidal thickness changes in the subfoveal area, intraoperative and postoperative complications at 1 week (1w), one month (1M), as well as three (3M), six (6M), nine and 12 months follow-up (12M). Macular scans were performed using the Spectralis® SD-OCT device (Heidelberg Engineering GmbH, Heidelberg, Germany).

Results: Preoperative IOP was 20.2 ± 7.5 mmHg and decreased upon follow-up ($p < 0.01$). Moreover, preoperative SCT was 191.1 ± 68.6 um and increased upon follow-up ($p < 0.01$). The postoperative mean IOP and SCT values were: 8.4 ± 5.1 mmHg and 243.7 ± 76.7 um at 1w and 14.3 ± 6.0 mmHg and 197.6 ± 65.4 um at 1M, gradually shifting to 13.4 ± 3.7 mmHg and 211.8 ± 61.7 um at 12M. The level of SCT increase was directly related to the scale of the IOP decrease, as well as its absolute value, in individual patients. At 12M, mean SCT remained elevated by 20.7 um compared to its preoperative value. The mean GM preoperatively was 2.9 ± 0.8 and decreased to 0.3 ± 0.8 at 12M ($p < 0.01$). YAG-goniopuncture was performed in 32.8% of cases between 1M and 12M postoperatively when the IOP target was not reached. In terms of complications, we noted a transient clinically significant hypotony (IOP≤ 5 mmHg) in 7 eyes at 1w postoperatively and a chronic clinically insignificant hypotony in 1 eye at 12M after surgery. Moreover, we observed choroidal detachment in 4 eyes, a shallow anterior chamber in 3 eyes and mild hyphema in 6 eyes. These complications occurred in cases with clinically significant hypotony and resolved within 1-2 weeks.

Conclusion: Based on our results, we noted that choroidal thickening is directly related both to the level of IOP decrease, and to its absolute value. Thus, the lower the IOP value and the greater the IOP reduction after surgery, the more SCT increases.

694 - P3.087

EARLY OUTCOMES AFTER THIRD-GENERATION TRABECULAR MICRO-BYPASS PERFORMED WITH PHACOEMULSIFICATION IN PATIENTS WITH OPEN-ANGLE GLAUCOMA

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Purpose: The newest trabecular micro-bypass device, iStent infinite, is comprised of three stents that can be implanted in a standalone procedure or in combination with phacoemulsification. This study evaluated the intraocular pressure- and medication-lowering efficacy of iStent infinite in combination with phacoemulsification in open-angle glaucoma and high risk suspects.

Methods: This was an unmasked, non-randomized, retrospective, consecutive study including 41 eyes of 28 patients who had undergone iStent infinite implantation with phacoemulsification. Subjects were either glaucoma suspects (n = 4) or patients with OAG (n = 37). Prior failed surgeries included 8 eyes with prior selective laser trabeculoplasty and 2 eyes with prior laser peripheral iridotomy. No patients had a history of failed prior incisional or cilioablative surgery. IOP, medication burden, and adverse events (AEs) were evaluated preoperatively and through 3 months postoperatively; a larger sample size and 6-month data will be available by the time of the conference.

Results: Mean IOP was reduced from a baseline of 17.0 ± 3.7 mmHg to 13.6 ± 4.1 (n = 27; $p < 0.0001$) at 1 month and 14.4 ± 3.4 mmHg (n = 11 $p = 0.062$) at 3 months. Baseline medication burden was 1.3 ± 0.9 (n = 41) and was 1.6 ± 0.7 at 3 months (n = 11, not significant), although the small sample size and residual postoperative medication regimen make it difficult to draw conclusions. Intraoperative complications included mild hyphema in two patients which resolved within 24 hours. Postoperative AEs included two patients with IOP spikes (>10 mmHg increase from baseline) which resolved by Month 1.

Conclusion: iStent infinite implantation in combination with phacoemulsification significantly reduced IOP through 3 months in mild-to-moderate glaucoma patients with no history of incisional or cilioablative surgery, with a favorable safety profile.

697 - P3.088

PAUL GLAUCOMA IMPLANT FOR THE TREATMENT OF REFRACTORY GLAUCOMA: PRELIMINARY OUTCOMES FROM A MULTICENTER RETROSPECTIVE COHORT STUDY

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Purpose: To evaluate the preliminary efficacy and safety results of the Paul Glaucoma Implant (PGI) for the treatment of refractory glaucoma patients.

Methods: Multicenter, retrospective cohort study of consecutive patients undergoing PGI in three European glaucoma units. Success was defined as IOP < 21 mmHg with 20% IOP reduction from preoperative values. Failure was defined as IOP above these thresholds for 2 consecutive visits after 3 months from surgery, loss of light perception, further intraocular pressure (IOP) lowering procedure, surgical revision for hypotony, and PGI removal. Kaplan-Meier analysis was used to estimate the success of the procedure.

Results: Eighty-four eyes (79 patients) were included in this study, with a median (interquartile range [IQR]) follow-up of 10.3 (4.1 to 20.2) months. The median (IQR) preoperative age and visual field mean deviation were 69.9 (57.5 to 78.7) years and -23.5 (-13.2 to -29.2) dB, respectively. The median IOP significantly ($p < 0.001$) decreased from 26.0 (21.8 to 32.3) mmHg preoperatively to 12.5 (10.0 to 16.0) mmHg and 11.0 (9.0 to 15.0) mmHg at 6 and 12 months, respectively (Figure 1). The median number of medications decreased from 3 (3 to 4) preoperatively to 0 (0 to 1) at the 1-year mark. Qualified success rates (95% confidence interval [CI]) at 6 and 12 months were 95% (87.9%-100%) and 86.3% (74.3%-100%), respectively (Figure 2). Postoperative complications included hyphema (12 eyes), choroidal effusion (8 eyes), corneal edema (8 eyes, requiring endothelial keratoplasty in 4 eyes), hypotony maculopathy (6 eyes), reduced anterior chamber depth (3 eyes), vitreous hemorrhage (2 eyes), obstructed tube by iris (2 eyes), diplopia (2 eyes), and tube exposure (2 eyes). Ripcord removal was the most common postoperative procedure (27 eyes). Two patients underwent a second PGI due to insufficient IOP reduction, while other two patients underwent PGI removal (in one case combined with Microshunt implantation) due to recurrent tube exposure.

Conclusion: PGI shows good preliminary efficacy with a favourable safety profile for the surgical treatment of refractory glaucoma. Randomized controlled clinical trials comparing this device to other aqueous shunts are needed.

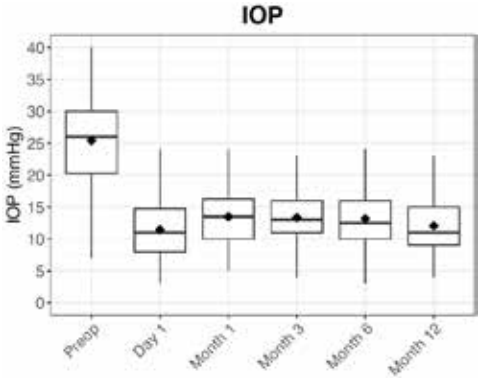

Figure 1. Intraocular pressure values over time.

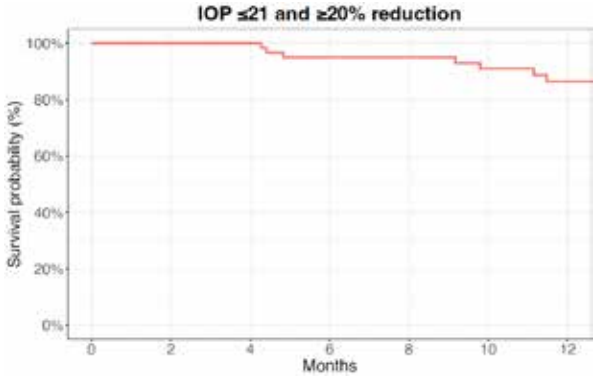

Figure 2. Kaplan-Meier curves depicting the success rate.

699 - P3.089

EFFICACY OF XEN63 GEL STENT DEVICE AT 12-MONTHS FOLLOW-UP IN PATIENTS WITH PROGRESSIVE GLAUCOMA

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Purpose: To analyze the results of patients with progressive glaucoma undergoing Glaucoma surgery using the XEN63® gel stent device.

Methods: An observational retrospective study was carried out in which we included 25 eyes of 24 patients, over 18 years old, who underwent Glaucoma Surgery using the XEN63® gel stent device from November 2022 to November 2023. The parameters studied were IOP and the number of drugs prior to surgery and in the postoperative period at 24 hours, 2 weeks, 3 months, 6 months and 1 year after the intervention. In addition, the number of complications or need for reoperation was recorded.

Results: The initial diagnosis of the sample was: primary open-angle glaucoma (65%), refractive glaucoma (19%), pseudoexfoliative glaucoma (8%) and myopic glaucoma (8%). 73% of the patients had not received prior treatment and 27% had received it (two patients with previous selective trabeculoplasty laser (SLT), three patients with non-penetrating deep sclerectomy and two patients with trabeculectomy and Ahmed valve). The preoperative mean IOP was 20.23 ± 4.15 mmHg and decreased to 14.75 ± 5.82 mmHg one year after the intervention. Medication use decreased IOP from a mean of 3 ± 0.84 mmHg to 0.5 ± 1 mmHg per patient. There was a need for reintervention in four patients who underwent a revision of gel stent device. Three blebs needling with Mitomycin C were performed. One case of serous choroidal detachment is described as complication and it resolved spontaneously. There was no case of stent exposure, persistent choroidal effusions, or endophthalmitis. No intraoperative complications were recorded.

Conclusion: The XEN63®, either alone or in combination with cataract surgery, significantly lowered the IOP and reduced the need for ocular hypotensive drugs over a period of 12 months in patients with progressive glaucoma with a favorable safety profile. This surgical technique could be a good alternative for those patients. Further studies, with a greater sample size and a longer follow-up are warranted to confirm these first results.

700 - P3.090

SELECTIVE LASER TRABECULOPLASTY AS LIFESAVING TREATMENT FOR THE CORNEA WHEN SEVERE OCULAR SURFACE DISEASE CO-EXISTS WITH GLAUCOMA

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Purpose: To evaluate the efficacy of Selective Laser Trabeculoplasty (SLT) in patients diagnosed with both glaucoma and severe cicatricial conjunctivitis (CC).

Methods: Enrolled patients underwent Goldmann tonometry and ocular surface status evaluation two weeks prior to SLT, on the day of the laser procedure, and at 2 weeks, 1, 3, 6, and 12 months post-SLT. The comprehensive evaluation included Schirmer Test (ST), Tear Break-Up Time (TBUT), Corneal Fluorescein Staining, and Ocular Surface Disease Index (OSDI) score.

Results: A total of 10 eyes from 7 patients (6 women/1 man) with a mean age of 58.8 ± 14.2 were included. Conditions included Ocular Graft-versus-Host Disease (2), Systemic Sclerosis (1), Ocular Cicatricial Pemphigoid (3), and Stevens-Johnson Syndrome (1). All patients were under systemic immunomodulation. Baseline mean IOP was 23.8 ± 2.1 mmHg which decreased to 15.9 ± 1.8 mmHg at 12 months ($p < 0.001$). The baseline number of lowering drugs was 2.2 ± 0.8 and decreased to 0.7 ± 0.7 one year after treatment ($p < 0.001$). At baseline, OSDI was 56.5 ± 20.5, TBUT was 2.5 ± 1.5 seconds, and ST was 3.8 ± 3.3 mm. At 6 months, there was an increase in TBUT (in 80% of eyes), decreased corneal fluorescein staining, and a reduction in OSDI symptoms (in 70% of cases) which remained stable at 12 months. No significant changes in ST were observed. No serious laser-related adverse events occurred. At 12 months, one eye underwent a second SLT and one required filtration surgery.

Conclusion: When the cornea is sufficiently clear, SLT may aid in preserving the ocular surface by avoiding potential harm from topical IOP-lowering medications. Alternatively, SLT can be used to reduce medication burden, leading to beneficial outcomes for the ocular surface and potentially averting the need for surgery, particularly challenging in severe ocular surface disease.

706 - P3.091

DURAGEN AS A HEALING MODULATOR AFTER NON-FUNCTIONING GLAUCOMA SURGERIES

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Purpose: To present fourteen cases of reinterventions performed on previously non-functioning glaucoma surgeries using Duragen® as a healing modulator.

Methods: We reviewed fourteen cases of reinterventions on non-functioning prior glaucoma surgeries (Eight non-perforating deep sclerectomies, five preserflo® microshunt implants and one Xen 63® implant) using DuraGen as a healing modulator conducted at our hospital from March 2023 to November 2023. Following surgery review and appropriate adjustment of implant size for each case according to the surgeon's criteria, DuraGen® was subconjunctivally placed in all cases with additional subescleral placement in some instances. Subsequently, conjunctiva closure was performed using Nylon 10/0. Postoperative treatment for all cases included a descending regimen of both antibiotics and corticosteroids, NSAIDs as tolerated, and cycloplegics for those that needed conversion to trabeculectomy.

Results: The preoperative mean intraocular pressure (IOP) was 27.5 mmHg with an average of 1.14 hypotensive medications. One-month post-surgery, the mean IOP was 12.2 mmHg with 0.14 hypotensive medications. No patient presented serious complications, except for one who required reintervention at two weeks due to iris incarceration.

Conclusion: The most common cause of failure in filtering surgeries is subconjunctival and episcleral fibrosis, with an increased risk in re-intervened patients. The introduction of antimetabolites like mitomycin C has improved success rates in these surgeries, but not without associated risks. In the search of alternative methods for post-surgical healing modulation, Ologen® implant had proven to be effective and safe but is no longer commercially available. DuraGen®, an implant with very similar characteristics (biodegradable collagen matrix with a porous structure designed for dura mater defect restoration), could be a suitable alternative. It serves as a support that modulates fibroblast infiltration and new collagen deposition, creating a stable filtration space once the matrix is absorbed.

710 - P3.092

MICROPULSE VERSUS CONTINUOUS WAVE TRANSSCLERAL CYCLOPHOTOCOAGULATION IN REFRACTORY GLAUCOMA

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Purpose: To compare the IOP-lowering efficacy of micropulse transscleral cyclophotocoagulation (MP-TSCPC) and continuous wave transscleral cyclophotocoagulation (CW-TSCPC) in eyes with refractory glaucoma.

Methods: Patients with a history of failed glaucoma surgery or high risk of failure due to previous eye surgery were referred for TSCPC. The procedure was performed with the Iridex Cyclo G6 (IRIDEX Laser System) using the MP3 or the G-Probe devices. Intraocular pressure (IOP), visual acuity, number of antiglaucoma medications and postoperative complications were monitored during 12-month follow-up. The success was defined as a reduction in IOP of ≥ 30% reduction from baseline.

Results: Thirteen patients were treated with MP-TSCPC and 20 with CW-TSCPC. The success rate after 12 months was 38.5% for MP-TSCPC and 50% for CW-TSCPC. The mean IOP at baseline was 30.2 mmHg for MP-TSCPC and 29.9 mmHg for CW-TSCPC. The change in IOP from baseline at 12 months was -3.9 mmHg in the MP-TSCPC group and -7.4 mmHg in the CW-TSCPC group, which was not significant ($p = 0.68$). No significant difference was found in the number of IOP-lowering medications. The ocular side effects: mild anterior chamber inflammation and transient epitheliopathy were more frequent in the CW group (4/13) than in the MP-TSCPC group (10/20), with severe visual loss occurring in 1 eye after CW-TSCPC treatment.

Conclusion: CW-TSCPC treatment resulted in a greater reduction in mean intraocular pressure from baseline than MP-TSCPC treatment, although it was not significant at 12 months.

750 - P3.093

THE USEFULNESS OF INTRAOPERATIVE OCT TO DETERMINE THE TUBE-ENDOTHELIUM DISTANCE AFTER PRESERFLO IMPLANTATION

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Purpose: To describe the usefulness of intraoperative optical coherence tomography (OCT) to predict the final PreserfloTM device position measuring tube-endothelium (T-E) distance.

Methods: A total of 13 eyes operated with PreserfloTM implant (Santen, Osaka, Japan) were included. A comprehensive ophthalmic examination was performed before and after glaucoma surgery (intraocular pressure (IOP), cut to disc ratio (C/D), visual field variables and OCT, endothelial cell count). Intraoperatively, anterior segment OCT scans were obtained using Rescan 700 OCT system (Carl Zeiss Meditec, Inc., Oberkochen, Germany) with cross-section of the device. One-day post-surgery anterior segment OCT using Spectralis OCT (Heidelberg) was performed in sitting position to obtain the same device section. T-E distance and tube length (TL) in the anterior chamber measured by both OCT, were the main variables. Pearson correlation (r) and intraclass correlation coefficient (ICC) were analyzed to determine intraoperative and office measurements correlation.

Results: 13 eyes (mean age was 65.42 (14.89) years) were analyzed. The mean intraoperative T-E distance measurement was 625.26 (SD 366.60) microns, and the in-office distance was 561.16 (SD 364.62) microns ($p = 0.540$). Intraoperative anterior chamber TL was 1386 (SD 701.82) microns and in-office TL was 1433.91 (SD 713.55) microns ($p = 0.029$). Excellent significative correlation was observed between both measurements of T-E distance ($r = 0.992$; $p = 0.008$) and between both TL ($r = 0.984$; $p = 0.016$). Good agreement was found between measurements obtained with both OCTs: ICC for T-E distance was 0.992 ($p < 0.001$) and 0.995 for tube length ($p = 0.001$).

Conclusion: An excellent correlation was detected between intraoperative and postoperative measurements. These results support the usefulness of intraoperative OCT to determine the correct implantation of the PreserfloTM device in anterior chamber.

757 - P3.094

PRACTICE PATTERNS OF TRABECULECTOMY IN GREECE

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Purpose: To investigate changes in glaucoma status (stage of disease, IOP level, number of medication) at the time of primary trabeculectomy over the last 10 years in Greece.

Methods: Thirty consecutive primary, stand-alone trabeculectomy cases, performed in 2023 and thirty consecutive cases performed in 2012 were identified from surgical log-books in 4 tertiary glaucoma clinics in Greece (Athens, Thessaloniki, Crete). Clinical and demographic data were retrospectively collected.

Results: Mean pre-operative intraocular pressure (IOP) and median medication requirements remained unchanged over the last decade and measured 26.3 ± 8.2 mmHg versus 26 ± 7.3 mmHg ($p > 0.058$) and 4 versus 4 in 2012 and 2023 respectively. Average visual field mean deviation (MD) of the operated eyes measured -17.4 ± 9.8 dB in 2023 versus -17.2 ± 9.9dB in 2012 ($p>0.05$). In 2012 58% of the eyes demonstrated split fixation, compared to 25% in 2023 ($p < 0.00001$). Of note 40% of the entire cohort had exfoliative glaucoma.

Conclusion: Eyes undergoing primary trabeculectomy in Greece are still operated at an advanced stage. Further research is needed to investigate whether advanced stage primary trabeculectomy is related to primary care delayed diagnosis, delayed referral or tertiary care practice patterns delaying indication for surgery.

760 - P3.095

USE OF PRESERFLO MICROSHUNT IN REOPERATED CONGENITAL GLAUCOMA: WHEN THE CHANCES NARROW

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Purpose: To determine, through the experience gathered in this case, the suitability of the PreserfloTM implant in complex glaucoma cases with little available surgical space.

Methods: Clinical follow-up over 4 years of a patient affected by congenital glaucoma, with systematic data collection in different forms such as clinical history, slit-lamp photographs and video recording through surgical microscope.

Results: We submit the case of a 45-year-old man who came to our office in 2018 presenting the following history:
Bilateral congenital glaucoma with onset in early childhood, requiring sequential bilateral trabeculectomy at 6 months of age. At 16 y-o, he underwent a new intervention on OS: Extracapsular cataract extraction + IOL + Ahmed implant at inferior quadrant. At 29 y-o, Phacoemulsification + IOL was performed on OD. Our first examination: BCVA: 12/40 OU - IOP: 16 I 18 mmHg [Timolol + Brimonidine + Latanoprost]. Slit lamp findings: OD: Flattened filtering bleb in upper quadrant, scleromalacia at the surgical site and underlying choroidal herniation and corectopic pupil - OS: Implant in lower quadrant, with significantly large and tight encapsulation - OU: Correct pseudophakia
Ophthalmoscopy: Papillary cupping, C/D ratio: 0.9 OU. VF: Deep superior arcuate scotomae in both eyes. Throughout the follow-up, IOP in OD became uncontrollable despite reaching maximal medical therapy. Visual field defects also worsened in that eye, so a filtering surgery was mandatory, but the scleromalacia severely limited the surgical space in the upper sectors, and the patient was reluctant to receive another Ahmed implant in the lower cuadrant.
Due to these circumstances, we decided to go for a PreserfloTM implant in superior temporal quadrant, making sure to avoid exposure to Mitomycin-C in the anterior 5mmof the sclera. Postsurgical assessment (bleb development, prior surgical site stability, anterior chamber inflammation and depth) was always within a satisfactory range. Over the last 6 months, IOP has remained in a 8-10 mmHg range and BCVA is 10/40.

Conclusion: We believe that the PreserfloTM implant, since it does not require a practicable anterior scleral fringe and produces a filtering bleb located 5-6mmposterior to limbus, represents an option to consider when it comes to reoperating eyes with compromised surgical spaces

773 - P3.096

INFLUENCE OF LASER TRABECULOPLASTY ON COMBINED PHACOEMULSIFICATION/ KAHOOK DUAL BLADE GONIOTOMY

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Purpose: To investigate the influence of laser trabeculoplasty (LTP) on subsequent surgery with combined phacoemulsification/Kahook Dual Blade goniotomy (phaco-KDB) in patients with open-angle glaucoma or intraocular hypertension.

Methods: A retrospective study of consecutive patients undergoing phaco-KDB between 2019 and 2021. Patients were divided into previously LTP treated and previously non-LTP treated, and LTP-treatment included argon laser trabeculoplasty (ALT) and selective laser trabeculoplasy (SLT). The primary goal was to investigate if previous LTP influenced later surgical outcome of phaco-KDB. Successful outcome of LTP and phaco-KDB was defined as an intraocular pressure (IOP)-reduction of ≥ 20% without added medications or surgery and/or a reduction of ≥ one medication after three months and one year respectively. The secondary goal was to investigate if the outcome of LTP could be predictive for the outcome of subsequent phaco-KDB. We also compared IOP- and medication reductions between LTP and non-LTP treated patients.

Results: 111 LTP treated patients were compared to 139 non-LTP treated patients. In LTP treated patients, surgical success of phaco-KDB was 82.9%, compared to 88.5% in non-LTP treated patients ($p = 0.204$). Reductions in IOP and medications were similar between groups. Furthermore, within the LTP group, patients with successful LTP-treatment had a subsequent surgical success of phaco-KDB in 80.7%, compared to 83.0% in patients with unsuccessful LTP-treatment ($p = 0.765$).

Conclusion: Previous LTP treatment did not affect the outcome of phaco-KDB, and the response of LTP was not corelated to the response of subsequent surgery with phaco-KDB. The results indicate that previous LTP treatment does not need to be considered when deciding upon the surgical procedure of phaco-KDB.

776 - P3.097

EFFICACY AND SAFETY OF HIGH-INTENSITY FOCUSED ULTRASOUND CYCLOPLASTY IN PATIENTS WITH REFRACTORY GLAUCOMA IN A REAL-LIFE SETTING

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Purpose: To assess the efficacy and safety of HIFU cycloplasty, in patients with end-stage refractory glaucoma in a real-life setting.

Methods: A retrospective cohort study carried out at Bordeaux University Hospital on patients who underwent HIFU cycloplasty, known as ultrasound cycloplasty (UCP), with the EYEOP1 device between October 2012 and February 2023. Postoperatively, subjects were assessed on day 3, 15, month 1, 3, 6, 9, 12, and then every 6 months. IOP, number of medications and complications were reported at each visit. Primary outcomes were the success rate (IOP reduction ≥ 20%, IOP > 5 mmHg and ≤ 21 mmHg) at 3 months post-surgery, and the percentage of IOP reduction. The secondary outcomes were the occurrence of intra and postoperative complications, visual acuity and additional procedures.

Results: 167 procedures on 137 subjects were performed in our study, from which 132 procedures could be included for the 3 months analysis. The mean follow-up was 10.8 ± 13.9 months. The mean IOP ± SD (standard deviation) at baseline was 26.0 ± 6.9 mmHg. The percentage of IOP reduction after treatment was 46.2% (14.0 ± 6 mmHg), 30.7% (18.0 ± 8.2 mmHg), 29.7% (18.3 ± 7.8 mmHg), and 26.5% (19.1 ± 7.3 mmHg) at 3 days, 1 month, 3 months and 12 months, respectively. Success was achieved in 69/132 eyes (52.3%). Treatment appears to be more efficient for POAG and EXG. We reported 6.5% of transient hypotonias, 3.6% of corneal ulcerations and 10.2% of macular oedemas, of which 1.2% has become chronic. Visual acuity was conserved at 3 months (p = 0.53).

Conclusion: With a satisfying success rate, a good safety profile and a conservation of visual acuity as observed in our study, UCP is an effective method to reduce IOP in patients with end-stage refractory glaucoma in a real-life setting. This study confirms its key position amongst actual cycloablative techniques.

781 - P3.098

TRENDS IN GLAUCOMA SURGERY IN A TERTIARY HOSPITAL IN SPAIN: 2010-2022

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Purpose: To analyze the glaucoma surgeries performed over the past 13 years in a tertiary hospital belonging to the Spanish National Health System and evaluate the change in trend.

Methods: A retrospective observational study was carried out. The surgeries performed in the glaucoma unit of a tertiary hospital belonging to the Spanish National Health System between January 2010 and October 2022 were considered. The data collected were date of surgery, procedure performed and whether it was an isolated or combined procedure. Age, sex and type of underlying glaucoma were collected from the patients. Surgeries on patients under 18 years of age were excluded. The data were analyzed and compared annually to obtain the time trend of glaucoma surgical procedures in recent years.

Results: Trabeculectomy, Glaucoma Drainage Devices (GDD) and cyclodestruction, collectively referred to as traditional surgery, showed a decrease from 93.18% to 23.61% during these years. Minimally invasive glaucoma surgery (MIGS) and minimally invasive bleb surgery (MIBS) exhibited a significant increase from 3.79% in 2010 to 74.68% in 2022 concerning total glaucoma surgeries (excluding isolated cataract extraction). Combined surgeries also demonstrated a significant increase from 39.02% in 2010 to 44.21% in 2022. In 2022 86.41% of the combined procedures were MIGS or MIBS.

Conclusion: In recent years, there has been a change in the trend of glaucoma surgeries. MIGS and MIBS procedures have shown a significant increase becoming the most commonly performed glaucoma procedures nowadays. Consequently, traditional glaucoma surgeries, mainly trabeculectomy, have decreased in frequency.

805 - P3.099

EVALUATION OF PATIENTS UNDERGOING DEROOFING PROCEDURE DUE TO ENCAPSULATED PLATE DEVELOPMENT FOLLOWING AHMED GLAUCOMA VALVE SURGERY, AND INVESTIGATION OF THE PROCEDURE'S IMPACT ON INTRAOCULAR PRESSURE AND NUMBER OF GLAUCOMA MEDICATION

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Purpose: Our aim is to evaluate patients with Ahmed Glaucoma Valve (AGV) who underwent deroofing procedure due to encapsulated plate development, and to investigate the impact of the procedure on the final intraocular pressure (IOP) and the number of glaucoma medications (NGM) used compared to the preoperative period. Additionally, the relationship between the time elapsed from AGV implantation to the procedure and the changes in final IOP and NGM has been assessed.

Methods: Our study included 11 eyes of 11 patients who underwent deroofing due to encapsulated plate development following AGV surgery. Patients' age, gender, glaucoma etiology, preoperative and postoperative 1-3-6 month, 1-2-3 year, and final IOP values, preoperative and final best-corrected visual acuities (BCVAs), NGM, and durations from AGV surgery to deroofing were noted.

Results: 6 of the patients were female (54.5%). The mean age of the patients was 41 ± 20.7 (3-65) years. 4 of the patients had neovascular glaucoma, 1 had congenital glaucoma (CG) with penetrating keratoplasty, 2 had penetrating keratoplasty, 1 had trauma-related glaucoma, 1 had secondary glaucoma due to uveitis, and 2 were diagnosed with CG. Preoperative BCVA was 1.4 (0.1-1.5) logMAR, IOP was 30 (12-35) mmHg, and the NGM used was 4 (2-4). Postoperatively, the final BCVA was 1.4 (0.1-1.5) logMAR, IOP was 16 (8-30) mmHg, and the NGM used was 3 (0-4). The duration from AGV implantation to deroofing was 16 (6-58) months. While no significant difference was observed between preoperative and postoperative final BCVAs ($p = 1$), a significant decrease was noted in mean IOP ($p = 0.008$), with no difference in the NGM used ($p = 0.11$). There was no relationship found between the duration from AGV implantation to deroofing and the change in preoperative and postoperative final IOP and NGM ($p = 0.89$, $p = 0.67$, respectively). During follow-up, two patients (18.2%) required repeat deroofing, and two patients (18.2%) required diode laser treatment.

Conclusion: Due to being a single-center study, our sample size is limited; however, our results indicate that deroofing is largely effective in the management of patients with encapsulated plate development following AGV surgery, leading to a significant decrease in IOP.

822 - P3.100

AB INTERNO XEN GEL STENT AT THE VIRGEN DE VALME UNIVERSITY HOSPITAL: EFFICACY AND SAFETY. COMPARISON WITH AB EXTERNO XEN GEL STENT

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Purpose: Describe a Ab interno Xen® gel stent cohort. Compare this cohort with a similar cohort of Ab externo Xen® gel stent.

Methods: Descriptive retrospective study where we reviewed a total of 72 Ab interno Xen®. We compared these results with a cohort of 70 Xen® Ab externo obtained in our hospital with similar characteristics.

Results: We studied 72 Ab interno Xen® gel stent. Four patients had previous glaucoma surgery. In 50% we did phaco-Xen®. Subconjunctival mitomycin C was used in 52.8% of patients. About the type of glaucoma: 66.2% open angle glaucoma, 15.5% pseudoexfoliative glaucoma, 16.9% myopic glaucoma and 1.4% glaucoma secondary to intravitreal dexamethasone implantation. The 64.8% of our patients had advanced glaucoma. The 71.9% used treatment at maximum dose (≥ 3 drugs) before surgery. After surgery, we observed a decrease of 6mmHg (mean IOP after 6 months: 14.55 mmHg). We performed the Student's t-test hypothesis test for quantitative measures. We confirmed that there were differences statistically significant. After surgery, 63.9% of patients did not require bleb revision and 41.7% did not require any drug for IOP control. Regarding complications: 40.6% had none. Overall, the reintervention rate was 29.6% (in this percentage is included the bleb revision). Regarding the cohort of 70 patients with Ab externo Xen®, the IOP reduction after surgery was 8 mmHg , which was also statistically significant. After surgery, the 15.2% required needling. The needling rate is clearly higher in Ab interno surgery, the prevalence was more than double (36.2%). With chi-square we found that the differences between the needling in Ab externo and Ab interno Xen® were statistically significant. At one year, 58.2% of the patients didn't require any medication and 69.7% had none complication. The overall reoperation rate was 13.4%.

Conclusion: The results show us safety and efficacy in Ab externo and Ab interno Xen®. In our hospital, when the condition of the conjunctiva allows it, we prefer the ab external approach due to the results obtained.

834 - P3.101

COMPARISON OF GONIOSCOPY-ASSISTED TRANSLUMINAL TRABECULOTOMY AND MITOMYCIN C-AUGMENTED TRABECULECTOMY

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Purpose: This study aims to compare the intraocular pressure (IOP)-lowering efficacy and complications of gonioscopy-assisted transluminal trabeculotomy (GATT) and mitomycin C-augmented trabeculectomy (TRAB) in patients with primary open-angle glaucoma (POAG) and pseudoexfoliation glaucoma (PEXG).

Methods: Patients over 18 years old with a diagnosis of PAAG or PEXG who underwent GATT or TRAB and were followed up for at least 12 months were included in the study. Surgical success was defined as ≥30% reduction in IOP or IOP ≤ 18 mmHg (without medication: complete success, with medication: partial success). Postoperative IOP, number of antiglaucomatous molecules, complications, and the need for secondary surgery were evaluated.

Results: Thirty-nine patients who underwent TRAB and 36 patients who underwent GATT were analyzed. The two groups had similar age ($p = 0.57$) and gender distributions ($p = 0.23$). Concurrent phacoemulsification surgery was performed on 9 patients undergoing GATT. The mean baseline IOP in the TRAB and GATT groups was 27.41 ± 8.32 mmHg and 24.24 ± 7.61 mmHg ($p = 0.10$), mean antiglaucomatous molecule numbers 3.74 ± 1.01 and 3.74 ± 1.10 ($p = 0.97$), respectively. At 12 months post-TRAB and GATT, the mean IOP was 11.28 ± 3.92 mmHg and 12.18 ± 2.36 mmHg ($p = 0.38$), mean antiglaucomatous molecule numbers 0.85 ± 1.34 and 0.94 ± 1.25 ($p = 0.75$), respectively. The reduction in IOP from baseline was 55.75 ± 17.52% in TRAB and 45.22 ± 18.57% in GATT ($p = 0.02$). While complete success rates at 12 months were 64.1% for TRAB and 52.8% for GATT ($p = 0.22$), partial success rates were 94.9% and 94.4%, respectively ($p = 0.91$). Intraoperatively, one GATT patient developed iridodialysis. Postoperatively, hyphema was observed in 2 TRAB patients, while 20 GATT patients developed hyphema and 7 had fibrin reaction. On the first postoperative day, one TRAB patient and four GATT patients experienced increased IOP.

Conclusion: In patients with PAAG and PEXG, GATT at 12 months postoperatively is as effective as TRAB in reducing IOP and medication numbers. However, TRAB achieves a greater reduction in IOP compared to GATT and exhibits higher rates of complete success. Although hyphema and fibrin development are more common after GATT, it is a surgery that protects the conjunctiva and sclera for a potential future filtration surgery.

844 - P3.102

DECOMPRESSION RETINOPATHY

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Purpose: To report a rare case of decompression retinopathy after an uncomplicated trabeculectomy with mitomycin C.

Methods: We describe a case of a 28-year-old woman with adult onset of juvenile simple glaucoma in both eyes who presented with decompression retinopathy after an uncomplicated trabeculectomy with mitomycin C.

Results: Ophthalmologic examination revealed bilateral glaucomatous changes on the optic nerve head with uncontrolled intraocular pressure levels but still with normal visual acuity. The patient was treated with topical and oral antiglaucomatous therapy to which the right eye measured intraocular pressure values of mid-teens, but the left eye did not react with intraocular pressure decrease and went up to 40mmHg with visual acuity dropping to 20/50. A trabeculectomy with mitomycin C (2 minutes of exposure, concentration of 0.4 mg/ml) under Sub-Tenon anaesthesia was performed after which measured intraocular pressure was 12mmHg. Twelve days after uncomplicated glaucoma surgery, the patient presented with multiple intraretinal and subretinal haemorrhages in the macular area, as well as intraretinal dot, blot and preretinal boat-shaped haemorrhages in the mid-peripheral and peripheral retina (Figure 1), reflecting decompression retinopathy which spontaneously resolved a month later. Oral ascorbic acid in the dose of 1000 mg daily was prescribed and usual anti-inflammatory corticosteroid therapy continued. The localized haemorrhages and sectorial macular oedema reduced progressively and recovered spontaneously during the first postoperative month. The levels of IOP remained in low teens without hypotensive medication and best corrected visual acuity increased again to 20/25.

Figure 1. Fundus photography of the left eye 12 days after trabeculectomy with mitomycin C (left) with multiple intraretinal and subretinal haemorrhages in the macular region, and intraretinal dot, spot and boat-shaped preretinal haemorrhages in the mid-peripheral and peripheral retina. Same eye a month later with spontaneous resolving of retinopathy (right).

Conclusion: Suprachoroidal haemorrhages following trabeculectomy are reported regularly in the literature, but retinal and subretinal haemorrhages are rare entities, arising due to mechanical or vascular mechanisms following a sudden postoperative decrease of intraocular pressure. It should be recognized as soon as possible and monitored regularly, but it is important to emphasize that spontaneous resolution can be expected.

852 - P3.103

COMPARISON BETWEEN CO2-LASER ASSISTED SCLERECTOMY SURGERY BND TRABECULECTOMY - 24 MONTHS OF FOLLOW-UP

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Purpose: The purpose of this study was to evaluate the efficacy and safety of CO2 laser-assisted sclerectomy (CLASS) compared to trabeculectomy (TRAB) in patients with primary open-angle glaucoma (POAG) and pseudoexfoliative glaucoma (PSXG).

Methods: A retrospective study was conducted, including all patients who underwent CLASS or TRAB surgery, excluding simultaneous phacoemulsification. We measured best corrected visual acuity (BCVA), intraocular pressure (IOP), Cup-to-Disc ratio (C/D), and number of instilled antiglaucomatous medications preoperatively and post-operatively at a 24-month follow-up. The criteria for evaluating success were defined as "complete success" (CS) when achieving IOP between 6-20 mmHg, reduced by at least 30% from the baseline, without the need for medication; and as "Qualified success" (QS) when the above criteria was met with or without medications. All intraoperative and postoperative complications were recorded.

Results: A total of 92 patients were included, with 56 having POAG and 36 having PSXG. Among them, 49 patients underwent CLASS surgery, while 43 patients underwent TRAB surgery. The mean baseline IOP was 25.66 ± 6.62 mmHg. There were no significant differences between the two groups at baseline in terms of IOP, C/D, BCVA, and the number of medications. BCVA did not show a significant change at 24 months in either group, with CLASS group experiencing a change of -0,18logMAR and the TRAB group experiencing a change of -0,16 logMAR (p = 0.780). When comparing CLASS with TRAB at 24 months, the mean reduction in IOP was -8.77 ± 6.29 mmHg versus -11.45 ± 7.70 mmHg (p = 0.043). The average use of postoperative medication was 2.27 ± 1.512 for CLASS and 1.57 ± 1.548 for TRAB (p = 0.033). The QS rate was 57.14% for CLASS and 67,44% in TRAB group (p = 0.310), while the CS rate was 18.37% vs 30,23%, respectively (p = 0,183). Postoperative complications were more frequent in the TRAB group (18.61%) compared to the CLASS group (8.16%) (p = 0.0138). The need of reoperations was similar between the two groups, with 36,73% in the CLASS and 34,88% in the TRAB group (p = 0.853).

Conclusion: Although CLASS demonstrated a less potent hypotensive effect compared to TRAB, it exhibited a more favourable complications profile. This procedure could serve as an alternative to TRAB, particularly in cases of early-to-moderate stage glaucoma.

853 - P3.104

POSTTRABECULECTOMY TIGHT SUTURE LYSIS

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Purpose: To evaluate intraocular pressure (IOP) changes after suture lysis following Mitomycin C augmented trabeculectomy

Methods: This retrospective study analyzes the 30 suture lysis procedure which is applied after Mitomycin- C augmented trabeculectomy surgery. The suture lysis was performed within the first postoperative month and the tight suture which is indicated in the operation note, was cut using an argon laser. The laser settings were 50-100 micron spot size, 300-500 mW laser power, and 1-3 shots with 0,1 sec laser duration. Preoperative topical %2.5 phenylephrine was applied 10 minutes before the procedure and 1 drop of topical propacaine was applied. The tip of an uncolored glass vial is used to visualize the suture.

Results: 30 eyes of 30 patients were included in the study. The mean age was 59.87 ± 13.16 years. 10 (33.3%) patients were female. The distribution of glaucoma type was as follows: pseudoexfoliative glaucoma 12 (40%), primary open angle glaucoma 5(16.7%), primary angle closure glaucoma 5(16.7%), pigmentary glaucoma 2 (6.7%), juvenile glaucoma 1 (3.3%), angle recession glaucoma 1 (3.3%), uveitic glaucoma 2 (6.7%), secondary glaucoma 2 (6.7%). Among all operations, 9 (30 %) of them were combined with phacoemulsification and trabeculectomy and the rest were trabeculectomy alone. The mean postoperative follow-up time was 6.83 ± 6.20 months. The mean interval between trabeculectomy and suture lysis was 9.37 ± 8.77 days (median 6.5 days). The mean pre-suture lysis IOP was 22.90 ± 8.62 mmHg which decreased to 11.63 ± 4.39 mmHg on the postoperative first day and to the 12.70 ± 4.64 mmHg at the last visit. The change in IOP from the pre-suture lysis to both the first postoperative day and last visit was statistically significant ($p < 0.0001$). At the last visit, the mean glaucoma medication number was 0.87 ± 1.23 (median = 0) and after sütürolysis 19 eyes did not have any additional procedure and 9 eyes had a needling application for encapsulated cyst, one eye had AGV implantation. 5 eyes had post suture lysis temporary hypotony but none developed choroidal detachment.

Conclusion: Post-trabeculectomy suture lysis procedures help to control the titration of IOP and provide immediate IOP reduction. However, 30% needed postoperative surgical revisions like neddling applications.

880 - P3.105

CORNEAL ENDOTHELIAL CELL LOSS AFTER GLAUCOMA SURGERY IN OPEN-ANGLE GLAUCOMA

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Purpose: The only proven factor in slowing the progression of glaucomatous neuropathy is lowering intraocular pressure (IOP) which can be achieved with pharmacology, laser therapy or surgery. Glaucoma surgery is associated with various adverse effects and one of the most dangerous is corneal endothelial cell loss (CECL) and a potential bullous keratopathy. In recent years several novel surgeries for reducing the IOP, collectively referred to as Microinvasive Glaucoma Surgery (MIGS) or Microinvasive bleb surgery (MIBS), have been developed. However, the long-term effects remain still unknown. The aim of the study is to compare endothelial cell loss after glaucoma surgeries after 12 months including canaloplasty, Preseflo MicroShunt, ExPress Mini Shunt and trabeculectomy. The last two surgeries were combined with cataract surgery.

Methods: We compared a group of patients with open-angle glaucoma who underwent glaucoma surgeries alone or combined with phacoemulsification with similar demographic and clinical characteristics. Study included 154 eyes: 27 eyes of 27 patients who underwent canaloplasty, 43 eyes after Preserflo implantation, 39 eyes after trabeculectomy combined with phacoemulsification and 45 patients who underwent ExPress Mini Shunt implantation combined with cataract surgery.

Results: Endothelial cell loss in Preserflo MicruShunt group decreased from 1974.48 ± 557.67 to 1773.18 ± 666.96 ($p < 0.05$), in canaloplasty group from 2274.13 ± 335.37 to 1968.38 ± 600.91 ($p < 0.05$), after trabeculectomy combined with phacoemulsification from 2075.50 ± 546.54 to 1641.50 ± 474.62 ($p < 0.05$) and in ExPress Mini Shunt combined group the decrease level was from 2078.05 ± 517.41 to 1393.42 ± 542.43 ($p < 0.05$).

Conclusion: Glaucoma surgeries, mainly traditional filtration surgeries which are often combined with cataract surgery, decrease number and density of corneal endothelial cells which potentially may lead to a bullous keratopathy. Interestingly the smallest decrease was observed in Preserflo group. To conclude we should qualify patients very carefully to decide which type of surgery is the best option and decide whether to combine or no to combine with cataract surgery.

885 - P3.106

USEFULLNES OF AMNIOTIC MEMBRANE IN SCLEROMALACIA AFTER FILTERING SURGERY

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Purpose: To demonstrate the usefulness of the amniotic membrane (AM) in the management of late aqueous humor leak secondary to an area of scleromalacia, after non-penetrating deep sclerotomy surgery (NPDS) without this resulting in the failure of the surgery.

Methods: A 53-year-old black woman, with a family history of glaucoma and with advanced glaucoma in the right eye, underwent surgery for NPDS without incident. After two years, positive Seidel was detected in the nasal ischemic area of the bleb secondary to an area of scleromalacia (figure 1 and 2).

Figure 1

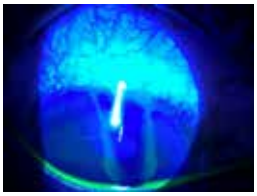

Figure 2

Figure 3

Figure 4

At first, she only underwent a procedure to repair the bleb with resection of the ischemic area. But this proved to be insufficient, and a third intervention was necessary to treat the area of scleromalacia. We considered using a donor sclera, but it was a fibrosed conjunctival with two previous surgeries, which most likely would not be able to cover the entire area. Thus, we proposed repair with equine pericardium, which is thinner, and AM, which disappears with time, with the aim of avoiding the failure of the filtering surgery. We began by dissecting the conjunctiva and removing a new avascular ischemic zone. Once the area of scleromalacia was exposed, we suture the equine pericardium superiorly, insert the membrane with a technique like the one used by retinologists for the treatment of macular holes and finish suturing the pericardium. Later, we closed the conjunctiva and finished by covering the entire area with AM (figure 3 to 7).

Figure 5

Figure 6

Figure 7

Results: After two years, the AM has disappeared from the scleromalacia area, the bleb is formed without ischemic areas and the IOP is controlled without the need for hypotensive treatment (figure 8 and 9).

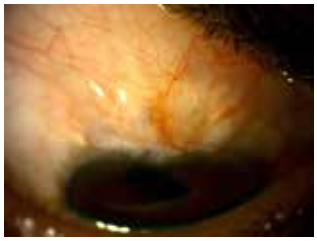

Figure 8

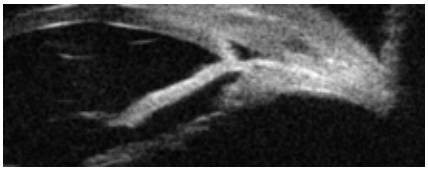

Figure9

Conclusion: The use of the AM, in cases of tissue defect, helps to limit the flow of aqueous for long enough, something essential so that the conjunctiva and Tenon can heal correctly and thereby achieve adequate IOP levels again to the glaucomatous damage that our patient presented.

889 - P3.107

OUR EXPERIENCE WITH SELECTIVE LASER TRABECULOPLASTY (SLT) - HOW HAS OUR TREATMENT STRATEGY CHANGED

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Purpose: The Laser in Glaucoma and Ocular Hypertension Trial published in 2019 resulted in a breakthrough in SLT used in the treatment of open-angle glaucoma, which also recommended the treatment as a first-line therapy. We have been using SLT treatment in our Clinic since May 2015. We describe the change/broadening of our indications and aftercare strategy compared to the beginning.

Methods: In the initial year we treated 8 eyes of 5 patients, which significantly increased in the following 4 years, a total of 337 eyes of 180 patients were treated. During the peak of the COVID-19 pandemic in Hungary (in 2020-2021), the number of interventions decreased significantly, as it was an optimal and safe treatment option to complement the therapy used. After the end of the pandemic (2022), the number of patients receiving treatment began to increase again. By the end of 2023, 487 patients underwent 509 procedures on a total of 937 eyes.

Results: In 2020, the SLT treatment was used as first-line therapy or to abandon monotherapy in order to achieve drop-free status in 3 out of 28 patients (10%), whose rate gradually increased in 2023. It increased to 36%, 51 out of 142 cases. At our clinic, we recorded the following intraocular pressure (IOP) values measured in patients undergoing SLT treatment: referral, immediately before treatment, 1 hour, 1 day, 1-3-6-12 month results after treatment, and then we continued the individualized controlls. Due to the post-treatment IOP jump described in the literature, we performed the 1-hour IOP measurements, however, we did not experience this during the first 2 years, so we omitted this measurement. We modify the therapy at the earliest 1 month after the treatment.

Conclusion: In recent years, SLT treatment has taken its appropriate therapeutic place in the application range of conservative treatment of glaucoma, and its first-line use has increased compared to complementary therapies. Based on both literature and our own results, SLT treatment is a safe procedure, and follow-up is not necessary as closely as we did in the beginning.

892 - P3.108

COMPARATIVE OUTCOMES OF THE PAUL AND BAERVELDT GLAUCOMA IMPLANTS ONE YEAR AFTER IMPLANTATION

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Purpose: To compare the efficacy and safety of Baerveldt 101-350 (BGI) and Paul (PGI) glaucoma implants 1 year after implantation.

Methods: Registry-based retrospective comparative study of patients implanted with a BGI (101-350) or a PGI by one surgical firm. The primary outcome was failure at 1 year, defined as an intraocular pressure (IOP) reduction of < 20% from baseline or > 21 mmHg, need for further glaucoma surgery, or loss of light perception. Success was defined as complete, if the patient was free of IOP-lowering medication, and qualified if medicated or unmedicated. Secondary outcomes included IOP and medication reduction, post-operative complications, and interventions.

Results: 102 patients (mean age (SD): 59.9 (14.1), 47% female) in the BGI group and 121 in the PGI group (60.2 (15.5), 46% female), with 12 months follow-up, were identified from the International Glaucoma Surgery Registry. 25.5% of BGI patients and 24.0% of PGI patients had failed at one year (p = 0.79). Complete (qualified) success was observed in 30% (74%) and 40% (76%), BGI and PGI, respectively, p = 0.15 (p = 0.79). The mean IOP (mmHg) (SD) at 1 year was 13.8 (4.5) mmHg (BGI) and 13.0 (5.14) (PGI) (p = 0.23). The mean number of medications (SD) was 1.3 (1.2) (BGI) and 1.0 (1.1) (PGI) (p = 0.09). The mean percentage IOP reduction(SD) was 37.4% (25.9) (BGI) and 45.0% (29.6) (PGI), p = 0.047. The mean percentage medication reduction (SD) was 45.5% (40.4) (BGI) and 53.7% (35.2) (PGI) (p = 0.11). The mean number of in-office interventions was higher in the BGI group (1.75 vs 0.8, p < 0.001) but not for interventions in the operating theatre. More patients with BGIs required acetazolamide during follow-up (6% vs 0.8%, p = 0.03). Stent suture exposure and prolonged postoperative inflammation were more common in the BGI group (4 vs 0, p = 0.04 for both). 1 PGI patient failed due to loss of light perception (PL to NPL on day 7). 4 BGI patients required further glaucoma surgery, vs 1 PGI patient (p = 0.12).

Conclusion: The PGI showed similar success and failure rates to the BGI, with slightly better medication and IOP reduction, and fewer in-office interventions for the PGI.

896 - P3.109

PREDICTION ACCURACY OF IOL CALCULATION FORMULAS IN COMBINED CATARACT SURGERY AND TRABECULECTOMY

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Purpose: The aim of this study was to evaluate the prediction error of the IOL calculation formulas incorporated in the European Society of Cataract & Refractive Surgeons (ESCRS) IOL calculator, as well as SRK/T formula.

Methods: Retrospective study including consecutive patients who underwent uneventful combined cataract surgery and trabeculectomy with monofocal IOL implantation. The following IOL calculation formulas were applied to predict the target spherical equivalent (SE) for the implanted IOL in each subject: Barrett Universal II, Cooke K6, EVO, Hill-RBF, Hoffer QST, Kane, PEARL DGS and SRK/T. Biometry was obtained using a swept-source optical biometer (IOL Master 700; Carl Zeiss). Prediction errors (PE), defined as the difference between postoperative and formula-predicted SE based on the IOL power implanted, were calculated at 3-6 months follow-up. Mean absolute error (MeanAE), median absolute error (MedAE) and the percentage of eyes within ± 0.25 diopters (D), ± 0.50D and ± 1.00D of PE were determined.

Results: A total of 41 eyes from 41 patients with a mean axial length (AL) of 23.39 ± 0.82mmwere included. The mean postoperative SE was -0.55 ± 0.71D. The formula presenting the lowest MedAE was EVO (0.29D), followed by SRK/T (0.30D), Cooke K6 (0.32D), Kane (0.34D), Hoffer QST (0.35D), Hill-RBF (0.35D), PEARL GDS (0.38D), and finally Barrett Universal II (0.43D). The percentage of eyes within ± 0.50D of PE was superior for Hill-RBF (65.9%), followed by Cooke K6 (64.1). For eyes within ± 1.00D of PE, the formula showing higher proportion was Hoffer QST (92.7%), followed by Kane (90.2%). Barrett Universal II was the formula with less percentage of eyes in all groups (29.3% for ± 0.25D PE, 53.7% for ± 0.50D PE, and 78.0% for ± 1.00D PE).

Conclusion: Overall, all formulas evaluated showed a robust performance. The finding that none of the modern formulas exhibited a significant advantage when compared to SRK/T suggests that eyes undergoing combined cataract surgery and trabeculectomy should be evaluated as a singular subgroup in terms of IOL power calculation.

900 - P3.110

COMPARATIVE STUDY OF PRESERFLO MICROSHUNT, XEN45 GEL STENT AND TRABECULECTOMY IN OPEN-ANGLE GLAUCOMA: 1-YEAR RESULTS

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Purpose: To compare the safety and efficacy of PRESERFLOTM MicroShunt (microshunt), XEN45® Gel Stent (gelstent) and trabeculectomy in open-angle glaucoma (OAG) during the first year

Methods: A single-surgeon retrospective case-control study on 384 eyes from 384 patients who underwent standalone glaucoma surgery was conducted. Primary outcomes were the proportion of patients with surgical success one year postoperatively. Complete success was twofold defined as intraocular pressure (IOP) between 6 and 15 mmHg and between 6 and 18 mmHg, without loss of light perception, additional glaucoma surgery or IOP-lowering medication. Qualified success implied pharmaceutical treatment or laser trabeculoplasty was necessary. Secondary endpoints were mean absolute IOP change, best-corrected visual acuity change, average number of, and change in, IOP-lowering medications, percentage of medication-free patients and the number and type of postoperative complications/interventions. Propensity score matching was used to equalize groups for selected covariates.

Results: Eighty-two eyes for microshunt, 185 for gelstent and 117 for trabeculectomy were included. Complete success rates for 15 and 18 mmHg, respectively, were 62.52% and 64.76% for microshunt compared to 28.22% and 31.74% for gelstent ($p < 0.001$) and 36.03% and 39.16% for trabeculectomy ($p < 0.001$). Qualified success rates were 73.51% and 75.74% for microshunt compared to 49.74% and 59.24% for gelstent ($p < 0.001$, $p = 0.0049$) and 50.57% and 57.07% for trabeculectomy ($p = 0.0027$, $p = 0.0155$). Mean absolute IOP reduction at year 1 was not significantly different between groups with -6.79 ± 7.31 mmHg, -6.04 ± 7.45 mmHg and -7.19 ± 8.38 mmHg for microshunt, gelstent and trabeculectomy, respectively. All groups showed a significant decrease in the average number of IOP-lowering medications, 3.01 ± 0.92 to 0.48 ± 0.94 for microshunt, 2.64 ± 1.10 to 1.01 ± 1.19 for gelstent and 2.91 ± 1.03 to 0.83 ± 1.00 for trabeculectomy. There was no significant difference between the groups. At year 1, 80.98% (microshunt), 56.62% (gelstent) and 58.57% (trabeculectomy) of the patients were medication-free. Trabeculectomy had a higher rate of postoperative interventions than microshunt and gelstent (45.66%, 19.65% and 32.87% respectively, $p < 0.0001$, $p = 0.0016$). Concerning postoperative complications, no significant differences were observed.

Conclusion: This study showed a higher success rate in the microshunt group compared to the gelstent and trabeculectomy group, despite no significant differences in mean IOP reduction at 1 year postoperatively, with less postoperative interventions and similar complication rates compared to trabeculectomy.

901 - P3.111

CHANGES IN CHOROIDAL VASCULAR INDEX AND AXIAL LENGTH IN PATIENTS WHO UNDERWENT BLEB NEEDLING AFTER TRABECULECTOMY

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Purpose: To evaluate the success of bleb needling after failed trabeculectomy and to analyze the choroidal vascular index and axial length changes after needling.

Methods: Forty-one patients who underwent trabeculectomy at SBU Beyoglu Eye Training and Research Hospital Glaucoma Unit and failed to achieve adequate intraocular pressure reduction were prospectively analyzed. The patients were divided into 2 groups according to the condition causing bleb insufficiency and the procedure to be performed. The first group consisted of patients with encapsulated blebs who underwent needling of the tenon cyst and the second group consisted of patients with flat blebs who underwent needling of the scleral flap. Best corrected visual acuity and intraocular pressure values were measured preoperatively in both groups. Biomicroscopic anterior segment and fundus examinations were performed. Preoperative retinal nerve fiber thickness and axial length were measured. Choroidal thickness was measured with enhanced depth imaging optic coherence tomography (EDI-OCT). Choroidal vascular indeks (CVI) values were calculated using Image J program. All these measurements were repeated at 1 week, 1 month, 3 months and 6 months postoperatively.

Results: The mean intraocular pressure values at postoperative week 1, month 1, month 3 and month 6 were statistically significantly lower than the preoperative IOP values in the tenon cyst needling and scleral flap needling groups ($p = 0.001$ and $p = 0.0001$). There was a significant decrease in axial length ($p = 0.002$) and a significant increase in foveal choroidal thickness ($p = 0.0001$) only in the tenon cyst needling group at all postoperative times. There was no significant change in CVI values in both groups. There was no statistically significant difference in any parameter between the two groups.

Conclusion: Both needling procedures with different techniques were effective in reducing intraocular pressure. Choroidal thickness increased and axial length decreased in the Tenon's cyst needling group. CVI did not change in both groups.

907 - P3.112

MULTI-CENTRE EVALUATION OF EXCIMER LASER TRABECULOSTOMY (ELT): EARLY UK OUTCOMES

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Purpose: ELT is a novel technique for enhancing outflow through the trabecular meshwork which can be performed as a standalone procedure or combined with cataract surgery. The concept uses a 308nm xenon chloride excimer laser with a non-thermal approach creating 10 ostomies and leaving no implant in the eye. There are published studies as far as back as 2006 using ELT but this technique has only recently become available in the UK and we report early results from four centres.

Methods: We collected real world retrospective data from four UK sites looking at demographics, intraocular pressure, number of medications and adverse events. Previous studies have shown the pressure reduction at 3 months is largely maintained at 2 and 5 years.

Results: The cohort has 106 patients with a mean age of 79 and the vast majority a diagnosis of primary open angle glaucoma. Mean pre-op IOP was 18.6 with an average of 1.63 medications and at 1 month was 15.4 with an average of 1 medication. At 3 months the mean IOP was 13.8 on 0.65 medications (Table 1). The IOP at 1 month was brought up by a small number of patients with pressure spikes (higher than baseline) but none of the patients at 3 months had high IOP. There were a small number cases with post-op uveitis and one with peripheral anterior synechiae but no hyphaema's and no serious or vision threatening complications.

	Pre-op	1 month	3 months
IOP	18.6	15.4	13.8
Medications	1.63	1	0.65

Conclusion: The early UK experience from 4 sites shows a more than 25% average drop in IOP at 3 months ($p < 0.001$) with on average one fewer anti-hypertensive medications than pre-op. There were no serious complications in our cohort of over 100 patients. These early results, in line with previously published studies, shows ELT to be safe and effective with the added advantage of not leaving an implant in the eye making it an attractive MIGS option.

908 - P3.113

DIRECT SELECTIVE LASER TRABECULOPLASTY: REAL-WORLD EXPERIENCE FROM A TERTIARY REFERRAL CENTRE IN THE UK

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Purpose: To evaluate the safety and efficacy of transscleral direct selective laser trabeculoplasty (DSLT) in the management of uncontrolled intraocular pressure in patients with ocular hypertension (OHT) or open angle glaucoma (OAG).

Methods: In this retrospective single-centre study, we analysed 20 eyes of 12 patients affected by OHT or OAG who underwent DSLT (Eagle. BELKIN Vision, Israel) in 2023. A standard protocol was used: 360°, 120 spots, 1.8mJ per spot, 2.3 msec duration with a total energy delivery of (mean ± SD) 202.38 ± 1.29 mJ. 1 eye had post-uveitic OHT, 14 primary OHT and 5 POAG. 5 eyes were treatment-naïve and no wash-out was instituted. We included patients who had previously undergone conventional SLT. Success was defined as 20% IOP reduction; "complete" with no/unchanged number of medications compared to baseline, and "qualified" if additional medication was required. We compared outcomes in medicated versus treatment-naïve eyes.

Results: At final follow-up, IOP decreased from 22.35 ± 4.74 to 18.55 ± 5.10 mmHg, resulting in an overall 3.80 mmHg (17.0%) reduction (p = 0.034). The proportion of eyes achieving 20% IOP reduction was 50%, of which 35% were complete successes with 15% requiring 1 additional hypotensive medication post-laser. The number of medications decreased from 0.75 ± 0.85 to 0.60 ± 0.7 (p = 0.453). Treatment-naïve eyes had an IOP reduction from 27.20 ± 2.17 to 17.00 ± 1.88 mmHg (reduction of 10.20 ± 3.56 mmHg (37.5%) (p = 0.003)) with no medications required. The difference between pre-treatment and post-treatment IOP was 8.53 mmHg greater in the treatment-naïve group compared to the treated group (p = 0.021). Over a follow-up of 4.0 ± 2.1 months, 2 eyes (10%) were affected by ocular discomfort for 36 hours post-laser and IOP spikes (≥3 mmHg) were observed in 6 eyes (30%). No severe adverse events were documented.

Conclusion: DSLT is a rapid semi-automated procedure with advantages in terms of time-efficiency and operator-independent efficacy. Our real-world outcomes are less favourable compared to trial results, but appear to show a trend towards improved overall success in the treatment-naïve subgroup, highlighting the importance of case selection and the potential benefit of further appropriately powered prospective studies in patients who have previously been treated with medication and/or SLT.

913 - P3.114

CORRELATION OF PRE-SURGICAL BIOMETRIC PARAMETERS AND FORMATION OF POST-SURGICAL PERIPHERAL ANTERIOR SYNEACHIAE IN PATIENTS WITH OPEN-ANGLE GLAUCOMA WITH PHACOEMULSIFICATION AND MICRO INVASIVE GLAUCOMA SURGERY

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Purpose: To identify correlations between preoperative biometric parameters and the formation of postoperative peripheral anterior synechiae (PAS) in patients with open-angle glaucoma (OAG) undergoing combined microinvasive invasive glaucoma surgery (MIGS) and phacoemulsification.

Methods: This was an observational, analytical, and prospective study conducted at Fundación Hospital Nuestra Señora de la Luz I.A.P. an ophthalmological referal center in Mexico City, between July 1, 2023, and December 30, 2023. We included patients with OAG aged 18 or above undergoing combined MIGS and phacoemulsification. Surgical interventions involved the use of iStent, Kahook dual-blade goniotomy (KDB), bent Ab-interno needle goniectomy (BANG), Trabex T, high-frequency deep sclerotomy (HFDS), and gonioscopy assisted transluminal trabeculotomy (GATT) devices, along with phacoemulsification and intraocular lens implantation. Ocular biometric parameters were measured using the IOL-Master 700. An ophthalmological assessment with slit-lamp examination, was performed to document the presence of PAS up to 3 months after the surgery. Statistical analysis was performed with Stata v. 15.1, conducting multiple comparisons with Kruskal Wallis test, Spearman's R correlation, and Chi squared test.

Results: Seventy-one patients were included, 41 (69%) female, with a median age of 73 (69 - 79 IQR) years, an axial length (AL) of 23.54 mm (22.69 - 24.68 IQR), anterior chamber depth (ACD) 3.12 mm (2.87 - 3.36), lens thickness (LT) 4.29 mm (3.93 - 4.52 IQR), white-to-white (WTW) 11.8 mm (11.5 - 12.0 IQR). BANG was the most perfomed MIGS with 30 (42.2%) eyes, followed by Trabex T and HFDS with 17 (23.9%) each, 2 GATT, 2 iStent, and 3 KDB were performed. In the BANG group, 5 (16.67%) developed PAS, while 3 (17.65%) in HFDS, 1 in GATT, 1 in iStent, and 1 with KDB, and none in the Trabex T group. Neither significant correlations were found between AL, ACD, LT, and WTW with the formation of PAS, nor differences between MIGS groups in patient demographics, and glaucoma characteristics.

Conclusion: No significant correlation or difference was found between preoperative biometric parameters and the formation of PAS in patients with OAG undergoing combined surgery between different MIGS.

917 - P3.115

DIURNAL FLUCTUATION OF IOP BEFORE AND AFTER SELECTIVE LASER TRABECULOPLASTY

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Purpose: Intraocular pressure (IOP) measurements in clinic do not capture fluctuations that occur outside of normal clinic hours and IOP fluctuation has been shown to be a risk factor for glaucoma progression.1-3 Six-year LiGHT trial outcomes demonstrated that selective laser trabeculoplasty (SLT) lowers IOP comparable to topical IOP lowering medications yet may preserve vision better.4 This study aims to assess changes in diurnal IOP fluctuation after SLT.

Methods: 59 eyes undergoing SLT at Moran Eye Center will be recruited to take 6 daily measurements (targeting 6 am to 9 pm) for 7 days with the iCare HOME tonometer before SLT and at 6-week, 3-month, and 6-month post-SLT timepoints. Inclusion criteria are patients ages 18-90 with a diagnosis of open angle glaucoma or ocular hypertension. We report data of patients who completed pre-SLT, 6-week post-SLT, and 3-month post-SLT measurements comparing IOP mean, range (max IOP – min IOP), and standard deviation (SD). 360 degrees of SLT treatment was standardized across patients with 4 days of post op NSAID. Pre- and post-SLT topical IOP lowering agents were kept stable.

Results: 32 eyes from 22 patients are included with a mean age of 63.9 years. Of the 22 patients, 72.7% are white and 59.1% are male with diagnoses of POAG (14), pseudoexfoliative glaucoma (2), pigmentary glaucoma (2), ocular hypertension (2), and normal tension glaucoma (2). There was a 13.7% decrease in mean IOP (± SD) 6 weeks after SLT treatment (17.1 (± 5.2) mmHg to 14.8 (± 3.7) mmHg, $p < 0.001$), and significant decreases in IOP range (13.1 (± 5.1) mmHg vs 10.34 (± 2.9) mmHg, $p = 0.004$), SD (3.49 vs 2.44, $p < 0.001$), and max IOP (25.0 (± 6.8) mmHg vs 20.6 (± 4.5) mmHg, $p < 0.001$). At 6 weeks post-SLT, 24/32 (75%) of eyes recorded max IOP outside of standard clinic hours (9 am-5 pm). Of 28 eyes with a lower max IOP post-SLT, the max IOP decreased by an average of 5.6 mmHg. There were no significant differences between 6-week and 3-month post-SLT data (N = 20 eyes).

Conclusion: Our preliminary data show significant decrease in diurnal mean IOP and fluctuation from baseline by 6 weeks post-SLT.

931 - P3.116

OUTCOMES AND EFFICACY OF GLAUCOMA DRAINAGE DEVICES (GDD) IN EYES WITH SCLERAL-FIXATED POSTERIOR CHAMBER INTRAOCULAR LENS FIL SSF IOL (SOLEKO, CARLEVALE)

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Purpose: This retrospective, non-comparative case series aimed to assess the safety, efficacy, and outcomes of Glaucoma Drainage Devices (GDD) in eyes with sutureless scleral fixation of the FIL SSF Intraocular Lens (IOL) (Carlevale, Soleko, Italy).

Methods: Twenty-one eyes previously implanted with Carlevale IOL (Soleko, Italy) for various indications and experiencing uncontrolled intraocular pressure (IOP) despite maximal medical therapy, underwent GDD implantation between 2021 and 2023. Patients were followed up for 12 months postoperatively, evaluating IOP, medication usage, and complications.

Results: Success, defined as IOP ≤ 21 mmHg with or without medication at two consecutive follow-up visits after three months, without additional glaucoma surgeries and without vision-threatening complications, was achieved in all cases. Pseudoexfoliative glaucoma was the most common diagnosis (71.43%), with Ahmed Glaucoma Valve (AGV), Baerveldt Glaucoma Implant (BGI) and PAUL Glaucoma implant (PGI) utilized in 47.62%, 33.33%, and 19.05% of cases, respectively. Mean preop IOP was 33.52 ± 5.84 and mean postop IOP was 13.0 ± 3.5 (IOP reduction 38.78% mmHg), ($p < 0.001$). Preop medication usage was 4 ± 0.55 and postop 1.38 ± 1.20, ($p < 0.001$). No major complications occurred in 71.43% while in 28.57% of patients, complications included: cystoid macular edema (CME), corneal decompensation and ocular hypotony.

Conclusion: GDD implantation is a safe and effective procedure to lower IOP and reduce medication dependence, in patients that have undergone implantation with the new sutureless scleral fixation Carlevale IOL (Soleko, Italy).

934 - P3.117

RESOLUTION OF BLEBITIS WITH HYPOTONY IN NON-PENETRATING SURGERY FOR HIGH MIOPYA: A CASE REPORT

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Purpose: The objective is to present an unusual case of blebitis following non-penetrating deep sclerectomy (NPDS) glaucoma surgery in a patient with high myopia, accompanied by a brief review of relevant literature.

Methods: This study involved reviewing the patient's medical history, pre and post-surgery imagery, and conducting a systematic literature search using the Medline Database combining the keywords: "non-penetrating deep sclerectomy," "blebitis," and "complications of glaucoma surgery."

Results: A pseudophakic 70-year-old male patient, who suffered myopic glaucoma that progressed despite maximum treatment, underwent NPDS in his left eye.Esnoper® (AJL Ophtalmic S.A, Spain) was implanted in the suprachoroidal space and mitomycin C 0,01% was used during 1 minute. One year later, he presented with recurrent viral conjunctivitis in the affected eye. Examination revealed the presence of a thin walled whitish bleb with Seidel. Cells and fibrine were present in the anterior chamber (Figures 1, 2, 3 and 7).

Figure 1. Blebitis in initial presentation.

Figure 2. Fibroneous reaction in the nterior chamber.

Figure 3. Evolution of the filtering bleb in the context of blebitis.

Figure 4. Postoperative image of cnjuctival advancement.

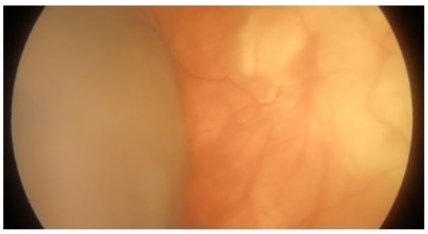

Figure 5. Fundis examination: choroidal detachment in myopic patient.

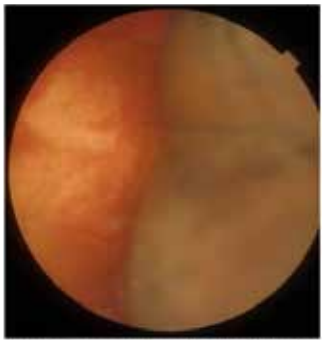

Figure 6. Fundus examination: choroidal detachment in myopic patient.

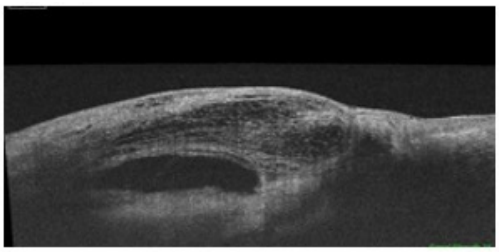

Figure 7. OCT: infected filterig bleb.

Treatment included subconjunctival injection of 0.2ml Vancomycin and Ceftazidime, along with fortified topical and oral antibiotics. At 48 hours after improvement of the infectious condition, topical corticosteroids was introduced but developed hypotony with choroidal detachment (Figures 5 and 6), that did not revert with conservative measures. Surgical intervention involved excision of necrotic conjunctival tissue, suturing of a weakened scleral flap, Ologen® implantation, and conjunctival advancement closure (Figure 4). Conjuntival samples sent for pathological analysis showed non-specific chronic inflammation.

Conclusion: NPFS is an uncommon cause possibly due to the protective role of the trabeculodescemetic membrane acting as a mechanical barrier. The use of antimetabolites like mitomycin C, especially in myopes with dinner scleras, may pose a higher associated risk of infection due to their impact on conjuntival innate and increased incidence of avascularity and transconjuntival leakage. Early blebitis detection is vital for optimal visual outcomes, emphasizing the importance of patient education and prompt emergency care seeking.

943 - P3.118

CHALLENGING MANAGEMENT OF GLAUCOMA ASSOCIATED WITH CORNEAL DYSTROPHY: A CASE REPORT

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Purpose: To present a case of a recently diagnosed patient with challenging-to-control glaucoma associated with corneal dystrophy.

Methods: Case report

Results: A 74-year-old male with a history of arterial hypertension, osteoarthritis, irritable bowel syndrome, dyslipidemia, vertigo syndrome, and genital and oral herpes. Ophthalmic history included episodes of episcleritis. Presented with bilateral red eye and diplopia (paresis of the left IV nerve). Ophthalmic examination revealed visual acuity of 20/25 in both eyes. Biomicroscopy shows conjunctival injection 360 degrees, cornea with subepithelial and epithelial alterations, keratitis, wide chamber, no tyndall or flare, IOP of 32/33 mmHg with four medications and fundus with increased cup-disc ratio, due to corneal alterations It was not possible to visualize structures of the iridocorneal angle using gonioscopy. Laboratory tests, including erythrocyte sedimentation rate and C-reactive protein, were normal, and magnetic resonance imaging revealed no abnormalities. Interconsultation was requested with the infectious disease and ocular surface section for corneal alterations where confocal microscopy was indicated, and the uveitis section where suspicion of sclerouveitis was ruled out. Despite medical therapy, IOP remained elevated, leading to a combined approach involving subcyclo laser (180 seconds, 360°, avoiding 3 and 9 o'clock positions, power of 2 W, duty cycle of 31.3%) and thermocyclo laser (8 applications in inferior temporal and inferior nasal quadrants, power of 2 W, 2 seconds exposure). This resulted in a reduction of IOP to 12/16 mmHg with three medications one month post-treatment. Confocal microscopy reported epithelial basement membrane dystrophy. Three months post-treatment, the patient maintained IOP at 18/22 mmHg on three medications. Concurrently, there was an improvement in symptoms.

Conclusion: Glaucoma in these cases is a diagnostic and therapeutic challenge; it is essential to reduce IOP not only to avoid optic neuropathy but also for the correct management of corneal pathologies. Epithelial basement membrane dystrophy is an autosomal dominant disorder, with bilateral involvement and which may present recurrent epithelial erosions.

946 - P3.119

MIXING TECHNIQUES FOR MANAGING A RELAPSING, SYMPTOMATIC GIANT OVERFILTERING BLEB: A CASE REPORT

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Purpose: To describe the clinical management in a case of an Overfiltering Bleb following uneventful Trabeculectomy surgery augmented with Mytomicin C (0.2 mg/ml).

Methods: Case Report. Clinical Information was collected from the database of the Glaucoma department, the video record of the surgery was reviewed, and Anterior Segment Optical Coherent Tomography (AS-OCT) images were reanalyzed. Image and clinical information were consented by the patient.

Results: A 63-year-old woman with pseudoexfoliative glaucoma underwent an uneventful trabeculectomy in her right eye with the use of antimetabolites for the prevention of early bleb scarring. At 8 weeks postoperatively, she presented with a foreign body sensation in her right eye. A slit-lamp examination revealed a big, exposed, inflamed perilimbal bleb involving all the inferior nasal sector and dellen formation at the corneal limbus/conjunctiva adjacent to the anterior border. The intraocular pressure was 18 mmHg and the anterior chamber depth was normal. One week later, the patient underwent bleb revision with two 9/0 nylon conjunctival compression sutures placed through both conjunctiva and sclera nasal to the flap. The sutures were kept as deep and radial as possible in order to redirect the flow to a more superior area. Two days later, the bleb acquired its previous shape, translating the failure of the procedure. The patient was readmitted to the O.R. the following week and submitted to new bleb-limiting compression sutures combined with autologous blood injection. She experienced complete resolution of symptoms and following visits documented disappearance of the bleb beyond the suture line, without recurrence at the 5-month follow-up visit. The consecutive AS-OCT assessment of bleb quantitative and qualitative measurements (volume and morphology) during post-operative follow-up was an important tool in the clinical decision making process.

Conclusion: The risk of late-onset focal leakage and formation of big blebs increases following trabeculectomy augmented with mitomycin C, eventually causing incomplete lid closure with severe dry eye symptoms and corneal dellen formation. These cases should be addressed as soon as possible and may involve several bleb revision techniques. This report suggests that combining conjunctival compression sutures with autologous blood injection might improve the success rate regarding the management of these situations.

950 - P3.120

EFFICACY AND SAFETY OF AB INTERNO XEN IMPLANT: A RETROSPECTIVE STUDY OF A COHORT OF 72 PATIENTS IN VIRGEN DE VALME UNIVERSITY HOSPITAL

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Purpose: The present study aims to evaluate the efficacy of the XEN® 45 implant via ab interno in the reduction of intraocular pressure (IOP) and the number of prescribed hypotensive drugs, as well as to analyse the postoperative complications associated with the intervention.

Methods: An exhaustive retrospective study was conducted on the clinical records of patients who underwent surgery with XEN® 45 implant via ab interno at the Hospital Universitario Virgen de Valme during the period from 2016 to 2019. Changes in mean IOP and drug counts 12 months after surgery, post-surgical complications, as well as the need for needling or surgical reintervention of the same eye were assessed.

Results: 72 eyes of 72 patients diagnosed with glaucoma were included in the study. Before surgery, mean IOP was 20.47 ± 5.82 mmHg. At 6 months after surgery, mean IOP decreased to 14.55 ± 4.03 mmHg and at 1 year it remained at similar levels (15.28 ± 4.07). The mean number of antihypertensive medications was significantly reduced from 2.86 ± 0.85 before surgery to 1.11 ± 1.09 at 12 months after surgery. After surgery up to 36.6% of patients required needling of the filtration bleb, as the most frequent complication was flattening or encapsulation of the bleb.

Conclusion: Glaucoma surgery using the XEN® 45 ab interno implant is an effective and safe procedure for lowering IOP and the number of hypertensive medications, with a predictable and acceptable safety profile. Frequent follow-up examinations are necessary for early recognition of filtration bleb failure and additional puncture procedures to improve aqueous flow and lower IOP.

953 - P3.121

BLEB RETENTION AND DE-EPITHELIZATION WITH CONJUNTIVAL ADVANCEMENT - SURGICAL REPAIR OF LATE-ONSET LEAKING FILTERING BLEB IN A MONOCULAR PATIENT

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Purpose: In this clinical case, we aimed to address a successful surgical technique in the management of a post-trabeculectomy late-onset bleb leak.

Methods: Clinical case description and video record images of the surgical steps to resolve late-onset leaking filtering bleb after trabeculectomy.

Results: A 68-year-old monocular male with uncontrolled ocular hypertension, despite maximum tolerated medical treatment and two sessions of selective laser trabeculoplasty, underwent trabeculectomy with mitomycin C. Post-op IOP remained at single digits (4 - 10 mmHg) during the first six years after surgery, with a BCVA of 20/20. After that, during a routine follow-up examination, the patient presented with decreased visual acuity (20/25), an IOP of 0 mmHg and evidence of a leaking bleb. Macular folds were subsequently identified in macular optical coherence tomography (OCT). To address symptomatic hypotony due to a late-onset bleb leak, the patient underwent surgical bleb revision. The procedure involved bleb preservation with de-epithelization of its avascular component and conjunctival advancement. After the placement of a superior corneal traction suture, a conjunctival dissection surrounding the avascular area was performed. Blunt dissection was carefully carried out in the subconjunctival plane to ensure adequate mobilization of conjunctival tissue. Wet-field cautery was employed to de-epithelize the surface of the avascular area. Finally, conjunctiva was advanced and sutured to the limbus using 10/0 nylon interrupted sutures. Anterior chamber was filled with balaced salt solution to check for any remaining leakage. By the second post-operative day, the patient's IOP had risen to 10 mmHg, with no signs of bleb leakage. After two weeks there were no macular folds on macular OCT. At the ten-month follow-up visit, BCVA was 20/20, IOP remained stable at 10 mmHg, and the bleb was diffuse, with no avascular areas.

Conclusion: This case underscores the challenges of managing a late-onset bleb leaking that lead to clinical hypotony. Timely surgical intervention, involving bleb preservation, de-epithelization, and conjunctival advancement, successfully resolved these issues and restored normal visual acuity. Overall, this case highlights the importance of individualized treatment strategies in complex glaucoma cases and the potential for favorable outcomes with appropriate surgical management.

954 - P3.122

COMPARISON OF ONE-YEAR OUTCOMES BETWEEN COMBINED MICROPULSE TRANSSCLERAL DIODE CYCLOPHOTOCOAGULATION WITH PHACOEMULSIFICATION AND COMBINED HYDRUS MICROSTENT WITH PHACOEMULSIFICATION

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Purpose: To compare the one-year efficacy between combined micropulse Transscleral Diode Cyclophotocoagulation with phacoemulsification (MPTCP-Phaco) and combined Hydrus Microstent with phacoemulsification (Hydrus-Phaco).

Methods: This is a retrospective review of all subjects that had undergone MPTCP-Phaco from May 2017 to September 2022 and Hydrus-Phaco from April 2019 to September 2022 at Department of Ophthalmology, National University Hospital, Singapore. Patients diagonosed with Primary open angle glaucoma and pseudoexfoliation glaucoma were included in the study. Hospital records were retrieved excluding angle-closure glaucoma and secondary glaucoma diagnoses. The follow-up periods was 12 months postoperatively. For those with both eyes operated on, data from the first treated eye was used. Intraocular pressure (IOP), number of IOP-lowering medications, and visual acuity (log-MAR) were recorded on day 1, month1, 3, 6 and 12 postoperatively.

Results: 23 eyes were included in the MPTCP-Phaco group and 38 in the Hydrus-Phaco group.The mean IOP at 6 and 12 months postoperatively in the MPTCP-Phaco group was significantly lower at 14.0 ± 2.2 mmHg and 14.5 ± 2.2 mmHg ($p < 0.01$, 0.01) respectively, compared to preoperative IOP of 16.8 ± 3.5 mmHg. In the Hydrus-Phaco group, IOP significantly decreased from preoperative of 17.2 ± 3.3 mmHg to 13.2 ± 3.5 mmHg and 15.2 ± 4.3 mmHg, respectively ($p < 0.01$, 0.03). There was no difference in IOP at 12 months post-operatively between the two groups ($p = 0.47$) . In the MPTCP-Phaco group, the mean number of medications used significantly decreased from 1.5 ± 0.6 preoperatively to 0.3 ± 0.4 and 0.2 ± 0.4, respectively ($p < 0.01$, < 0.01) at 6 and 12 months postoperatively. In the Hydrus-Phaco, the number of medications similarly decreased from preoperative of 1.4 ± 0.8 to 0.2 ± 0.7 and 0.2 ± 0.7, respectively ($p < 0.01$, < 0.01). The number of medications at 12 months postoperatively did not differ between the two groups ($p = 0.67$). In the MPTCP-Phaco group, visual acuity improved from A preoperatively to B at 12 months postoperatively. Similarly, in the Hydrus-Phaco group, visual acuity improved from A preoperatively to B postoperatively.

Conclusion: MPTCP-Phaco and Hydrus-Phaco are considered effective procedures in lowering IOP and decreasing the number of IOP-lowering medications.

965 - P3.123

PRESERFLO MICROSHUNT VERSUS NON-PENETRATING DEEP SCLERECTOMY FOR GLAUCOMA MANAGEMENT - SHORT-TERM RESULTS

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Purpose: To compare the short-term efficacy and safety of the PRESERFLO™ MicroShunt (PF) versus Non-Penetrating Deep Sclerectomy (NPDS) with Esnoper®

Methods: Retrospective comparative cohort study in a tertiary hospital including 72 eyes of 72 patients submitted to surgery (35 undergoing PF implantation – Group 1 and 37 NPDS – Group 2) between January of 2022 and June of 2023. The main outcome measures were intraocular pressure (IOP), number of IOP-lowering medications, visual acuity, complications, surgical duration, postoperative interventions, and reoperations. Surgical failure was defined as IOP>21 mmHg or < 20% reduction from baseline, IOP < 5 mmHg, reoperation, or loss of light perception. Complete and qualified success were cases meeting the above criteria with and without glaucoma medications, respectively.

Results: Baseline characteristics (age, sex, IOP, number of IOP-lowering medications, visual fields mean defect) were comparable between groups (p>0.05). Overall, 64.5% of eyes had primary open-angle glaucoma and the percentage of eyes submitted to a combined phacoemulsification surgery in each group were similar (p = 0.984). Mean follow-up time was 9.35 ± 2.75 months. At 6-months, IOP decreased from 20.30 ± 5.39 and 19.82 ± 5.54 mmHg to 14.68 ± 5.53 (p = 0.002) and 12.38 ± 3.49 mmHg (p < 0.001) and the mean number of IOP-lowering medications decreased from 3.07 ± 1.14 and 3.54 ± 0.58 to 0.47 ± 0.84 and 0.26 ± 0.57 in Group 1 and Group 2, respectively. Number of complications (10 vs 7, p = 0.335), surgical duration (62.51 ± 16.17 min vs 70.60 ± 17.88 min, p = 0.06) and number of postoperative interventions (9 vs 12, p = 0.704) were similar among studied groups. At 6-months, complete success was achieved in 65.7% of eyes in Group 1 and in 73% of eyes in Group 2 (p = 0.504). Surgical failure was higher in Group 1 (22.9% vs 2.7%, p = 0.01). Excluding the first implanted PF (n = 15, considered the learning curve), surgical failure was comparable to Group 2 (11.1% vs 2.7%, p = 0.198).

Conclusion: PF and NPDS share comparable safety profiles. Excluding initial PF cases to adjust for the learning curve, efficacy aligned with NPDS, suggesting that mastery of the technique could lead to fewer re-interventions. Nonetheless, no advantage in surgical duration was observed within the PF group.

969 - P3.124

12-MONTH REAL WORLD OUTCOMES OF THE OMNI SURGICAL SYSTEM AT A REGIONAL NHS OPHTHALMIC CENTRE IN THE UK

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Purpose: To assess the real-world effectiveness of the OMNI® Surgical System in managing glaucoma patients within a UK regional ophthalmic centre.

Methods: A retrospective analysis of electronic health records was conducted encompassing all cases of OMNI® surgery between October 2022 and March 2023. The standard surgical plan was for 360° viscocanaloplasty and 180° trabeculotomy. Parameters including intraocular pressure (IOP), topical glaucoma medication usage, and mean deviation were examined preoperatively and postoperatively. Statistical analysis employed paired t-tests, supplemented by subgroup analysis categorized by baseline IOP levels (≥18 mmHg vs. < 18 mmHg).

Results: A total of 33 eyes from 31 patients were included in the 12-month follow-up. The mean baseline IOP was 19.30 ± 6.44 mmHg. Most patients had moderate to advanced glaucoma (MD ≥ 4 dB) and the baseline mean deviation averaged -8.98 ± 7.20. The mean angles of viscocanalostomy and trabeculotomy procedures were 341.25 and 149.69 degrees, respectively, with 63.6% of cases involving combined phacoemulsification and OMNI® surgery. Significant reductions were observed in mean IOP (4.06 mmHg, 21.0%, p = 0.002) and topical glaucoma medication use (1.33 medications, p < 0.001) at the 12-month mark. Visual field mean deviation remained stable between baseline and 12 months (p = 0.320) indicating stabilisation of their condition. Cases of combined phaco-OMNI® surgery exhibited greater reductions in both IOP (5.71 mmHg, 29.6%, p = 0.064) and medication usage (1.76 medications, p = 0.002) compared to standalone OMNI® surgery. Complications included early (< 30 days post-op) (4) and late (5) IOP elevation (>21 mmHg), hyphaema (3) and iridodialysis (1). Subgroup analysis demonstrated a more substantial reduction in IOP for patients with baseline IOP ≥ 18 mmHg (6.75 mmHg, 28.9%, p = 0.003). Eyes with a baseline IOP of less than 18 mmHg had no significant change in IOP but a greater reduction in medications (1.77 vs 1.05) although this did not reach statistical significance (p = 0.068).

Conclusion: The findings of this study indicate that OMNI® surgery yields significant reductions in IOP and topical glaucoma medication use over a 12-month period, with combined phaco-OMNI® surgery having superior outcomes. Notably, patients with higher baseline IOP levels experienced greater reductions in IOP postoperatively.

972 - P3.125

OUTCOMES OF BLEB NEEDLING WITH 5-FLUOROURACIL: COMPARISON BETWEEN INSULIN SYRINGE AND MICROVITREORETINAL BLADE

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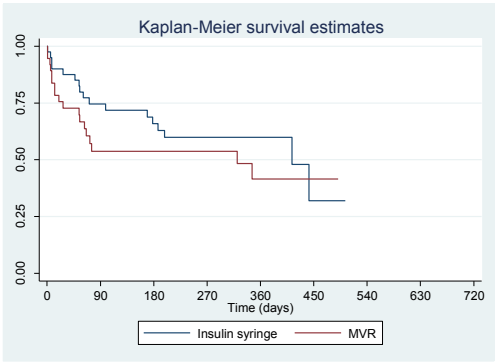
Purpose: The primary objective was to study the outcomes of bleb needling revision (BNR) with 5-Fluorouracil (5FU). The secondary objective was to compare the outcomes between Insulin syringe (IS)(30G) and Microvitroretinal (MVR) blade (25/23G), commonly used to perform the procedure.

Methods: It was a retrospective audit study. Consecutive adult patients who underwent BNR+5FU between Nov'19-Apr'22 were included. Demographic details, pre-operative, intra-operative and post-operative data up to one year was collected. Success was defined as 'Complete' if IOP was 6-21 mmHg without use of glaucoma medications, and 'Qualified' if glaucoma medications were required.

Results: A total of 77 episodes (65 eyes of 59 patients) were included. The mean age of the sample was 70.12 ± 13.76 years. 62.34% were Caucasians, 23.38% were Asians and 14.28% were of Afro-Caribbean ethnicity. 74% of the cases were of primary glaucoma, and the rest 26% constituted secondary glaucoma. Following BNR+5-FU, the mean pre-operative IOP, 25.51 ± 7.68 mmHg, reduced to 16.04 ± 5.94 mmHg at month-12 ($p < 0.001$), with a persistent drop of > 30% at all time points. The complete success at month-2 and month-12 was 35.38% and 21.21% respectively, and qualified success was 64.62% and 50% respectively. All cases of hypotony resolved by month-2. Increasing age, diagnosis, lower pre-operative IOP and increased interval between previous to current BNR were significant risk factors for failure on univariate analysis, but none were significant in multivariable analysis. There was no significant difference in IOP, % IOP drop, success and hypotony between IS and MVR groups, however, the latter possessed 77.78% of the previously needled eyes ($p < 0.001$). On Kaplan-Meier analysis (12-months), at a survival criteria of IOP≤ 21 mmHg, 59.87% IS and 41.48% MVR were successful ($p = 0.23$). When the survival criteria was made stringent at ≤ 18 mmHg, 50.45% IS and 30.26% MVR ($p = 0.22$) were successful. When further intervention to lower IOP was taken as failure, 64.34% IS and 60.15% MVR needlings were successful ($p = 0.21$) at 12-months.

Conclusion: BNR+5FU is effective in controlling IOP in the short to medium term. IS and MVR are equally effective and safe methods; however, the MVR may offer equivalent outcomes even in previously failed eyes.

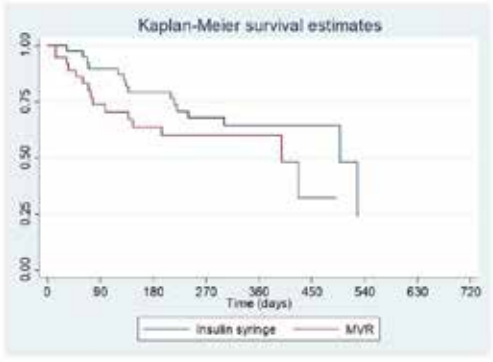
Success: IOP≤ 21mmHg



Logrank p=0.23

Survival estimates	6 months	12 months
Insulin	65.86%	59.87%
MVR	53.78%	41.48%

Success: No further intervention required to lower IOP



Log rank test p=0.21

Survival estimates	6 months	12 months
Insulin	79.24%	64.34%
MVR	63.69%	60.15%

973 - P3.126

VISUAL FIELD PROGRESSION AND RNFL CHANGE AFTER PRESERFLO MICROSHUNT IMPLANTATION - INTERIM RESULTS OF A PROSPECTIVE COHORT STUDY AT THE OPHTHALMOLOGY DEPARTMENT KLINIKUM KLAGENFURT

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Purpose: The trabeculectomy is the gold standard in glaucoma surgery, nevertheless often postoperative interventions have to be done. The PreserFlo MicroShunt (Santen, Osaka, Japan) implantation occurs without the critical steps of the trabeculetomy. According to a study a 20% eye pressure reduction was achieved in 53.9% of patients one year after PreserFlo MicroShunt implantation and the risk of postoperative hypotony was clearly minimized. It has been shown that after trabeculectomy there is a stable development of visual fields in the first 3 months after surgery and then, despite adequate intraocular pressure reduction, visual fields deteriorate. At the Klinikum Klagenfurt structural and functional changes after PreserFlo MicroShunt Implantation are evaluated.

Methods: 43 eyes of 40 patients suffering from glaucoma (POAG (29), PEG (11), PDG (2) und NTG (1)) were included in the interim analysis of the study. The patients had to have insufficient eye pressure reduction despite medical treatment/selective laser trabeculoplasty. Patients, who had prior glaucoma surgery, were excluded from the study. Preoperative visual field examinations and measurements of the RNFL (retinal nerve fibre layer) and eye pressure took place. The postoperative visual field examinations, retinal nerve fibre layer measurements and eye pressure check-ups were done after 1, 3, 6 and 12 months.

Results: The eye pressure reduction was more than 20% after 1 year in 93% of the included eyes. The baseline visual field examination showed a mean MD (mean deviation) of 10.9 ± 6.65 dB/year, after 12 months the mean MD of the visual fields was 10.85 ± 6.69 dB/year. Nevertheless, the mean thickness of the RNFL decreased from 66.30 ± 26.29 µm/year at baseline to 63.88 ± 25.06 µm/year 12 months after surgery.

Conclusion: The results show that in the majority of patients an eye pressure reduction of more than 20% can be achieved one year after PreserFlo MicroShunt implantation. Furthermore, the visual field did not deteriorate in the period examined, nevertheless a reduction of the RNFL could be shown.

974 - P3.127

REAL-WORLD 4 AND 5-YEAR OUTCOMES FOR PATIENTS TREATED WITH THE ISTENT INJECT (G2) MINIMALLY INVASIVE GLAUCOMA SURGERY DEVICE

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Purpose: To report the 4 and 5-year long-term real-world outcomes of the iStent Inject (G2) device.

Methods: Retrospective Case Series. An automated algorithm was used to extract baseline and follow-up data for patients undergoing iStent implantation with or without cataract surgery. As experience was gained with the iStent, the baseline glaucoma severity criteria for use of the device were relaxed. Therefore, the results are presented as 2 cohorts. The study was registered as a clinical audit.

Results: There were 50 eyes (38 patients) with 5-year data (cohort 1) and 59 eyes (47 patients) with 4-year data (cohort 2). Most cases were combined with cataract surgery. For cohort 1, mean IOP (mean number of medications) were as follows: Baseline 20.1 mmHg (2.4); 6 months: 14.1 (1.7); 12m: 14.2 (1.6); 24m: 15.1 (1.6); 36m: 14.3 (1.8); 48m: 14.9 (1.7); 60m: 14.7 (1.7) $p < 0.001$ for IOP (-5.4 mmHg) and medication (-0.7) reduction at 5 years. For cohort 2: Baseline: 17.1 mmHg (1.5); 6m: 13.9 (0.9); 12m: 13.1 (1.1); 24m: 15.5 (1.0); 36m: 14.4 (1.2); 48m: 14.2 (1.2) $p < 0.001$ for IOP (-2.9 mmHg) and $p = 0.016$ for medication (-0.3) reduction at 4 years. Mean Visual acuity at baseline compared with final follow-up across both cohorts improved from 0.25 logMAR at baseline to 0.13 at final follow-up, n = 109 eyes (71 patients), $p = 0.008$. Average mean deviation (MD) across both cohorts improved from -9.63dB at baseline to -8.29dB at a minimum of 3.5 years follow-up (n = 78 eyes, 53 patients, with reliable visual fields, $p = 0.025$). No patients suffered visual loss related to corneal endothelial damage.

Conclusion: In this real-world study, the iStent inject in combination with cataract surgery demonstrated a concomitant reduction in IOP and medication burden in 109 eyes (71 patients) through 4 and 5 years. This was achieved in 2 distinct cohorts with higher and lower mean baseline pressures and medication level and with significant glaucoma (mean baseline MD of -9.63dB). Visual acuity and MD improved due to the combined cataract surgery. These results were sustained through 4 and 5 years, demonstrating that the iStent inject is a safe and effective device for the long-term treatment of glaucoma in real-world patients.

979 - P3.128

PRESERFLO MICROSHUNT VERSUS TRABECULECTOMY: ONE-YEAR SURGICAL OUTCOMES

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Purpose: To compare the efficacy, safety and postoperative surgical intervention between Preserflo® MicroShunt and trabeculectomy with mitomycin C.

Methods: Data from the first consecutive cohort of Microshunt procedures were matched with recent trabeculectomy procedures. All surgeries were performed with mitomycin C. Primary endpoint included changes in intraocular pressure (IOP). Secondary endpoints included rates of complications and further surgical interventions. Complete surgical success was defined as an IOP ≤ 21 mmHg, no further surgical reintervention, no loss of light perception vision, no chronic hypotony (IOP ≤ 5 mmHg) and no medications to control IOP. The same criteria applied for qualified success, but the use of medication was permitted.

Results: We enrolled 50 eyes in each group. After 12 months, complete success was 78.7 % (95% CI: 59.1%-90.2%) in the MicroShunt group and 77.5 % (95% CI: 58.7%-91.1%) (p = 0.3). The reduction of IOP in eyes with complete success after 12 months was 12.2 ± 10.0 mmHg in the trabeculectomy group and 13.6 ± 6.8 mmHg in the MicroShunt group (p = 0.5). More interventions were required in the trabeculectomy group, 44.7% versus 26.0% in the microshunt group (p = 0.02). Interventions mainly included needling at the slit lamp in 76.2% of all interventions in the trabeculectomy group and 30.8% in the MicroShunt group, while revisions in the operating room were more frequent in the MicroShunt group (19.0% and 61.5%, respectively).

Conclusion: The MicroShunt is similarly effective as trabeculectomy in lowering IOP at 12 months, but requires fewer surgical procedures than trabeculectomy, most of which must be performed in the operating room.

985 - P3.129

BLEB EPITHELIAL CHANGES DURING BLEB MATURATION IN GEL STENT SURGERY: A PROSPECTIVE STUDY

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Purpose: The XEN45 Gel Stent (XGS) (Abbvie®) is less invasive than traditional filtering surgeries but still depends on a bleb formation that can condition the postoperative success. We aimed to determine the main characteristics of the bleb on XGS surgeries, measured with in vivo confocal microscopy (IVCM) and cytology impression.

Methods: We performed a prospective, interventional study that included patients with open-angle glaucoma with over-target-IOP despite maximum tolerated medication or glaucoma progression and that underwent XGS implantation (24 eyes, one eye per patient). Demographics, IOP, and glaucoma medication were recorded at baseline and during follow-up. Success was defined as a postoperative IOP below 21, 18, and 15 mmHg for mild, moderate, and severe cases according to the preoperative perimetry. At baseline, 3- and 6-month visits, VCM was performed, measuring goblet cell density (GCD), microcyst-like structures density (MSD), and area (MSA) (in units/mm2 andmm2, respectively) together with impression cytology (IC). Impression cytology samples were examined under confocal microscopy after goblet cell and inflammatory cell immunostaining with anti-MUC5AC and anti-HLADR antibodies, respectively.

Results: Of the 24 cases, two were excluded due to XGS malposition and one due to loss of follow-up. At three and six months, IOP went from 19.8 (2.8) [mean (confidence-interval)] to 18.4 (6.1) ($p = 0.53$) and 16.1 (5.5) ($p < 0.05$), respectively. GSD decreased compared to baseline; however, despite the IOP stabilization at 6 months, MSD [from 23.5 (16.1) to 36.2 (19.9) and 30.7 (18.3)] and MSA [from 8.9 (10.1) to 30.3 (31.2) and 22.4 (17.4)] significantly increased at 3 and 6 months compared to baseline (all comparisons, $p < 0.05$). When the IC samples were analyzed, HLA-DR levels were significantly lower at 3 and 6-month visits ($p < 0.05$). Mucin levels were also increased at 3 months, but not statistically significant compared to baseline.

Conclusion: In XGS, the conjunctival changes correlated to a functioning bleb are detectable at three months despite the later, more definitive IOP. This could mean that the epithelial changes at the conjunctiva during bleb maturation are an active process that could last longer than the early postoperative period.

986 - P3.130

REVIEW OF 5FLUOROURACIL-AUGMENTED TRABECULECTOMY-BLEB NEEDLING PROCEDURE DURING COVID-19 PANDEMIC IN ONE NHS ENGLAND TRUST

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Purpose: To assess the success-rate, determine any Covid-19-pandemic related and/or other factors predicting the need for and for improving success-rate of 5Fluorouracil- augmented trabeculectomy-bleb needling procedure(5FU-BN).

Methods: All 5FU-BN performed in the Ophthalmology-theatres by two fellowship-trained Glaucoma surgeons over three hospital-sites covered under a single NHS trust in England between 07/09/2020 and 31/12/2022 were reviewed. The Follow-up tenure ranged from 25-40 months post-procedure. The operation and clinical records were collected from the online Electronic-Patient-Record systems including Open eyes, CLIP and Zeiss Forum viewer and analysed retrospectively using Microsoft Excel spreadsheets.

Results: A total of 58 5FU-BN (32-eyes, 28 Right-eyes) were undertaken consecutively during the Covid-19-pandemic tenure under our review. Indications included uncontrolled Intraocular Pressure (IOP) in encysted blebs, fibrotic blebs, under-functioning blebs and adhered adjustable-trabeculectomy sutures. Of note, due to the UK-wide limited availability of Mitomycin C for a few months during the study tenure, 19 eyes (32.75%) under study had 5FU application per-operative during the primary-Trabeculectomy surgery. The interval between the primary trabeculectomy to 5FU-BN ranged from 2 weeks to 34 years. 44 eyes (75.8%) had reduction of IOP post-procedure. 30 eyes (51.7%) needed lesser (compared to pre-operative) or no (24-eyes) drops post-procedure. 24 eyes (41.3%) needed further 5FU-BN and 7 eyes needed further definitive glaucoma surgeries. These included trabeculectomy (1-eye), Preserflo (3-eyes), initial trabeculectomy followed by Baerveldt shunt implantation (1-Eye) and trans-scleral-Cycloablation-laser (2-eyes). The eyes needing repeated 5FU-BN were also noted to be more inclined to need further surgical procedures. Incidentally, the main factors affecting the need (sometimes, repeated) for 5FU-BN included eyes with secondary glaucoma following ocular-inflammation, eyes with thin and scarred sclera noted during primary-trabeculectomy and more significantly, the eyes with long-term use of Bimatoprost/Brimonidine drops and/or glaucoma drops with preservatives (especially Benzalkonium chloride).

Conclusion: We find 5Fluorouracil-augmented trabeculectomy-bleb needling, a safe and effective measure for IOP-reduction and for lesser Glaucoma drops usage. This procedure can effectively delay or even avoid future definitive glaucoma surgery. The use of preservative-free Glaucoma drops and avoiding the use of Bimatoprost/Brimonidine is recommended, where possible.

987 - P3.131

POSTOPERATIVE EVOLUTION AFTER AB EXTERNO XEN IMPLANT SURGERY AT THE VIRGEN DE VALME UNIVERSITY HOSPITAL. PRELIMINARY STUDY

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Purpose: To describe the cohort of patients with ab externo XEN implantation, to analyze the evolution of intraocular pressure (IOP) at 6 months post-surgery, changes in medical treatment, safety of the open conjunctival approach and post-surgical complications. To compare these results with the ab interno approach.

Methods: Retrospective observational study of 70 patients operated with ab externo XEN implant at the Virgen de Valme University Hospital. Inclusion criteria: patients ≥ 18 years, follow-up of at least 6 months, at least 3 recorded visits, ab external surgery with XEN implant and diagnosis of glaucoma. Ab interno surgeries and cases that did not meet these criteria were excluded.

Results: 70.5% of patients had advanced glaucoma, mainly primary open angle (64.2%). The mean IOP prior to surgery was 23.39 mmHg. Most patients were receiving preoperative medical treatment (97.1%), with maximum dose in 73.9% of the cases and having preservatives in 76.8%. The 22.85% had undergone previous surgery and 41.4% were pseudophakic. Surgery with ab external XEN implant was performed in all patients, with mitomycin in 97.1%. IOP decreased significantly by 32.75% at 6 months, with a final average of 15.73 mmHg, and 58.2% of the cases did not require post-surgery drugs. Complications occurred in 30.3%, the most common being flattening/encapsulation of the filtering bleb (18.2%) and implant malposition (9.1%), requiring needling in 15.2% and reoperation in 13.4%.

Conclusion: Surgery with ab external XEN implant proved to be effective and safe at 6 months, significantly reducing IOP, number of drugs and with manageable complications. We obtained similar results to the literature for the ab interno approach, with surgical advantages and improvement in the needling rate post-surgery. However, studies with longer follow-up and sample size are needed to validate these results.

994 - P3.132

MMC APPLICATION TECHNIQUE: DO THEY REALLY MATTER?

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Purpose: To determine the efficacy and safety profile of direct scleral Mitomycin C (mmC) administration versus the conventionalmmC-soaked sponges application technique during trabeculectomy surgery.

Methods: Retrospective study that compares two distinctmmC application techniques. Inclusion criteria were eyes with glaucoma (primary and secondary) submitted to filtration surgery (Trabeculectomy and Phacotrabeculectomy) with a follow-up of 6 months. Group 1 underwent trabeculectomy surgery with 0.2mL ofmmC applied directly onto the sclera under Tenon's capsule after peritomy, without subsequent balanced salt solution (BSS) irrigation. Conversely, Group 2 underwent the conventional application technique, usingmmC-soaked sponges placed under Tenon's capsule prior to scleral flap dissection, left in situ for 3 minutes, followed by sponge removal and copious BSS irrigation (50 mL) to wash out the antimetabolite.mmC at a concentration of 0.2 mg/mL was used for both groups.

Results: Group 1 comprised 15 eyes, with 6 undergoing trabeculectomy and 9 submitted to phacotrabeculectomy, while Group 2 included 27 eyes, with 4 of them receiving trabeculectomy and 23 submitted to phacotrabeculectomy. Mean preoperative IOP in Group 1 was 19.73 ± 7.41 mmHg, reducing to 13.40 ± 3.54 mmHg at 6 months postoperatively ($p = 0.0041$). Corresponding values for Group 2 were 21.96 ± 5.47 mmHg preoperatively and 13.59 ± 3.76 mmHg at the final visit ($p < 0.001$). Mean preoperative number of antiglaucoma medications was 3.73 ± 1.28 in Group 1 and 3.30 ± 1.03 in Group 2, which reduced to 0.73 ± 1.16 and 0.89 ± 0.89, respectively, with p-values of < 0.001 for both groups. Complications including seidel at 1 month and thin-walled cystic bleb occurred in 13.33% eyes in Group 1 and 20.00% in Group 2.

Conclusion: Direct scleralmmC injection may be as safe and as effective as conventional application. Prospective studies with homogeneous groups are imperative to support its efficacy and safety further.

996 - P3.133

COMPARISON OF REFRACTIVE SURPRISE AND COMPLICATION RATES IN GLAUCOMA AND ROUTINE CATARACT SERVICE USING HOFFER-Q AND SRK/T FORMULAE

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Purpose: The aim of this study was to highlight if any discrepancies exist between refractive outcomes for Intraocular Lenses (IOLs) using Hoffer Q and SRK-T formulas. A close focus in analysis was given to determine complication rates and refractive surprises between cohorts. Benchmark national standards for cataract surgery dictate that 85% of eyes should be within 1D and 55% within 0.5D.

Methods: A systematic, retrospective analysis of 2 patient cohorts- a glaucoma service cohort consisting of overall smaller eyes (n = 736) and a routine, cataract service cohort (n = 8578) containing eyes of AL > 26 mm.Hoffer-Q formulae was used in eyes of < 22 mm axial length (AL), and the SRK/T formulae was used in eyes of >22mmAL.
Analysis was completed in both cohorts quantifying complication rate and refractive surprise rate (set as >0.5D between mean and predicted refraction).

Results: The complication rate was similar ($p < 0.05$) between the glaucoma service cohort and the routine cataract service cohort, with rates of 3.9% (n = 29) and 3.1% (n = 263), respectively. Refractive surprise rates in eyes with an AL of less than 22, using Hoffer-Q formulae, were notably higher in the glaucoma service group compared to the routine cataract service ($p < 0.05$), showing rates of 47.7% (n = 623) and 42.3% (n = 78), respectively. Similarly, utilizing the SRK/T formula, refractive surprise rates in eyes with an AL greater than 22 were higher in the glaucoma group ($p < 0.05$), with rates of 44.4% (n = 108) versus 37.0% (n = 8378) in the routine cataract service. In the glaucoma cohort, eyes with ALs between 20.00-20.99mmshowed acceptable refractive results below 0.5D in 40.3% of patients with 79.1% of cases being below 1D. This falls slightly below the expected national standard. Eyes of ALs between 21.00mmto 26.00mmall reached national standards.

Conclusion: Considering the elevated occurrence of refractive surprises observed in eyes with extreme axial lengths (especially AL < 22 mm) we recommend exercising caution in predicting refractive values to mitigate risk of refractive shifts from hyperopia to myopia and vice versa. Notably, glaucoma eyes in this study have exhibited heightened variability, manifesting in increased rates of refractive surprises compared to the standard observed in routine cataract surgery.

UK EXPERIENCE OF GATT AT A TERTIARY HOSPITAL

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Purpose: The study aimed to evaluate the outcomes of gonioscopy-assisted transluminal trabeculotomy (GATT) procedures conducted on patients with glaucoma at a UK tertiary centre, focusing on various efficacy parameters over a substantial follow-up period.

Methods: This retrospective analysis encompassed all patients aged over 18 who underwent GATT procedure at the Birmingham Midland Eye Centre over a specified period. Eligibility criteria included a minimum of 12 months of post-operative follow-up. The study's primary endpoint was the assessment of intraocular pressure (IOP) changes, while secondary endpoints included the number of glaucoma medications, visual acuity (VA), visual field perimetry variations, and retinal fiber nerve layer (RFNL) thickness. The diverse cohort represented multiple glaucoma types, with a significant proportion of primary glaucoma cases.

Results: The cohort consisted of 131 eyes from 107 patients, with a mean age of 61.3 years (range 18-90). Of these patients, 58.7% were male. The average duration of follow-up was 4.72 years, within which a 38.2% failure rate was observed. Baseline mean IOP was recorded at 28.4 mmHg, with patients on an average of 3.2 glaucoma medications, and an average VA of 0.355. At the last follow-up, there was a significant reduction in mean IOP to 16.7 mmHg, and the average number of glaucoma medications decreased to 1.08. However, VA showed a decline, worsening to an average of 0.688.

Conclusion: GATT emerges as an effective intervention for IOP reduction in a diverse and comprehensive glaucoma population. Future studies should explore the long-term sustainability of IOP reduction and the clinical significance of VA changes post-GATT

1008 - P3.135

EXCISION AND RECONSTRUCTION OF AN HYPERTROPHIC AND FUNCTIONAL BLEB WITH BOVINE PERICARDIUM (TUTOPATCH) AND AMNIOTIC MEMBRANE: A CASE REPORT

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Purpose: Bleb dysfunction is a late complication following glaucoma filtration surgery. We describe our surgical technique for excision and reconstruction of a hypertrophic bleb complication using bovine pericardium patch graft (Tutopatch®) and amniotic membrane.

Methods: Case report, presenting an hypertrophic bleb over the cornea with a good intraocular pressure control. The hanging bleb without leak caused dysesthesia and high irregular astigmatism. Bleb reconstruction involved excision of corneal fibrous material and avascular conjunctiva, preserving original scleral and tennon. Bovine pericardium patch graft (Tutopatch®) was sited over these with fixed sutures, reinforcing the underlying scleral, and the conjunctiva advanced. Superior epithelium corneal defect was covered using amniotic membrane.

Results: Reconstruction with bovine pericardium patch graft and amniotic membrane resulted in pain relief, visually rehabilitation and good aesthetic results, with preservation of bleb function.

Conclusion: Repair of bleb dysfunction with varied techniques has been reported, including conjunctival advancement, use of scleral patch graft, dural patch graft or pericardium. Additional use of amniotic membrane promotes epithelialization and exhibits anti-fibrotic and anti-inflammatory features.

483 - P3.136

TRENDS IN FELLOWSHIP TRAINEE TRABECULECTOMY EXPOSURE IN THE US

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Purpose: There is a well-documented decline in the number of trabeculectomies performed in the USA in recent years. Many have attributed this to the burgeoning trend of tube shunts and minimally invasive (MIGS) procedures. We sought to investigate whether these trends are emergent at the level of fellows in training and if there is a difference in hands on experience as primary surgeon compared to overall exposure to attending cases.

Methods: Association of University Professors of Ophthalmology Fellowship Compliance Committee (AUPO-FCC) collects summaries of surgeries performed by fellows in training in the USA. The yearly average number of procedures performed per fellow was analyzed based on primary versus assisted cases for trabeculectomy compared to tube shunts over a 9 year time period.

Results: From 2014 through 2022, the mean number of trabeculectomy surgeries performed per fellow as primary surgeon decreased by 26.8% while that of tube shunt surgeries increased slightly by 8.3% (Figures 1 and 2). Data from 2014 through 2018 show an even steeper decline of 41.4% for trabeculectomies performed by an attending surgeon with fellow assist compared to 24.0% decline for that of tube shunts. The overall total case exposure of trabeculectomies (primary and assist) decreased by 29.0% compared to 3.6% decline for total tube shunt cases. By 2018, the mean number of minimally invasive glaucoma surgeries surpassed that of trabeculectomies performed by fellows in training.

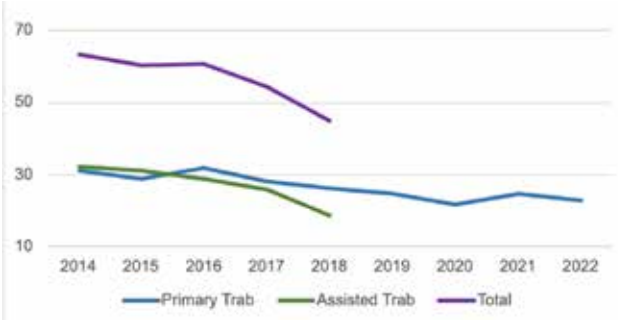

Figure 1. Mean # of trabeculectomy primary vs assisted

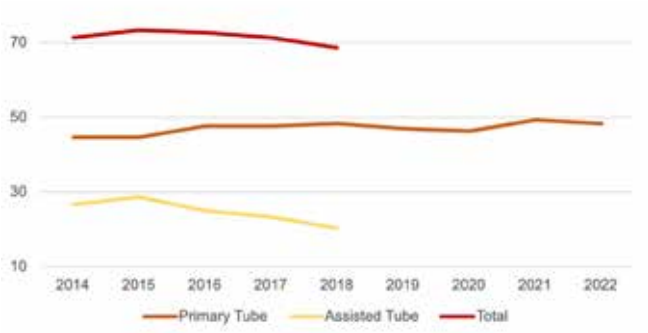

Figure 2. Mean # of tube shunts primary vs assisted

Conclusion: In recent years, glaucoma surgeons in training are not only performing fewer trabeculectomies but are also receiving less exposure overall to the traditional trabeculectomy technique. The mean number of minimally invasive glaucoma surpassed that of trabeculectomies performed by fellows in training. The continued decrease in trabeculectomy training in US fellowships may be of concern given the increase in the need for properly trained glaucoma specialists worldwide.

497 - P3.137

OPTIMAL PERFORMANCE OF SELECTIVE LASER TRABECULOPLASTY: 18-MONTH RESULTS OF THE SWEDISH OPTIMAL SLT MULTICENTER RANDOMISED CONTROLLED TRIAL

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Purpose: Several variants of selective laser trabeculoplasty (SLT) are used in clinical practice. The objective of this trial was to compare the outcomes of the four most significant variants, differing in treatment extent and laser power settings.

Methods: Four hundred patients with primary open-angle glaucoma, pseudoexfoliative glaucoma, or ocular hypertension were included in a multicentre, masked, randomised controlled trial. SLT was performed in 180 degrees (50 ± 5 laser spots), or in 360 degrees (100 ± 10 laser spots). Laser power was titrated either just below the cavitation bubble threshold (standard energy), or to a level producing cavitation bubbles at 50–75% of laser applications (high energy). Target IOP was set for each eye prior to randomisation, and patients were followed according to a standardised protocol, with IOP measured at least every 6 months. Treatment escalation (including repeated SLT) was performed if the target IOP was not reached or maintained, supported by a decision aid. Success rates, defined as an IOP reduction of at least 20% without any further intervention, were calculated during follow-up. Further, IOP reduction (with correction for selectively missing data in failed cases) was calculated. The differences between the groups were analysed with a chi-square-test and a one-way ANOVA, respectively. The study protocol is described in detail elsewhere [1].

Results: The 360/high group had a superior success rate with 43.8% of patients fulfilling success criteria after 18 months, compared to 23.2%, 13.3%, and 26.9% in the 180/standard, 180/high, and 360/standard groups, respectively ($p < 0.001$; Figure 1). The IOP was 3.92 mmHg below baseline in the 360/high group after 18 months, compared to 2.03, 1.54, and 2.72 mmHg, respectively ($p < 0.001$).

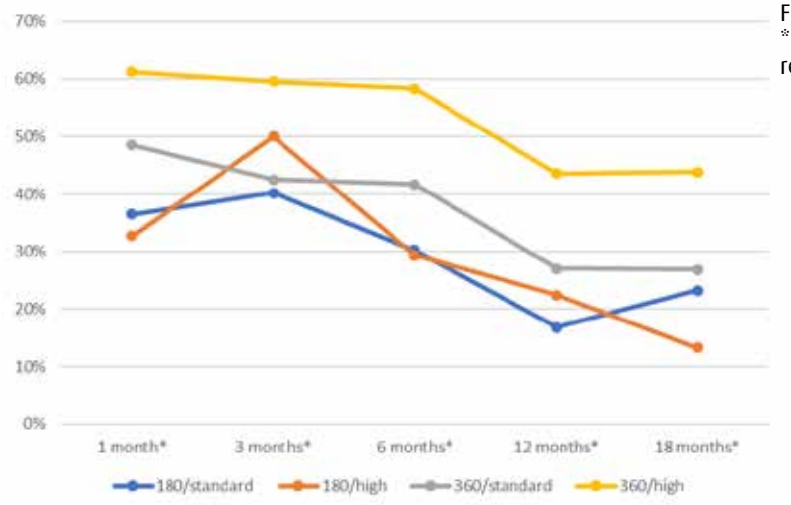

Figure 1. Success rate 1–18 months after SLT.
* = $p < 0.001$, 0.037, < 0.001, < 0.001, and < 0.001, respectively.

Conclusion: SLT performed according to the 360/high protocol maintained superior results compared to the alternatives 18 months after treatment. In a prior publication,[1] we have demonstrated a low rate of adverse events and an unproblematic occurrence of postoperative discomfort. Therefore, we suggest that the 360/high SLT protocol is considered the preferred SLT variant.

References

1. Dahlgren et al. Optimal Performance of SLT. Ophthalmol Glaucoma. 2023 Oct 12: S2589-4196(23)00191-6.

566 - P3.138

AN INTERMEDIATE-TERM ANALYSIS OF BAERVELDT AND PAULS GLAUCOMA IMPLANTS AT MOORFIELDS EYE HOSPITAL

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Purpose: To evaluate the intermediate term (1-3 years) outcomes of non-valved glaucoma tube shunt surgeries regarding implant type, mitomycin-C (mmC) application, and the adjunctive usage of anti-vascular endothelial growth factors (Anti-VEGF).

Methods: A retrospective single center comparative case series that compared the outcomes of 2 non valved glaucoma tube shunts: Baerveldt glaucoma implant (BGI) Vs Paul glaucoma implant (PGI), the application ofmmC in different methods and concentrations, and intraoperative injection of Anti-VEGF on IOP, number of medications, visual acuity and success rates up to 36 months post-operatively.

Results: 480 patients were analysed over 36 months. There was no difference in the treatment outcomes up to 36 months based on the type of tube implant (p = 0.009). There was no statistical significance in the difference between usingmmC and Avastin (p = 0.3). PGI patients were on fewer medication at 36 months (p = 0.009), and this was consistent at each interval. Patients who had PGI had better vision (p = 0.055).

Conclusion: The novel PGI is at least non-inferior to the standard BGI, the efficacy of which has been extensively studied before, in the intermediate term. The usage of adjunctive anti-metabolites and anti-VEGF agents doesn't affect the outcomes of glaucoma tube shunt surgery.

685 - P3.139

DETERMINING THE CHARACTERISTICS OF A SUCCESSFUL BLEB: A COMPARATIVE, PROSPECTIVE STUDY OF TRABECULECTOMY AND XEN45 SURGERIES USING ANTERIOR SEGMENT OCT AND IN VIVO CONFOCAL MICROSCOPY

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Purpose: Trabeculectomy remains the gold standard glaucoma surgery, but the less penetrating XEN45 Gel Stent (XGS) (Abbvie®) has shown noteworthy intraocular pressure (IOP, mmHg) and medication reduction. Both have in common a bleb formation. We aimed to determine the main characteristics of the bleb on successful surgeries, measured with anterior segment optical coherence tomography (AS-OCT) and in vivo confocal microscopy (IVCM).

Methods: A prospectively, nonrandomized interventional study was conducted. Adult patients with open-angle glaucoma with over-target-IOP despite maximum tolerated medication or glaucoma progression underwent either a trabeculectomy (n = 15) or XGS implantation (n = 24). Data on demographics, IOP, glaucoma medication, and standard automated perimetry were recorded preoperatively and during the 6-month follow-up period. Success was defined as a postoperative IOP below 21, 18, and 15 mmHg for mild, moderate, and severe cases. AS-OCT measures including bleb morphology, bleb wall (BWT), epithelial thickness (BET), and bleb-wall sub-epithelium cyst-like structures area (BSCSA) were determined at the 1, 3, and 6-month visits. At the 3- and 6-month visits, IVCM was also performed, measuring goblet cells and microcyst-like structures.

Results: IOP went from 18.7 (3.9) to 13.1 (2.6) (paired t-test, $p < 0.05$) and from 19.8 (2.8) to 16.1 (5.5) ($p < 0.05$) in the trabeculectomy and XGS groups, respectively. In the trabeculectomy group, 73% of the eyes met the success definition compared to 46% in the XGS group. Despite being different procedures, the predominant AS-OCT bleb morphologies in the successful surgeries were a) subconjunctival separation with spaces in superficial layers and b) multiple, internally (deep and superficial) layered blebs. In the first type, AS-OCT measures were higher (BWT, BET, BSCSA) compared to the layered blebs; this translated in a higher density and area in the goblet cells and epithelial cyst area measured by the IVCM in the first group; however, these differences were not statistically significant (Mann-Whitney U-test).

Conclusion: In our group, the best proxy measure associated with surgical success was the bleb morphology measured with AS-OCT. The epithelial changes detected by ASOCT and IVCM could not determine the success of one type of bleb over the other.

703 - P3.140

HYPOTONY FAILURE CRITERIA IN GLAUCOMA SURGICAL STUDIES AND THEIR INFLUENCE ON SURGERY SUCCESS

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Purpose: Review hypotony failure criteria used in glaucoma surgical outcome studies and evaluate their impact on success rates.

Methods: We conducted a systematic review (PROSPERO CRD42022378096) and applied the hypotony failure criteria to 934 eyes and 1,765 eyes undergoing trabeculectomy and deep sclerectomy (DS) with a median follow-up of 41.4 and 45.4 months, respectively. IOP-related success was defined as: (A) IOP ≤ 21 mmHg with ≥ 20% IOP reduction; (B) IOP ≤ 18 mmHg with ≥ 20% reduction; (C) IOP ≤ 15 mmHg with ≥ 25% reduction; (D) IOP ≤ 12 mmHg with ≥ 30% reduction. Failure was defined as: IOP exceeding these criteria in two consecutive visits >3 months after surgery, loss of light perception, additional IOP-lowering surgery, or hypotony. Cox regression estimated failure risk for different hypotony criteria, using no hypotony as a reference. Analyses were conducted for each criterion and hypotony type (i.e., numerical [IOP threshold], clinical [clinical manifestations], mixed [combination of numerical and/or clinical criteria]).

Results: Of 2,503 studies found, 278 were eligible, with 99 (35.6%) studies lacking hypotony failure criteria. Numerical hypotony was predominant (157 studies [56.5%]). Few studies employed clinical hypotony (3 isolated [1.1%]; 19 combined with low IOP [6.8%]). Forty-nine different criteria were found, with IOP < 6 mmHg, IOP < 6 mmHg on ≥2 consecutive visits after 3 months, and IOP < 5 mmHg being the most common (41 [14.7%], 38 [13.7%], and 13 [4.7%] studies, respectively). In both cohorts, numerical hypotony posed the highest risk of failure (Hazard Ratio [HR] between 1.51-1.21 for criteria A to D; p < 0.001), followed by mixed hypotony (HR between 1.41-1.20 for criteria A to D; p < 0.001), and clinical hypotony (HR between 1.12-1.04; p = 0.07 for DS criteria D, p≤ 0.017 for other criteria). Failure risk varied greatly with various hypotony definitions, with HR ranging between 1.02-10.79 for trabeculectomy and 1.00-8.36 for DS.

Conclusion: Hypotony failure criteria are highly heterogenous in the glaucoma literature, with few studies focusing on clinical manifestations. Numerical hypotony yields higher failure rates than clinical hypotony and can underestimate glaucoma surgery success rates. Standardizing failure criteria with an emphasis on clinically relevant hypotony manifestations is needed.

914 - P3.141

POST-OPERATIVE OUTCOMES OF TRABECULECTOMY WITH MITOMYCIN C IN FAILED PRESERFLO MICROSHUNT CASES

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Purpose: To evaluate the post-operative outcomes of trabeculectomy with mitomycin C after PreserFlo MicroShunt failure.

Methods: Retrospective consecutive case series. Patients underwent trabeculectomy with mitomycin C (0.2 mg/ml or 0.4 mg/ml for 3 mins) after a previously failed PreserFlo MicroShunt in Sunderland Eye Infirmary were recruited between September 2021 and Nov 2023. Demographic data, such as age, gender, glaucoma type, number of glaucoma medications, visual acuity, IOP before and after PreserFlo implantation and trabeculectomy, complications, and additional procedures were analyzed.

Results: Five eyes of five patients were identified via surgical logbook. Mean age was 73.4 years. All patients were Caucasian and pseudophakic. Three patients had primary open angle glaucoma, one had secondary glaucoma from Fuchs heterochromic cyclitis and one steroid induced glaucoma. PreserFlo MicroShunt removal was performed in 3 eyes as a combined procedure with trabeculectomy surgery. There was no significant change in BCVA (logMAR) (mean pre-op 0.34 vs post-op 0.43; p = 0.14). Mean IOP reduced from baseline 27.2 mmHg to 9.2 mmHg after trabeculectomy. Mean IOP at 1 week, 1 month, 3 months and at the most recent review were 13 mmHg, 11.6 mmHg, 11 mmHg and 9.2 mmHg respectively. All cases achieved >20% reduction in IOP (range 40 to 75%). The median follow-up duration was 17 weeks. One patient developed clinical hypotony (IOP 4 mmHg and shallow choroidal effusion) at 6 weeks which resolved after conservative treatment. One patient required bleb needling at 16 weeks post-op. Mean number of glaucoma medications reduced from 2.2 to 0 post-trabeculectomy.

Conclusion: Our consecutive case series suggest that trabeculectomy with mitomycin C can be an effective treatment option in failed PreserFlo MicroShunt cases in Caucasian patients. Longer follow-up and more cases are required to assess the long-term efficacy of trabeculectomy performed after failed PreserFlo MicroShunt.

550 - P3.142

EVOLUTION OF GLAUCOMA SURGERY WITH TRABECULECTOMIES, LIGS, AND MIGS - A RETROSPECTIVE STUDY

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Purpose: Patients with glaucoma often require surgical procedures. Recently, less invasive surgical approaches, known as Micro-Invasive Glaucoma Surgeries (MIGS) and Less-Invasive glaucoma surgeries (LIGS), have been developed. We aimed to review of MIGS and LIGS, and we sought to examine the evolution of glaucoma surgery types within our department.

Methods: A literature review was conducted using PubMed, Scopus, Google Scholar, and manual review (to January 2024), with the search query: "MIGS, LIGS, glaucoma." We retrospectively assessed glaucoma surgery data from our Ophthalmology department, identifying the type and number of surgeries from 2020 compared to 2023.

Results: Our literature review identified 539 studies on PubMed and 600 on Google Scholar, most published after 2019, including 34 systematic reviews and 12 clinical trials. Systematic reviews concluded that MIGS are effective and safe, but further studies are needed. Our retrospective evaluation revealed 139 glaucoma surgeries in 2020 (including 31 XEN, 70 trabeculectomies, 30 non-penetrating sclerectomies , 5 iStents, 2 Ahmed valves, and 1 Baerveldt). In 2023, we identified 331 glaucoma surgeries (26 XEN, 30 trabeculectomies, 32 sclerectomies, 20 Preserflo, 160 iStents, 27 GATT, 2 MIMS, 4 needling ab interno combined with cataract surgery, 28 goniotomies, and 2 Ahmed valves).

Conclusion: The heterogeneous group of MIGS and LIGS includes four categories based on their mechanisms: suprachoroidal drainage (e.g., iStar), bleb formation/LIGS (XEN 45, XEN 63, Preserflo), trabecular outflow enhancement (iStent, Hydrus, GATT, trabeculotomy, ELIOS, etc.), and reduction of aqueous humor production (cycloablation, endocyclophotocoagulation). We identified a shift in our department, with an increase in the total number of glaucoma surgeries and in number and types of MIGS, and a decrease in trabeculectomies. Valves were sparingly used due to economic constraints. Nevertheless, randomized trials are needed to objectively evaluate each surgical technique. Tailoring the choice of glaucoma surgical technique to each patient is essential.

POSTER SESSION 4

ANTERIOR CHAMBER BIOMETRIC DATA AND ANGLE CLOSURE PREVALENCE FOR A UK COHORT

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Purpose: Analyse anterior chamber angle biometric data for a UK population, establishing angle closure, and compare to normative data described in the literature for similar East Asian populations to that recruited from in the Zhongshan Angle Closure Prevention Study (ZAP).

Methods: Patients attending a community eye clinic, based in Birmingham, UK, underwent an anterior segment optical coherance tomography (OCT) as part of standard pre-testing. Clinical, biometric and demographic data over an 8 week period was retrospectively reviewed. Pseudophakic, aphakic and patients < 18 years were excluded. The Anterion (Heidelberg Engineering) was used. Biometric data extracted included Angle Opening Distance at 500 microns from scleral spur (AOD 500), Trabecular Iris Space Area at 500 microns from scleral spur (TISA 500), Lens Thickness, Lens Vault, Pupil Diameter, White to White (WTW), Iris Curvature (IC), Central Corneal Thickness (CCT), Aqueous depth (AQD), Anterior Chamber Depth (CCT + AQD). Iridotrabecular contact (ITC) in ≥ 2 full quadrants was confirmed by a suitably trained clinician by analysing the images. Patients deemed to have ITC in any 2 full quadrants were reviewed by a second experienced clinician.

Results: 108 patients (195 eyes) met the study's inclusion criteria and were included in this study. 1.8% had ITC in 2 quadrants. 2.6% of the patients in the age range of 50 to 70 years had ITC in two quadrants. No patients had ITC in more than two quadrants. Data collected on ethnicity showed our cohort was comparable with UK 2021 Census data for Birmingham, UK. Average AOD 500, TISA 500 and ACD in our population was 0.38 mm, 0.13 mm² and 3.32 mm respectively. Average AOD 500, TISA 500 and ACD in an East Asian population as per the literature was 0.47 mm, 0.15 mm² and 3.08 mm respectively.

Conclusion: Our UK data differs from that previously described for East Asian populations. The prevalence of ITC in ≥ 2 quadrants was 1.8% and and was 2.6% in the 50-70 age group. This is lower than the 9.07% prevelence reported in the subjects screened for the ZAP trial. Further studies are required to establish how this may impact the current RCOphth Management of Angle-Closure Glaucoma guidance.

435 - P4.002

SUICIDE RISK IN JUVENILE OPEN ANGLE GLAUCOMA PATIENTS

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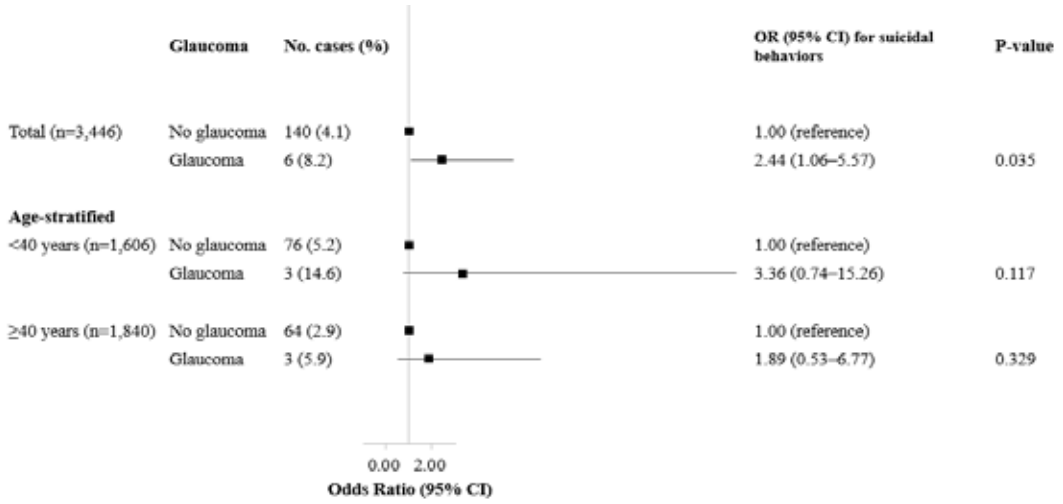
Purpose: To investigate the association between juvenile open-angle glaucoma (JOAG) and mental health among Koreans.

Methods: This study used nationally representative data from the 8th Korea National Health and Nutrition Examination Survey (KNHANES) 2021. Glaucoma diagnosis followed the International Society of Geographical and Epidemiological Ophthalmology criteria based on glaucomatous structural defects, visual field defects, corrected vision, and intraocular pressure. As outcomes, suicidal behaviors, psychiatric counseling, and depression were evaluated through mental health questionnaires. Odds ratios (ORs) with 95% confidence intervals (CIs) were estimated using logistic regression models, adjusting for covariates.

Results: Among 7,090 participants, 3,446 met the inclusion criteria for analysis, and 88 (2.6%) were diagnosed with open-angle glaucoma (OAG). After adjusting for age, sex, and best-corrected visual acuity (VA), participants with OAG were revealed to have significantly higher odds of suicidal behaviors (i.e., ideation, planning, or attempts) compared with those without OAG (OR: 2.70; 95% CI: 1.12 - 6.54; p = 0.028). This association remained significant after further adjustments for socioeconomic status, lifestyle factors, and presence of chronic conditions (è = 0.031 and 0.035, respectively). However, there was no significant difference for the other two outcomes, psychiatric counseling and depression. An age-stratified analysis revealed a stronger association between OAG and suicidal behaviors in younger JOAG participants (< 40 years) than in older OAG participants (≥ 40 years) (OR: 3.80 vs 2.22; 95% CI: 0.79 - 18.22 vs. 0.56 - 8.80, respectively).



Conclusion: OAG patients showed a higher risk of suicidal behaviors than those without glaucoma particularly in JOAG patients. Young adults with glaucoma may need closer attention paid to their mental health for prevention of suicidal ideation, planning, and attempts.

BRIDGING PERSPECTIVES: INSIGHTS INTO THE RELATIONSHIP BETWEEN CONGENITAL GLAUCOMA AND AICARDI-GOUTIÈRES SYNDROME - A CASE ANALYSIS

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Purpose: This study aims to explore the rare association between Aicardi-Goutières syndrome (AGS) and congenital glaucoma by presenting a detailed case report. The purpose is to contribute to the limited body of knowledge on this specific correlation and shed light on the clinical manifestations and management of both conditions.

Methods: A six-year-old child of Moroccan origin with parental consanguinity, diagnosed with AGS confirmed by genetic testing, was evaluated. The patient exhibited neurological symptoms and signs typical of AGS, with subsequent development of congenital glaucoma. Ophthalmological examinations, including intraocular pressure measurements and surgical interventions, were conducted to manage the ocular aspects of the condition.

Results: The patient's clinical journey unfolded with neurological manifestations of AGS, leading to the identification of a homozygous mutation in the RNASEH2B gene. At 18 months, the child presented with amblyopia secondary to endotropia and was later diagnosed with congenital glaucoma. Treatment involved pharmacological interventions, including timolol/brinzolamide and latanoprost, followed by surgical procedures like goniotomy. The case responded positively to treatment, showcasing the effectiveness of the chosen therapeutic approaches.

Conclusion: This case study represents the second documented instance supporting the association between Aicardi-Goutières syndrome and congenital glaucoma, emphasizing the importance of excluding other potential causes. Furthermore, it is the first report detailing this association in relation to the RNASEH2B mutation. While trabeculectomy is commonly employed in such cases, our study opted for the less invasive goniotomy with favorable outcomes. The findings underscore the need for additional studies to elucidate the specific genetic associations with congenital glaucoma in AGS, particularly considering the absence of established links with the RNASEH2B mutation in current literature.

260 - P4.004

THE CARBON FOOTPRINT OF GLAUCOMA CARE

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Purpose: This study aimed to assess the carbon footprint of glaucoma care, considering the environmental impact of different aspects such as patient and staff travel, clinic consumables, waste disposal, and power consumption associated with clinic visits and selective laser trabeculoplasty (SLT) treatments. To determine their relative environmental impact, the study aimed to estimate and compare the carbon emissions associated with primary treatments for new glaucoma diagnoses, specifically topical medication (drops) and SLT.

Methods: The study obtained ethical approval as a sustainability audit. Data were collected on patient and staff travel methods and distances, clinic consumables, waste disposal, and power consumption related to clinic visits and SLT treatments in two hospitals. Alternative methods were employed to estimate the footprint in procured devices, such as laser device, by considering the weight of raw materials. The study also utilized outcomes from the Laser In Glaucoma and ocular Hypertension Trial (LiGHT) to understand how the choice of primary treatment influenced patient pathways.

Results: The primary source of glaucoma care emissions was travel, particularly in rural, lower-density populations. Energy consumption during hospital visits and the additional energy used for SLT treatment were found to be modest. Emissions from long-term eye drop use, disposable materials in clinics, and waste disposal were relatively modest, with negligible contributions. The additional carbon footprint of laser treatment was assessed based on embedded carbon in device manufacture and transport, revealing a wide variation in estimated footprint per use of the laser.

Conclusion: The study concluded that travel constituted the greatest source of emissions for glaucoma clinics, especially in rural settings. However, as glaucoma progressed and patients underwent surgeries, such as cataract or glaucoma surgery, these procedures became dominant contributors to environmental impact due to their extensive use of single-use supplies. To promote more sustainable glaucoma care, the study recommended minimizing unnecessary travel through intelligent risk assessment, optimizing follow-up intervals, and offering community-based care where appropriate. Additionally, the findings from the LiGHT trial suggested that a laser-first treatment strategy for newly diagnosed open-angle glaucoma (OAG) could potentially reduce surgical interventions and emissions if patient visits were minimized.

307 - P4.005

ASSOCIATION OF CALCIUM CHANNEL BLOCKERS USE WITH VISUAL FIELD PROGRESSION IN GLAUCOMA CLINICS

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Purpose: To investigate the relationship between exposure to systemic calcium channel blockers (CCBs) and visual field (VF) progression in a large patient cohort.

Methods: We extracted VF data, demographics, and systemic medication information for 73,990 patients from five glaucoma clinics in England. VFs performed after incisional glaucoma surgery were excluded. We selected eyes with ≥ 5 reliable 24-2 SITA VFs (false positive rate < 15%) over ≥ 4 years and ≥ 2 tests with VF loss as estimated by Mean Deviation (MD) < -2 dB. We randomly selected one eye per patient (14,475 eyes; 133,505 tests) and identified 1,426 patients exposed to CCBs. We studied the effect of CCB exposure on MD progression with a Linear Mixed Model (Lmm), with random intercepts and slopes. The MD was the response variable. The interaction between CCB exposure (dichotomous) and time (continuous) modeled the difference in rate of progression (RoP) between exposed and non-exposed. For our main analysis, we compared the exposed group to a control group, selected through multivariable (MV) propensity score (PS) matching. A secondary analysis was performed with a MV-Lmmon the whole cohort; as for the main Lmm, interactions between the additional predictors and time modeled their effect on RoP. Variables in the PS and MV-Lmm, selected via a causal diagram, are reported in the Figure.

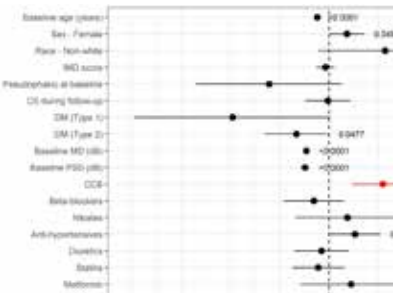

Figure. Forest plot showing the effect of the selected variables on the rate of progression (RoP), in dB/year per variable unit. The dashed vertical line indicates no effect (0 dB/year). Positive values indicate a slower (more positive) RoP compared to baseline. Only systemic corcosteroids and beta-blockers were considered. IMD = Index of Multiple Deprivation (per standard deviation from the average, lower indicating more deprived); DM = diabetes mellitus; CS = cataract surgery; CCB = calcium channel blockers; MD = mean deviation; PSD = pattern standard deviation.

Table

	CCB users[a], N = 1,426	Matched controls[a], N = 1,426	p-value[b]
Demographics			
Age (years)	73 (65, 78)	73 (67, 78)	0.198
Sex - Female	748 (52%)	757 (53%)	
Race - Non-white	28 (2.0%)	30 (2.1%)	
IMD score	12 (7, 22)	12 (7, 22)	0.940
Diabetes			0.222
Type 1	22 (1.5%)	14 (1.0%)	
Type 2	304 (21%)	282 (20%)	
Cataract surgery			0.410
Phakic at baseline	765 (54%)	754 (53%)	
Pseudophakic at baseline	59 (4.1%)	74 (5.2%)	
CS during follow-up	602 (42%)	598 (42%)	
Baseline MD (dB)	-3.2 (-6.2, -1.6)	-3.2 (-5.9, -1.7)	0.802
Baseline PSD (dB)	2.7 (1.8, 5.8)	2.7 (1.8, 5.9)	0.812
VF tests (N)	9.0 (6.0, 12.0)	8.0 (6.0, 11.0)	0.003
Follow-up (years)	8.76 (6.17, 11.74)	8.12 (5.93, 11.01)	0.002
Baseline VA (logMAR)	0.20 (0.00, 0.30)	0.20 (0.00, 0.30)	0.260
Average IOP (mmHg)	16.5 (14.6, 19.0)	16.4 (14.0, 18.9)	0.052
Medications			
Diuretics	560 (40%)	550 (39%)	0.490
Anti-hypertensives	825 (58%)	811 (57%)	0.596
Nitrates	144 (10%)	119 (8.3%)	0.106
Statins	727 (51%)	738 (52%)	0.680
Systemic corticosteroids	157 (11%)	173 (12%)	0.349
Beta blockers	356 (25%)	362 (25%)	0.796
Psychoactive drugs	213 (15%)	240 (17%)	0.167
Metformin	166 (12%)	151 (11%)	0.372

a Median (IQR); n (%)

b Wilcoxon rank sum test; Pearson's Chi-squared test

Results: Participant demographics are reported in the Table. CCB users had a slower RoP (Estimate [95%-Confidence Interval]: -0.29 [-0.32, -0.27] dB/year) compared to PS-matched controls (-0.34 [-0.37, -0.31]dB/year, p = 0.022). The results from the MV-Lmmare shown in the forest plot in the Figure and confirmed the association between CCB exposure and faster RoP (p = 0.0006). Anti-hypertensives (other than nitrates and systemic beta-blockers) were also significantly associated with slower RoP. Systemic corticosteroids were associated with faster RoP. Older age and more positive baseline MD and Pattern Standard Deviation were associated with faster RoP. Female sex was associated with a slower RoP.

Conclusion: In this large clinical cohort, CCB exposure was significantly associated with a slower VF deterioration rate, after multivariable adjustment.

361 - P4.007

FETAL GROWTH RESTRICTION LEADS TO ENLARGED VERTICAL CUP-TO-DISC RATIO IN ADULTS BORN AT TERM

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Purpose: This study explores associations between fetal growth restriction or excessive fetal growth, along with perinatal factors on the optic nerve head morphology in adulthood.

Methods: This retrospective cohort study involved a prospective ophthalmological examination of individuals born at full term (with a gestational age of ≥ 37 weeks) spanning from 1969 to 2002. Each participant underwent non-mydriatic fundus camera photography to capture images of the optic discs, followed by manual measurements. The vertical cup-to-disc ratio (VCDR) and optic disc area were examined and compared based on their birth weight relative to gestational age. These categories included those with former moderate (birth weight percentile between the 3rd and < 10th), severe SGA (below the 3rd percentile), normal (AGA , 10th-90th percentile), and moderately (birth weight >90th to 97th percentile) and severely (birth weight > 97th percentile) large for gestational age (LGA) adults within the age range of 18 to 52 years.

Results: Overall, 535 eyes of 280 individuals (age 29.74 ± 9.23 years, 144 females) born at term were included. Multivariable analysis showed a significant association between a larger VCDR in the severe SGA group (B = 0.05, 95% CI 0.01-0.10; p = 0.02). In the univariable model, placental insufficiency demonstrated an association with VCDR (B = 0.10, 95% CI 0.01-0.19; p = 0.03). Other perinatal factors did not demonstrate an association with VCDR. Furthermore, optic disc area was smaller in individuals born moderately SGA at full-term (B = -0.17, 95% CI -0.33- -0.001; p = 0.05) .

Conclusion: In conclusion, this study provides evidence that individuals born at-term with severe SGA have an increased VCDR. These findings indicate that fetal growth restriction has a lasting impact on the optic nerve head morphology until adulthood and may indicate a lower neuronal reserve for degenerative optic disc diseases.

380 - P4.008

USERS OF REIMBURSED GLAUCOMA MEDICATIONS IN FINLAND IN 1986-2022

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Purpose: The study evaluates the long-term trends of patients using reimbursed glaucoma medications in Finland (population of 5.5 million in 2022) and in the area of Tampere University Hospital, Finland (population of 0.5 million in 2022).

Methods: The numbers of new and deceased users of reimbursed glaucoma medications at end of each year in 1986-2022, analyzed also by gender and different age groups, were collected from the registry of Social Insurance Institution of Finland (Kela) in Tampere area and in Finland.

Results: The data demonstrated 1) large difference in glaucoma medication users between Tampere area vs. whole country until 2009 (Figure 1), and 2) the long-term decreasing trend of the 'net medication users' in the country (Figure 2). Similar trend in net users was detected also in Tampere area. The trends are related to the increase of aging population with decreasing life expectancy. No gender differences were noticed in the trends.

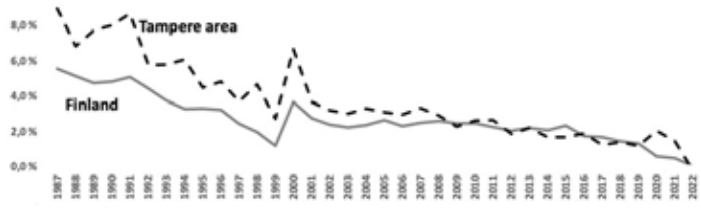

Figure 1. The yearly increase in the rate of new drug users between Tampere area and Finland.

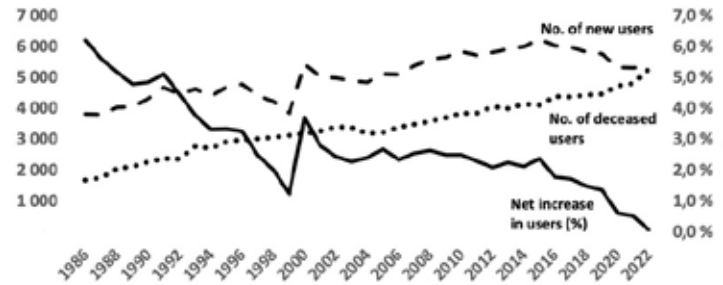

Figure 2. Net increase (%) of glaucoma drug users (no. of new users vs. no. of diseased users) in Finland.

Conclusion: As predicted in 2009 in Finland3 and in 2017 Japan2, the net change in glaucoma drug users starts to decrease due to population aging. Regional differences in glaucoma drug users have been reported e.g., in also Denmark in 1996-2011.3 In addition, although during that time the populations of Finland and Denmark were the same, the number of glaucoma drug users in Denmark was 1.5-fold compared to Finland.

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449 - P4.009

RELATIVE RISKS FOR DEMENTIA AMONG INDIVIDUALS WITH GLAUCOMA: A META-ANALYSIS OF OBSERVATIONAL COHORT STUDIES

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Purpose: To investigate the relative risks (RRs) for dementia among individuals with glaucoma.

Methods: We conducted a search of PubMed, Web of Science, Scopus, and Cochrane databases for observational cohort studies examining the association between glaucoma and dementia until March 2023. Two authors independently screened all titles and abstracts according to predefined inclusion and exclusion criteria. Pooled RR and 95% confidence intervals (CIs) were generated using random-effect models.

Results: The meta-analysis included 18 cohort studies conducted in eight countries and involving 4,975,325 individuals. The pooled RR for the association between glaucoma and all-cause dementia was 1.314 (95% CI, 1.099-1.572; I2 = 95%). The pooled RRs for the associations of open-angle glaucoma with Alzheimer dementia and Parkinson disease were 1.287 (95% CI, 1.007-1.646; I2 = 96%) and 1.233 (95% CI, 0.677-2.243; I2 = 73%), respectively. The pooled RRs for the associations of angle-closure glaucoma with all-cause dementia and Alzheimer dementia were 0.978 (95% CI, 0.750-1.277; I2 = 17%) and 0.838 (95% CI, 0.421-1.669; I2 = 16%), respectively. No evidence of publication bias was detected in the Begg-Mazumdar adjusted rank correlation test (p = 0.47).

Conclusion: Based on current observational cohort studies, there is evidence supporting that glaucoma is a risk factor for dementia in the adult population.

453 - P4.010

GLAUCOMA MANAGEMENT IN EASTERN EUROPE

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Purpose: The aim of this study was to explore the status of glaucoma management in six Eastern European countries (Azerbaijan, Georgia, Kosovo, Moldova, Poland, Ukraine).

Methods: A standard questionnaire was sent to glaucomatologists from six Eastern European countries (EEC) addressing existence of a national glaucoma patient organization; resident education in ophthalmology; nonemergency access to an ophthalmologist; use of diagnostic techniques/instruments; frequency of visual field testing; reimbursement of the diagnostic methods; initial treatment; prescription of generics in ophthalmology; rights of the pharmacist regarding dispensing of glaucoma medication. Answers were analyzed and summarized.

Results: As of 2023, none of the EEC had a glaucoma patient organization. Among these, four out of six countries have developed national glaucoma guidelines. Four out of the six nations reported no waiting period for residency positions, while in the remaining two, the wait could extend up to a year. The length of residency programs varies from two to five years. None offer glaucoma fellowship programs, and access to surgical training during residency is notably limited. Four out of the six EEC allow patients to directly consult an ophthalmologist for non-emergency cases, the other two countries require a referral from a general practitioner. A common protocol for initial glaucoma diagnosis across all EEC includes the use of slit lamp examination, Goldman/Maklakov tonometry, standard automated perimetry, and ophthalmoscopy, with Goldman and Maklakov tonometers being the predominant types used in the region. Typically, glaucoma patients undergo visual field testing twice a year.First prescription of glaucoma medication is made exclusively by ophthalmologist in all the countries. Financial coverage for diagnostic tests varies: three countries provide full coverage through state insurance, two offer partial coverage, and one country has only private insuranse coverage. The initial treatment approach for glaucoma is medical monotherapy, with no restrictions in prescribing either branded or generic medications.

Conclusion: This first of its kind research provides valuable insights into glaucoma management practices in EEC, emphasizing the need for improved standardization and patient-centered support across the region to enhance the quality of care and prevent blindness due to glaucoma.

463 - P4.011

COMPARISON OF THE SOCIOECONOMIC STATUS OF GLAUCOMA PATIENTS UNDERGOING DIFFERENT TYPES OF SURGERY

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Purpose: To compare the socioeconomic status of patients undergoing different types of glaucoma surgery.

Methods: Retrospective review of our Electronic Medical Records was undertaken to identify all patients who glaucoma surgery in our hospital in the last 10 years. The postcodes of these patients were linked to the Index of Multiple Deprivation 2019 to estimate the level of social deprivation. Patients were grouped based on the surgical procedure they underwent. We included only the first operation of the first eye of each patient. Unpaired t-tests for each group were performed against the trabeculectomy group. Statistical analysis was performed using Graphpad Prism® Version 10.1.1.

Results: We identified 1695 patients (mean age 70.9 years) that had surgery; 788 underwent trabeculectomy, 119 tube, 229 Cyclodiode, 45 deep sclerectomy, 514 MIGS (148 OMNI, 230 istent, 95 Xen, 16 Preserflo, 25 Hydrus). Mean deprivation status was statistically significant lower only in the tube group compared to the trabeculectomy group ($p = 0.0365$). The mean age of the tube group was significantly lower compared to the trabeculectomy group (64 vs 70 years, $p < 0.0001$).

Conclusion: The difference in the age and index of multiple deprivation between the tube and the trabeculectomy groups may represent higher prevalence of secondary glaucoma in patients with lower socioeconomic status. All other groups had no differences in the socioeconomic status comparing to the trabeculectomy group which may indicate that the selection of the type of glaucoma surgery is based on clinical grounds only.

469 - P4.012

GLAUCOMA CARE IN UKRAINE: 2 YEARS WAR

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Purpose: To learn the peculiarities of glaucoma care in Ukraine in wartime

Methods: General information from ophthalmologists of state/private clinics and patient survey data from different regions of Ukraine.

Results: Data on glaucoma care were analyzed from frontline territory and territory with martial law. In frontline areas, significant destruction of housing and medical facilities led to a serious breakdown of the health care system. More than 50% of the population were evacuated to other regions of Ukraine and other countries. The activities of medical institutions were mainly aimed at providing emergency medical care to the wounded including those with eye injuries. Mostly glaucoma patients were sent for examination to other regions or obtained medical therapy according to previous recommendations. There was a significant decrease in patient visits for glaucoma in 3-4 times. In regions with martial law it was decrease of glaucoma cases on about 40% and increase on about 2.5% number of cases with advanced POAG and drug-resistant IOP. And it was revealed the increase of cases with acute PACG on about 4%. Real problems with medications and with IOP control due to frequent air raids and possible bombings resulted in changing in algorithm of glaucoma care. The number of laser operations (SLT) has increased by an average of 3-5%, and choice of therapy depended on the availability of drugs in pharmacies. So, the primary problems in Ukraine due to war (serious damage to the health care system and a deficiency of eye departments for IOP control, eye examinations, and surgery) and the secondary problems (long-term stress, significant changes in private priorities and according to an attention to the health) resulted in significant increase in the number of individuals with advanced glaucoma

Conclusion: Adapting to the realities of wartime is a great challenge and our ophthalmologists gradually improve their practical work with glaucoma care.

482 - P4.013

DEFINING A STANDARDISED MINIMUM CLINICAL DATASET FOR GLAUCOMA PROCEDURES

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Purpose: Standardised routine clinical data collection that enables national audits have furthered knowledge and helped improve outcomes in multiple ophthalmic conditions. However, despite the high volumes and expenditure in glaucoma procedures globally, currently no agreement exists on the data variables that should be collected to compare their outcomes.

Methods: A set of defined clinical variables to be collected for patients undergoing any intraocular pressure lowering (IOP) procedure was developed by a RCOphth subcommittee, in collaboration with glaucoma societies in United Kingdom & Ireland (UKEGS) and Europe (EGS). Principles around standardising definitions, minimising data collection burden and electronic medical record implementation were adhered to.

Results: The following data items to be collected were agreed upon:

	Mandatory	Desirable	Optional
Pre-operative	• Glaucoma type • Visual acuity • IOP and Topical glaucoma medication number (on same date) • Oral acetazolamide use	• Patient year of birth • Patient's sex • Eye laterality • Previous glaucoma procedures & eye surgery • IOP measurement method • Peak IOP	• Ethnicity • Ocular co-pathology • Prior refraction • Axial length • Central corneal thickness • Anticoagulation use • Date of cataract surgery • Lens status • Visual field test strategy, MD, VFI, False positives • OCT average RNFL thickness, device used • Endothelial cell count
Intraoperative	• Procedure date • Surgeon • Procedure name (±lens extraction) • If revision surgery	• Surgeon grade • MMC/5FU use • Glaucoma surgery intraoperative complications	• Anaesthetic • MMC/5FU concentration and duration • Other intraoperative anti-scarring treatment • Cataract surgery complications/ events
Post-operative	• Complications • Reoperations for complications • Further IOP lowering procedures • Visual acuity • IOP and Topical glaucoma medication number (on same date) • Oral acetazolamide use	• Postoperative interventions • IOP measurement method	• Visual field test strategy, MD, VFI, False positives • OCT average RNFL thickness, device used • Endothelial cell count

The full clinical dataset also defines the data type for each clinical variable and references recommended classifications and coding for glaucoma related diagnoses, procedures and post-operative complications.

Conclusion: This dataset represents an agreed set of standardised clinical information for patients undergoing IOP lowering surgical or laser interventions, that can be collected from routine care across different platforms. The large volume of real-world data that could be gathered would enable future national and international audits and research to be conducted in comparing outcomes of glaucoma procedures.

509 - P4.014

PUBBLICATION RATES AND DETERMINANTS OF THE SCIENTIFIC PUBLICATION FOR ABSTRACT PRESENTED AT THE AMERICAN GLAUCOMA SOCIETY ANNUAL MEETINGS

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Purpose: To evaluate the publication rate and assess the factors associated with the publication of studies presented at the American Glaucoma Society (AGS).

Methods: We reviewed all abstracts presented at the AGS annual meeting between 2010 and 2020. For each abstract, we collected the following variables: presentation type (oral paper or poster), geographical area, number of authors, first and last authors' gender, financial disclosures, study design (prospective, cross-sectional, etc.), study type (randomized trial, meta-analysis, etc.), and nature of results (positive vs. negative). We then identified which studies had been published (via MEDLINE) and analyzed the publication rate using Kaplan-Meier analysis. Finally, we identified factors associated with the publication incidence through multivariable Cox regression.

Results: 1602 studies were analyzed, (277 papers and 1325 posters). The cumulative incidence (95% CI) of conversion to publication was 53.6% (51.1%-55.9%), with a median time to publication of 29 months. Oral papers (HR: 1.39, p = 0.001), male gender of the first author (HR: 1.20, p = 0.022), multicentric studies (HR: 1.25, p = 0.044), positive results (HR: 1.38, p = 0.012), higher number of coauthors (HR: 1.25, p = 0.044) were associated with a higher probability of publication. Studies from Oceania had higher publication rates compared to North America (HR: 2.97, p = 0.038), with no significant difference observed in other geographical areas (p ≥ 0.056). Study types, such as those involving animal models (HR: 0.45, p = 0.001), or autoptic samples (HR: 0.43, p = 0.034), cellular studies (HR: 0.39, p = 0.036), and study designs such as cohort (HR: 0.43, p < 0.001), case-control (HR: 0.43, p < 0.001), interventional (HR: 0.47, p < 0.001), non-randomized prospective (HR: 0.42, p < 0.001), comparative retrospective (HR: 0.40, p = 0.008), screening and diagnostic test studies (HR: 0.35, p < 0.001), and surveys (HR: 0.40, p < 0.001), had a lower probability of publication compared to randomized controlled trials. Studies about diagnostic tests (HR: 1.56, p < 0.001), quality of life (HR: 2.19, p < 0.001), and training (HR: 1.09, p = 0.02) were associated with a higher probability of publication in comparison to glaucoma surgical studies.

Conclusion: Approximately half of AGS abstracts were eventually published. Our study identified several factors related to the probability of publication, providing valuable insights for authors and researchers in the field of ophthalmology and clinical research.

530 - P4.015

MONITORING INTRAOCULAR PRESSURE (IOP) AND MEAN OCULAR PERFUSION PRESSURE (MOPP) CHANGES AFTER ANTI-VEGF INTRAVITREAL INJECTIONS

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Purpose: The main purpose is comparing trends of Intraocular pressure (IOP) and mean ocular perfusion pressure (MOPP) after intravitreal injections (IV) performed on patients in supine or seated position. The second endpoint is identifying potential risk factors for excessive IOP rising and delayed normalisation.

Methods: Hundred nineteen patients underwent an injection of 0,05 mL of anti-VEGF drug in supine (Group 1) or seated position (Group 2). IOP was measured with iCare IC200 rebound tonometer and blood pressure with an automated sphygmomanometer. IOP and blood pressure, from which MOPP was determined, were measured before IV, immediately, at 5 minutes and 30 minutes after the injection. Correlations with age, lens status, axial length, central corneal thickness, glaucoma, anterior chamber depth were analysed.

Results: Mean IOP was 16.2 ± 4.936 mmHg and 15.36 ± 3.972 mmHg and mean MOPP was 52.4 ± 10.0 mmHg and 55.6 ± 11.9 mmHg respectively in Group 1 (59 patients) and in Group 2 (60 patients). Just after the injection IOP rose in both Groups (53.75 ± 16.34 mmHg and 47.96 ± 14.61 mmHg respectively, $p = 0.044$), then decreased at 5 minutes (31.53 ± 11.34 mmHg and 29.84 ± 12.44 mmHg respectively, $p = 0.438$) and at 30 minutes (22.55 ± 8.31 mmHg and 20.54 ± 6.63 mmHg respectively, $p = 0.147$). After IV, MOPP significantly dropped in both Groups (43.6 ± 18.1 mmHg and 28.0 ± 18.0 mmHg respectively, $p < 0.01$) and it took up to 30 minutes to return within baseline values. At 30 minutes, 37.3% of the patients in Group 1 and 51.67% in Group 2 returned to IOP within their baseline value +2SD. At the same time point, 75% of the glaucomatous patients were still above that limit. A positive correlation was found between IOP rise and glaucoma ($p = 0.02$), axial length ($p = 0.08$) and baseline IOP ($p = 0.07$).

Conclusion: Although IOP rise after the injection was transient, some patients experienced extremely high and long-lasting IOP. Especially for glaucomatous patients, higher IOP may persist for a longer period.

558 - P4.016

DETERMINANTS OF REPEAT NON-ATTENDANCES AT FACE-TO-FACE GLAUCOMA CONSULTATIONS: A PATIENT ENGAGEMENT STUDY

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Purpose: Administrative systems to manage glaucoma outpatient non-attendance highlight the potential to exacerbate health inequalities by overlooking difficulties faced by particular demographic groups. This study seeks to characterise factors associated with repeat non-attendance across face-to-face glaucoma outpatient appointments and implement processes to enhance patient engagement.

Methods: A retrospective cohort patient engagement study at a tertiary-level ophthalmic institution in the UK between 1st August 2022 and 31st December 2023. Electronic medical and sociodemographic data pertaining to individuals with 2 or more non-attendances with in this period were extracted. All repeat non-attenders were contacted to seek their experience and suggestions to improve access to the outpatient service.

Results: A total of 392 patients did not attend appointments, 102 patients (26%) did not attend 2 or more appointments in this period. 66% of repeat non-attenders struggled to understand letters or SMS reminders sent to them due to a language barrier, 52% relied on friends, family or a carer to bring them to their appointment and 26% struggled to read clinic correspondence due to a significant visual impairment in both eyes

Conclusion: Persistent non-attendance among the vision impaired, socially dependent and those requiring language interpretation highlights a need to reform the manner in which patients are contacted for appointments. Effective use of eye care liaison officers, simplified correspondence in a variety of languages using vetted automated free online translation facilities and SMS reminders sent to carers may help support patients to take control of their care and reduce health inequalities.

588 - P4.017

HEALTH LITERACY AMONG A PORTUGUESE POPULATION: WHAT DO PATIENTS KNOW ABOUT GLAUCOMA

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Purpose: Studies show that individuals with limited health literacy skills experience worse health outcomes in a multitude of chronic diseases including glaucoma. It has been demonstrated that these patients have poorer compliance, worse disease understanding and greater disease progression. Glaucoma patients with poor health literacy skills demonstrate greater visual field loss at the time of diagnosis. Since we strive to improve care for patients with glaucoma, further attention to this problem must be taken. The main purpose of our study was to evaluate patients' knowledge about glaucoma basic concepts.

Methods: A 24 question survey was given to patients followed by the glaucoma department, by phone or in person. Epidemiological data and personal therapeutic regimens were collected as well as data concerning the pathophysiology, treatment and prognosis of the disease. All patients included had primary or secondary open angle glaucoma. Informed consent was obtained and the research adhered to the tenets of the Declaration of Helsinki.

Results: Survey responses were obtained from 79 patients with a mean age of 72 years old. Most of the patients had a low education level. 86.1% were medicated with 1 or 2 eyedrops containers and 89.8% were on intraocular pressure (IOP)-lowering medication for at least 2 years. The majority of patients could not enumerate glaucoma risk factors (74.5%), their glaucoma type (94.9%) or the best glaucoma definition (57%). However, they were able to relate the disease to a high IOP (75.9%) and the possibility blindness (96.2%). A significant part could also understand the absence of symptoms at the initial state (53.2%), the purpose of the eyedrops treatment (64.6%), the absence of cure (53.2%) and the irreversibility of the disease (48.1%). Most patients face their illness with some preoccupation (48.1%).

Conclusion: Some investment should be done to improve health literacy in the glaucoma population. Appropriate language and handed material must be used, adapted to patients' education level so that the message is clearly transmitted. The main objective of these interventions is to increase patients' understanding of the disease so that their adherence and compliance with the treatment, regular exams and appointments can also increase.

591 - P4.018

UTILISING SYSTEMIC MITOCHONDRIAL FUNCTION TO ESTABLISH POTENTIAL VULNERABILITY TO GLAUCOMA, COGNITIVE DECLINE AND RELATIONSHIPS WITH AGEING

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Purpose: Mitochondrial dysfunction may be a biomarker of biological ageing in neurodegenerative diseases such as glaucoma and Alzheimer's. We aimed to assess mitochondrial function on optic nerve health and cognitive function for the first time in an aging longitudinal population study

Methods: Systemic mitochondrial function were measured in 115 volunteers from the TwinsUK cohort. Using fresh peripheral blood mononuclear cells (PBMCs), MitoPlates™ S-1 assays were completed testing for 31 different substrate reactions in triplicate. Cross-sectional glaucoma-related endophenotypes (intraocular pressure (IOP), retinal nerve fibre layer (RNFL) thickness and vertical cup to disc ratio (VDCR)) and cognitive measures (Cantab-PAL and the Useful Field of View (UFOV)) alongside frailty were assessed. Linear mixed models adjusted for age, sex and family structure investigated associations between phenotypes and mitochondrial substrates. A backwards stepwise regression model was completed for each phenotype, including all associated substrate maximum reaction rates (RR).

Results: Within the study cohort, mean (SD) age was 66.9 (± 14.6) years. Mean endophenotype values measured were IOP: 12.8 mmHg (± 3.02), VCDR: 0.4 (± 0.11) and RNFL: 96.5 µm (± 10.38). Monozygotic twin correlations were generally higher than dizygotic, suggesting a degree of heritability. Using multivariable regression models, RNFL thickness was associated with increased RR of a-Keto-Isocaproic Acid ($\beta = 0.96$, $p < 0.001$). Lower IOP was associated with increased RR of a-Keto-Butyric Acid ($\beta = -0.09$, $p = 0.022$) , a-Keto-Isocaproic Acid ($\beta = -0.19$, $p < 0.001$) and Glycogen ($\beta = 0.08$, $p = 0.002$). Larger VCDR was associated with increased RR of D-Gluconate-6-PO4 ($\beta = 0.005$, $p < 0.001$). For cognition measures, a-Keto-Isocaproic Acid ($\beta = 0.08$, $p = 0.003$) and Glycogen ($\beta = -0.08$, $p = 0.002$) were associated with Cantab-PAL, a-Keto- Butyric Acid ($\beta = -0.04$, $p = 0.042$) and Palmitoyl-DL-Carnitine Chloride ($\beta = 0.03$, $p = 0.03$) with UFOV.

Conclusions: We have identified novel mitochondria-related biomarkers for glaucoma and cognition, particularly in key compounds involved in the biosynthesis of amino acids, secondary metabolites, and the tricarboxylic acid cycle. Further larger and longitudinal studies are required to establish the importance of these pathways and to determine if future mitochondria-related treatments (such as nicotinamide) influence these enzyme reactions or if these biomarkers could be utilised to develop 'personalised' care for treatment and monitoring of patients with glaucoma.

607 - P4.019

ANALYSING THE CARBON FOOTPRINT OF SINGLE TOPICAL ANTI-GLAUCOMA TREATMENT VERSUS SLT

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Purpose: Healthcare is a significant contributor to global carbon emissions. As the global burden of glaucoma increases so does its carbon footprint. A recent meta-analysis has suggested that the global prevalence of glaucoma will reach 111 million people by the year 2040. Our study aimed to estimate the carbon footprint of one topical anti-glaucoma agent versus selective laser trabeculoplasty.

Methods: A review of literature was carried out via web search and analysis of available studies on the topic of sustainability. The carbon footprint of a typical patient attending the glaucoma clinic with a diagnosis of primary open angle glaucoma (POAG) or ocular hypertension (OHT) was estimated for those prescribed latanoprost versus those treated with selective laser trabeculoplasty (SLT). The estimates were calculated for a 3-year period following initial diagnosis.

Results: One generic topical drop bottle (including packaging) weighs on average 40g and equates to 7 kg of CO2eq (considering patient transport and packaging). In terms of waste mass, using one generic drop amounts to 1.44 kg of waste over a 3-year period (the average efficacy of SLT laser in the LiGHT study). Incorporating carbon emissions from medical procurement, patient travel and waste disposal the average carbon emissions for a single topical glaucoma agent over 3 years were estimated to be 317 kg of CO2eq versus only 63 kg of CO2eq for patients receiving SLT – a fivefold reduction. Gazzard et al. demonstrated that 74% of patients receiving SLT remained drop free at 3 years. This study further brings attention to the role that SLT plays not only in optimizing patient outcomes but also its role in reducing carbon emissions in glaucoma especially in light of the growing disease burden. Further studies are required to look at the specific environmental impact on SLT laser treatment, as this was outside of the scope of this study.

Conclusion: Our study demonstrates the vast difference in carbon footprint between those receiving SLT versus single agent glaucoma therapy. The most significant component of which was carbon emissions from patient transport to and from clinics/pharmacies and increased clinical waste from multidose containers and their packaging.

615 - P4.020

EVALUATION OF THE AWARENESS AND ADHERENCE OF GLAUCOMA PATIENTS TO DRIVING STANDARDS IN THE UK

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Purpose: Patients who have bilateral glaucoma must inform the UK Driving and Vehicle Licensing Agency (DVLA). Patients who have unilateral glaucoma are not required to inform DVLA if they are group one drivers. Despite most clinicians being aware of DVLA driving standards, previous studies done in the UK reported that few clinicians actually discuss this issue with patients. We conducted this audit to 1) evaluate the current understanding and practice of glaucoma patients with regards to glaucoma and driving and 2) to evaluate the practice of glaucoma team members with regards to glaucoma patients and driving.

Methods: Patients attending glaucoma clinics at Cambridge University Hospitals (CUH) between 18 November 2022 and 2 December 2022 were offered to complete an annonymous questionnaire while waiting for their consultations. The audit was registered with the Audit Team at CUH.

Results: A total of 173 patients responded to the questionnaire; of whom 106 had glaucoma. Only 29.6% of bilateral glaucoma patients and 11% of unilateral glaucoma patients report that they were advised to inform DVLA by a glaucoma team member. About 65% of bilateral glaucoma patients and 18% of unilateral glaucoma patients reported that they had informed the DVLA about their glaucoma. In total, 70.4% of bilateral glaucoma patients report that they were not advised to inform DVLA by a glaucoma team member, half of them report that they have informed DVLA about their glaucoma despite not being advised to do so by a glaucoma team member.

Conclusion: In our audit, a considerable percentage (35%) of bilateral glaucoma patients who are current drivers have not informed DVLA. This confirms that glaucoma patients underreport their condition to the DVLA. In addition, 70.4% of bilateral glaucoma patients report that they were not advised to inform DVLA by a glaucoma team member. This suggests that patients with glaucoma bilateral had not been adequately informed by the glaucoma team to report their condition to the DVLA. Although unilateral glaucoma patients are not required to inform DVLA, our audit suggests that unilateral glaucoma patients were occasionally unnecessarily advised to inform DVLA which represents unnecessary burden added to the patients.

686 - P4.021

PREVALENCE OF GLAUCOMA IN THE NETHERLANDS: RESULTS FOR THE MAASTRICHT STUDY

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Purpose: To assess the prevalence of glaucoma in the Maastricht area, the Netherlands.

Methods: We used data from The Maastricht Study, a population-based prospective observational cohort study in the southern region of the Netherlands, comprising 9,188 participants ranging in age from 40 to 75 years. Determination of glaucoma prevalence was performed through a three-step process. Firstly, the ISGEO classification was applied to perimetry data. The association between disc area and vertical cup-to-disc ratio was assessed with quantile regression. The vertical cup-to-disc ratio of the optic disc was obtained by employing a convolutional neural network to segment fundus images of the optic cup, a technology developed by Thirona in Nijmegen, the Netherlands. In the second step, all visual field results categorized as 'Outside Normal Limits' by the glaucoma hemifield test were individually manually graded. Three experienced ophthalmologists conducted the manual grading process. In cases where grading standards varied among the three individuals for a particular visual field report, a final decision was reached after discussion among the three experts. The third step involved merging the percentile results from the vertical cup-to-disc ratio with the visual field results to determine the ultimate prevalence of glaucoma in the Maastricht population.

Results: Overall prevalence of glaucoma in the current study was 1.44%. Age-specific prevalence figures increased from 0.02% in the age group of 40 to 49 years to 0.73% in the age group of 60 to 69 years, then decreased to 0.35% in the age group of 70 to 79 years. Men had approximately two times higher risk of having glaucoma than women (odds ratio, 1.9). In 87.36% of the patients, glaucoma had not been diagnosed previously.

Conclusion: The study revealed a prevalence of glaucoma at 1.44%. Notably, the prevalence of glaucoma was consistently higher in women than in men across all age groups. It is worth highlighting that a substantial 87.36% of the participants lacked a definitive glaucoma diagnosis prior to their inclusion in the study.

688 - P4.022

USAGE OF IOP-LOWERING MEDICATION IN THE URBAN ADULT POPULATION - RESULTS FROM THE HAMBURG CITY HEALTH STUDY (HCHS)

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Purpose: To describe the usage of medication to lower the intraocular pressure (IOP) in the urban adult population of Hamburg/Germany

Methods: The Hamburg City Health Study (HCHS) is a prospective, long-term, population-based cohort study that includes a random sample of 45,000 participants aged between 45 and 74 years from the general population of Hamburg, Germany. In this analysis, data of the first 10,000 participants of an extended health examination were included, who were asked to bring their current medication for the study participation, in which also self-reported history of glaucoma was assessed.

Results: Valid data for medication use were available for 9.532 study participants, of whom 319 subjects were on IOP-lowering medication (average age 67.1 years, SD 7.57), according to 3.4 percent, which was slightly higher in women (3.5%, SD 7.74) than in men (3.2%, SD 7.39), but not statistically significant. There was a positive correlation between age and IOP-lowering medication ($p \leq 0.001$). More than 9.0 % in the oldest age group used glaucoma medications. The most common single agents were prostanglandin analogues (38.5%), carbonic anhydrase inhibitors (14.3%) and beta-blockers (12.4%). 29 % used combined medications with two active agents. Self-reported glaucoma was present in only 214 subjects (67.1 percent) of patients who used IOP-lowering medication.

Conclusion: The usage of IOP-lowering medication is more common than prevalence data for glaucoma since cases of treated ocular hypertension (OHT) without any structural glaucomatous damage may have been included in this study. The discrepancy between medication usage and self-reported history of glaucoma needs further explanation.

733 - P4.024

THE IMPORTANCE OF CHECKING INTRAOCULAR PRESSURES

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Purpose: Glaucoma is a chronic optic neuropathy with an insidious onset and progressive course, often asymptomatic until advanced stages of the disease, where significant, irreversible, and in many cases disabling visual loss for the patient already exists. In Spain, more than half a million people suffer from it, but only half are aware of it. This leads us to consider the importance of a screening protocol and early detection, both for glaucoma and ocular hypertension, which is its main risk factor.

Methods: An observational, descriptive, cross-sectional study conducted in commemoration of World Glaucoma Day at our hospital. Every individual passing through the hospital lobby was offered intraocular pressure (IOP) measurement with an ICare IC100 Tonometer. Subjects with an IOP higher than 21 mmHg underwent a second measurement with a Goldmann tonometer, as well as pachymetry and evaluation of the optic nerve under a slit lamp. Patients already diagnosed with glaucoma did not participate in the study.

Results: Out of the 169 subjects who agreed to participate in the study and met the inclusion criteria, we detected 2 patients with undiagnosed chronic open-angle glaucoma, 1 with optic nerve drusen, and 15 with ocular hypertension, one of whom had a bilateral grade 1 iridocorneal angle and required YAG laser Peripheral Iridotomy in both eyes.

Conclusion: A population screening protocol could promote early detection of ocular hypertension and glaucoma, thus favoring timely treatment, improving the visual prognosis of the disease, and possibly even preventing progression to blindness.

DIGITALISATION IN GLAUCOMA CONSULTATIONS IN SPAIN: THE DIGITOFT PROJECT

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Purpose: To describe the design and functioning of the new digitalization circuit for consultations and for intraocular pressure (IOP) follow-up as part of the DiGITOft Project –a pioneer digitalisation project in our country within a public hospital setting that involves specifically trained optometry and ophthalmology teams and aims to lower waiting lists and increase quality of care.

Methods: Descriptive 1-year study in which we show results of our telediagnostics circuit in terms of discharge or referral to the different steps in the circuit (reinsertion into the telediagnostics circuit, face-to-face consultation with a general ophthalmologist, face-to-face consultation with a specialist ophthalmologist), in general and focused to the area of glaucoma. Calculations are also done about the proportion of extra patients that can be seen telematically due to time saving, as well as the waiting times required since referral. A satisfaction survey rated 0-5 is also performed to a sample of patients.

Results: Out of the 1501 patients included in the circuit, 23% we directly discharged by an optometrist, 21% did not show up, 20% were referred to a general ophthalmologist face-to-face, 21% returned to the telediagnostics circuit, 6% were given a new virtual consultation and only 9% needed to see a specialist ophthalmologist face-to-face. Of our patients, 10% had been referred by their primary care doctor due to high IOP or glaucoma suspicion. The number of patients seen this way in a standard schedule increased by 60%, and waiting time decrease from 15 months to only 1 (94% time reduction). In the satisfaction survey, patients rated the service 4-73 out of 5 (s.d. 0.7).

Conclusion: Digitalisation in health and, particularly, in a glaucoma consultation is an efficient manner to solve management problemes in a public health system. It lowers waiting lists and referral time, improves overall patient health care an dynamises consultations. Additionally, patient satisfaction is high. Our results are in line with similar European projects.

764 - P4.026

THE ROLE OF A MULTIDISCIPLINARY APPROACH IN THE MANAGEMENT OF GLAUCOMA WITHIN OPHTHALMOLOGY, IN UK BASED NHS HOSPITALS

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Purpose: Glaucoma clinics in NHS hospitals within the United Kingdom (UK) are staffed by a multidisciplinary team, consisting of both medical doctors as well as other practitioners: Glaucoma Nurses (GN), Optometrists (OP), Orthoptists (ORT) and Other (OTH) healthcare practitioners (e.g. Ophthalmic Technicians). This study examines the correlation of each sub-group of practitioner's capabilities, excluding medical doctors, within UK Glaucoma clinics.

Methods: This is a cross-sectional study of 19 respondents to an electronic questionnaire, distributed by Glaucoma UK, to those who are members of Glaucoma UK as of January 2023. The questionnaire was completed by one practitioner for each NHS Hospital within the UK, who was asked to respond on behalf of their Ophthalmology department between 30/1/23 and 1/12/23. The skill score of each practitioner was determined by categorising each responsibility and asigning a numerical value to each responsibility performed, calculating the total skill score for each sub-group of practitioners e.g. (1 Point) Patient Education, IOP Phasing, Assessment of Follow Up Patients. (2 Points) Gonioscopy, Assessment of New Patients, Fundoscopy. (3 Points) Laser, Prescribing and Suture Removal.

Results: The evaluation of the 19 Glaucoma departments found that 17 included Optometrists (89.5%), 9 (47.40%) included Glaucoma Nurses, 8 (42.10%) included Orthoptists and 5 (21.10%) included Other healthcare practitioners. The mean number of Glaucoma clinics, per week per Ophthalmology unit, was found to be 6.89 ± 3.9. The mean skill score for each sub-category of practitioner is as follows: 24.25 ± 4.49, 15.64 ± 6.33, 11.14 ± 5.30 and 6.00 ± 2.94 (OP vs GN vs ORT vs OTH respectively). The results demonstrate that as the number of Glaucoma clinics per week increase, so does the skill score of each practitioner. This correlation was statistically significant for OP, GN and OT (0.767, $p < 0.001$; 0.758, p 0.007; 0.986, p 0.014 respectively), but not statistically significant for ORT (0.386, p 0.392).

Conclusion: The results demonstrate the correlation between the increased level of training by all sub-categorical practitioners as the number of Glaucoma clinics per week increase. Ultimately illustrating the inherent value of a multidisciplinary approach to Glaucoma care within NHS hospitals in the UK.

803 - P4.027

LOW VISION REHABILITATION IN THE GLAUCOMAS

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Purpose: The case presentation of this paradigm is to expand the conception of glaucoma care to encompass not just medical treatment but to emphasize quality of life enhancements through Low Vision Rehabilitation.

Methods: A review of the WHO definitions of low vision led to an identification of gaps involving functional and quality of life issues. Literature review qualified the gaps which were addressed via a comprehensive spectrum of care model.

Results: A new paradigm of glaucoma care was developed incorporating not just physical and medical aspects, but visual abilities, functional independence and impact on quality of life leading to a comprehensive approach to care for the patient with glaucoma.

Conclusion: Glaucoma care is limited by current definitions of IOP, visual fields and ocular nerve testing and would more appropriately serve patient needs by incorporating the identified aspects of whole care.

856 - P4.028

THE INFLUENCE OF THE DIAGNOSIS AND TREATMENT OF GLAUCOMA ON THE QUALITY OF LIFE OF ASYMPTOMATIC PATIENTS

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Purpose: To discuss the influence of glaucoma diagnosis and treatment on patients' quality of life (QoL) and the role of the way how the ophthalmologist is presenting it. Glaucoma is a leading cause of irreversible blindness and visual impairment worldwide. This causes obvious deterioration of the quality of life (QoL). When glaucoma is diagnosed in early stages patients are asymptomatic, so their vision has no influence on the QoL. The diagnosis itself may cause severe concerns, including the fear of blindness (FOB), the necessity of long-life treatment, its side effects, and costs.

Methods: Literature review and our own patients experience. 42 studies presenting the influence of glaucoma on QoL were analyzed and the influence of glaucoma diagnosis on mental state of asymptomatic patients and the burden and side effects of treatment on the QoL. Additionally, four patients referred to us (age 30 to 72 years) with normal visual functions treated for glaucoma from 8 to 21 years with severe fear of blindness and serious side effects will be presented. Patients were told by their physicians that they will go blind when not treated, became obsessed about their IOP, and could hardly stop taking medications.

Results: In most studies, QoL assessment was based on visual functions (acuity and visual field). Where FOB in initial glaucoma has been studied, it was decreasing with follow-up and treatment if visual function was preserved. In some papers it was stressed that falsely diagnosing patients as having glaucoma can significantly reduce their QoL and well-being. In patients referred to us glaucoma was diagnosed prematurely, and the treatment was introduced without preliminary observation. Moreover, the physicians exaggerated the risks of losing sight and the necessity of applying drops indefinitely and despite normal vision patients were unable to enjoy life as they were before diagnosis.

Conclusion: An eye doctor diagnosing glaucoma may harm the patient if he does not provide him with reliable information about the disease. Early glaucoma should not be recognized until progressive optic neuropathy is confirmed. The risk of losing sight and blindness usually cam be assessed after some years of observation.

891 - P4.029

PERCEPTION AND KNOWLEDGE OF OVERDIAGNOSIS AND OVERTREATMENT IN GLAUCOMA: A SURVEY OF SPANISH OPHTHALMOLOGISTS

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Purpose: To assess the perception and knowledge Spanish ophthalmologists have of overdiagnosis (OD) and overtreatment (OT) in the field of glaucoma.

Methods: An anonymous, 26-item online survey evaluating the perception, attitudes and knowledge of Spanish ophthalmologists regarding OD/OT was sent to members of the Spanish Glaucoma Society and the Spanish Ophthalmology Society. The study offers descriptive statistics and an analysis of the potential drivers of OT/OD which may lead to OD/OT.

Results: Of the 195 respondents, 55% were aware of the current definition of OD/OT. Only 13 (6.7%) believe OD/OT is not a clinically significant problem. There was no significant differences in terms of demographics, type of practice and treatment preferences between ophthalmologists who considered OD/OT important and unimportant, except for a higher proportion of PhDs among the "not clinically relevant" group. No differences were found between groups considering clinical findings/real-life scenarios. "Peace of mind" was considered a principal driver of OD/OT by both groups. Moderate OHT was considered the most common clinical scenario for OD/OT. OD/OT was estimated to affect 20% of medically treated patients and only 5% of those submitted to surgery.

Conclusions: Spanish ophthalmologists reported being aware of the importance of OD and OT. However, only half were aware of the current definition of OD and OT. Most participants believe a White Paper should be produced to reduce the prevalence of OD/OT. The low participation rate and the non-response bias may limit the generalization of the results.

911 - P4.030

ASSESSING GLOBAL SOCIAL AWARENESS OF GLAUCOMA: INSIGHTS FROM THE WORLDWIDE SEARCH TRENDS

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Purpose: This study assesses glaucoma social awareness over time by analyzing worldwide search trends and discussing factors contributing to heightened awareness and search interest.

Methods: Utilizing Google Trends (Alphabet Inc) data spanning from January 2004 to December 2023, search interest for "glaucoma" worldwide in all categories was examined. The relative search interest values were analyzed over the years to identify any trends or patterns indicative of changes in social awareness. The geographic distribution of the search was descriptively analyzed. Subsequently, the data was segmented to investigate specific periods, to explore potential relationship with events occurred during the periods.

Results: Over the 20-year span, the peak search was in March 2023 (specifically 12-18 March 2023), and the lowest search was in December 2009. Prior to 2008, search interest in glaucoma exhibited modest fluctuations with a downward trend (slope -0.49, $p < 0.001$). A plateau was observed between 2009 to 2010 (slope -0.19, $p = 0.15$). After that, there was a noticeable upward trend in search interest (slope 0.14, $p < 0.001$), significantly changed from prior to 2008 ($p < 0.001$). Surges were observed particularly in early March each year, most appreciably since 2010 onwards. These observed spikes coincided with the annual World Glaucoma Week events, which have been organized by the World Glaucoma Association since 2008. There was a significant decline in search interest in 2020, possibly due to the COVID-19 pandemic. The top five locations with the highest search proportion for "glaucoma" in the most recent five years were identified as Cuba, Ghana, Zambia, Trinidad & Tobago, and Nigeria, indicating potentially related to a high prevalence of glaucoma among Africans, together with effective promotional campaigns in these regions.

Conclusion: The findings show increased glaucoma awareness over the past two decades, with surges coinciding with global campaigns. This rising interest suggests heightened public awareness. The study highlights the impact of social awareness campaigns like World Glaucoma Week in driving engagement. Further research on promotional targeting and geographical variations in prevalence could inform social awareness initiatives.

927 - P4.031

THE ADDITIONAL YIELD OF PERIODIC SCREENING FOR OPEN-ANGLE GLAUCOMA: INCIDENT GLAUCOMA DETECTION IN THE THESSALONIKI EYE STUDY POPULATION

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Purpose: To identify incident glaucoma cases detected during regular ophthalmic care and from screening in a population-based setting and study the additional yield of periodic screening for open-angle glaucoma (OAG).

Methods: The baseline cohort included 2,554 participants above 60 years of age who participated in a longitudinal, population-based study in Thessaloniki, Greece. 1,468 subjects from the original cohort who had not died or moved to a distant geographic location were eligible and re-invited for follow up analysis 12 years after baseline. Among eligible subjects, 1,092(74%) were examined. The same methodology used in the baseline examinations was followed. For the present analysis, undiagnosed glaucoma was defined as absence of either prior self-reported glaucoma diagnosis or ocular hypertension or prior medical treatment and/or surgery for glaucoma at the incidence visit. Glaucomatous damage staging was performed using the Hodapp-Parish-Anderson (HPA) criteria.

Results: The population at risk, after excluding glaucoma patients diagnosed during the baseline study, consisted of 1,042 participants. Forty-six subjects developed incident OAG and 27 of them (58.7%, 95% CI: 43.5-71.7) were undiagnosed at follow-up visits, corresponding to a 2.6% (27 of 1042 [95% CI: 1.6-3.6]) 12-year incidence rate of undiagnosed OAG. After dividing the population at risk into non-pseudoexfoliative (non-PEX) and PEX subjects, the incidence of undiagnosed primary open-angle glaucoma (POAG) and PEXG was 14 of 772 (1.8%) and 13 of 270 (4.8%) respectively. Glaucoma stage did not differ between previously diagnosed and undiagnosed cases according to HPA criteria ($p = 0.46$ for better eye and $p = 0.72$ for worse eye). Seventeen undiagnosed cases (17 of 1042[1.6%]) had moderate or worse visual field damage in at least one eye.

Conclusion: The overall rate of undiagnosed incident OAG in the population-based cohort was substantial. The rate of undiagnosed incident glaucoma among PEX subjects was high. A periodic screening programme could have detected a significant number of cases with glaucoma. This could represent the overall additional yield of periodic screening over 12 years. More studies are needed to define the intervals of periodic screening and evaluate cost-effectiveness.

929 - P4.032

BASELINE RISK FACTORS FOR THE DEVELOPMENT OF OPEN-ANGLE GLAUCOMA IN A TWELVE-YEAR GLAUCOMA INCIDENCE STUDY. THE THESSALONIKI EYE STUDY

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Purpose: To determine baseline risk factors of incident open-angle glaucoma (OAG) in an elderly White population.

Methods: A prospective-longitudinal population-based study was conducted in Thessaloniki, Greece consisting of 2,554 participants age 60 years and older. Twelve years following baseline examinations, 1,468 subjects who had not died or moved to a distant geographic location were deemed eligible and re-invited for follow-up examinations using the same methodologies undertaken at baseline. One thousand ninety-two (74%) were re-examined. Subjects were classified as having POAG or PEXG according to specific criteria same to the ones used at baseline. In the present analysis, subjects who had participated in both the baseline and follow-up examinations were included. Subjects who had home visits in either baseline or incidence visit and those who were diagnosed with glaucoma at baseline were excluded. Univariate regression analysis included potential risk factors. In multivariate regression analysis factors with a p-value of ≤ 0.2 were included in the model.

Results: Overall 826 subjects (783 controls and 43 glaucoma cases) met final inclusion criteria for analysis with a mean age at incidence of 79.3 ± 3.9 and 80.4 ± 4.1 respectively. In multivariate regression analysis adjusted for potential confounders, the following factors were associated with incident glaucoma: pseudoexfoliation(PEX) at baseline (OR 4.07, 95%CI 1.67-9.89, p = 0.002); Higher baseline IOP (OR 1.26 per mmHg, 95%CI 1.15-1.40, p < 0.001); c/d ratio (OR 8.12 per 1 unit, 95%CI 1.32-50.02, p = 0.024); family history of Glaucoma (OR 2.76, 95%CI 1.11-6.83, p = 0.028); history of heart attack (OR 4.35, 95%CI 1.75-10.82, p = 0.002). Blood pressure(BP) > 140/90 was associated with reduced odds of incident OAG (OR 0.42, 95%CI 0.19-0.92, p = 0.030) compared to BP ≤ 140/90 without anti-hypertensive treatment. Increased hours of sleep (OR 0.79, 95%CI 0.64-0.98, p = 0.038) and alcohol consumption at least one drink per month (OR 0.38, 95%CI 0.16-0.92, p = 0.033) were associated with decreased odds of glaucoma.

Conclusion: IOP, PEX, family history of glaucoma and history of heart attack increased the risk for incident OAG. BP >140/90 reduced odds of incident glaucoma. Increased hours of sleep and alcohol consumption were found to be protective of developing glaucoma.

938 - P4.033

BASELINE FACTORS ASSOCIATED WITH UNDIAGNOSED INCIDENT OPEN-ANGLE GLAUCOMA: THE TWELVE-YEAR INCIDENCE THESSALONIKI EYE STUDY

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Purpose: To identify baseline factors associated with undiagnosed incident open-angle glaucoma (OAG), in an elderly population in Thessaloniki, Greece.

Methods: A prospective-longitudinal population-based study was conducted in Thessaloniki, Greece consisting of 2,554 participants, aged 60 years and older. Twelve years following baseline examinations, 1,468 subjects who had not died or moved to a distant geographic location, were deemed eligible and were re-invited for follow-up examinations, using the same methodologies undertaken at baseline. One thousand ninety-two (74%) subjects were re-examined. Subjects were classified as having POAG or PEXG according to specific criteria, same to the ones used at baseline. In the present analysis, the incident OAG cases were included. Undiagnosed glaucoma was defined as absence of either prior self-reported glaucoma diagnosis, or ocular hypertension, or prior medical treatment and/or surgery for glaucoma at the incidence visit. Subjects who had home visits in either baseline or incidence visit, were excluded. Logistic regression analyses were performed on baseline factors, including age, family history of glaucoma, vertical cup-to-disk (C/D) ratio, intraocular pressure (IOP), pseudoexfoliation (PEX) and diabetes status.

Results: Two incident OAG cases with home visits were excluded. The proportion of undiagnosed glaucoma among all incident OAG cases with clinic visits was 58,1% (25/43). Patients without PEX at baseline were 12 times more likely to be undiagnosed (OR: 11.567, 95% CI: 1.16 to 115.291, p = 0.037). Baseline IOP was statistically significantly associated with undiagnosed OAG (OR: 0.706 per mmHg, 95% CI: 0.521 to 0.957, p = 0.025), as was C/D ratio (OR: 0.002 per 1 unit, 95% CI: 0.000 to 0.488, p = 0.027) and family history of glaucoma (OR: 0.052, 95%CI: 0.004 to 0.679, p = 0.024).

Conclusion: Lower IOP and smaller C/D ratio, as measured prior to the manifestation of glaucoma, were associated with increased rate of undiagnosed incident OAG. The absence of PEX increased the likelihood of being undiagnosed with OAG. Patients without family history of glaucoma also had a higher probability of being undiagnosed.

957 - P4.034

ADVANCING GLAUCOMA CARE IN SCOTLAND THROUGH NES GLAUCOMA AWARD TRAINING (NESGAT) AND A NOVEL VIRTUAL REALITY-BASED PERIMETER: A MIXED METHODS RESEARCH STUDY

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Purpose: To examine the perspectives of ophthalmologists, optometrists and patients on a novel community glaucoma pathway (NESGAT), and to design a patient-centred model for community glaucoma monitoring that combines Artificial Intelligence (AI) and Virtual Reality (VR) platforms to improve accessibility and efficiency.

Methods: Ophthalmologists and optometrists across Scotland participated in questionnaires, semi-structured interviews and focus group discussions centered on; current capacity issues, barriers to community glaucoma monitoring and appropriate community reimbursement rates. Thematic analysis was used to explore trends observed in questionnaire data. Furthermore, user perspectives on using a Virtual Reality Perimetry platform (PeriStation™) and test time comparison between Sequential Optomised Reconstruction Strategy (SORS) and SITA (Swedish Interactive Thresholding Algorithm) Standard was tested in healthy participants.

Results: Amongst questionnaire respondents, 75% ranked the highest barrier for community glaucoma monitoring to be inadequate reimbursement rates or difficulty conducting visual field tests. In semi-structured interviews and focus group discussions, 22 participants highlighted the significant amount of additional training required to become NESGAT-certified and the opportunity costs associated with the resource-intensive nature of current visual field testing strategies to be the most significant barriers to wider adoption. Most optometrists expressed a willingness to expand their current scope of community glaucoma assessment if an automated, integrated and faster visual field testing strategy was available. Mean test time using SORS was 59% faster compared to SITA-Standard (290 seconds; [SD 18] vs 707 seconds; [SD 71]). All participants agreed or strongly agreed that they were able to perform visual field testing on a VR headset and 75% found the VR-based test to be more pleasant.

Conclusion: The novel Community Glaucoma Service in Scotland, delivered by NESGAT-qualified optometrists has the potential to improve patient accessibility and clinical outcomes. However, there remains significant barriers to its wide-scale adoption by community optometrists including the need for extensive training and its associated opportunity costs.

268 - P4.035

RISK OF PRIMARY OPEN-ANGLE GLAUCOMA (POAG) BETWEEN SYSTEMIC B-BLOCKERS AND CALCIUM CHANNEL BLOCKERS

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Purpose: Beta-blockers and calcium channel blockers are widely prescribed for cardiovascular issues, but their impact on the risk of sight-threatening ocular diseases, like glaucoma, is unclear. This study employs real-world data from the Chang Gung Research Database in Taiwan to compare the risks of primary open-angle glaucoma (POAG) between beta-blocker and calcium channel blocker users.

Methods: This study emulated a target trial with patient data from the multi-institutional Chang Gung Research Database (CGRD) in Taiwan. In total, 71,023 patients with cardiovascular-associated issues using beta-blockers and calcium channel blockers between 2010-2022 were identified. 10,249 patients were excluded due to missing demographics, age < 18 years old diagnosis of any other retinal diseases, concomitant use of beta- and calcium channel- blockers, prior use of any study drug. Baseline characteristics were balanced using inverse probability of treatment weighting with propensity scores. Incidence of POAG served as the primary outcome. The need for surgical intervention for glaucoma, peak intraocular pressure (IOP), IOP fluctuation and use of glaucoma medications > 1 for glaucoma control served as secondary outcomes.

Results: There were 29,314 beta-blocker and 31,460 calcium channel blocker users included for the analysis. Calcium channel blocker users exhibtied significantly higher cumulative hazard for POAG compared to the beta-blocker users ($p < 0.05$). Both groups had similar incidence of glaucoma surgeries (including trabeculectomy and plate-based tube shunts), IOP peak and fluctuation. Beta-blocker users had a relatively lower prevalence of concurrent antiglaucomatic medication use > 1 compared to calcium channel blockers.

Conclusion: Compared to patients under the use of beta blockers, calcium channel blocker users had a higher risk of POAG. The similar IOP profiles between the two medications suggested factors beyond IOP as possible contributors of POAG risks in these patients.

283 - P4.036

THE INFLUENCE OF PERSONALITY TRAITS ON ADHERENCE TO GLAUCOMA TREATMENT

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Purpose: Cloninger's psychobiosocial model of personality suggests that consistent patterns of health-related behaviors arise from the intricate interplay among various neurobiological processes, influenced by the genetic and environmental factors shaping an individual's temperament and character traits. The study aimed to assess the correlation between personality traits and treatment adherence in individuals diagnosed with primary open-angle glaucoma (POAG).

Methods: This cross-sectional study included 113 POAG subjects. All the participants underwent a comprehensive ophthalmological examination. The analysis of personality traits utilized the Croatian adaptation of The Temperament and Character Inventory-Revised (TCI-140), assessing four temperament traits—harm avoidance (HA), persistence (PS), novelty seeking (NS), reward dependence (RD); and three character traits—self-transcendence (ST), cooperativeness (CO), self-directedness (SD). The Culig Adherence Scale (CAS), a valid and reliable self-administered instrument, was employed to evaluate medication adherence.

Results: According to the CAS, only 45 (39.8%) subjects were adherent to topical treatment. Adherent and non-adherent subjects did not significantly differ according to age ($t = 1.205$, $p = 0.231$) and gender ($\chi 2 = 0.002$, $p = 0.964$). Adherence was significantly negatively related only to the character trait of ST ($\tau = -0.236$, $p < 0.05$), which indicates that a higher score in this character dimension was associated with less adherent behavior and vice versa. No significant correlations were observed between adherence and other personality dimensions ($p > 0.05$). Nevertheless, ST's significant moderate positive relation to PS ($\tau = 0.325$, $p < 0.001$) and negative to SD ($\tau = -0.350$, $p < 0.001$) were found, which might presume that an increase in the study sample would result in adherence's negative relation to PS and positive to SD.

Conclusion: Patients with a tendency towards higher self-transcendence are less likely to adhere to topical treatment. This correlation could stem from the increased challenge of these individuals in prioritizing their personal needs, including the ability to consistently follow treatment plans. Therefore, a holistic approach to glaucoma treatment, one that considers not only the biological aspects of the disease but also the psychosocial factors influencing patient behavior, could offer personalized healthcare strategies. This may lead to enhanced treatment adherence and improved outcomes.

617 - P4.037

DEGREE OF ALCOHOL CONSUMPTION AND GLAUCOMA RISK: A DOSE-RESPONSE META-ANALYSIS OF POPULATION-BASED STUDIES

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Purpose: Previous studies have suggested a harmful association between alcohol intake and glaucoma. It remains unclear, however, whether this relationship follows a continuous dose-response pattern or not. Therefore, we aimed to identify any dose-response relationship and its pattern between alcohol consumption and open-angle glaucoma (OAG) risk.

Methods: A systematic search of the MEDLINE, EMBASE and Cochrane databases was conducted for population-based studies. For each study, heterogeneous alcohol types, categorizations, and units were standardized to the reference dose (i.e., gram per day [g/day]) and analyzed (PROSPERO: CRD42020218324).

Results: Eight studies (187,810 individuals, including 3,417 OAG patients) categorizing alcohol intake into 3 or more levels were included in the analysis. The pooled relative risk (RR) of any alcohol-consumption association with OAG was 1.11 (95% CI, 1.02-1.21, I2 = 28%). A two-stage random-effects dose-response meta-analysis found a linear dose-response relationship between alcohol consumption and OAG risk (p = 0.39, Wald test). The pooled RR per 10 g increase of daily alcohol intake was 1.08 (95% CI, 1.01-1.18). Methodological quality was assessed on the Newcastle-Ottawa Scale, and the scores thus assessed ranged from 5 to 9. No publication bias was evident, either by Egger's linear regression test (p = 0.590) or Begg and Mazumbar's adjusted rank correlation test (p = 0.458).

Conclusion: The results suggest that alcohol intake and glaucoma susceptibility to have a linear-shaped dose-response relationship. Future research could (1) analyze impact of fluctuations of alcohol intake over time and (2) identify factors associated with individual responses to alcohol consumption.

628 - P4.038

THE ASSOCIATION BETWEEN CHRONIC PERIODONTITIS AND OPEN ANGLE GLAUCOMA

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Purpose: To investigate the relationship between chronic periodontitis and open angle glaucoma.

Methods: A total of 17476 subjects participated in the KNHANES between 2010 and 2011, 6215 subjects who were 19 years of age or older and underwent an ophthalmological examination satisfying the International Society of Geographical and Epidemiological Ophthalmology criteria and a dental examination were included. The exclusion criterion was ocular surgery (i.e., cataract, retina, or refractive), presence of AMD and missing data. A total of 3640 subjects were included in the analysis, excluding those with teeth, those who were pregnant, and received orthodontic treatment. The periodontal disease was assessed using the CPI (Community Periodontal Index), a community index developed by WHO.

Results: Of the total 3640 patients, 161 (3.86%) had glaucoma and 3479 (96.14%) did not have glaucoma. Among the 161 glaucoma patients, 47 (37.86%) had periodontitis, and among the non-glaucoma patients, 889 (22.08%) out of 3479 patients had periodontitis. (p value < 0.001) The periodontitis group was more likely to have glaucoma than the non-periodontitis group. (odds ratio [OR], 1.53; 95% confidence interval [CI], 1.01-2.32, adjusted for age, sex, DM, HTN, smoking rate). For those over 40 years old, the OR was 1.71 (95% CI, 1.12-2.63), and for men, it was 1.86 (95% CI, 1.11-3.13). When comparing the group with and without periodontitis in DM patients, the OR was 2.87 (95% CI, 1.40-5.88).

Conclusion: Our study shows a relationship between chronic periodontitis and glaucoma. Future follow-up studies will be necessary to understand the clear mechanism for the relationship between periodontal disease and glaucoma.

693 - P4.039

SERUM VITAMINS AND RETINAL NERVE FIBER LAYER THICKNESS CHANGES ON SD-OCT: THE ALIENOR STUDY

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Purpose: Glaucoma is a neurodegenerative disease, characterized by a progressive loss of retinal ganglion cells and a progressive thinning of the retinal nerve fiber layer (RNFL) on optical coherence tomography (OCT). Vitamins B6, B9 and B12 may contribute to retinal vascular diseases and optic neuropathies through their contribution to the homeostasis of homocysteine levels. Vitamins A, D and E may also be important for the protection of optic nerve due to their strong antioxidant properties. There are few epidemiological studies on this emerging topic. Thus, the aim of our study was to investigate the relationship between serum vitamins A, D, E, B6, B9, B12 and longitudinal changes in RNFL thickness in the Alienor study.

Methods: The Alienor study is an ongoing population-based cohort of 963 older residents of Bordeaux (France) followed since 2006. RNFL thickness was measured with spectral domain-optical coherence tomography (SD-OCT) every 2 years over an 8-year period. Serum vitamins A, D, E, B6, B9 and B12 were measured at baseline from fasting blood sample. Linear mixed models were used to assess the association between serum vitamin levels and RNFL changes over time, adjusted for age, gender, axial length, family history of glaucoma, alcohol consumption and vitamin D supplement use.

Results: This study included 1 187 eyes (624 participants). Among all nutrients assessed, vitamins E and B9 were significantly associated with longitudinal changes in RNFL thickness. A 1-standard deviation (SD) increase of vitamin E (4.8 µg/L) and of vitamin B9 (11 nmol/L) were associated with slower RNFL thinning by 0.15 µm/year (95% confidence interval (CI), 0.02-0.28, p = 0.03), 0.12 µm/year (95% CI, 0.01-0.23, p = 0.03), respectively. No significant association was observed for vitamins A, D, B6 and B12 with RNFL either at baseline or with longitudinal changes.

Conclusion: Higher levels of vitamins E and B9 were associated with a slower RNFL thinning on SD-OCT over time, suggesting that those vitamins may contribute to the neuroprotection of the optic nerve head and may be interesting in glaucoma management.

378 - P4.040

IT'S NOT OVER YET: THE OCULAR COMPLICATIONS OF LEPROSY IN POST-ELIMINATION INDIA

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Purpose: Over half of the world's MB leprosy cases are in India (Singal et al., 2013). In 2005, India's government declared leprosy elimination status and integrated specialised leprosy services with general healthcare. India's integrated leprosy healthcare has left leprosy patients vulnerable to ocular disability and other morbidities. Multi-drug therapy does not treat or halt the progression of ocular complications hence 1-2% of patients go on to develop cataracts, lagophthalmos and uveitis. In the post-elimination era, cooperation is needed between NGOs and primary-to-tertiary level healthcare services to manage ocular manifestations in leprosy patients (Pandey, 2015).

Methods: This scoping review was conducted over a 8-week period in August 2023. Peer-reviewed quantitative and qualitative papers were found using MEDLINE (Ovid). Ethical approval was not necessary for this study because primary data was not collected.

Results: Unfortunately, the influence of stigma cannot be understated as leprosy patients are less likely to access healthcare services due to the lack of specialist leprosy care delivered at general medical health centres, geographical distance, financial capability and societal ostracism. Local healthcare infrastructure and socioeconomics influenced how integration was implemented across the country with poorer areas recording lower levels of specialist healthcare training and resource allocation.

Conclusion: In conclusion, leprosy-related ocular disability has been unaddressed by India's integration strategy. The lack of communication between tiered healthcare services, reduced emphasis in healthcare training and access to specialist services has resulted in greater difficulty in identifying and diagnosing leprosy-related ocular disease in post-elimination India. In future, there is potential for a collaborative effort between health and social care services to detect early stages of ocular disease in leprosy patients thereby reducing their level of disability.

404 - P4.041

RISK OF STEROID RESPONSIVENESS IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE FLARE TREATED WITH SYSTEMIC CORTICOSTEROIDS: A PROSPECTIVE STUDY

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Purpose: To evaluate the risk of increased intraocular pressure (IOP) in patients with inflammatory bowel disease (IBD) flare who received systemic corticosteroid treatment (SCT).

Methods: A prospective, longitudinal and observational study was carried out in 59 patients with IBD flare in SCT. The ophthalmology protocol included an ocular history (OH) questionnaire and complete ophthalmological examination at baseline, IOP at one month and a complete ophthalmological examination at the end of the TCS. The variation of IOP at the different points of follow-up, the patient's distribution in three risk groups depending on the IOP and IOP elevation (steroid responsiveness, SR), and the possible relationship between the SR and OH and the presence of other systemic side effects (SSE) were analyzed.

Results: The mean IOP was 13.95 ± 2.77 mmHg at baseline, 15.49 ± 3.35 mmHg at one month and 15.36 ± 2.97 mmHg at the end of treatment, with a IOP difference from baseline of 1.54 ± 2.63 mmHg at one month of follow-up (CI 95% = 0.82 to 2.25 mmHg, p = 0.0001) and 1.51 ± 2.68 mmHg at the end of TCS (CI 95% = 0.76 to 2.25 mmHg, p = 0.0002). We observed a good ocular safety profile (IOP < 21 mmHg and IOP rise ≤ 5 mmHg in both eyes) in 83.64% of the patients and a potentially severe ocular side effect (IOP ≥ 21 mmHg and IOP rise ≥ 5 mmHg in almost one eye) in 3.64% of the patients at one month of follow-up. We observed 16.36% SR at almost one eye and 10.91% binocular SR. No statistically significant differences were found between patients with SR and OH, other SSE and demographics, except the presence of overweight in the enrollment.

Conclusion: Despite statistic IOP rise after the use of corticosteroid systemic treatment in IBD flare in our series, we have observed a good ocular security profile. We didn't observe relationship between the steroid responsiveness and ocular history or other systemic side effects.

571 - P4.042

THE NUTRITIONAL HABITS OF PATIENTS WITH NEWLY DIAGNOSED PSEUDOEXFOLIATIVE GLAUCOMA

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Purpose: To evaluate the nutritional habits of patients with newly diagnosed pseudoexfoliative glaucoma (PEXG) and compare them with those pertaining to individuals with newly diagnosed primary open-angle glaucoma (POAG), subjects with pseudoexfoliation syndrome (XFS) and healthy controls.

Methods: This case control study involved 306 participants, including patients with newly diagnosed PEXG, age- and sex-matched normal controls (NC), patients with newly diagnosed POAG, and subjects with XFS. The study was conducted at the Glaucoma Department of Clinic for Eye Diseases, Clinical Centre of Serbia, Belgrade.

Results: The mean age in the PEXG, POAG, XFS and NC groups was 73.61 ± 8.46, 65.50 ± 8.97, 74.81 ± 6.80 and 73.58 ± 9.34 years, respectively (PEXG vs. POAG, $p < 0.001$). While body mass index (BMI) of all groups was comparable, a statistically significant difference in the frequency of fruit consumption was observed between patients with PEXG and those with POAG ($p = 0.013$). Daily consumption was reported by 50.6% and 56.3% of the PEXG and POAG cohort, respectively, while 44.6% and 25.0% members of these groups indicated consuming fruit 2-3 times per week. The highest olive oil consumption was reported by healthy controls, as 19.0% and 20.2% of individuals in this group used it daily and 2–3 times per week, respectively ($p = 0.005$). These consumption patterns were reported by 22.5% and 13.8% of patients with POAG ($p = 0.011$), 10.2% and 25.4% of respondents with PEX syndrome ($p = 0.049$), and 6.0% and 8.4% of the PEXG group.

Conclusion: Patients with PEXG, POAG, and XFS as well as healthy controls who took part in this study reported similar levels of meat, fish, milk and milk products, starchy foods, green and leguminous vegetables, citrus and stone fruit consumption. However, those with newly diagnosed POAG differed from other groups with respect to the consumption of other fruit types. Statistically significant differences were also noted in olive oil consumption, whereby the lowest intake was noted for the PEXG group.

Keywords: pseudoexfoliative glaucoma, newly diagnosed, pseudoexfoliation syndrome, primary open-angle glaucoma, nutrition, habits

306 - P4.043

BILATERAL MYOPIC SURPRISE - IOP ELEVATION - IRIS PLATEAU SYNDROME - A CASE REPORT OF A POSSIBLY NEW ENTITY

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Purpose: To present a case of bilateral postoperative myopic surprise and unilateral IOP elevation after uneventful phacoemulsification in a hyperopic female with iris plateau syndrome.

Methods: A 76-year-old female had bilateral iridotomies for PACG 13 years ago with subsequent normal IOP values. The patient underwent uneventful right eye cataract surgery in May 2023. An unexpected myopic shift of -2.50 D was noted. In December 2023, left eye cataract surgery was performed. Implanted IOL was chosen to avoid a myopic shift in the left eye. However, again, the myopic shift of -1.75 D was noted with postoperative IOP elevation 3 weeks after surgery (41 mmHg). Full examination, UBM, IOL Master, and anterior OCT were performed.

Results: Three weeks after left eye surgery, UBM showed iris plateau configuration with anterior displacement of iridolental diaphragm closing the anterior chamber angle in both eyes. IOL was regularly positioned in lens capsule. ACD preoperatively and postoperatively was shallow (on Master 700, preoperatively 2.50mmright eye, 2.50mmleft eye; postoperatively 3.17mmright eye, 2.70mmleft eye). The suggested mechanism was anterior vitreous displacement, pushing the iridolental diaphragm and closing the angle, which takes weeks to months to develop. The patient was treated with topical IOP lowering medications and acetazolamid orally. IOP regulation was satisfactory, but myopic shift remained. Ten days later, IOP was normal, ACD deepened bilaterally (3,93mm/3,70mm), but the refraction status changed only in left eye (BCVA with -0.75 D was 0,9 on Snellen chart). Since the IOP values were normal with topical therapy only and refractive status was unstable, no further treatment (as cycloplegia, mannitol infusion, anterior vitrectomy, laser procedures) was advised.

Conclusion: Myopic surprise - IOP elevation - iris plateau syndrome in this patient is possibly related to preoperatively undiagnosed iris plateau configuration. Since the IOP was normal with topical therapy only and refraction status on the left eye improved without any treatments suggested for malignant glaucoma, we suspect it could be a new entity related to iris plateu configuration.

734 - P4.044

LONGITUDINAL ANALYSIS OF TRANSITION CLINIC FOLLOW-UP IN A TERTIARY GLAUCOMA CENTRE

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Purpose: Paediatric glaucoma significantly threatens sight, making the transition from paediatric to adult healthcare crucial. This study evaluates transition clinic outcomes and identifies risk factors for additional surgeries post-transition.

Methods: A single-center quantitative retrospective analysis was conducted on 46 eyes of 28 patients (9 female, 19 male) who attended the transition clinic at Birmingham Children's Hospital from 2017 to 2023 and subsequently received follow-up care at Birmingham Midland Eye Centre. Parameters analyzed included intraocular pressure (IOP), visual acuity (VA), cup-to-disc ratio (CDR), visual field integrity, and the nature and duration of subsequent surgical interventions. Our demographic population was diverse with half of the patients phakic (50%), and the majority suffered from secondary glaucoma (71.7%).

Results: Follow-up retention was high at 92.9%.with only 2 patients being lost to follow up. The mean nterval between the transition clinic and adult clinic follow-up was 5.07 months. At the time of first adult clinic follow up, the average visual acuity was 0.73 logMAR, with an IOP of 17.4 mmHg on an average of 2.0 medications with 1.7 previous glaucoma procedures. Further surgical intervention was required in seven patients (nine eyes), representing 30.4% of the cohort, with a qualified success rate of 66.6%. The average duration from transition clinic to requiring further glaucoma lowering procedure was 18.4 months. This study establishes that intraocular pressure at transition clinic is a significant($p = 0.044$) predictor of the need for additional glaucoma surgery post-transition with BCVA at transition ($p = 0.076$) and BCVA(0.061) and medications at adult follow-up (0.089) approaching significance.

Conclusion: This is the first study evaluates the effectiveness of transition clinics, assesses the risk of patient attrition, and quantifies the rate of subsequent surgeries within this demographic. Transition clinics are crucial in managing paediatric glaucoma, with implications for improving long-term outcomes.

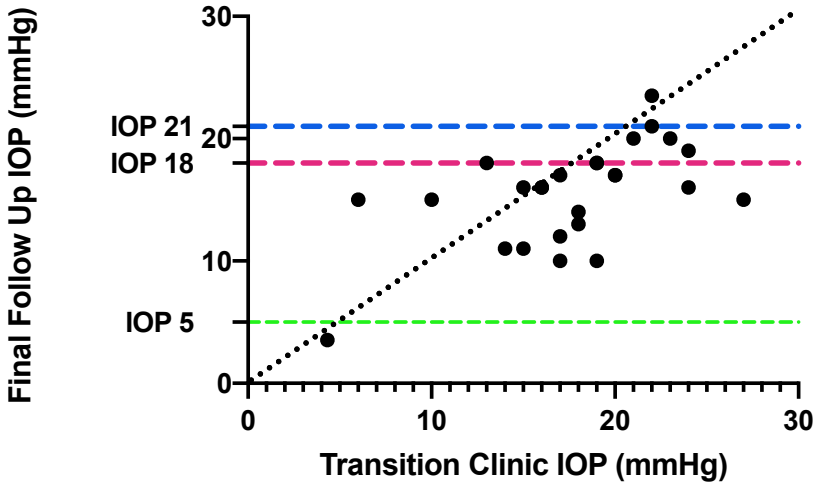

Figure 1: Scattergram of Intra-ocular pressure at transition and final follow up.

202 - P4.045

RETINAL NERVE FIBER LAYER THICKNESS CHANGES AFTER COMBINED PHACO-ELIOS

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Purpose: Describing the changes in peripapillary nerve fiber layer thickness (RNFL) in patients with glaucoma who underwent combined phacoemulsification-ELIOS at 48 months.

Methods: Retrospective, single-center chart review of adult patients diagnosed with ocular hypertension or glaucoma who underwent combined phacoemulsification-ELIOS. Preoperative and postoperative clinical data was collected and analyzed, and the global thickness of peripapillary nerve fiber layer using the SD-OCT (Heidelberg) was captured yearly for 48 months. The main outcome measure was the mean change in RNFL thickness from year to year. Surgical approach consisted of routine phacoemulsification combined with a 308 nm excimer laser delivered through an intraocular fiberoptic probe to create 10 microchannels through the trabecular meshwork up to the inner wall of Schlemm´s canal in the inferonasal quadrant. Postoperative management and follow-up was comparable to routine phacoemulsification.

Results: 57 eyes of 47 patients were included. Twenty-eight (59.5%) were female and 19 (40.5%) were male with a mean age of 72.85 years. This sample included patients with OHT (10.5%), primary open angle glaucoma (70.1%), chronic angle closure glaucoma (10.5%) and other types of glaucoma (8.7%). Mean intraocular pressure (IOP) at baseline (BL) and 4 years was 20.6 and 17.8 mmHg, with a mean number of medications of 1.78 and 0.35, respectively. Mean peripapillary RNFL at BL, 12, 24, 36 at 48 months was 82.63, 82.95, 82.90, 80.63 and 80.95 µm, respectively. Normalization of the data indicated loss of -0.0057/year with a cumulative loss over 4 years of -0.02, translating into mean loss of -0.47 µm/year and a cumulative loss of 1.88 µm at 4 years for this cohort. ANCOVA analysis demonstrated the differences in thickness to be significant only between BL and year one ($p = 0.01$; standard error 0.11).

Conclusion: Phaco-ELIOS showed to be effective for decreasing IOP and number of medications up to 4 years. Most importantly, the 4-year RNFL thickness analysis showed that decrease of thickness did not exceed the age-related loss published for non-glaucomatous eyes (0.5-0.3 µm per year), addressing the main objective of glaucoma treatment of halting or slowing down the disease progression.

205 - P4.046

COMPARISON OF GLAUCOMATOUS VISUAL FIELD DEFECTS WITH HUMPHREY 24-2 SITA STANDARD, SITA FAST, AND SITA FASTER TESTS

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Purpose: To compare 24-2 Swedish Interactive Thresholding Algorithm (SITA) Standard, SITA Fast, SITA Faster tests performed with Humphrey automated perimetry (HFA3 Model 840, Zeiss) in patients with glaucomatous visual field defect.

Methods: Seventy-two eyes of 72 patients with glaucomatous visual field defects, who were followed up at Dokuz Eylul University Faculty of Medicine, Department of Ophthalmology, Glaucoma Unit, were included in the study prospectively. 24-2 SITA Standard, SITA Fast and SITA Faster tests were applied to the patients with Humphrey automated perimetry device. These 3 tests were compared in terms of test duration, global indices (MD, PSD, VFI) and also width and depth of glaucomatous defect.

Results: Seventy-two patients consisted of 36 (50%) male and 36 (50%) female. The mean age of the patients was 66.01 ± 10.22 years (31-88 years). Glaucoma diagnosis was primary open-angle glaucoma in 45 patients (62.5%), pseudoexfoliation glaucoma in 10 patients (13.9%), normal tension glaucoma in 7 patients (9.7%), chronic angle closure glaucoma in 6 patients (8.3%), pigmentary glaucoma in 2 patients (2.8%), uveitic glaucoma in 1 patient (1.4%) and juvenile glaucoma in 1 patient (1.4%). The mean test durations for the SITA Standard, SITA Fast, and SITA Faster tests were 420.38 ± 53.87 sec, 275.94 ± 45.52 sec, and 191.89 ± 35.48 sec, respectively and test durations were found to be statistically significantly different in all 3 tests ($p < 0.001$). There was no statistically significant difference between the 3 tests in terms of mean deviation, width, and depth of glaucomatous defect ($p = 0.211$, $p = 0.762$ and $p = 0.70$, respectively). There was statistically significant difference between the tests in terms of visual field index (VFI) and pattern standard deviation (PSD) values ($p = 0.008$ and $p < 0.001$, respectively).

Conclusion: Test duration was found to be shorter in SITA faster test when compared to SITA Standard and SITA Fast tests. However, all 3 tests were similar in terms of width and depth of the glaucomatous defect.

236 - P4.047

GLAUCOMA RISK STRATIFICATION: A QUALITY IMPROVEMENT PROJECT

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Purpose: The objective of this project was to classify glaucoma cases according to their complexity and the potential risk of vision impairment, aiming to enhance the quality of service offered at East Surrey Hospital Glaucoma Clinic.

Methods: A glaucoma risk stratification tool was used to categorise patients who were attending the glaucoma clinic at East Surrey Hospital for follow-up appointments into different risk groups, represented by the colours green (low risk), amber (moderate risk) and red (high risk).

Results: In our 240-patient cohort, the stratification resulted in a diverse distribution among the three groups. Notably, 46% were Amber cases, while Green and Red cases accounted for 26% and 25%, respectively. A small fraction, just 3%, showed no signs of ocular hypertension or glaucoma and were discharged to opticians. The risk stratification tool proved to be cost-effective by optimising resource allocation in the glaucoma service. It efficiently utilised consultant-level expertise for complex cases. Prioritising patients by risk level reduced waiting time, ensured timely access to essential services, improved 'Green' cases management, ensured treatment adherence and promoted continuity of patient care.

Conclusion: In conclusion, this Quality Improvement Project streamlined patient risk assessment in the glaucoma service, effectively addressing post-SARS-CoV-2 pandemic demand. It optimised resource allocation for 'Green,' 'Amber,' and 'Red' cases, ensuring efficient and high-quality care.

249 - P4.048

CLINICAL PREDICTORS OF ABNORMAL NEUROIMAGING RESULTS IN PATIENTS WITH VISUAL FIELD DEFECTS

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Purpose: Guidelines about neuroimaging for patients with nonglaucomatous visual field defect (VFD) are sparse. We performed a retrospective, cross-sectional study to analyze the clinical presentations and neuroimaging findings of patients with nonglaucomatous VFD.

Methods: We included patients who underwent brain magnetic resonance imaging (MRI) for differential diagnosis of their nonglaucomatous VFD between 2013 and 2022. Patients with neurologic symptoms other than decreased visual acuity, those who have history of brain lesion, or those with systemic medication known to cause optic neuropathy were excluded. Demographic and ophthalmic characteristics were analyzed. The reasons for conducting brain MRI were classified into three: (1) VFD respecting vertical meridian, (2) VFD inconsistent with IOP or structural change, and (3) VFD with fast progression (aggravation of mean deviation over 1.5 dB per year). Logistic regression was conducted to identify independent risk factors for significant lesion responsible for nonglaucomatous VFD.

Results: A total of 159 patients (258 eyes) had undergone brain MRI, and 95 patients (169 eyes) had been diagnosed with open-angle glaucoma for at least one eye. For the pattern of VFD, arcuate VFD was the most common (36.9%) but the frequency of VFD pattern showed a significant difference depending on the glaucoma history ($p = 0.007$). 29 patients (42 eyes) showed significant finding and intracranial tumor was the most common finding (9 patients), followed by cerebrovascular accident (6 patients). Presence of peripapillary atropy was associated with a 65% reduction in relative risk of significant finding in brain MRI (odds ratio [OR] 0.353, 95% confidence interval [CI] 0.136-0.919, $p = 0.033$). Older age (OR 1.049, 95% CI 1.018-1.081, $p = 0.002$), presence of visual acuity symptoms (OR 5.79, 95% CI 2.361-14.195, $p < 0.001$), presence of incomplete homonymous hemianopsia (OR 15.167, 95% CI 3.096-74.30, $p = 0.001$), and reason for taking brain MRI, VFD with fast progression, (OR 4.385, 95% CI 1.266-15.189, $p = 0.02$) were analyzed to be independent risk factors for significant finding in brain MRI.

Conclusion: VFD with nongluacomatous pattern or progression may indicate lesion along visual pathway. For nonglaucomatous VFD, neuroimaging is recommended for patients who are older or with decreased visual acuity. It is also recommended for fast progression or incomplete homonymous hemianopsia.

257 - P4.049

THE IMPACT OF COVID-19-RELATED DELAYS ON VISUAL OUTCOMES IN GLAUCOMA PATIENTS: A RETROSPECTIVE COHORT STUDY ACROSS TWO TERTIARY CENTRES IN LONDON, UK

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Purpose: This study assessed the correlation between COVID-19-related appointment delays and visual outcomes in glaucoma patients.

Methods: 13,744 patients seen under glaucoma services at the Western Eye and Charing Cross Hospitals were enrolled. 500 patients were randomly selected from this and screened. Data was extracted from the pre-COVID (prior to 11th March 2020) and post-COVID (4th July 2020) periods, including visual field mean deviation (VFMD), intraocular pressure (IOP), best-corrected visual acuity (BCVA), demographic data and clinical background.

Results: 138 patients with various glaucoma types were included. The median patient age was 75 (IQR 15); 53% were male, 25% were British White, and 17% had diabetes. The median follow-up delay was 72 days (IQR 227). VFMD and delay correlation analysis showed a significant negative correlation for both eyes (right: $p = 0.0002$, left: $p = 0.0234$). Both IOP and BCVA showed no significant positive correlations across both eyes. Mean linear regression analysis found significant negative correlations between VFMD and delays across both eyes in African (right: $p = 0.0005$, left $p = 0:0004$) and Mixed White & Black Caribbean (right: $p = 0.035$, left: $p = 0.0396$) ethnicities, as well as a diagnosis of diabetes ($p = 0.0123$) in the left eye. Our data shows that prolonged delays correlated with poorer visual field outcomes in this population. There is significant data to suggest that those with African, White & Black Caribbean ethnicities, and diabetes may have been more adversely affected that the rest of the population.

Conclusion: We found an association between increased appointment delay over the acute COVID-19 period and worse visual field outcomes in glaucoma patients, disproportionately affecting some subgroups more.

276 - P4.050

GLAUCOMA SURGERY IN OCTOGENERIAN: FIVE-YEAR OUTCOMES

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Purpose: The burden of glaucoma has grown with an increasingly ageing population. The purpose of this study is to determine five-year outcomes of glaucoma surgery in patients aged 80 years and above.

Methods: We retrospectively reviewed the records of consecutive patients, aged 80 years and older, who underwent glaucoma surgery, by multiple surgeons, at the Birmingham and Midland Eye Centre between 1st January 2016 to 31st December 2018. Data regarding glaucoma diagnosis, procedure type were collected. Primary outcomes included patient mortality rates at five years and surgical success/failure(as per WGC guidelines). Secondary outcomes included changes in visual acuity(VA), intraocular pressures (IOP) and glaucoma medications.

Results: A total of 154 consecutive patient records were included in data analysis. Over half of these patients had primary open-angle glaucoma (55.6%). At five years, the mortality rate was 25%. The most commonly performed procedure was phacoemulsification surgery combined with angle-based minimally invasive glaucoma surgery (MIGS) at 62% with 44% of the total population receiving a trabecular micro-bypass stent. Whilst there was a trend to a reduction in mean VA from 0.55 ± 0.59 logMAR pre-operatively to 0.75 ± 0.87 logMAR post-operatively, this was not found to be statistically significant ($p = 0.21$) using the Wilcoxon signed-rank test. The mean IOP at time of listing was 21 ± 7.19 mmHg, as compared to last visit, at 14.82 ± 4.61 mmHg; the mean number of glaucoma drops was 1.92 ± 0.79 pre-operatively and 1.17 ± 0.91 post-operatively. Both showed a statistical significant difference between pre and post-operative values ($p < 0.00001$). At five years, the rates of complete and qualified success were 17% and 44.2% respectively. Tube surgery resulted in the highest qualified success rate in this cohort at 80% while bleb needling showed the lowest rate at 25%.

Conclusion: Two thirds of patients over 80 years who require surgical management of glaucoma in our unit undergo cataract surgery combined with angle-based glaucoma surgery. A quarter of patients over 80 years who undergo glaucoma surgery die within five years. While over half of the surgeries in our cohort do not meet the criteria of surgical success, there is a statistically significant reduction in both pre-and post-operative IOP and number of glaucoma drops, with no statistically significant reduction in VA.

330 - P4.052

THE TSIOGKASPAETH (TS) GRID FOR DETECTION OF VISUAL FIELD DEFECTS

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Purpose: The TsiogkaSpaeth (TS) grid is a new, low cost and easy to access portable test for visual field (VF) screening, which can be used by clinicians in everyday clinical practice. Our study aimed to determine the validity of this screening grid test for identifying VF defects.

Methods: We enrolled three groups of participants: 10 adult patients with different types of neurological VF defects, 30 adult patients with glaucomatous VF defects and 40 controls. The TS grid test was performed in one eye of each participant in each group. Sensitivity, specificity, and positive and negative predictive values of the TS grid grading were assessed using the 24–2 VF Humphrey Field Analyser (HFA) as the reference standard. Univariate linear regression analysis was conducted between the TS grid test grading and 24-2 HFA parameters.

Results: In the neurological disease group, sensitivity and specificity of the TS grid test were 100% and 90.91% respectively. The Area Under Curve was 0.9545 with 95% CI 0.87-1.00. There was a significant correlation between the number of the TS grid test grading and the Visual Field Index of the HFA 24-2 ($r = 0.9436$, $p < .0001$). In the glaucoma group, sensitivity and specificity of the TS grid test were 100% and 89.36% respectively. The Area Under Curve was 0.8727 with 95% CI 0.79-0.95. There was a significant correlation between the number of the TS grid test grading and the Visual Field Index of the HFA 24-2 ($r = 0.9$, $p < .0001$) and between the TS grid test grading and the mean deviation (MD) of the HFA 24-2 ($r = 0.86$, $p < .0001$).

Conclusion: The sensitivity and specificity of the TS grid test were high in detecting VF defects in neurological disease and glaucoma. The TS grid test appears to be a reliable, low cost and easily accessed alternative to traditional VF tests in diagnosing typical neurological patterns of visual field defects and in screening of glaucoma patients. This grid may find place in screening subjects for visual field defects in everyday clinical practice and in remote areas deprived of specialized health care services.

406 - P4.053

NOMOGRAM-BASED PREDICTION OF VISUAL FIELD PROGRESSION IN MYOPIC NORMAL TENSION GLAUCOMA: A RETROSPECTIVE COHORT STUDY

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Purpose: This retrospective cohort study aimed to investigate predictive factors for visual field progression in patients with bilateral myopic normal tension glaucoma (mNTG) through the development of a nomogram prediction model.

Methods: We included 150 eyes from 75 patients with mNTG (refractive error ≤ -0.5 D and axial length (AXL) ≥ 24.50 mm) who underwent serial visual field (VF) examinations over a minimum 6-year follow-up. Patients were categorized into two groups based on the presence of visual field progression. The prediction model was developed using logistic regression, and internal validation was carried out using the bootstrapping method.

Results: Multivariable analyses identified female sex, steep lamina cribrosa steepness index (LCSI), the presence of paracentral or central scotoma, and microvascular dropout as risk factors for VF progression in mNTG patients. The resulting nomogram, incorporating these risk factors, demonstrated a concordance index (C-index) of 0.873 (95% CI 0.800-0.928).

Conclusion: The established nomogram provides clinicians with a valuable tool to identify risk factors associated with glaucoma progression in patients with mNTG. This empowers clinicians to make well-informed decisions in the effective management of patients diagnosed with mNTG.

471 - P4.054

ANTERIOR-SEGMENT OPTICAL COHERENCE TOMOGRAPHY IMAGING OF PATIENTS UNDERGOING SUPRACILIARY GLAUCOMA DEVICE IMPLANTATION

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Purpose: To evaluate anatomical changes after implantation of a novel supraciliary minimally invasive glaucoma drainage device using swept-source anterior segment optical coherence tomography (AS-OCT).

Methods: Forty-eight eyes with open-angle glaucoma underwent standalone or combined MJ implantation and were imaged postoperatively using AS-OCT at intervals up to 6 months. Parameters such as implant depth (ID), implant position (IP), cleft width (CW) in Circumferential Lake (CL) or Cleft Angle (CA), and the amount of suprachoroidal fluid (SCF) as well as number of quadrants with visible SCF were assessed.

Results: Following MJ implantation, intraocular pressure (IOP) significantly decreased from 22.5 ± 9.0 mmHg to 14.1 ± 6.4 mmHg ($p < 0.001$) at 6 months, with concurrent reduction in ocular hypotensive medications. SCF grading decreased from 3.1 ± 1.0 on day 1 to 1.5 ± 1.1 at 6 months ($p < 0.001$). Cleft width measured in CL reduced from 3.3 ± 0.9 to 3.2 ± 0.6 ($p = 0.8$), and C.A decreased from 35.9 ± 8.8 degrees to 30.2 ± 7.1 degrees at 6 months ($p = 0.07$). The number of quadrants with visible SCF decreased from 3.7 ± 0.8 to 2.2 ± 1.6 ($p < 0.001$). Implant depth and position remained stable, with 45.5% being anterior, 33.3% at Schwalbe's line, and 21.2% behind it. Implant orientation varied, with 13.0% touching the iris, 69.6% pointing toward the anterior chamber, and 17.4% directed at the cornea.

Conclusion: AS-OCT is a non-invasive tool to image the supraciliary and suprachoroidal space after MINIject implantation. We found a gradual decrease in the amount of SCF drainage and the number of quadrants with visible SCF over 6 months. Cleft width remained stable and was not statistically associated with IOP lowering.

511 - P4.055

INCIDENCE AND PREDICTORS OF GLAUCOMA CONVERSION IN EYES WITH PHYSIOLOGIC LARGE CUP: MINIMUM 10-YEAR FOLLOW-UP STUDY

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Purpose: To investigate the natural history of optic disc with physiologic large cup (PLC) (ie, vertical cup/disc ratio [VCDR] ≥ 0.6 without retinal nerve fiber layer defect) and the risk factors for glaucoma conversion.

Methods: Subjects who underwent a health screening examination at a large health screening center from 2003 to 2010 (n = 76,030) were involved. The prevalence of PLC in the cohort was analyzed. The incidence rate of glaucoma conversion was estimated per 100 person-years among cases with a follow-up period longer than 10 years. Multivariate Cox proportional hazards regression was used to identify ocular and systemic factors associated with glaucoma conversion.

Results: Among 74,617 eligible subjects, 3569 subjects (4.8%) had PLC. Of those with a follow-up period longer than 10 years (n = 859), the incidence rate of glaucoma conversion was 0.95 per 100 person-years. A total of 12.1% of PLC eyes progressed to glaucoma after 8.7 ± 3.9 years (range, 2.0-16.5 years). Higher VCDR (adjusted hazard ratio [aHR] = 4.36; 95% CI = 2.675-7.103), violation of the inferior superior nasal tempo- ral neuroretinal rim thickness rule (aHR = 1.86; 95% CI = 1.057-3.258), presence of retinal arterial sclerosis (aHR = 1.63; 95% CI = 1.040-2.550), and lower total bilirubin level (aHR = 0.58; 95% CI = 0.340-0.991) were associated with glaucoma development.

Conclusion: This study identified the prevalence of PLC as well as the incidence rate of glaucoma conversion and the risk factors for glaucoma development in PLC eyes. The natural history of PLC may help clinicians to better understand its risk factors and the specific management needs of their patients.

599 - P4.056

EVALUATION OF CORNEAL BIOMECHANICS AND OPTIC NERVE HEAD MORPHOLOGY IN LONG-TERM GLAUCOMATOUS PROGRESSION AFTER DEEP SCLERECTOMY

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Purpose: To examine the relationship between the rate of peripapillary retinal nerve fiber layer (pRNFL) thinning over time and corneal biomechanics, as well as optic nerve head (ONH) morphology, both preoperatively and perioperatively, in patients undergoing deep sclerectomy (DS).

Methods: A retrospective study was conducted on 36 eyes undergoing DS, with follow-up of pRNFL thickness using Spectralis OCT for at least 3 years and a minimum of 5 OCT scans. Progression was defined as a decrease in pRNFL thickness greater than 1 µm/year, with a significance level of $p < 0.05$. Variables such as age, sex, axial length, and preoperative visual field damage (Humphrey Field Analyzer) were analyzed, along with the intraocular pressure (IOP), the corneal hysteresis (CH), and the corneal resistance factor (CRF) measured by Ocular Response Analyzer (ORA), the ONH cupping, the prelaminar tissue (PLT) thickness, and the lamina cribrosa (LC) position measured by OCT Spectralis-EDI technology before DS and 3 months postoperatively.

Results: The mean follow-up time was 78 months, with an average of 10.92 OCT scans per patient. Significant progression was detected in 9/36 eyes. Eyes with significant progression in pRNFL exhibited a lower central corneal thickness (CCT) ($p = 0.015$), a higher IOP ($p = 0.005$), a lower CH ($p = 0.028$), a greater pRNFL thickness ($p = 0.047$) and a more posterior LC position ($p = 0.043$) before DS. Furthermore, in patients with significant pRNFL progression, a greater decrease in the IOP ($p = 0.001$) and a higher increase in the CH ($p = 0.028$) and in the PLT thickness ($p = 0.034$) were detected 3 months postoperatively.

Conclusion: The intraocular pressure, the CCT, the CH, and the LC position before glaucoma surgery were associated with long-term glaucomatous progression at the pRNFL level. Regarding perioperative changes, greater variation in the IOP, the CH, and the PLT thickness were also associated with progression, potentially related to higher initial IOP in this group of patients.

657 - P4.057

EFFECTS OF CATARACT SURGERY ON OPTIC NERVE HEAD MORPHOLOGY

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Purpose: To investigate the effect of uncomplicated cataract surgery on optic nerve head (ONH) morphology using spectral domain optical coherence tomography (SD-OCT)

Methods: Thirty-two cataract patients who had uneventful cataract surgery were included in this study. Evaluation of IOP and SD-OCT imaging of ONH were performed before and 1 month after the surgery. IOP, retinal nerve fiber layer thickness (RNFLT), Bruch membrane opening-minimum rim width (BMO-MRW), lamina cribrosa depth (LCD), and lamina cribrosa tissue thickness (LCTT) were measured.

Results: There were statistically significant increases in RNFLT (from 93.2 ± 11.8 to 95.8 ± 11.1 μ, p = 0.005) and BMO-MRW (from 435.7 ± 78.3 to 465.4 ± 116.2 μ, p = 0.042) while a decrease in IOP (from 16.9 ± 2.8 to 15.2 ± 2.1 mmHg, p < 0.001) was observed after cataract surgery. No significant changes were observed in both LCD and LCTT after the cataract surgery (p = 0.148 and p = 0.249, respectively). The amount of decrease in IOP affects the amount of increase in RNFLT (r: -0.985, p < 0.001) but not in BMO-MRW (r: -0.441, p < 0.208).

Conclusion: Uneventful cataract surgery results in an increase in both RNFLT and BMO-MRW and a decrease in IOP, while no significant changes were observed in either LCD or LCTT. Our results imply that RNFLT is more vulnerable than BMO-MRW, LCD, or LCTT to IOP changes that result from cataract surgery.

682 - P4.058

MEASUREMENT OF INTRAOCULAR PRESSURE BEFORE AND AFTER SURGICAL TREATMENT OF RHERGMATOGENUS RETINAL DETACHMENT

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Purpose: To compare the intraocular pressure (IOP) before and after surgical treatment of rhegmatogenous retinal detachment.

Methods: Observational prospective study, 11 patients were in PPV/BE and 8 patients in the PPV group. IOP was measured by Goldmann Application Tonometer. We also used the PubMed database to find other prospective or retrospective studies.

Results: The mean value of IOP in PRE-VPP group was 12.37 ± 3.11 compared to 15.50 ± 2.77 in POST-VPP. The mean value of IOP in PRE-VPP/BE group was 11.63 ± 1.74 compared to 16.27 ± 3.37 in POST-VPP/BE group where we found a significative increase of 4.63 ± 3.13 ($p < 0.05$). There was a non significative increase of IOP of 3.12 ± 3.13 in POST-VPP compared to PRE-VPP ($p > 0.05$).

Conclusion: Our first results confirm a significant rise of IOP in the group treated with scleral band; the study suggests a lower increase of IOP in the VPP group but a higher sample size will be necessary to increase the significance level of the study.

684 - P4.059

ROLE OF THE AMPK ISOFORM NUAK1 IN HUMAN GLAUCOMA LAMINA CRIBROSA CELLS

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Purpose: NUAK1 is a one of the members of the AMP-activated protein kinases (AMPK) that are critical regulator of cellular energy homeostasis. We have previously showed defective mitochondrial function and altered cellular bioenergetics in glaucoma lamina cribrosa (LC) cells, as well as reduced oxidative phosphorylation and increased glycolysis. NUAK1 contain a kinase associated domain which is phosphorylated and activated by upstream regulators including kinase liver kinase B1 (LKB1) also called STK11, and Ca2+/calmodulin-dependent PK kinase β (CaMKKβ), and nuclear Dbf2-related (NDR2) also called STK38. Here, we aim to investigate the effect of a potent inhibitor HTH-01-015 on NUAK1 and its upstream regulators, extracellular matrix (ECM) gene expression in TGF-β1-induced NUAK1 expression in LC cells.

Methods: LC cells from 5 glaucomatous (GLC) donor eyes and 5 normal (NLC) age-matched controls were cultured. At 60-70% confluence, cells were pre-treated with TGF-β1 (10 ng/ml for 24 hrs). Quantitative real-time RT-PCR and Western immunoblotting were used to measure the effect of HTH-01-015 on NUAK1and its upstream activators, extracellular matrix (ECM) gene expression in TGF-β1-induced NUAK1 expression in LC cells.

Results: NUAK1, LKB1, CaMKKβ, and NDR2 expression levels were significantly elevated in GLC cells compared to NLC cells ($p < 0.05$; $n = 3$). TGF-β1 significantly increased NUAK1 expression in NLC cells ($p < 0.05$; $n = 3$), while treatment of NLC cells, pre-treated with TGF-β, with HTH-01-015 (1 μM), resulted in a significant down regulation of NUAK1 and ECM gene expression.

Conclusion: The expression level of NUAK1is elevated, as it's upstream regulators LKB1, CaMKKβ, and NDR2 in GLC and in NLC cells treated with TGF-β. HTH-01-015 the TGF-β induced NUAK1 expression in NLC cells, resulting in a downstream reduction in ECM genes Thus, halting the pro-fibrotic activity and metabolism of GLC cells by down-regulating NUAK1 expression is an exciting new therapeutic target aimed at ameliorating glaucoma LC associated fibrosis.

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778 - P4.060

THREE-YEAR FOLLOW UP OF FOCAL RETINAL NERVE FIBRE LAYER SCHISIS: A NEW PREDICTOR FOR GLAUCOMA PROGRESSION?

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Purpose: To characterise and evaluate an ocular coherence tomography (OCT) finding termed by our group as focal retinal nerve fibre layer schisis (fRNFL-S). This study aims to investigate the structural and clinical characteristics of this finding and assess its potential association with glaucomatous progression.

Methods: Serial Heidelberg Spectralis OCT-GMPE scans of 523 patients diagnosed with glaucoma at Royal Liverpool University Hospital, from 2017 to 2023 were reviewed. Structural measurements of the area of schisis were measured using the tool provided by Heidelberg software. RNFL and ganglion cell layer (GCL) thickness were evaluated. The relationship between visual acuity, intraocular pressure, treatment and visual field (Humphrey, 24-2 SITA protocol) and the corresponding changes in the scans was analysed.

Results: A cohort of 37 patients were found to demonstrate fRNFL-S (7%). The areas of fRNFL-S were localised within the circumpapillary scans and were associated with a visible RNFL defect on infrared imaging (Figure 1). The superotemporal quadrant was the most frequent location of this defect (33.3%). Spontaneous resolution was observed in 46% of the cases, predominantly between the first and the second year after the first visualisation (1,71 years (1,27-2,14) p = 0.044). The presence of fRNFL-S is associated significantly to an increase in IOP of average of 2.9 mmHg (p = 0.004) in the first year, and the resolution is associated with a decrease in the following year of 1.5 mmHg (p = 0.12). Significant thinning was found in global and temporal sectors of RNFL in the year of the resolution of the fRNFL-S and the following, as well as in the GCL thickness in the temporal, inferior and superior sectors and the GCL volume in all quadrants.

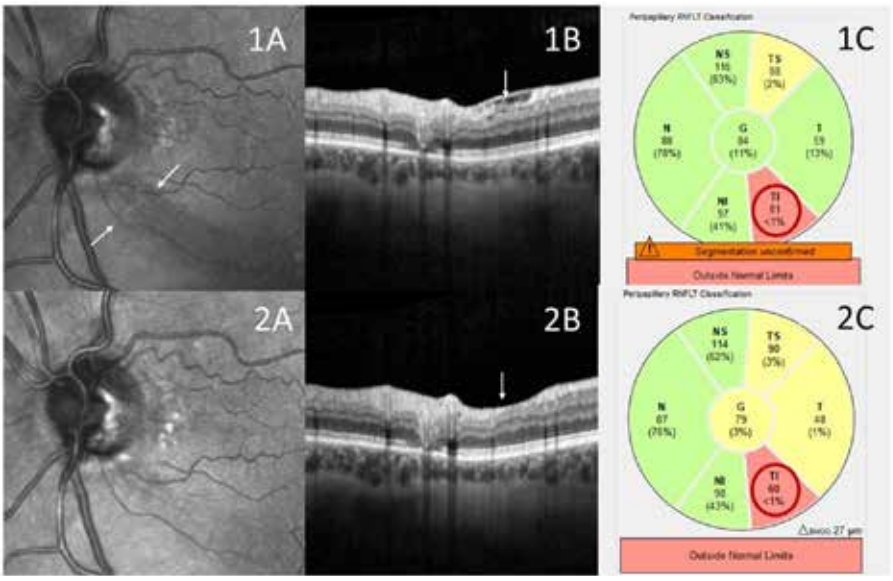

Figure 1. Left eye course of a fRNLFL-S on the inferotemporal quadrant. A fobre defect is seen on the infrared image (1A) that correlates with the presence of the localised schisis (1B). After one year of follow-up, the schisis collapses (2B), the image of the fibre layer defect fades (2A) and coincide with a thinning of 21 µm in the infertemporal sector.

Conclusion: These findings suggest a possible association of the fRNFL-S with a thinning in the corresponding RNFL and GCL layers. This rRNFL-S could be potentially provoked by an increase in IOP and its resolution when IOP is decreased after pertinent treatment has been applied. This novel imaging finding may provide an ability to predict earlier features of progression and earlier intervention, but larger-scale studies are required to validate these findings.

800 - P4.061

COMPARISON OF PATIENT SATISFACTION BETWEEN VIRTUAL REALITY VISUAL FIELD TESTING TO HUMPHREY VISUAL FIELD

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Purpose: This is a pilot study comparing patient satisfaction between a commercially available virtual reality visual field to the standard Humphrey automated perimetry in an academic practice.

Methods: A retrospective analysis was conducted on glaucoma patients who underwent visual field testing using the Palmscan VF2000 G2 (VVF) headset (Micro Medical Devices; Calabasas, CA). Inclusion criteria comprised patients who had undergone a minimum of 5 Humphrey 24-2 or 30-2 SITA standard visual field (HVF; Carl Zeiss Meditech; Dublin, CA) in total with the most recent HVF completed within the preceding 6 months. Patient demographics are listed in Table I. Primary outcome measures included a 5-point Likert scale questionnaire assessing patient satisfaction with regard to fatigue, comfort, and apprehension levels in comparison to HVF, as well as an overall preference rating between HVF and VVF.

Table I: Demographics of patients

Demographic	Value
No. of Women	2
No. of Men	8
No. of questionnaires	10
Age, mean ± SD, y	61.6 ± 14.4

Results: Out of the total of 10 patients undergoing Palmscan VF2000 G2 headset testing, the Wilcoxon signed-rank test revealed significantly higher comfort scores for VVF compared to HVF ($Z = 2.67$, $p < 0.01$). Furthermore, VVF showed significantly less reported fatigue ($Z = 2.80$, $p < 0.05$) and apprehension ($Z = 2.20$, $p < 0.03$). Overall, there was a preference for VVF over HVF ($p < 0.01$).

Conclusion: This pilot study demonstrates improved patient satisfaction with virtual reality visual field testing over traditional methods. These findings underscore the potential benefits of incorporating VR technology into visual field assessments. The results of this pilot show the potential that a VR perimeter may offer a more patient-friendly approach that could enhance both satisfaction and potential data accuracy.

902 - P4.062

LONG TERM RESULTS OF SURGICAL AND MEDICAL TREATMENT OF PATIENTS WITH ADVANCED GLAUCOMA

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Purpose: Surgical treatment is generally avoided in end-stage glaucoma because of the risk of irreversible permanent vision loss. We aimed to determine the surgical and medical treatment outcomes in advanced glaucoma.

Methods: In this retrospective study, 146 eyes of 119 patients with advanced glaucoma were included. Advanced glaucoma was classified as visual fields with a mean deviation (MD) of Humphrey visual fields below -12 dB according to the Hodapp-Parrish-Anderson classification system. The intraocular pressure (IOP), glaucoma medications, visual acuity, visual field MD, and surgical complications were documented. Data were analyzed using the non-parametric Mann-Whitney U and Wilcoxon signed-rank test.

Results: The mean follow-up was 55.1 ± 44.3 months. The mean baseline IOP decreased from 21.9 ± 8.8 mmHg to 13.5 ± 2.9 mmHg, and 26.0 ± 9.2 mmHg to 14.1 ± 4.7 mmHg at the second-year follow-up in the medical (n = 65 eyes) and surgical (n = 81 eyes) treatment group, respectively (both $p < 0.001$). IOP reduction was significantly greater in the surgical treatment group than in the medical treatment group in the first year (11.8 and 7.0 mmHg, $p = 0.002$) and at the last visit (11.3 and 7.6 mmHg, $p = 0.02$). In both groups, there were no significant differences in visual acuity and visual field MD follow-ups compared to baseline. The Wipe-out phenomenon was not observed in any patient. In the surgical treatment group, the number of glaucoma medications used at the second-year follow-up was significantly lower than the medical treatment (1.3 ± 1.5 vs 2.6 ± 1.1, $p < 0.001$, respectively).

Conclusion: Both medical and surgical treatment provides a significant reduction in IOP, but surgical treatment provides a greater reduction in IOP and the number of glaucoma medications. Target IOP values can be achieved with successful surgery without a wipe-out phenomenon in patients with advanced glaucoma.

912 - P4.063

THE IMPACT OF DELAYED FOLLOW UP ON GLAUCOMA PROGRESS DURING COVID 19 QUARANTINE PERIOD IN KEFALONIA ISLAND

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Purpose: To determine the negative impact of delayed follow up in glaucoma diagnosed patients during COVID-19 pandemic emergency lockdown in the setting of a secondary care, island hospital.

Methods: In this retrospective analysis data of 170 glaucoma patients were analyzed from March 2019 to March 2020 - before first lockdown in Greece and from May 2021 until May 2022- after the last lockdown. Intraocular pressure (IOP) and thinning of retinal nerve fiber layer (RNFL) were examined.

Results: Until March 2020, 142 patients with primary open angle glaucoma, 21 patients with pseudoexfoliation glaucoma, 4 with normal tension glaucoma and 3 patients with neovascular glaucoma were followed in our department. During the first year of COVID-19 lockdown there was a reduction by 83% of medical visits (only 29 patients had a regular follow up) but even after the end of the lockdown periods there was still a reduction by 20%. The mean IOP before lockdown was 15.9 mmHg and post lockdown 16.7 mmHg. The average thinning of retinal nerve fibre layer (RNFL) was 80.3μm pre-lockdown and 77.8 μm post-lockdown. Two patients of the group presented with a severe deterioration and loss of visual acuity due to significant RNFL thinning and one patient with neovascular glaucoma had eye evisceration due to interruption of medical treatment.

Conclusion: These results confirm that a proportion of glaucoma patients presented with worsening of their disease due to the delayed follow up and due to the poor compliance with using intraocular pressure - lowering drugs during the COVID 19 pandemic. It is remarkable that many of them did not return to regular follow up probably due to the fear of going to the hospital for specialist's consultation.

955 - P4.064

THE RESULT OF VISUAL FIELD ASSISTED WITH COMPUTER PROGRAM OF GLAUCOMA PATIENTS IN CHUMPHON KHET UDOMSAKDI HOSPITAL

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Purpose: To compare the reliability of perimetry between computer-assisted (practicing VF test by using computer program prior to performed VF) and conventional method (gone through VF test directly).

Methods: Seventy-seven Glaucoma patients with never undergo for CT-VF were enrolled in this study. The patients had divided into two groups, the computer-assisted group and conventional method group to performed VF test. The parameters of FL, FP and FN were compared by using Mann-Whitney U test.

Results: The result showed male and female are 32.43% and 67.57% in computer-assisted group and 47.50% and 52.50% in conventional method group respectively. The mean ± standard deviation (S.D.) age was 63.35 ± 8.43 in computer-assisted group and 59.73 ± 12.37 in conventional method group respectively. All parameters of FL, FP and FN were compared in each group with p value 0.10, 0.37 and 0.53 respectively.

Conclusion: The reliability of perimetry in computer-assisted group did not demonstrate superiority over the conventional method group in this study.

960 - P4.065

LONG-TERM FOLLOW-UP OF VISUAL FIELD LOSS AFTER ELECTRICAL OPTIC NERVE STIMULATION IN NORMAL TENSION GLAUCOMA

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Purpose: Normal tension glaucoma (NTG) is characterized by optic nerve degeneration and loss of retinal ganglion cells causing visual field impairment without elevated intraocular pressure (IOP). The current standard approach in NTG therapy is further reduction of the IOP. Despite effective medications leading to IOP-lowering, glaucoma exacerbation and progressive vision loss among patients is common. Electrical stimulation of the optic nerve (ONS) facilitates axonal regeneration and survival of retinal ganglion cells. The case series provides real-world evidence for long-term clinical efficacy of ONS in NTG.

Methods: Ten NTG patients, between 46 and 80 years old, with progressive vision loss despite therapeutic IOP reduction underwent electrical ONS. Closed eyes were separately stimulated by bipolar rectangular pulses with intensities up to 1.2 mA sufficient to provoke phosphenes. Ten daily stimulation sessions within 2 weeks lasted about 80 min each. Right before ONS at baseline (PRE), visual field loss was documented by static threshold perimetry in the central 30° visual field and compared to the same assessment approximately one year afterwards (POST). Mean defect (MD) was defined as primary outcome parameter. Only perimetries with a reliability factor (RF) of max. 20% were considered.

Results: Perimetry follow-up of 19 eyes in 10 patients fulfilled the inclusion criteria. MD significantly decreased from PRE 12.4 ± 6.6 dB (mean ± SD) to POST 10.3 ± 6.5 dB one year after ONS ($p < 0.01$) corresponding to an average improvement of visual fields. 14 eyes in 8 patients showed a reduction of MD ranging from 0.2 to 8.5 dB (3.2 ± 2.1 dB). Thus, 73.7% of eyes in the present case series were responders.

Conclusion: Innovative treatments that preserve visual function through mechanisms other than lowering IOP are required for NTG with progressive vision loss. The present long-term data document progression halt or even improvement of visual fields in more than 73% of affected eyes after ONS and, thus, extend existing evidence from clinical trials.

982 - P4.066

OUTER RETINAL TUBULATIONS AT THE AREA OF PERIPAPILLARY ATROPHY IN PATIENTS WITH GLAUCOMA

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Purpose: To present a case series of 3 patients with glaucoma or suspicious for glaucoma in which Outer Retinal Tubulations (ORTs) were identified in the area of peripapillary atrophy.

Methods: We present 3 cases in which ORTs were found in the area of peripapillary atrophy of patients with glaucoma or suspicious for glaucoma. These patients were examined at the Glaucoma Service of a tertiary referral hospital. Retinal scans were obtained and analysed with Spectralis® OCT (Heidelberg Engineering GmbH, Heidelberg, Germany). ORTs are round or ovoid formations that are usually found in the margin between healthy and unhealthy retina in degenerative retinal diseases (mainly in age-related macular degeneration).

Results: ORTs were found in the peripapillary area of 3 patients (2 women and 1 man; 2 of them were of Caucasian ancestry and 1 of Asian). In one patient, glaucoma advancement was associated with an increase in the number of ORTs and expansion of the area of peripapillary atrophy over the course of follow-up.

Conclusion: ORTs can be found in the peripapillary atrophic areas of individuals with glaucoma or suspicious for glaucoma and represent damage or outer retina or retinal pigment epithelium. Their number could increase with the progression of glaucoma.

405 - P4.067

BASELINE SERUM LEVEL OF INTERFERON GAMMA IS A POSSIBLE PROGNOSTIC MARKER FOR THE DEVELOPMENT AND PROGRESSION OF PRIMARY OPEN ANGLE GLAUCOMA

Maximilian Braun[1,2,3], Chhavi Saini[1], Shuhong Jiang[2], Kin-Sang Cho[2], Jessica Sun[1], Grace Johnson[1], Dong Feng Chen[1,2], Lucy Shen[1]

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Purpose: Previously we showed that elevated serum levels of interferon gamma (IFN-γ), a cytokine secreted by helper T cells, correlated inversely with retinal nerve fiber layer thickness (RNFLT) in patients with primary open angle glaucoma (POAG). Here, we investigate whether baseline measurements of IFN-γ can predict subsequent development and progression of POAG.

Methods: Adult patients with POAG and controls underwent baseline serum measurement for IFN-γ. Patients with autoimmune diseases or significant ocular diseases other than POAG were excluded. All subjects were followed for at least 20 months. A change in glaucoma status was defined as a composite endpoint including the need for glaucoma surgery or glaucoma laser treatment, occurrence of a disc hemorrhage, reliable visual field (VF) deterioration, progressive RNFLT thinning, and use of additional glaucoma eye drop(s) from baseline.

Results: Seventeen POAG patients and 6 control subjects were included. A change in glaucoma status was observed in 14 subjects with glaucoma progression in 13 POAG patients and glaucoma development in 1 control subject. The change group (n = 14) and no-change group (n = 9) were similar in length of follow-up (25.7 ± 4.3 vs. 24.8 ± 3.0 months, p = 0.56) and baseline characteristics (age, gender, race, BMI, visual acuity, IOP, RNFLT, mean VF deviation, and number of IOP-lowering eye drops, all p > 0.05). Among all subjects, baseline serum concentration of IFN-γ was significantly elevated in the change group compared to no-change group (39.5 ± 15.8 vs. 18.4 ± 14.3 pg/ml, p = 0.005, Figure 1A). In the POAG group, the baseline IFN-γ level seemed higher in those with progression than without progression, although this difference was non-significant (41.2 ± 15.1 vs. 31.7 ± 10.1 pg/ml, p = 0.24, Figure 1B).

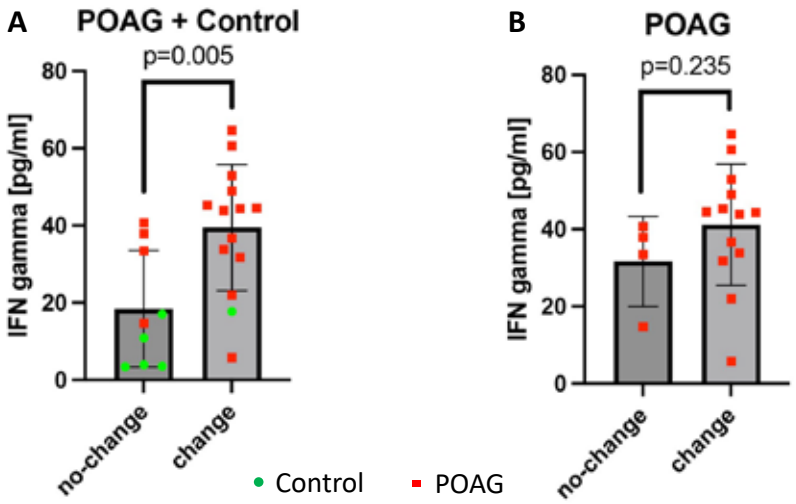

Figure 1. Baseline INF-g serum concentrations comparing no-change group vs change group.

Conclusion: Elevated baseline levels of IFN-γ were found in subjects who subsequently developed POAG or progressed, supporting the role of T-cell mediated autoimmunity in glaucoma. The lack of differences in the POAG group is likely due to small sample size. In this ongoing study with more subjects completing the follow-up time each month, we hope to present additional results to support IFN-γ as a prognostic biomarker for POAG.

510 - P4.068

VISUAL FIELD PROGRESSION IN THE LEUVEN EYE STUDY: VASCULAR AND NON-VASCULAR PREDICTORS

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Purpose: Emphasizing the significance of non-intraocular pressure (IOP) related risk factors, the presence of normal tension glaucoma underscores the importance of the Leuven Eye Study (LES). The LES seeks to identify both vascular and non-vascular predictors of visual field progression during its follow-up examinations.

Methods: Patients with both high and normal tension glaucoma (HTG and NTG) who underwent a follow-up assessment were included. Backward selection multivariable regression models incorporated various vascular and non-vascular variables, with the continuous rate of visual field mean deviation (MD) change as outcome.

Results: A total of 251 patients attended the follow-up visit, providing sufficient visual fields for evaluation (121 NTG, 130 HTG). The median follow-up time was 4.5 years, and the median IOP during follow-up was 12.0 mmHg. The overall median rate of progression was -0.2 dB/year, with no statistically significant differences between the NTG and HTG groups. Fast progression (< -1 dB/year) was observed in 16% of patients, with 6% experiencing catastrophic progression (< -2 dB/year). The backward selection process identified several significant ($p < 0.05$) and clinically relevant (estimate size < -0.01 MD/year) predictors of future progression. These were ranked in descending order of estimate size: existing central visual field defect (-0.410 MD/year), preceding glaucoma surgery (-0.290 MD/year), higher MD at baseline (-0.026 MD/year), higher age (-0.013 MD/year), and wider arteriolar diameters (-0.011 MD/year).

Conclusion: Preliminary analysis of the LES cohort revealed a gradual rate of visual field loss over an approximately 5-year follow-up period. Despite median follow-up IOP values in the low teens, a notable proportion of patients exhibited signs of clinically meaningful progression. In such instances, IOP-independent factors, such as vascular dysfunction potentially indicated by arteriolar diameters, may have contributed to the observed progression. Further in-depth exploration of these data is warranted.

625 - P4.069

THICKER INNER NUCLEAR LAYER AND MICROCYSTIC MACULAR CHANGES: PREDICTORS OF GLAUCOMA PROGRESSION AND THE IMPACT OF INTRAOCULAR PRESSURE FLUCTUATION

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Purpose: To investigate the relationship between microcystic macular edema in the inner nuclear layer or INL thickness and visual field (VF) progression in glaucoma patients

Methods: Patients with primary open-angle glaucoma who had a follow up period of more than 3 years were included in this retrospective observational study. We identified macular cystic changes through Spectralis optical coherence tomography (OCT) B-scans, measuring the INL thickness within the macular circles defined by Early Treatment Diabetic Retinopathy Study using the automated segmentation program. Progression of glaucoma was determined using the Guided Progression Analysis program of the Humphrey filed analyzer, calculating the mean deviation (MD) changes (dB/year).

Results: Microcystic macular changes were observed in 12 (7.5%) of 162 patients. Patients with microcystic macular change had thicker INL thickness than those without it ($p = 0.010$). Progressors had a higher probability of having microcystic macular changes and the thicker average INL thickness than nonprogressors ($p = 0.003$, $p = 0.019$). The thicker INL thickness was associated with faster VF progression based on MD slope (dB/year) in the multivariate regression analysis ($p = 0.045$). In the multivariate regression analysis, greater IOP fluctuation was found to be associated with both a thicker INL and the presence of microcystic changes ($p = 0.003$, 0.028).

Conclusion: INL changes, especially increased macular INL thickness, was linked to subsequent VF progression in glaucoma patients. This study suggests that greater macular INL thickness, influenced by IOP fluctuations, may serve as an indicator of progressive glaucoma.

870 - P4.071

FUNCTIONAL PROGRESSION OF PRIMARY OPEN-ANGLE GLAUCOMA IN PATIENTS WITH DIABETES MELLITUS TYPE 2

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Purpose: To assess the effect of diabetes mellitus (DM) type 2 on the functional progression of primary open-angle glaucoma (POAG) by comparing the rate of progression of POAG in eyes with and without diabetes.

Methods: The study included 32 patients (60 eyes) with POAG and DM type 2 (group I) and 32 patients (58 eyes) with POAG without DM (group II), matched by age and gender to the patients in group I. The group of patients with POAG and DM type 2 was formed according to a history of diagnosed diabetes over the age of 30 years without objectively detected diabetic retinopathy. Visual field (VF) losses were determined by standard automatic perimetry, program 30-2. For each examined eye the slope of MD (Mean deviation) changes over time was calculated and the Rate of Progression - RoP (the change of MD / year) was established.

Results: A significant difference was observed for initial MD values (118 eyes) between the two groups: MD in group I was -5.52dB, MD in group II – -10.66 dB respectively. The percentage of eyes with initially severe VF losses (with MD > -12 dB) was higher in group II: 21 eyes (36.2%) vs. 7 eyes (11.7%). Thirty-four eyes (56.7%) in group I (60 eyes) showed progression vs. 38 (65.5%) in group II (58 eyes). The mean value of RoP in group I was -0.98 ± 1.12 vs. -0.78 ± 0.66 in group II respectively. There was not a significant difference between mean Rate of progressors in both groups ($p > 0.05$).

Conclusion: Despite the greater rate of progression in eyes of patients with POAG and diabetes mellitus type 2, the difference did not achieve statistical significance.

894 - P4.072

POTENTIAL OF OPTICAL COHERENCE TOMOGRAPHY OF THE OPTIC DISK FOR THE DIFFERENTIAL DIAGNOSIS OF PROGRESSIVE MYOPIA AND PRIMARY OPEN-ANGLE GLAUCOMA

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Purpose: To analyze parameters of the optic nerve head (ONH) as differential markers of myopia progression and primary open-angle glaucoma using optical coherence tomography (OCT).

Methods: 72 patients (144 eyes) with myopia and 27 (54 eyes) with primary open-angle glaucoma were studied. The standard parameters and tilt of the ONH, chorioretinal peripapillary atrophy (PPA), localization of the lamina cribrosa (LC) of the sclera and the main trunks of the central retinal vessels were assessed. Statistical data processing was carried out using Statistica 10.0 for Windows, calculation of Pearson's, Spearman's correlation coefficients, the Kruskal-Wallis and Mann-Whitney tests.

Results: A positive correlation between the AL of the eye and the sizes of the cup of ONH (its area, horizontal and vertical diameters) was found. An uneven change in the volume, mean and maximal depth of the cup of the ONH was established. An inverse correlation between the AL and the size of the neuroretinal rim (NRR) (its area, volume, and the ratio of the NRR to the ONH) was determined. An increase in the severity of the PPA zone with a tendency to a decrease in the thickness of the retinal nerve fiber layer (RNFL) in the inferior, nasal superior and superior sectors of the ONH was identified. Correspondence of the location of the PPA zone to the direction of the ONH tilt was revealed. A negative correlation between the AL and the depth of localization of the LCP of the sclera was noted.

Conclusion: OCT revealed parameters (changes in the size of the ONH cup and NRR, a decrease in the depth of the LC of the sclera; "nasalization" of the main trunks of the central vessels of the retina, the chorioretinal PPA formation with a gamma zone in it and an increase in the beta zone; a tendency towards thinning of the RNFL in the superior and inferior sectors of the ONH; ONH tilt with a tendency to thinning of the RNFL depending on the direction of the tilt) may be useful in interpreting data in myopia, predicting its progression, as well as in differential diagnosis with glaucoma optic neuropathy.

993 - P4.073

EVALUATION OF STRUCTURE-FUNCTION RELATIONSHIP IN ADVANCED PRIMARY OPEN ANGLE GLAUCOMA (POAG)

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Purpose: To investigate the relationship between functional and structural parameters including peripapillary and macular vessel densities in advanced POAG

Methods: 40 eyes of the 40 patients with advanced primary open angle glaucoma were included in this cross-sectional study. Each patient underwent comperhensive ophthalmological examination, 10-2 visual field (VF) testing (Humphrey HFA-II 720i Automated Perimetry, Carl Zeiss, USA), Optic Coherence Tomography (OCT) and angiography (OCT-A) imaging (Avanti SOLIX SD-OCT with AngioVue Essential, Optovue, USA). The relationship of macula and optic nerve head (ONH) OCT, OCT-A parameters with BCVA and 10-2 VF mean deviation (MD) were assessed. A p-value of ≤ 0.05 was considered statistically significant.

Results: BCVA was correlated with ganglion cell complex (GCC) thickness and macular vessel density ($p < 0.05$). Each 1 µm decrease in GCC thickness was associated with 0.01 logMAR increase in BCVA ($p < 0.05$). Each 1% decrease in superficial perifoveal vessel density was associated with 0.07 logMAR increase in BCVA ($p < 0.02$). VF MD was correlated with GCC thickness, macular and ONH vessel densities ($p < 0.05$). Each 1 µm decrease in GCC thickness was associated with a reduction of 0.39 dB for 10-2 VF MD ($p < 0.01$). Also, each 1% decrease in superficial parafoveal vessel density and peripapillary vessel density were associated with a reduction of 1.57 dB and 0.75 dB for VF MD, respectively ($p < 0.05$).

Conclusion: GCC thickness, macular and ONH vessel densities are associated with the severity of central visual field damage in advanced primary open angle glaucoma, suggesting potential as biomarkers for monitoring disease progression.

573 - P4.074

PATHOPHYSIOLOGY AND MANAGEMENT OF POST TRAUMATIC GLAUCOMA IN CLOSED GLOBE INJURIES

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Purpose: Ocular hypertension is a significant complication of traumatized eyes, which can lead to secondary glaucoma. If not promptly identified and addressed, visual outcomes can be poor. This case series aims to describe the pathophysiology and management of post-traumatic glaucoma following closed globe injuries, highlighting ultrasound biomicroscopy's (UBM) role in unraveling anterior chamber anatomy.

Methods: We report a series of 8 patients that suffered closed globe injuries leading to ocular hypertension and/or secondary glaucoma. The epidemiological (gender; age) and clinical characteristics (visual acuity; intra-ocular pressure [IOP]; biomicroscopy, gonioscopy and UBM findings; treatment) were collected at the initial visit and after six months.

Results: All patients were male and had a mean age of 42.4 years. At the initial visit, visual acuity and IOP were 0.68 logMAR and 36.25 mmHg, respectively. Gonioscopy, complemented by UBM, showed that angle recession was the most frequent cause of post-traumatic glaucoma (50%). Hyphema, lens subluxation, delayed closure of cyclodialysis cleft and increased venous episcleral pressure due to a carotid-cavernous fistula were also found (12.5%). Besides addressing the traumatic uveitis with cycloplegic and steroids, all the patients required topical IOP lowering medications (4, 3 and 2 agents in 37.5%; 12.5%; 50% respectively). Oral acetazolamide (75%) and mannitol infusion (12.5%) were added for acute IOP control. Surgery was performed in 62.5% of patients (25% vitreoretinal; 25% glaucoma; 12.5% flow-diverter stent). At six months of follow-up, visual acuity and IOP were 0 logMAR and 15.88 mmHg, respectively. The majority of patients developed post-traumatic glaucoma (75%), requiring one lowering agent (67.7%) for chronic IOP control.

Conclusion: Detailed visualization of the angle structures, through gonioscopy and UBM, proved crucial in elucidating the mechanism underlying ocular hypertension following closed globe trauma. Recognizing such pathophysiological mechanisms will determine the appropriate course of treatment, thereby influencing long-term management and results in post-traumatic glaucoma.

775 - P4.075

SUSTAINED INTRAOCULAR PRESSURE ELEVATION FOLLOWING ND:YAG LASER POSTERIOR CAPSULOTOMY IN UVEITIC GLAUCOMA: A CASE REPORT AND LITERATURE REVIEW

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Purpose: This case report delineates the persistent elevation of intraocular pressure (IOP) in a male patient with uveitic glaucoma following Nd:YAG laser posterior capsulotomy. We also review the current literature for the mechanism, diagnosis, and treatment for the elevated IOP after Nd:YAG laser posterior capsulotomy.

Methods: A case report and retrospective analysis of the medical records. Ocular examination was conducted during outpatient visits.

Results: A 30-year-old male was referred to the Glaucoma Unit for poor IOP control in his right eye for three months. He had a history of uveitic glaucoma related to sarcoidosis, managed with IOP-lowering drugs and steroids. Three years prior, he underwent phacoemulsification with intraocular lens implantation in both eyes due to cataracts following prolonged steroid treatment. Additionally, trabeculectomy was performed in his left eye three years ago and in his right eye one year ago due to poor IOP control. Nd:YAG laser posterior capsulotomy for the right eye was conducted three months ago due to the dense posterior capsular opacification, leading to persistent elevated IOP in subsequent follow-up visits. Clinical examination revealed a best-corrected visual acuity of 20/60 OD and 20/40 OS, with IOP readings measuring 32.3 mmHg OD and 7.5 mmHg OS. Slit lamp examination demonstrated a quiet and diffuse bleb OU. Gonioscopy displayed a narrow angle (Shaffer grading 0-2) in the right eye with an open filtering site. Fundus examination revealed bilateral large cupping (C/D 0.7 OD; C/D 0.9 OS). Subsequent management involved the administration of Simbrinza eye drops (Brinzolamide 10mg/ml + Brimonidine 2 mg/ml) and Timolol maleate 0.5% ophthalmic solution twice daily. This regimen resulted in decreased IOP and maintained stable visual fields during consecutive follow-ups.

Conclusion: This case report highlights the potential manifestation of sustained elevated IOP in meticulously controlled uveitic glaucoma patients after ND:YAG posterior capsulotomy. Possible mechanisms may be vitreous strand incarceration or stronger inflammation in uveitic patients. Prudent consideration of this serious complication is imperative before undertaking the aforementioned procedural intervention.

949 - P4.076

LONG-TERM PROGNOSIS FOR GLAUCOMA IN PATIENTS WITH POSNER-SCHLOSSMAN SYNDROME (PSS) IN TERTIARY EYE HOSPITAL IN RIYADH, SAUDI ARABIA

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Purpose: Posner-Schlossman syndrome (PSS), also known as glaucomatocyclitic crisis, is a condition characterized by abnormally high intraocular pressure (IOP) along with non-granulomatous anterior chamber inflammation, open angles, and normal visual fields & optic nerve, in some cases eyes might develop chronic glaucoma, which might lead to vision loss. We are here reporting the long-term prognosis for glaucoma in patients with PSS in a tertiary care hospital in Riyadh, Saudi Arabia (KKESH).

Methods: A retrospective review of all patients with PSS records at KKESH who were diagnosed during 2010 to 2020 and followed up for at least 2 years regularly.

Results: 35 patients were included, 25 males, age 45.68 (22-73) years old, 19 diagnosed as PSS in the right eye. The age of PSS onset (1st recognized attack of glaucomatocyclitic crisis) was 35.03 (16-53) years old. We followed up the patients for 11.22 (2-37) years, 15 patients reported no more attacks since 2022 or prior, they were considered to be recovered, after a duration of 7.06 (2-21) years of having regular attacks, every 1-24 (mean of 8.4) months. In between the attacks some patients were off medications (n = 14), some kept on steroid drops (n = 11) for the control of the disease, as they developed an attack whenever they stop or reduce their steroid frequency, and 2 of them developed cataract & underwent phacoemulsification. Some of the patients were kept on antiglaucoma medication between the attacks (n = 9). Antiviral treatment tried in 3 cases, but with no success, as the course of the disease or attack frequency did not change. Majority of the patient had stable disc cupping over the years 0.44 (0.2-0.9). 9 eyes developed chronic uncontrolled glaucoma & needed glaucoma surgery, one eye lost light perception, & 3 eyes lost more than 2 lines of vision. These patients age of onset of crisis was 37.14 (25-49) years, they needed the surgical intervention after 8.57 (1-24) years of follow up, and they had their attacks every 6.66 (1-18) months prior to developing chronic increase in IOP.

Conclusion: PSS has unpredictable course, treatment modality or prognosis, but had 40% recovery rate, and a non-favourable outcome in 25% of our patients.

288 - P4.077

COMPARISON OF GOLDMANN APPLANATION TONOMETRY WITH ICARE(TM) AND ICARE HOME(TM) REBOUND TONOMETRY IOP MEASUREMENTS AFTER SURGICAL PROCEDURES

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Purpose: To compare intraocular pressure (IOP) measurement values between the Goldmann applanation tonometer (GAT) and the iCareTM and iCare HomeTM rebound tonometry devices and to evaluate whether the postoperative conditions of glaucoma filtration surgery, including surgery type, affect these measurement outcomes.

Methods: Patients undergoing filtering glaucoma surgery (deep sclerectomy, trabeculectomy and Glaucoma Drainage Implants, GDI) at the University Eye Clinic, Bonn, Germany, underwent IOP measurements by GAT, iCareTM and iCare HomeTM on the day of surgery, on the day of discharge (2 days post-op) and on the first postoperative follow-up visit (1-2 weeks). A p value of < 0.05 was considered statistically significant.

Results: 40 patients were recruited. We compared preoperative, discharge, and first postoperative follow-up IOP both the operated and contralateral eyes. Outcomes showed no significant difference in IOP for the operated eye and the contralateral eye between the three devices. In terms of device consistency, we assessed intraclass correlation coefficients (ICC) of GAT, iCareTM and iCare HomeTM for the contralateral eye and the operated eye at all above-mentioned visits. The ICC values were all above 0.85, indicating excellent consistency. The percentage of iCare HomeTM with GAT (ΔiCareHome-GAT) ≤ 2 mmHg was lower than iCareTM with GAT (ΔiCare-GAT) at most times and eye groups. Except for the operated eye group at the first postoperative follow-up visit and the preoperative contralateral eye group, the percentages of ΔiCareHome-GAT ≤ 2 mmHg in these two groups were higher than ΔiCare-GAT, which were 51.5% and 62.2%, respectively. The 95% consistency limits of ΔiCareHome-GAT were at their largest on the day of discharge, reaching (11.2, -10.2), according to Bland-Altman analysis.

Conclusion: The consistency of the iCareTM, iCare HomeTM and GAT in measuring IOP in patients undergoing glaucoma surgery is good at most time points and contexts. However, the percentages of ΔiCareHomeTM-GAT and ΔiCareTM-GAT that were within ≤ 2 mmHg were both less than 65%. This implies that post glaucoma filtering surgery, rebound tonometry, including patient self-measurements at home, should still be interpreted with caution.

589 - P4.078

COMPARISON BETWEEN 24-2 ZEST AND 24-2 ZEST FAST STRATEGIES IN GLAUCOMA AND OCULAR HYPERTENSION USING A FUNDUS PERIMETER

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Purpose: The aim of this study was to compare the test duration of ZEST (Zippy Estimation by Sequential Testing) strategy with ZEST FAST and to evaluate the test-retest variability of ZEST FAST strategy on patients with glaucoma and ocular hypertension using a Compass (CMP, Centervue, Padova, Italy) fundus perimeter.

Methods: This was a multicentre retrospective study. We analyzed one eye of 60 subjects, 30 glaucoma patients and 30 patients with ocular hypertension. For each eye we analyzed three visual field examinations performed with CMP 24-2 grid: one test performed with ZEST strategy and two tests performed with ZEST FAST. Mean examination time and mean sensitivity between the two strategies were computed. ZEST FAST test-retest variability was examined.

Results: In the ocular hypertension cohort, test time was 223 ± 29s with ZEST FAST and 362 ± 48s with ZEST (38% reduction, $p < 0.001$). In glaucoma patients, it was respectively 265 ± 62s and 386 ± 78s (31% reduction using ZEST FAST, $p < 0.001$). The difference in mean sensitivity between the two strategies was -0.24 ± 1.30 dB for ocular hypertension and -0.14 ± 1.08 dB for glaucoma. The mean difference in mean sensitivity between the first and the second test with ZEST FAST strategy was 0.2 ± 0.8 dB for patients with ocular hypertension and 0.24 ± 0.96 dB for glaucoma patients.

Conclusion: ZEST FAST strategy showed a significant reduction in examination time compared to ZEST, with good agreement in the quantification of perimetric damage.

247 - P4.079

EFFECT OF SYSTEMIC AND REGIONAL VASCULAR INSUFFICIENCY ON THE STRUCTURAL PROGRESSION OF NORMAL TENSION GLAUCOMA

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Purpose: To identify the role of systemic arterial stiffness and choroidal microvascular insufficiency on structural progression of normal-tension glaucoma (NTG).

Methods: Early NTG patients who underwent pulse wave velocity (PWV) measurements and optical coherence tomography (OCT) angiography (OCT-A) at baseline were subjected to a retrospective review of medical records. A total of 88 eyes of 88 patients were analyzed. Patients were categorized depending on the presence of peripapillary choroidal microvasculature dropout (MvD) and structural progression was determined using the trend-based analysis of cirrus OCT.

Results: Twenty-eight eyes displayed choroidal MvD (64.0 ± 9.7 years old, 53.6% males), and 60 eyes did not show any MvD (60.4 ± 9.7 years old, 53.3% males) at baseline. Patients were followed for 53.2 ± 18.6 months. When they were further divided based on PWV (high PWV ≥ 1400 cm/sec), those with choroidal MvD and high PWV showed significantly faster thinning in macular ganglion cell-inner plexiform layer (GCIPL; p = 0.029). In comparison to those with low PWV and no MvD, eyes with high PWV and MvD in the peripapillary area were likely to show fast structural progression (≤ -1.2 μm/year) in the macular GCIPL by odds of 6.583 (95% CI 1.323-32.757, p = 0.021).

Conclusion: In NTG eyes, GCIPL thinning was faster when choroidal MvD and high systemic arterial stiffness were present. The simultaneous presence of regional and systemic vascular insufficiency may be associated with rapid structural progression in eyes with low baseline intraocular pressure.

302 - P4.080

THE EYEMATE-SC-TRIAL - TELEMETRIC SELF-MEASUREMENT OF INTRAOCULAR PRESSURE WITH A MINIMALLY INVASIVE IMPLANTABLE SUPRACHOROIDAL MICROSENSOR

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Purpose: Measuring and controlling intraocular pressure (IOP) is fundamental to glaucoma treatment. For valid mapping of the highly dynamic IOP, continuous monitoring is desirable and self-tonometry has been proposed as a superior alternative for measuring IOP throughout the day. Implantation of the novel EYEMATE-SC microsensor (Implandata) in the suprachoroidal space enables continuous and contact-free IOP self-monitoring. The objective of this study was to assess the EYEMATE-SC's safety, performance, and accuracy over a one-year period in patients with primary open-angle glaucoma (POAG) undergoing simultaneous nonpenetrating glaucoma surgery (NPGS).

Methods: The study design was a prospective, multicentre, open-label, single-arm, interventional clinical trial. During NPGS (canaloplasty or deep sclerectomy), an EYEMATE-SC sensor was implanted in 24 eyes of 24 patients with POAG. During the 12-month follow-up, we assessed the safety of the device in terms of its position and adverse events. Furthermore, the performance of the EYEMATE-SC sensor, as well as the limits of agreement (LoA) between its measurements and IOP measurements obtained through Goldmann applanation tonometry (GAT) were analysed.

Results: The sensor was successfully implanted in all eyes during canaloplasty (n = 15) or deep sclerectomy (n = 9). During the 12-month follow-up no device migration, dislocation or serious device-related complications occurred. The IOP agreement analysis included a total of 536 pairwise measurements using the EYEMATE-SC. Regarding the measurements of GAT and EYEMATE-SC, there was an overall mean difference of 0.8 mmHg (95% confidence interval (CI) of LoA [-5.1; 6.7 mmHg]). The maximum difference of 2.5 mmHg (95% CI of LoA, [-5.1; 10.1 mmHg]) was reached on day 10 and improved gradually. From 3 months post-surgery until the end of the follow-up, the mean difference was -0.2 mmHg (95% CI of LoA, [-4.6; 4.2 mmHg]) with 100% of eyes showing an IOP difference within ± 5 mmHg compared to GAT.

Conclusion: The EYEMATE-SC sensor was safe, well tolerated through 12 months and allowed accurate, continuous IOP self-monitoring via a hand-held device.

858 - P4.081

THE EFFECT OF PHCOEMULSIFICATION ON THE INTRAOCULAR PRESSURE OF PATIENTS WITH OPEN-ANGLE GLAUCOMA: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Purpose: The aim of this meta-analysis is to evaluate the effect of phacoemulsification and intraocular lens implantation on intraocular pressure (IOP) in patients with primary open-angle glaucoma (POAG), exfoliative glaucoma (XFG), normal tension glaucoma (NTG) or normal individuals.

Methods: A literature review of 6 databases was undertaken in July 2023. We included the phacoemulsification arms of the randomized controlled trials (RCTs) that enrolled only a single eye of each patient with POAG, XFG, NTG, or normal individuals. The primary outcome was the mean change in IOP 12 months after phacoemulsification. Studies that analyzed any other type of lens extraction or included patients who had undergone previous glaucoma surgery or complicated phacoemulsification were excluded. The adjusted ROBINS-I tool was used to evaluate the risk of bias.

Results: Nine arms of nine RCTs involving 502 patients were included in this meta-analysis. Overall, the mean IOP decreased by 3.77 mmHg (95%CI: -5.55 to -1.99, I2 = 67.9%) 12 months after surgery; however, the evidence supporting this finding is of low strength, primarily due to the high risk of bias and inconsistency of the results in the included studies. The sub-group analysis based on the existence of a washout period before IOP measurements showed that IOP decreased by 5.25 mmHg (95%CI: -7.35 to -3.15, I2 = 0%) in studies with washout, while it decreased by 3.13 mmHg (95%CI: -5.46 to -0.81, I2 = 75.8%) in studies without washout. The sensitivity analysis of the second group, excluding an outlying study with the highest individual effect estimate, showed a decrease of 1.81 mmHg (95%CI: -2.95 to -0.67, I2 = 0%).

Conclusion: There is evidence that cataract surgery can reduce IOP in patients with POAG or XFG. The net effect of phacoemulsification is masked and affected by the topical IOP-lowering medications used before IOP assessment. More future studies with washout as part of their protocol might be helpful to confirm our results.

868 - P4.082

OBJECTIVE QUANTIFICATION OF BLEB FUNCTION USING SWEPT SOURCE ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY

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Purpose: Evaluation of bleb function typically relies on subjective assessment of en-face morphological features on slit-lamp examination. This study evaluates use of anterior-segment OCT (AS-OCT) and image texture analysis to provide objective, quantifiable parameters of bleb function in eyes that have undergone trabeculectomy and non-penetrating deep sclerectomy surgery.

Methods: Cross-sectional study of 204 blebs of 120 patients who had undergone trabeculectomy (Trab, n = 96) or deep sclerectomy (DS, n = 108) surgery at least one year prior for glaucoma. Swept source AS-OCT was used to capture filtering blebs in the sagittal plane with raster slices oriented in the plane of the scleral flap. Standardized regions of interest (400x800 pixels) bisecting the sclerostomy/trabeculo-descemet window and scleral flap and just proximal to the peripheral cornea were cropped and segmented. Following image processing, pixel intensity and area-related values of each segmented region were measured using batch processor function in Matlab.

Results: Median post-operative follow up was 8.4 years (IQR 3.2-9.0). Complete success (CS; IOP ≤ 18 mmHg with no medications), qualified success (QS; IOP ≤ 18 with medications) and failure (F; IOP >18 mmHg) in Trab and DS cohorts were 37.3%, 32.7% and 30.0% respectively. In Trab blebs, mean pixel intensity (PI) was significantly lower in CS as compared to QS and F blebs (150.8 ± 14.5 vs 157.4 ± 13.4 vs 167.4 ± 13.5, p = 0.0001). Standard deviation of pixel intensity values and solidity were also significantly lower in CS and QS as compared to F in both Trab and DS. Sagittal area values of blebs were significantly greater in CS and QS groups compared to F in both Trab and DS cohorts. A moderate inverse correlation was observed between maximal bleb height and PI in both Trab (r = -0.49, p < 0.0001) and DS (r = -0.46, p < 0.0001) groups.

Conclusion: We found that image intensity and bleb area values of AS-OCT sagittal raster slices were significantly associated with medication-free surgical success compared to qualified success and failure. These quantitative parameters may be used to objectively evaluate bleb function in clinical practice, and may help guide pharmacological treatment/early surgical intervention in the post-operative period in glaucoma surgery.