

10th

International Congress on Glaucoma Surgery



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ABSTRACT BOOK



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London - February 6-9, 2020





MID-TERM CLINICAL RESULTS OF AB INTERNO TRABECULOTOMY USING TRABECULAR HOOKS WITH PHACOEMULSIFICATION IN JAPANESE GLAUCOMA PATIENTS

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Purpose: To evaluate mid-term clinical results of ab interno trabeculotomy using trabecular hooks with phacoemulsification.

Methods: A retrospective chart review was performed on patients who underwent ab interno trabeculotomy with phacoemulsification at least 1 year ago. Changes of patients' intraocular pressure (IOP) and medication scores were evaluated.

Results: Thirty-three eyes of 26 patients with 21 primary open angle glaucoma, 7 exfoliation glaucoma, and 5 secondary glaucoma were included in the study. The mean follow-up time was 18.7 ± 5.2 months. The mean preoperative IOP and medication score decreased from 22.1 ± 6.8 mmHg and 4.3 ± 0.9 to 15.0 ± 3.4 mmHg and 2.0 ± 1.5 , 14.0 ± 1.9 mmHg and 2.4 ± 1.3 , 14.0 ± 2.7 mmHg and 2.6 ± 1.2 , 13.9 ± 2.2 mmHg and 2.6 ± 1.4 and 14.6 ± 5.3 and 3.0 ± 1.4 at 1, 6, 12, 18 and 24 months, respectively. These decreases were statically significant ($p < 0.01$ and $p < 0.01$), except for decrease of medication score at 24 months ($p = 0.067$). Four eyes needed additional surgeries; implantation of filtration device at 4 months, cyclophotocoagulation at 17 and 21 months and trabeculectomy at 25 months.

Conclusion: Additional surgeries were needed in some cases, however, in most cases, the lowering effect on IOP and medication scores were sustainable during mid-term follow-up.



INITIAL OUTCOMES OF COMBINED PHACOEMULSIFICATION WITH ENDOCYCLOPHOTOCOAGULATION WITH AND WITHOUT AB INTERNO TRABECULOTOMY IN OPEN ANGLE GLAUCOMA

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Purpose: To evaluate and compare the efficacy and safety of combined phacoemulsification (PHACO) and endocyclophotocoagulation (ECP) with and without ab interno trabeculotomy (KDB) in patients with uncontrolled open angle glaucoma.

Methods: Retrospective study evaluated the 12 months outcomes patients who underwent combined PACHO+ECP+HDB (GI) vs PHACO+ECP(GII). Primary outcome measure was mean pre and postoperative intraocular pressure (IOP); secondary outcomes included: number of glaucoma medications, visual acuity, report complete and qualified success, failure, and complications.

Results: A total of 46 eyes were included, basal preoperative IOP was 16.96 ± 3.66 mmHg for GI and 15.64 ± 4.88 for GII ($p = 0.122$) and 11.44 ± 2.15 and 12.45 ± 1.90 respectively ($p = 0.031$) at 12 months followup. Complete success: 54.5% for GI and 40.7% for GII; qualified success: 92.6% and 90.9% respectively. Medications fell from 2.0 to 0.8 GI and 1.5 GII.

Conclusion: Patients with uncontrolled open angle glaucoma at 12 months follow up shows reduction of IOP efficiently and safety with both procedures. When ab interno trabeculotomy is added to phacoemulsification and ECP mean IOP is reduced more and this difference comparing both interventions studied is clinically significant.



PREVALENCE OF ENDOPHTHALMITIS AFTER AQUEOUS SHUNT IMPLANTS AND RELATED PROCEDURES IN AN EYE SERVICE

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Purpose: To investigate the rate of endophthalmitis, its microorganisms, risk factors and visual outcomes, related to aqueous shunt implant (tube) surgery in the Glaucoma service in 5 years of laboratory electronic database.

Methods: This study was approved by the Clinical Audit Office. All eyes with tube implant or related surgery were reviewed from 2009 to 2013. Development of endophthalmitis was identified from the electronic database and notes reviewed.

Results: A total of 1827 tubes, 893 revisions and 2391 removal of stent suture (RoS) were performed. In total 6 eyes developed endophthalmitis, all were following revision/RoS. Time till onset was 8 ± 6.7 days. The rate of endophthalmitis was 0.67% after tube revision and 0.25% after RoS. No microorganisms were identified in any samples.

Conclusion: Endophthalmitis is a rare complication of tube surgery, its rate in this study was less than reported in literature and was only observed after revision/RoS surgeries.



COMBINED 25-GAUGE (25G) ENDOSCOPE-ASSISTED PARS PLANA AHMED GLAUCOMA VALVE PLACEMENT AND VITRECTOMY FOR ADVANCED GLAUCOMA WITH ANTERIOR SEGMENT ABNORMALITIES

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Purpose: To report the efficacy of a combined procedure utilizing 25G endoscope-assisted pars plana Ahmed Glaucoma Valve (AGV) placement and vitrectomy in advanced secondary glaucoma with corneal opacity or small pupils with fibrous changes.

Methods: This was a retrospective chart review of 19 patients (20 eyes) who underwent AGV placement with ≥ 6 months follow-up. The majority were diagnosed with neovascular glaucoma ($n=15$). All eyes underwent 25G endoscope-assisted AGV placement with vitrectomy. Efficacy and safety were assessed at 1,3,6,12,18, and 24 months postoperatively. Outcome parameters included intraocular pressure (IOP), number of glaucoma medications, and complications. Data from the most recent follow-up examination were analysed.

Results: The mean age was 55.8 ± 16.1 years, and the mean follow up duration was 13.1 ± 5.8 months; mean preoperative and postoperative IOP were 34.9 ± 9.3 mmHg and 12.2 ± 2.2 mmHg, respectively ($p < 0.001$). The mean number of glaucoma medications decreased from 4.9 ± 0.2 to 1.8 ± 1.5 after the operation ($p < 0.001$). No complications occurred in 18 of 20 eyes. The cumulative probability of success at the 2-year follow up was 95.0%.

Conclusion: The 25G endoscope-assisted pars plana AGV placement is safe and effective for advanced glaucoma with anterior segment abnormalities.



IMPACT OF PREOPERATIVE TOPICAL DIFLUPREDNATE ON TRABECULECTOMY OUTCOMES: A RANDOMISED CONTROLLED TRIAL

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¹RPC, AIIMS, Ophthalmology, ²AIIMS, Anatomy

Purpose: To evaluate the effect of preoperative topical difluprednate on trabeculectomy outcomes.

Methods: Out of 60 primary angle closure glaucoma patients, who all meeting inclusion criteria were randomized into two groups (30 in each group). Group 1 received preoperative 0.05% difluprednate eye drops 4 times/day and group 2 received 0.5% carboxymethylcellulose eye drops 4 times/day for 2 weeks. All patients underwent trabeculectomy with 0.02% mitomycin-C. Primary outcome was intraocular pressure (IOP) reduction. Qualified and complete success was defined as IOP \leq 12mmHg/ \geq 6mmHg with/ without medications.

Results: Of the 60 patients enrolled, 57 completed the protocol. Two in steroid group and one patient in placebo group dropped out. The mean age of 60 participants was 51.6 ± 6.37 years. Both groups had comparable mean preoperative IOP. At 6 months, intention-to-treat analysis showed a significant difference in mean IOP between the two groups (group-1: 10 ± 1.53 mmHg, group-2: 12.27 ± 3.05 mmHg $p = 0.002$). Complete success was 93.33% in group-1 and 86.67% in group-2 at 6 months ($p < 0.001$). ASOCT showed significant difference in bleb height between two groups with no significant difference in bleb radial width at 6 months. Real-Time PCR was done to evaluate expression pattern of genes in two groups and the genes analysed (NFkB, MMP, CTGF, PDGF, MAPK3, Casp3) were all significantly ($p < 0.01$) downregulated in steroid group.

Conclusion: Preoperative use of topical difluprednate is associated with improved trabeculectomy outcomes in terms of IOP control, better bleb morphology and downregulation of genes associated with extracellular matrix deposition, inflammation and neuronal apoptosis.



INTRACAMERAL BEVACIZUMAB VERSUS MITOMYCIN C AS ADJUNCTS TO TRABECULECTOMY; 3-YEAR RESULTS

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Purpose: To compare long-term results of adjunctive intracameral injection of bevacizumab to standard application of mitomycin C (MMC) in trabeculectomy.

Methods: Prospective, randomized study of 100 eyes with primary open-angle or pseudoexfoliation glaucoma requiring trabeculectomy. 50 eyes received bevacizumab and 50 eyes MMC. Complete success i.e IOP between 6 and 21 mmHg with at least 20% reduction from baseline was the primary outcome. All patients reached 3-year follow-up.

Results: Average baseline IOP and number of medications were similar between groups ($p > 0.5$). IOP and medications decreased significantly in both groups at all follow-up points compared to baseline ($p < 0.001$). At last visit, both IOP and medication requirements were not significantly different between groups ($p = 0.60$, $p = 0.70$ respectively). However, IOP was significantly lower in the bevacizumab group 3 and 6 months postoperatively ($p = 0.01$, $p = 0.03$ respectively). Although similar between groups at last visit, complete success was significantly higher in the bevacizumab group at months 6 and 12 (96% vs 82% and 88% vs 72%; $p = 0.03$, $p = 0.04$ respectively) with less patients requiring additional anti-glaucoma medications at months 6, 9 and 12 ($p = 0.03$, $p = 0.04$ and $p = 0.03$ respectively). Postoperative interventions and complication rates were similar between groups.

Conclusion: Intracameral administration of bevacizumab has similar long-term efficacy results to MMC but significantly reduces the need for IOP lowering medications during the first year of follow-up.

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LONG-TERM EFFECTIVENESS OF ISTENT MICRO SHUNT IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA

Mario Montelongo, Joseph T Kavanagh, William E. Spensel (USA)

Purpose: To examine the long-term efficacy of the iStent micro shunt in lowering intraocular pressure (IOP).

Design: Retrospective quality assurance chart review

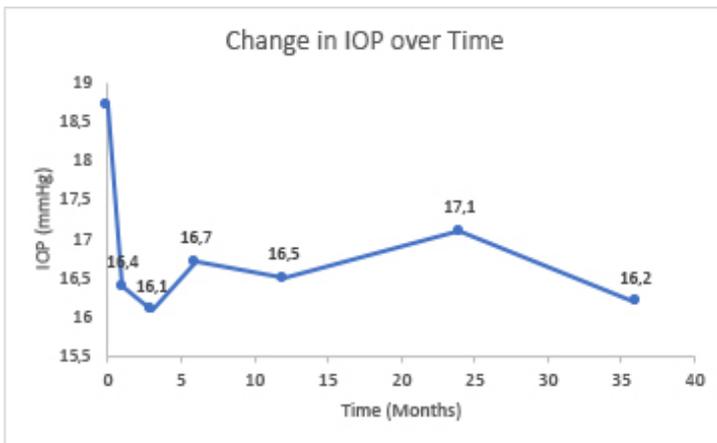
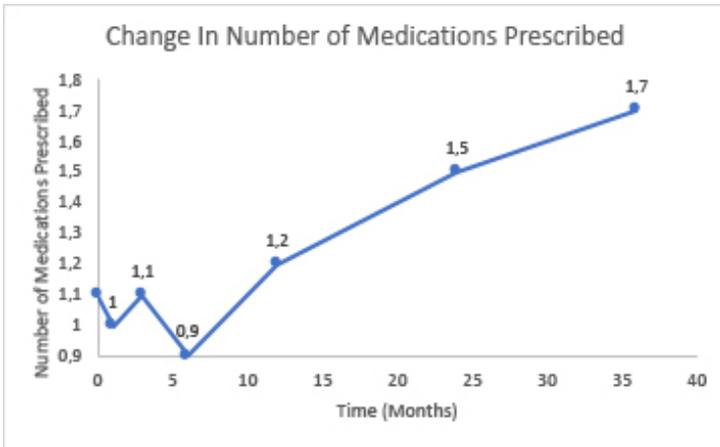
Methods: Inclusion: all individuals with mild to moderate primary open angle glaucoma who had undergone phacoemulsification with intraocular lens (IOL) implantation and subsequent iStent placement. Change in IOP was assessed using paired t-test and a simple linear regression was calculated to correlate number of medications prescribed based on time.

Results: 100 eyes of 61 patients were assessed (mean age 72.75; 32M 29F). At baseline mean IOP was 18.7 ± 0.4 mmHg and patients were on a mean of 1.1 ± 0.11 IOP-lowering drop. At 1 day, 7 days and 1, 3, 6, 12, 24, 36 months after surgery IOP dropped from the baseline value of 18.7 ± 0.4 to 16.7 ± 0.5 (-2mmHg, -11%), 17.5 ± 0.5 (-1.2mmHg, -6.4%), 16.4 ± 0.3 (-2.4mmHg, -12%), 16.1 ± 0.5 (-2.6mmHg, -13%), 16.7 ± 0.4 (-2mmHg, -11%), 16.5 ± 0.4 (-2.2mmHg, -12%), 17.1 ± 0.5 (-1.6mmHg, -8%), 16.2 ± 0.8 (-2.5mmHg, -13%) respectively ($p < 0.05$). A significant regression equation was found between number of medications prescribed and time ($F(1,5) = 78.063$, $p < 0.0001$), with an R^2 of 0.939. Medications at 1, 3, 6, 12, 24, and 36 months changed from baseline of 1.1 ± 0.11 to 1 ± 0.12 , 1.1 ± 0.11 , 0.9 ± 0.11 , 1.2 ± 0.12 , 1.5 ± 0.22 , and 1.7 ± 0.21 , respectively.

Discussion: While the patients in this study saw a statistically significant reduction in IOP at every time interval, it is important to note that our population underwent phacoemulsification with IOL implantation at the time of iStent placement. One study that assessed the effects of phacoemulsification on IOP in healthy eyes with a mean baseline IOP of 16.2mmHg saw a sustained reduction in IOP by 3.6mmHg (22%) up to 4 years after surgery. In our population mean IOP remained well-controlled across all time intervals but with a highly significant rate of medication use. While IOP remained in mid-normal range IOP reduction (mean 10.9%) did not approach the 20% reduction stated to be of clinical significance by European Glaucoma Society and American Academy of Ophthalmology.



Conclusions: iStent implantation in patients with mild to moderate glaucoma was associated with statistically significant but not clinically significant reduction in IOP up to 3 years post implantation, with progressive increase in topical medication over time.



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VIDEOS

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V02

NOVEL TECHNIQUE FOR COMBINED TREATMENT AND EVALUATION OF OPEN-ANGLE GLAUCOMA: AB INTERNO ITRACK CANALOPLASTY COMBINED WITH IN VIVO TRYPAN BLUE VENOGRAPHY

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¹Ophthalmology, University of Calgary, Calgary, Canada, ²Ophthalmology, University of Toronto, Oakville, Canada

Purpose: To demonstrate a method of visualizing aqueous outflow combined with a minimally invasive glaucoma surgery (MIGS).

Methods: Trypan blue is injected into a Healon ophthalmic viscoelastic cannister via a one inch-25 gauge needle. The Trypan blue is then mixed into the Healon at various depths. A 2.2 mm clear corneal incision is then made temporally followed by a paracentesis. Healon is used to inflate the anterior chamber followed by nasal goniotomy. The iTrack (iScience Interventional, Menlo Park, CA), attached to a screw-driven syringe, is inserted into the goniotomy and advanced through Schlemm's canal¹. A small amount of trypan-viscoelastic mixture can be injected into Schlemm's canal allowing visualization of the outflow pathway.

Results: The authors are evaluating the safety and efficacy of this technique and data collection is ongoing. Currently there have been no complications and intraocular pressure lowering is equivalent to previously described iTrack canaloplasty.

Conclusion: Currently, we have no established clinical way to evaluate aqueous outflow. The authors describe a technique that allows the visualization of the aqueous outflow pathway directly during surgery. This technique may allow us to further our understanding of the aqueous outflow system and its role in the underlying pathophysiology of glaucoma. Further research is required to evaluate the prognostic significance of this technique.



V03

HEMI-GONIOSCOPY-ASSISTED TRANSLUMINAL TRABECULOTOMY COMBINED WITH DIRECT AB-INTERNO VISCOCANALOPLASTY: DESCRIPTION AND PRELIMINARY RESULTS

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Purpose: To describe a novel method of achieving intraocular pressure lowering via gonioscopy assisted-transluminal trabeculotomy (GATT) combined with viscocanaloplasty.

Methods: Hemi-GATT is performed in standard approach for 180 degrees. Following this an ophthalmic viscoelastic surgical device is used to viscodilate Schlemm's canal and the downstream collector channels.

Results: Data collection is ongoing. Preliminary results are shown here. Sample size of $n = 10$ with a mean pre-operative intraocular pressure (IOP) of 21 mmHg. Mean pre-operative number of glaucoma drops was 3 with average daily diamox equal to 500 mg daily (3 patients). One-month post-operative course showed a 38% reduction in IOP. No complications occurred.

Conclusion: The authors describe a novel technique that can be used in conjunction with a validated MIGS that allows treatment of the post-trabecular outflow system. Viscocanaloplasty represents a minimally invasive technique that can be combined with other minimally invasive glaucoma surgeries. This technique may prove a cost-effective way to improve treatment of glaucoma in a minimally invasive fashion with safety and efficacy profile equivalent or better than GATT. Preliminary results show modest IOP lowering sustained at one month post-operative follow up.



V04

USE OF THE SECOND FEMTO LASER IN EYE SURGERY WITH GLAUCOMA

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In recent years, the introduction of the Femtosecond laser sparked a small revolution in the world of cataract. This technology allows us to perform a complete capsulorhexis, a regulated and programmable faco fragmentation that is especially useful in patients with narrow anterior chambers. Below are four situations in which the use of the femtosecond laser can help with surgery in patients with glaucoma.

Case 1: Narrow chamber cataract (sub 1 mm) and contralateral miss direction. Femtosecond is performed with a 5.2 mm capsulotomy centered on the pupil. After, a dry central posterior vitrectomy is performed and finally a phacoemulsification with the bevel down technique without complications.

Case 2: Cataract in a patient previously operated for trabeculectomy by GAE. 5.2 mm capsulotomy centered on pupil is performed and extended range lens is introduced.

Case 3: Combined cataract and glaucoma surgery with Xen implant introduction. The vacuum of the femtosecond does not cause conjunctival hemorrhages that prevent the correct visualization of the introduction of the device.

Case 4: Glaucoma surgery by Express implant and attempted capsulotomy in a patient with concentric contraction of the capsular bag.

Bio of the Author: Susana Perucho Martínez. Hospital Universitario de Fuenlabrada, Madrid. Licenciada en medicina y cirugía (1995 - 2001. Doctora en Medicina y Cirugía en el año 2007. Universidad Complutense de Madrid. Formación MIR en Oftalmología en Hospital 12 de Octubre (2002-2006). Subespecialidad en Glaucoma



V05

TRAUMATIC GLAUCOMA WITH IRIDODIALYSIS**Esperanza Gutierrez Diaz¹, Maria Dolores Lago Llinas¹, Jose Luis Torres Peña¹, Beatriz De Lucas Viejo¹, Marta Montero Rodriguez¹***¹Hospital Universitario 12 de Octubre, Glaucoma, Madrid, Spain*

We present a patient with a traumatic glaucoma due to angle recession diagnosed years after the trauma with advanced glaucoma, and that had also an inferior iridodialysis. A deep sclerectomy with MMC was performed to control the IOP, with cataract extraction and suture of the iridodialysis as adjuvant procedures. The procedure was uneventful, although the improvement in visual acuity was limited by the severe glaucomatous damage. IOP after surgery was in the high teens, and a prostaglandin analog was prescribed to maintain the IOP in the low teens, and preserve the remaining vision. After 5 years of follow-up, the patient remains stable and doesn't need any more treatment.

Bio of the Author: Esperanza Gutiérrez-Díaz. Staff Physician and Chief of Anterior Unit in the University Hospital 12 de Octubre, Complutense University of Madrid. She specializes in glaucoma since 1990. Her main areas of interest are glaucoma drainage devices and non-penetrating filtering surgery. She has participated in numerous national meetings as speaker and has authored more than 50 papers in peer-reviewed scientific journals. She has written a book about Glaucoma Drainage Devices and several chapters of books regarding glaucoma and examination techniques, and collaborates with several journals as reviewer.



V06

DANGEROUS EYE: LET'S TAKE ADVANTAGE OF WHAT WE HAVE**Maria Dolores Lago Llinas¹, Esperanza Gutierrez Diaz¹***¹Ophthalmology, Hospital Universitario 12 de Octubre, Madrid, Spain***DANGEROUS EYE: "LETS TAKE ADVANTAGE OF WHAT WE HAVE"**

17th years old male with open angle glaucoma associated with Sturge-Weber Syndrome.

He was performed an Ahmed valve implant with 3 years old.

Ocular examination: right eye with 0.5 visual acuity, IOP 22 mmHg with 3 glaucoma drops, an intracorneal localized tube and non-functioning valve.

We performed a surgery with tube release from the cornea, check the valve by purging with tripan-blue. Then we made a new scleral channel to insert the tube in anterior chamber, parallel to iris, covered the tube with lyophilized fascia lata patch and close the conjunctiva.

Bio of the Author: Maria Dolores Lago Llinas. Academic qualification and training in ophthalmology: Medical degree, Medicine Faculty Autonoma University of Madrid, 1994-2001. Doctorate: Surgery Department of Autonoma University of Madrid, 2002-2004. Research aptitude, 2005. Specialized in ophthalmology in Hospital Universitario 12 de Octubre, Universidad Complutense de Madrid. 2002-2006. Profesional experience: consultant in the glaucoma Department of Hospital Universitario "12 de Octubre" of Madrid since 2007. Book chapters and papers: first author: 6; second author: 29. Papers in training courses: first author: 8. International congress presentations: first author: 7. National congress presentations: first author: 38.



V07

DIFFERENT SURGICAL TECHNIQUES FOR TUBE REVISION**Cynthia Yu-Wai-Man¹, Sheng Lim¹***¹King's College London, Department of Ophthalmology, St Thomas' Hospital, London, United Kingdom*

Summary: This video highlights four different surgical techniques for tube revision.

Case 1: Tube erosion - Functional tube. Dragon technique (double tunnel) is used to divert the tube, which is inserted into the anterior chamber at a different position.

Case 2: Tube erosion - Non-functional tube. The tube is trimmed to the base of the plate.

Case 3: Tube too short. A tube extender is connected to the tube end and inserted into the anterior chamber.

CASE 4: Not enough conjunctiva

A rotational conjunctival graft is used from the inferior fornix conjunctiva.

Bio of the author

Dr Yu-Wai-Man is a Clinician Scientist and Consultant Ophthalmologist at King's College London. Dr Yu-Wai-Man became a Fellow of the Royal College of Ophthalmologists (London) in 2013 and did her Glaucoma surgical fellowship at St Thomas' Hospital (London). She was also an NIHR Francis Crick Institute Clinical Research Fellow at the UCL Institute of Ophthalmology (PhD 2014-2017), and was awarded a EUREKA Fellowship in Translational Medicine in 2015. Dr Yu-Wai-Man is the Chief Investigator of clinical trials of novel targeted therapeutics in glaucoma surgery. Her lab is focused on wound healing research and glaucoma genetics, and is in close proximity to the NIHR BRC Genomics facility, Advanced therapies manufacturing GMP unit and Clinical Research facility. Over the last 5 years, she has also set up an extensive unique biobank of ocular tissues and cell lines in glaucoma patients.



V08

MANAGEMENT TO TRABECULECTOMY AND HYPOTONY**Nurettin Akyol¹, Adem Türk²***¹KTÜ , Ophthalmology, Trabzon, Turkey, ²KTU, Ophthalmology, Trabzon, Turkey*

Hypotony is intra ocular pressure 6 mmHg and if under 4 mmHg and permanent damage occurs. Hypotony in trabeculectomy surgery may result from various etiologies. Intraoperative, expulsive hemorrhage (supra choroidal hemorrhage). Postoperative early and late, bleb leakage, choroidal effusion, inflammation (blebitis and endoftalmi). Most hypotony resolve spontaneously and medical treatment. In this video, the treatment approach of hypotony in trabeculectomy.

To discuss the methods used in treatment of hypotonia after trabeculectomy. The aim of this study is to present surgical treatment of bleb leakage and choroidal detachment.



V09

BLEB RESCUE OPERATIONS**Jyoti Shakrawal¹, Talvir Sidhu¹, Ramanjit Sihota¹, Tanuj Dada¹**¹RPC, AIIMS, Ophthalmology, India

We describe different techniques for improving outcomes of bleb revision surgery to restore bleb function. 1-Bare sclera technique for leaking, over-hanging/over-filtering bleb. 2-Bleb-sparing-epithelial-exchange for thin, cystic, avascular bleb. 3-Ologen implant technique for thin bleb with small scleral necrosis. 4-Bleb repair with scleral patch along with ologen for thin bleb with full thickness scleral defect. 5-Maumenee's repair with pedicel conjunctival graft for partial thickness scleral necrosis in a thin bleb. This will be a video-assisted educational training on Bleb Rescue Operations along with peri-operative anterior segment imaging and UBM documentation which can have used to enhance success of bleb revision surgery.

Bio of the Author: Jyoti Shakrawal, (MD) received her MBBS degree from SMS medical college, Jaipur and MD, ophthalmology from Dr. Rajendra Prasad centre for ophthalmic sciences, All India Institute of Medical Sciences (AIIMS), New Delhi. Currently pursuing senior residency at AIIMS, New Delhi. She has completed her MD thesis on the subject "Illuminated Microcatheter Circumferential Trabeculotomy versus Ab-externo Trabeculotomy for Primary Congenital Glaucoma: a Randomized Controlled Trial" under the guidance of Professor Tanuj Dada and has presented research poster on the same at international ophthalmology conferences (ICGS 2016; won best poster). She had recently presented her research paper on "Comparative evaluation of phacoemulsification alone Versus phacoemulsification combined with Goniosynechialysis in Primary Angle Closure Glaucoma: A randomised controlled trial." at 8th World Glaucoma Congress 2019. She is currently involved in research projects on Congenital Glaucoma and Primary Angle Closure Glaucoma.



VI0

ACUTE FLUID MISDIRECTION SYNDROME AND DIFFERENT TREATMENT METHODS

Susana Perucho Martínez¹, Aitor Fernandez Garcia², Carlos Fernandez Escamez¹, Elena Martín Giral¹, Nicolas Toledano Fernandez¹

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The fluid misdirection syndrome is a rare clinical condition characterized by an axially very shallow anterior chamber with the absence of suprachoroidal effusion or hemorrhage. It usually occurs during uneventful phacoemulsification. Faced with these situations, pars plana decompression is required. Prior to performing a posterior decompression, the surgeon must be certain that there is no evidence of choroidal effusion or hemorrhage. The decompression might be done by puncture with a straight needle 3 mm from the rim and then aspiration of retrolenticular fluid (“Chandler Maneuver”) Vitreous traction might be a concern when performing this procedure. Furthermore, the treatment has not always been described as successful Hence it would be preferable to use a small-gauge trocar/cannula vitrectomy cutter (23-, 25-, or 27-gauge). The cutter can then remove retrocapsular fluid using a high cut rate and thus be able to complete the phacoemulsification.

Bio of the Author: Susana Perucho Martínez. Hospital Universitario de Fuenlabrada, Madrid. Licenciada en medicina y cirugía (1995 - 2001). Doctora en Medicina y Cirugía en el año 2007. Universidad Complutense de Madrid. Subespecialidad en Glaucoma. Facultativo especialista de Área en el Servicio de Oftalmología del Hospital de Fuenlabrada desde Julio 2006 hasta la actualidad. Especialista en Glaucoma (desde 2006 hasta la actualidad). Profesora Colaboradora de Oftalmología de la Universidad Rey Juan Carlos de Madrid desde el año 2011 hasta la actualidad. Vocal de Tribunal de Tesis en los años 2011 - 2018. Directora de trabajos fin de Máster en la Universidad Rey Juan Carlos, 2018.



VII

MANAGING TUBE MIGRATION FOLLOWING GLAUCOMA IMPLANT SURGERY**Surinder Pandav¹, Faisal Tattaruthodi¹, Madhuri Akela¹, Manpreet Kaur¹***¹Postgraduate Institute of Medical Education & Research, Advanced Eye Center, Chandigarh, India*

Tube migration is often encountered after tube surgery for glaucoma. Tube migration into the anterior chamber can lead to corneal endothelial damage whereas, retraction of tube outside the eye leads to high intraocular pressure and failure of surgery. This video demonstrates management of anterior migration of tube through external and internal approaches. Retracted tubes generally require a tube extender to increase the tube length. Commercially available tube extenders are expensive and bulky. We demonstrate a simple technique where a silicone tube can be joined to the existing retracted tube to gain length.

Bio of the Author: Dr. Surinder Pandav is working as Professor of ophthalmology at PGIMER, Chandigarh, India. Dr. Pandav did Glaucoma Research Fellowship in 2005 and Glaucoma Clinical Fellowship in 2006 at Perth, Australia (Lions Eye Institute and Royal Perth Hospital). He was visiting Professor at Center for Eye Research Australia, Melbourne Australia, from 2014 to 2016 where was involved in basic research on understanding functioning of Glaucoma Drainage Devices. He was also involved in the Glaucomatous Optic Neuropathy Evaluation (GONE) project, which is an Internet based system for evaluation of Optic Disc Assessment Skills among ophthalmologists and trainees. Dr. Pandav has been the President of the Chandigarh Ophthalmology Society, General Secretary North Zone Ophthalmological Society, General Secretary Glaucoma Society of India. He is actively involved in glaucoma research and has published about 100 research papers and delivered over 200 talks in various conferences/ seminars.



VI2

CYPASS TRIMMING

Jose Luis Torres Peña¹, Marta Montero Rodriguez¹, Maria Dolores Lago Llinas¹, Beatriz De Lucas Viejo¹, Esperanza Gutierrez Diaz¹

¹Hospital Universitario 12 de Octubre, Glaucoma, Madrid, Spain

We present two patients with a history of cypass implantation and reduction of endothelial cells. For trimming, we used capsulorexis scissors. Cypass trimming is a maneuver designed to reduce the loss of endothelial cells in susceptible patients.

Bio of the Author: Jose Luis Torres Peña. Degree in medicine: Catholic University of Santa Maria, Arequipa Peru, from 2004 to 2011. Resident internal doctor of ophthalmology: University Hospital October 12 in Madrid from 2012 to 2016. Training stay in glaucoma at the Hospital October 12: from June 2016 to December 2018. Glaucoma department doctor: San Rafael Hospital, Madrid, Spain, from January 2017 to the present. Medical Director: OftalmoVisión Clinic, Madrid, Spain, from February 2019 to present.



VI3

GONIOTOME; A NEW GLAUCOMA SURGERY FOR THE EUROPEAN MARKET

Vipul Ramjiani¹, Daniel Gosling¹, Graham Auger¹

¹Sheffield Teaching Hospitals NHS Foundation Trust, Eye, Sheffield, United Kingdom

Summary: Goniotome +IA is a minimally invasive glaucoma procedure, a new device in Europe. A V-shaped serrated blade removes trabecular meshwork via an ab-interno approach, allowing direct communication with Schlemm's canal. The goniotome blade is aided by irrigation and aspiration lines. This allows for clearer angle views and maintains anterior depth intraoperatively. The lines are connected to a phacoemulsification machine, simplifying its implementation. This video demonstrates its use in real eyes. We summarise our early experience and outcomes at Sheffield Teaching Hospitals NHS Foundation Trust, United Kingdom.

Bio of the Author: Mr Vipul Ramjiani is a senior trainee working at Sheffield Teaching Hospitals (STH) NHS Foundation Trust, United Kingdom. He will be going on to complete a fellowship in glaucoma before a consultancy post. He has produced this video to help with the awareness of Goniotome +IA. The procedure is currently being performed by Mr Graham Auger, Consultant Glaucoma Surgeon at STH. Mr Auger is the first surgeon in Europe to be performing the procedure.



VI4

SEMI-OPEN SUBTENON AB INTERNO XEN STENT TECHNIQUE**Yu Xiang George Kong^{1,2,3}**¹Royal Victorian Eye and Ear Hospital, Ophthalmology, Melbourne, Australia,²Mount Waverley Eye Surgeons, Melbourne, Australia, ³Monash Medical Centre, Ophthalmology, Clayton, Australia

Semi-open XEN insertion developed by Dr George Kong aims to (1) dissecting a potential space for filtration (2) avoid intra-tenon insertion (3) ensure adequate tissue above stent to avoid erosion (4) avoid anterior bleb leak. Semi-open technique involves the key steps of (1) small posterior incision ~2mm in length, ~8mm from limbus to reach subtenon space (2) dissect subtenon pocket with thin blunt dissector (3) maintain pocket using viscoelastic (4) insertion of XEN ab interno into pocket and (5) conjunctival closure with single 10-0 vicyl. This technique leads to diffuse, slightly elevated blebs with less risk of obstruction of XEN stent by tenon.

Bio of the Author: Dr George Kong is a Consultant glaucoma specialist at the Royal Victorian Eye and Ear Hospital and Monash Hospital in Melbourne. He received his ophthalmology training in Melbourne and subsequently received glaucoma surgical training in Melbourne and also with Prof. Keith Martin in Cambridge UK. He has completed a PhD on optic nerve and aging with Prof. Jonathan Crowston. He is the co-inventor of the world's first Apple iPad based perimetry software and is actively involved in research into home monitoring for glaucoma patients.



VI5

PRIMARY NEEDLING IN XEN45 GEL STENT IN GLAUCOMA SURGERY

Susana Perucho Martínez¹, Elena Martín Giral¹, Aitor Fernandez Garcia²,
Nicolas Toledano Fernandez¹, Carlos Fernandez Escamez¹

¹Hospital Universitario de Fuenlabrada, Ophthalmology, Madrid, Spain, ²Innova Ocular Madrid, Ophthalmology, Madrid, Spain

The XEN gel stent is a minimally invasive surgical device aimed at creating a subconjunctival drainage of aqueous humor, thereby reducing intraocular pressure (IOP). More important than where the implant is in the subconjunctival space, is that the implant is completely released in that space. For this we propose primary needling that ensures this correct position and therefore it's ensures the success rate of the XEN45 Gel Stent with a lower rate of postoperative maneuvers.

Bio of the Author: Susana Perucho Martínez. Hospital Universitario de Fuenlabrada, Madrid. Licenciada en medicina y cirugía (1995 - 2001). Doctora en Medicina y Cirugía en el año 2007. Universidad Complutense de Madrid. Subespecialidad en Glaucoma. Facultativo especialista de Área en el Servicio de Oftalmología del Hospital de Fuenlabrada desde Julio 2006 hasta la actualidad. Especialista en Glaucoma (desde 2006 hasta la actualidad). Profesara Colaboradora de Oftalmología de la Universidad Rey Juan Carlos de Madrid desde el año 2011 hasta la actualidad. Vocal de Tribunal de Tesis en los años 2011 - 2018. Directora de trabajos fin de Máster en la Universidad Rey Juan Carlos, 2018.



VI6

RESTORING DRAINAGE USING A PRESERFLO MICROSHUNT DURING BLEB REVISION**Paolo Meier¹, Tejal Magan¹, Avi Kulkarni¹***¹King's College Hospital, Ophthalmology, London, United Kingdom*

We describe a novel application for the Preserflo Microshunt during revision of a leaking conjunctival bleb. A 62 year-old patient presented with a leak from an avascular trabeculectomy bleb. Revision with excision of the avascular conjunctiva was undertaken. To improve long-term efficacy, a Microshunt was implanted beneath the existing scleral flap. The postoperative IOP was consistently below 12 mmHg without glaucoma medication and with no bleb encystment within 6 weeks following surgery. Implanting the Preserflo Microshunt under a previous trabeculectomy flap during bleb revision ensures good IOP control. Late failure may be less likely than if revision alone is undertaken.

Bio of the Authors: 1. Paolo Meier MD FMH Ophthalmology FEBO FICO, Glaucoma Fellow, King's College Hospital, London. 2. Tejal Magan MBBS, Specialist registrar, King's College Hospital, London. 3. Avi Kulkarni BSc MBBS FRCSEd (Ophth), Consultant Ophthalmologist, King's College Hospital, London.



VI7

RESCUE MICROSHUNT RESCUED

Marta Montero Rodriguez¹, Jose Luis Torres Peña¹, Maria Dolores Lago Llinas¹, Beatriz De Lucas Viejo¹, Esperanza Gutierrez Diaz¹

¹Hospital Universitario 12 de Octubre, Glaucoma, Madrid, Spain

An 18 years-old woman with advanced glaucoma diagnosed in childhood and previous surgery with Express and Ahmed valve in both eyes. Preserflo® Microshunt was implanted in the left eye. Two weeks later IOP was 25 mmHg. Surgical revision showed the tube entangled in the insertion of rectus muscle and blocked by fibrosis. After the tube was freed, good filtration was observed. It was fixed with a 10-0 nylon suture to direct it away from the muscle and covered by Ologen®. After 6 months, the IOP is 11 mmHg without treatment. Preserflo may be a good alternative in operated phaque patients. It may maintain a good function despite slight tilt of the tube.

Bio of the Author: Marta Montero Rodriguez. Current position: Staff physician in the Department of Ophthalmology at the “12 de Octubre” Hospital, Complutense University, Madrid, Spain. Medical School: Medicine and Surgery Bachelor, Santiago de Compostela University, Spain 1983. Graduate of Medicine and Surgery, Santiago de Compostela University, Spain 1983. Work: Ophthalmology Resident, Department of Ophthalmology, 12 de Octubre Hospital, Complutense University, Madrid, Spain:1989-1992. Staff Physician, Department of Ophthalmology at the 12 de Octubre Hospital, Complutense University, Madrid, Spain:1993-to present time. Scientific activity: Publications: International: 11, National: 6. Book: 1, Book chapters: 1. Speaker, Symposiums and Round Tables: 20. Clinical Trial: 3. Principal investigator in FIS: 1. Others: Residents Tutor from 01/07/2011 to 11/06/2019.



VI8

AHMED DRAINAGE IMPLANTATION IN PENETRATING KERATOPLASTY AND ANTERIOR CHAMBER RECONSTRUCTION**Tatyana Iureva¹, Nadezhda Senchenko²**

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Severe forms of the Dry Eye Syndrome is often accompanied by corneal xerosis, trophic ulcers and perforation formation resulting into secondary glaucoma. The treatment is problematic as hypotensive eye drops are not effective, maximum medical therapy (MMT) aggravates xerosis of the eye surface.

Purpose: To present a clinical case of surgical treatment of secondary glaucoma in a patient after corneal perforation with xerosis caused by target therapy of lymphoblastic leucosis. The patient with acute lymphoblastic leukemia was prescribed a target chemotherapy which led to clinical hematologic remission. During the second course of chemotherapy severe form of Dry Eye Syndrome and corneal ulcer developed. Corneal perforation, IOP elevation to 30 mmHg occurred. The decision on combined surgery was made: penetrating keratoplasty, reconstruction of the anterior segment, Ahmed drainage implantation. Ahmed drainage was implanted and sutured to sclera prior to penetrating keratoplasty. A “reverse” method of a hole formation was used for drainage implantation. The puncture was made by an injection needle from the side of the anterior chamber after the corneal excision. The anterior chamber was restored; the fusion between the iris and the cornea was separated. Three months after chemotherapy. The epithelized corneal graft was cloudy by 50%. The drainage was correctly located in the anterior chamber. IOP was 17 mmHg without medication.

Conclusion: The use of the proposed technique in penetrating keratoplasty ensures correct position of Ahmed drainage providing the normal level of IOP which is important for the engraftment of the donor cornea.



VI9

TIPS AND TECHNIQUES FOR MICROPULSE TRANS-SCLERAL CYCLOPHOTOCOAGULATION

Brinda Shah¹, Safaa Mahmoud¹, Apurva Goray¹, Paritosh Shah¹

¹Yeovil District Hospital NHS Foundation Trust, Ophthalmology, Yeovil, United Kingdom

Summary: This video demonstrates the technique of applying micropulse trans-scleral laser cyclophotocoagulation which is proving to be a safe, non invasive treatment for glaucoma with a quick post operative recovery. It addresses questions regarding anaesthesia , laser settings, equipment, technique and tips to make it a straightforward technique for a more effective treatment .We also briefly present our post operative care regimen and results.

Bio of the Author: Ms Brinda Shah is a Consultant Ophthalmologist in Yeovil District Hospital in Somerset ,UK, specialising in Glaucoma, having previously completed a Glaucoma and A&E fellowship at Moorfields Eye Hospital followed by a Research fellowship in Glaucoma at St Thomas Hospital London. She is also the speciality lead for NIHR clinical Research network for Ophthalmology for the South West Peninsula and is actively involved in teaching and training at Yeovil for doctors, allied professionals, optometrists and Medical students from Bristol Medical College.



V20

NON PENETRATING DEEP SCLERECTOMY: VISCO-DISSECTION OF THE TRABECULO-DESCEMET'S MEMBRANE AND SURGICAL MANEUVER TO SOLVE A POST SURGICAL INCARCERATION OF IRIS IN THE TRABECULO-DESCEMET'S MEMBRANE

Elena Milla¹, Marta Pazos¹, M^a Jesus Muniesa¹

¹Hospital Clínic of Barcelona. Institut Clínic d'Oftalmologia (ICOF), Glaucoma, Barcelona, Spain

Summary: Presentation of the glaucoma surgery video of two patients with open angle glaucoma by phaco-non-penetrating deep sclerectomy (NPDS) and visco-dissection of the trabeculo-Descemet's membrane (TDM). This visco-dissection facilitates the peeling of the TDM minimizing the risk of breaking it during surgery. In both cases, a biodegradable collagen matrix (Ologen[®]) implant was used at the sub and suprascleral level as a space maintainer and healing modulator. One of these patients presented spontaneous rupture of the MTD one month after surgery with the iris incarcerated in the MTD, so this patient required a new surgical intervention presented in this video. Incarcerated iris release was performed through paracentesis and iris traction with retinal forceps and performing an iridectomy with the help of a vitreotome with good evolution, diffuse filtering bleb formation and good intraocular pressure control.

Bio of the Author:

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Hospital Clínic of Barcelona. Institut Clínic d'Oftalmologia (ICOF), Spain, Glaucoma Department



V21

SURGICAL TREATMENT OF GLAUCOMA AND CATARACT IN A PATIENT WITH IRIS COLOBOMA**Maria Dolores Lago Llinas¹, Esperanza Gutierrez Diaz¹***¹Ophthalmology, Hospital Universitario 12 de Octubre, Madrid, Spain*

51 years old female with amblyopia in right eye. The ocular examination showed: 0.1 visual acuity, iris coloboma, cataract, deep anterior chamber depth and no phacodonesis. She needed 3 glaucoma drops and the optic nerve was severely affected. We performed a combined surgery of glaucoma and cataract by non-penetrating deep sclerectomy and phaco with tension ring. After the lens implantation we performed an iris suture by the Siepser ab-external technique.

Bio of the Author: Maria Dolores Lago Llinas. Academic qualification and training in ophthalmology: Medical degree, Medicine Faculty Autonomía University of Madrid, 1994-2001. Doctorate: Surgery Department of Autonomía University of Madrid, 2002-2004. Research aptitude, 2005. Specialized in ophthalmology in Hospital Universitario 12 de Octubre, Universidad Complutense de Madrid. 2002-2006. Professional experience: consultant in the glaucoma Department of Hospital Universitario “12 de Octubre” of Madrid since 2007. Book chapters and papers: first author: 6; second author: 29. Papers in training courses: first author: 8. International congress presentations: first author: 7. National congress presentations: first author: 38.



V23

DRAINAGE OF PRE-DESCEMETIC HEMATOMA AFTER NON-PENETRATING DEEP SCLERECTOMY**Maria Dolores Lago Llinas¹, Beatriz de Lucas Viejo¹**¹hospital Universitario 12 de Octubre, Ophthalmology, Madrid, Spain

76 year-old patient with atrial fibrillation treated with acenocoumarol and open-angle glaucoma in treatment with 3 drugs. A non-penetrating deep sclerectomy with 5-fluorouracil combined with phaco was performed. After 48 hours, the acenocoumarol was reintroduced. Two weeks later a hematoma in the scleral lake and upper intracorneal predescemetic space of 2.5 mm approaching the pupillary border was observed. A surgical drainage was decided and the procedure consisted of descematorhexis and blood drainage using a DSAEK spatula, hyperpressure controlled with viscoelastic, achieving the evacuation of the blood clot to the anterior chamber. In 5 months follow-up there has been no rebleeding.

Bio of the Author: Maria Dolores Lago Llinas. Academic qualification and training in ophthalmology: Medical degree, Medicine Faculty Autonoma University of Madrid, 1994-2001. Doctorate: Surgery Department of Autonoma University of Madrid, 2002-2004. Research aptitude, 2005. Specialized in ophthalmology in Hospital Universitario 12 de Octubre, Universidad Complutense de Madrid. 2002-2006. Profesional experience: consultant in the glaucoma Department of Hospital Universitario “12 de Octubre” of Madrid since 2007. Book chapters and papers: first author: 6; second author: 29. Papers in training courses: first author: 8. International congress presentations: first author: 7. National congress presentations: first author: 38.



V24

**NON-PENETRATING GLAUCOMA SURGERY (NPGC) WITH
SPURNECTOMY AND SUPRACILIARY IMPLANT****Alex Samir Fernández Santodomingo¹, Miriam Rahhal Ortuño¹, Emma
Marín Payá¹, Jorge Vila Arteaga²***¹Ophthalmology, Hospital Universitari i Politècnic La Fe, Valencia, Spain, ²Valencia,
Hospital Universitari i Politècnic La Fe, Glaucoma, Spain*

Within the glaucoma surgeries we have the Non-Penetrating Glaucoma Surgery (NPGS), being a variety of this with spolonectomy. This technique has proven its effectiveness in the maintenance of good control of intraocular pressure and safety. This surgery uses the initial steps similar to NPGS, the differentiating step is the removal of the scleral spur, with the consequent opening of the suprachoroidal space, where we can associate it with suprachoroidal implants. The association of spolonectomy with deep non-penetrating sclerectomy is an effective technique that significantly reduces intraocular pressure, maintaining this significant decrease during the first two years of surgery.

Bio of the Author: Alex Samir Fernández Santodomingo, resident of third year in ophthalmology in Hospital Universitari i Politecnico La Fe (Valencia, Spain). He have some participations in local and international congress with oral presentations and posters. The most interest areas of these participations are in glaucoma pathology and glaucoma surgery. He is currently pursuing his doctoral thesis, investigating about the changes in suprachoroidal spaces after glaucoma surgery. In this occasion, with a video presentation about Non-Penetrating Glaucoma Surgery with some special variations.



V25

DEEP SCLERECTOMY COMBINED WITH OLOGEN IMPLANT AND MITOMYCIN-C APPLICATION FOR TREATMENT OF PRIMARY OPEN ANGLE GLAUCOMA

Mohamed Elmalah¹

¹AIAzhar University Hospital in Cairo, Ophthalmology, Cairo, Egypt

Summary of the Video: The video presented the modifications of Deep Sclerectomy with Deg-roofing of the Schlemm's canal, associated with Ologen implant under Scleral flap that treated during surgery by Mitomycin-C application for 2 minutes in a concentration of 0.2% under first sclera flap for treatment of Primary Open Angle Glaucoma patients. This operation can be done separately or combined with Phaco- emulsification. As prescribed in the video, the procedure is safe and not associated with marked or severe complications as with trabeculectomy, as hypotony and shallow AC. Even it can be done suture-less. Long- term follow up for more than two years revealed high success rate with minimal complications.

Thanks Dr Mohamed Elmalah MD, PhD



V26

NON-PENETRATING GLAUCOMA SURGERY. DEEP SCLERECTOMY WITH SPACE MAINTAINER IMPLANT**Ali Albeshri***King Khalid Eye Specialist Hospital, Riyadh, Saudi Arabia*

Lately, I realized that when you have an uncontrolled open angle glaucoma it is very useful to think about deep sclerectomy at the first place, no matter what is the stage of glaucoma or what was the level of intra-ocular pressure. The outcome is always promising, and has faster visual recovery. At least I can enjoy my sleep.

Here is 45-year-old lady who is known to have advanced open angle glaucoma in her only seeing right eye. She was uncontrolled on maximum tolerated medications. The decision was to go for deep sclerectomy with space maintainer implant.

The procedure started with peribulbar block and the eye prepped and draped as usual.

Pilocarpine instilled preoperatively to constrict the pupil and stretch the iris tissue away from the planned area of trabeculo-descemet's window. 7-0 vicryl as a tractional suture applied, then fornix-based peritomy at the 12 O'clock was carried out. Hemostasis done gently. Then, superficial scleral flap fashioned in a pocket-like manner. Mitomycin C 0.2mg/ml applied subconjunctivally and undermined the flap for 2 minutes. Copious amount of balanced salt solution used to irrigate the area, then milked out to dry the field preparing it to the next step. Superficial flap extended to the corneal stroma for 2mm. After that, deep flap performed meticulously, and aqueous fluid observed percolating nicely. Deep flap excised from its base successfully. Inner wall of Schlemm canal & juxtacanalicular trabecula are peeled off using special forceps. After we created an incision to the supraciliary space, a space maintainer implanted to prevent collapse of superficial flap.

Then, superficial flap repositioned and closed loosely with 10-0 nylon. The conjunctiva closed also with 9-0 vicryl suture. The wounds checked for leak then subconjunctival injection of steroid and antibiotic at the end.

The day 1 post-operatively the patient was doing great and the IOP was 06 mmHg with deep AC and flat retina and she was discharged right away.



V27

TRABECULAR PEELING TECHNIQUE FOR PERFORMING AB INTERNO TRABECULECTOMY - 1 YEAR RESULTS

Ankush Mahajan¹, V.k. Mahajan¹

¹Mahajan Eye Hospital and Maternity Home, Ophthalmology, Jalandhar, India

Purpose: To evaluate the efficacy of a novel technique of performing ab interno trabeculectomy either alone or when combined with phacoemulsification in the management of glaucoma.

Methods: A retrospective study of 38 patients. the trabecular meshwork was incised for a few clock hours at its anterior border using a 30G needle . The trabecular tissue flap was firmly grasped with a 25G ILM peeling forceps and pulled out creating a free flap of trabecular meshwork 3-4 clock hours long .This flap was then repeatedly held and pulled in a tangential direction using either ILM or a capsulorrhexis forceps to complete 120 to 360 degrees trabeculectomy.

Results: 33 underwent combined phaco with trabeculectomy , 5 underwent only trabeculectomy . Complete 360 degree ab interno trabeculectomy was accomplished in 8 cases .120 degree of trabecular meshwork was peeled off in 30 cases .The pre op IOP was 22.79 ± 5.95 mm of Hg .The post op IOP at 1 week , 1 month, 6 month and 1 year was 15.66 ± 4.6 (n=38), 15.62 ± 3.43 (n= 34) , 16.15 ± 3.07 (n= 27) , 16.11 ± 2.74 (n= 37) (p= 0.0001) respectively.The anti glaucoma medication use decreased from 2.0 ± 0.83 preoperatively to 0.2 ± 0.6 at 1 year. Hyphema occurred in 94.74% cases but resolved spontaneously in all.

Conclusion: This new technique of trabecular peeling is an effective method of achieving 120- 360 degree of Ab interno trabeculectomy causing clinically significant decrease in IOP in both open as well as narrow angle glaucoma patients.



V28

**THE ROLE OF POROUS COLLAGEN IN TRABECULECTOMY
WITHOUT SUTURING SCLERAL FLAP**Ahmed Elbably¹*¹East Kent Hospitals University, Ophthalmology, Canterbury, United Kingdom*

Purpose: To assess the role of porous collagen in trabeculectomy without suturing the scleral flap.

Methods: Twenty five eyes of twenty five patients with different types of glaucomas. Intra ocular pressure was not controlled medically. Trabeculectomy was performed with double-layered-ologen sandwiching the scleral flap. No scleral sutures were performed. 18 months follow up were performed.

Results: Average IOP after 18 months follow up is low teens with mild short term complications.

Conclusion: Double-layered-porous collagen sandwiching the sutureless scleral flap can enhance the short term results of trabeculectomy.



V29

SUTURE LESS SCLERAL TUNNEL TRABECULECTOMY IN MANAGEMENT OF PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA**Mohammad D.M. Arish^{1,2}***¹Ophthalmology, Zahedan University of Medical Sciences, Zahedan, Iran, ²Edinburgh. Consultant Neuro-ophthalmology, Glaucoma*

To assess the effect of suture less scleral tunnel trab. In the management of POAG patients.

Bio of the author: Fellow Of Royal College of Surgeons of Edinburgh Assistant Prof. Zahedan University Of Medical Sciences, Member of European Glaucoma Society.



V30

COMBINED KERATOPLASTY ,CATARACT WITH IOL AND AHMED VALVE IMPLANTATION FOR CONGENITAL ANIRIDIA**Hani Nasr¹***¹Memorial Eye Institute for Ophthalmic Research, Ophthalmology, Cairo, Egypt*

Left eye underwent keratopalsty at 7 months age IOP was normal. Right eye tension was 35 mm Hg trabeculectomy with mitiomycin failed → did another operation trabeculectomy with trabecotomy developed corneal opacity with complicated cataract tension with 30 mmHg. Combined keratoplasty I/A with PMMA IOL and Ahmed valve implantation for the right eye. Post operative cornea is clear IOL in place IOP 10 mmHg.



V31

TUBE IN TUBE TECHNIQUE**Lina Osman¹, Peter Shah², Joseph Abbott²***¹Leicester Royal Infirmary , Ophthalmology, Leicester, United Kingdom, ²Birmingham Childrens' Hospital, Ophthalmology , Birmingham , United Kingdom*

Glaucoma drainage devices are widely used. Tube retraction is a recognised post-operative complication, which can occur at any postoperative stage. It is reportedly commoner in the paediatric population due to axial growth and increase scarring response. Many techniques have been described for tube extension. Chiang et al recently described the novel Tube in Tube technique. This video shows the technique being used on two children by the same surgeon. We include in the presentation intra-operative surgical video and wet lab footage to highlight learning points for those new to the procedure, as well as pro and cons of the technique. We found the technique extremely useful and effective. It allows stable tube placement and good pressure control and is our preferred means of tube extension.

Bio of the Authors: 1. Ms Lina Osman. University Hospitals of Leicester; Leicester Royal Infirmary MBBS, MSc CEH, FRC Ophth.
2. Prof Peter Shah. University Hospitals Birmingham NHS Foundation Trust BSc (Hons), MB ChB, FRC Ophth, FRCP Edin.
3. Mr Joseph Abbott. University Hospitals Birmingham NHS Foundation Trust BM BS, BMedSci, FRC Ophth.



V32

DRAINAGE DEVICE IMPLANTATION IN SEVERE SCLEROMALACIAElena Milla¹, Marta Pazos¹, M^a Jesus Muniesa¹¹Hospital Clinic, Ophthalmology, Barcelona, Spain

We present the case of a 58 yo lady with advanced, refractory primary open-angle glaucoma and severe idiopathic scleromalacia that presented previous failed trabeculectomy and endocyclophotocoagulation. Due to visual field progression and intolerance to multiple medications she was scheduled for drainage device implantation. Severe, extensive scleral thinning was observed in all four quadrants. A donor scleral graft was sutured in the upper temporal quadrant, securing the graft to the areas of relatively healthy scleral tissue. An Ahmed valve was then sutured to the donor sclera and the tube obstructed with occlusive 7/0 vycril peritubular suture to avoid postoperative hypotony due to tissue debility.

Bio of the Author: Degree of Medicine and Surgery at the Faculty of Medicine of the Central University of Barcelona in July 1991 and specialization in Ophthalmology at Hospital de Bellvitge, Barcelona from 1991 to 1995. PhD in Medicine at the University of Lausanne (Switzerland). Fellowship at Jules Gonin hospital (Lausanne, Switzerland) from 1996 to 1998 in Ocular genetics. Member of the Spanish Thematic Network of Cooperative Research in Health (RETICS). Researcher at IDIBAPS, Hospital Clinic of Barcelona. Glaucoma consultant at Institut Comtal d'Oftalmologia (ICO) and Hospital Clínic of Barcelona. Director of the Genetics Unit at the Institut Comtal d'Oftalmologia, Barcelona (www.icoftalmologia.es) from 2006 to date. Assistant Professor of Ophthalmology at the University of Barcelona; Faculty of Medicine from 2006.



V33

**EXACT POSITIONING OF TUBE IN POSTERIOR CHAMBER DURING
GLAUCOMA DRAINAGE DEVICE (GDD) SURGERY****Jose Luis Torres Peña¹, Beatriz De Lucas Viejo¹, Maria Dolores Lago
Llinas¹, Marta Montero Rodriguez¹, Esperanza Gutierrez Diaz¹***¹Hospital Universitario 12 de Octubre, Glaucoma, Madrid, Spain*

We present a technique described by Javier Moreno-Montañés MD (Spain) that facilitates the insertion of the tube in the posterior chamber. The tunnel is made with a 23G needle from the inside of the globe, advancing below the iris into the ciliary sulcus and exiting towards the sclera, and the tube is guided by a 10-0 prolene suture double armed with straight needles passed through the end of the tube. The advantages are the guiding of the tube that prevents kinking or entrapments in the zonula or lens capsule, and the entrance placed more posteriorly, which give us less extraocular portion of the tube and less risk of exposure.

Bio of the Author: Jose Luis Torres Peña. Degree in medicine: Catholic University of Santa Maria, Arequipa Peru, from 2004 to 2011. Resident internal doctor of ophthalmology: University Hospital October 12 in Madrid from 2012 to 2016. Training stay in glaucoma at the Hospital October 12: from June 2016 to December 2018. Glaucoma department doctor: San Rafael Hospital, Madrid, Spain, from January 2017 to the present. Medical Director: OftalmoVisión Clinic, Madrid, Spain, from February 2019 to present.



V34

**BAERVELDT IMPLANT COMBINED WITH VITRECTOMY IN
NANOPHTHALMOS****Esperanza Gutierrez Diaz¹, Marta Montero Rodriguez¹, Beatriz De Lucas Viejo¹, Jose Luis Torres Peña¹, Maria Dolores Lago Llinas¹***¹Hospital Universitario 12 de Octubre, Glaucoma, Madrid, Spain*

A 27-year-old male with nanophthalmos (axial length 17 mm) and advanced glaucoma, with previous strabismus and refractive surgery (multifocal lens insertion in piggyback). In the right eye, an Ahmed valve was implanted but had to be removed due to recurrent exposure. For the right eye, we choose a Baerveldt implant due to its thin and flexible plate, which was trimmed to adapt it to the eye size. The tube was inserted in the vitreous cavity (associated vitrectomy), and covered with a fascia lata patch. A full-thickness sclerotomy was also performed. After a follow-up of 18 months, IOP is controlled in the low teens without medical treatment, and without exposure of the device.

Bio of the Author: Esperanza Gutiérrez-Díaz. Staff Physician and Chief of Anterior Unit in the University Hospital 12 de Octubre, Complutense University of Madrid. She specializes in glaucoma since 1990. Her main areas of interest are glaucoma drainage devices and non-penetrating filtering surgery. She has participated in numerous national meetings as speaker and has authored more than 50 papers in peer-reviewed scientific journals. She has written a book about Glaucoma Drainage Devices and several chapters of books regarding glaucoma and examination techniques, and collaborates with several journals as reviewer.



V35

GLAUCOMA DRAINAGE IMPLANTS: LEARNING FROM EXPERIENCE AND TIPS FOR THE BEGINNERS

Rashmi Krishnamurthy¹, Sirisha Senthil¹

¹LV Prasad Eye Institute, VST Glaucoma Centre, Hyderabad, India

Glaucoma Drainage Devices (GDDs) play a significant role in the treatment of refractory glaucomas in both children and adults. Various steps during implant surgery including conjunctival incision and closure, implant fixation and tube insertion may be challenging for the beginners. Additional steps prophylactically like Pars plana vitrectomy and irido-zonulo-hyloido-vitrectomy also is challenging in the same sitting. With experience, we have learnt few modifications during surgery which makes it easier to learn and perform implant surgery for beginners even in most complex situations and the same are described in this video.

Bio of the author: Rashmi Krishnamurthy completed her basic medical education from Vydehi Institute of Medical Sciences, Bangalore, followed by Post graduation in Ophthalmology from Minto Ophthalmic Hospital - Bangalore Medical College, Bangalore and Venu Eye Institute, New Delhi. She then pursued long term Fellowship in Glaucoma from LVPEI, Hyderabad. Rashmi is well trained in managing both adult and childhood Glaucomas. Her other areas of interest are managing combined Surgeries, implant surgeries and complex glaucomas. She is a member of the Glaucoma Society of India and All India Ophthalmological Society. She has a keen interest in research and academics and has published papers and presented at various conferences.



V36

ANTERIOR VITRECTOMY PLUS PHACOEMULSIFICATION IN TREATMENT OF MALIGNANT GLAUCOMA

Fei Li¹, Xiulan Zhang¹

¹Zhongshan Ophthalmic Center, Clinical Research Center, Guangzhou, China

A middle-aged woman with malignant glaucoma after anti-glaucoma surgery received surgical treatment. Anterior vitreous body (AVB) was partially removed to decrease the intraocular pressure (IOP). Then anterior chamber was reformed with viscoelastic agent and phacoemulsification was performed to extract the lens. Intraocular lens implantation was completed with the insertion of capsular tension ring. Then AVB was fully removed to keep a normal IOP. After the surgery, the patient's anterior chamber kept deep and IOP was well controlled. No progression was seen in the follow-up visits. Anterior vitrectomy plus lens extraction is an effective way to treat malignant glaucoma.

Bio of the Authors: Fei Li, MD, PhD, is currently working at Zhongshan Ophthalmic Center. His research interests include ocular imaging, big data in glaucoma and cognitive impairment in glaucoma.

Prof. Xiulan Zhang, MD, PhD, glaucoma specialist, is currently the director of the Clinical Research Center at Zhongshan Ophthalmic Center. She is the outstanding PI of State Key Laboratory of Ophthalmology in China, and was listed as one of the TOP 100 influential people in ophthalmology in 2014. She was awarded the Achievement Award of APAO in 2017. She is the fellow of the AAPPO and the board member of the Asia-Pacific Glaucoma Society (APGS), Asia Angle-Closure Glaucoma Club (AACGC) and the secretary of Chinese Glaucoma Society (CGS). She also served as the Convener of the Glaucoma Scientific Program of APAO Congress 2018-2019.

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P002

24-MONTH OUTCOMES OF EXCISIONAL GONIOTOMY WITH THE KAHOOK DUAL BLADE IN ANGLE-CLOSURE GLAUCOMA

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Purpose: To characterize the long-term effects of phacoemulsification with Kahook Dual Blade (KDB)-assisted goniosynechialysis and excisional goniotomy on intraocular pressure (IOP) and IOP medication use in eyes with angle-closure glaucoma (ACG) and cataract.

Methods: Retrospective analysis of 42 eyes of 24 subjects through 24-months of follow-up. IOP and medication data were collected at each follow-up visit.

Results: Preoperatively, mean (SE) IOP was 25.5 (0.7) mmHg and the mean number of medications per eye was 2.3 (0.1). At 24-months, mean IOP was 13.5 (0.4) mmHg (-12.0 mmHg [47.1%]; $p < 0.0001$) and the mean number of medications used was 0.5 (0.1) medications per eye (-1.8 medications [78%]; $p < 0.0001$). At 24-months, 40/42 eyes (95.2%) achieved IOP < 18 mmHg, 42/42 eyes (100%) achieved IOP reduction of $> 20\%$, 36/42 eyes (85.7%) required > 1 fewer medications for IOP control, and 29/42 (69.0%) were medication-free. No eyes required additional glaucoma surgery through 24-months of follow-up. No vision-threatening complications occurred in any eye.

Conclusions: Phacoemulsification plus KDB-assisted goniosynechialysis/excisional goniotomy in ACG produced statistically and clinically significant reductions in both IOP and medication use through 24 months of follow-up. The need for more invasive procedures (trabeculectomy or tube-shunt implantation) was prevented or delayed in all eyes for at least 2 years. This procedure provides a significant and sustained benefit in eyes with ACG and cataract.



P005

LONG-TERM EVALUATION OF ISTENT SURGERY PERFORMED ON JAPANESE PATIENTS

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Purpose: To evaluate the long-term results of iStent surgery performed on Japanese patients.

Methods: This was a retrospective nonrandomized observational study. iStent surgery was performed on 70 eyes from 54 patients (mean age 75.5±6.92, range 61-88, 20 males and 34 females) in Yamanashi University from April 2017 to December 2018.

Results: Primary open-angle glaucoma was observed in 47 eyes, secondary glaucoma in 4 eyes, pseudo-exfoliation glaucoma in 12 eyes, other type of glaucoma in 7 eyes. All surgery was performed with phacoemulsification. Mean preoperative IOP of 16.3±4.5mmHg decreased to 13.9±3.0mmHg at 1 months, 14.2±3.1mmHg at 3 months, 14.5±2.9mmHg at 6 months, 14.4±2.4mmHg at 12 months, respectively (P<0.05). Adjunctive medication decreased from 3.6±1.2 to 1.0±1.2 at 6 months, 1.0±1.2 at 12 months, respectively (P<0.001). BCVA was significantly improved from 0.41±0.48 to 0.11±0.29, respectively (P<0.001). Corneal endothelial cell density decreased from 2391.6±377.8 to 2254.9±446.7, respectively (P<0.001). 5 eyes occurred short-term IOP elevation. 2 eyes received additional glaucoma surgery.

Conclusion: iStent surgery is safe and effective for Japanese patients.



P006

IMPLEMENTATION OF A PILOT OPHTHALMIC-FOCUSSED UNDERGRADUATE MICROSURGICAL SKILLS TRAINING PROGRAMME

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Purpose: Given a current paucity of UK undergraduate microsurgical and Ophthalmic surgery-focussed practical courses, we introduced a novel national course engaging medical students interested in microsurgical specialties, particularly Ophthalmology.

Methods: Collaborating with an international eye-care pharmaceutical company, we delivered a programme incorporating lectures covering microsurgical techniques and ophthalmic-focussed content including anatomy, phacoemulsification principles and procedure, and strabismus. Subsequently, 16 students utilised state-of-the-art phacoemulsification systems removing in-situ cataracts from simulation eyes via established surgical proforma, intraocular lens implantation into the aphakic eyes, and microsuturing. Additionally, we provided high-fidelity Ophthalmic surgical simulators with forceps-training and capsulorrhexis modules, and virtual-reality headsets for anatomy demonstration.

Results: We administered pre-/post-course questionnaires to all delegates. 5-point Likert-responses demonstrated statistically significant increases across metrics: confidence describing phacoemulsification steps; 1.75 ± 1.13 to 4.44 ± 0.63 ($p < 0.0001$), confidence performing basic microsurgical techniques; 2.31 ± 1.14 to 3.88 ± 0.62 ($p < 0.0001$), and to considering a surgical career; 3.94 ± 0.93 to 4.63 ± 0.62 ($p = 0.0195$). Qualitative feedback included 'an incredible, transformative experience'. Lecture Likert-responses ranged from 4.50 ± 0.82 to 4.81 ± 0.40 and practical sessions 4.25 ± 0.86 to 5.00 ± 0.00 .

Conclusion: Given these encouraging data we propose to collaboratively expand and implement this novel educational initiative, increasing undergraduate engagement with microsurgery and Ophthalmology.



P007

ASSOCIATION BETWEEN MORPHOLOGICAL CHANGES IN FILTERING BLEBS AND INTRAOCULAR PRESSURE INCREASE AFTER PHACOEMULSIFICATION

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Purpose: To evaluate the association between morphological changes in filtering blebs and intraocular pressure (IOP) increase post-phacoemulsification using three-dimensional anterior segment optical coherence tomography (3D AS-OCT).

Methods: Thirty-three eyes of 32 patients with functioning blebs who had undergone phacoemulsification were included. The subjects were classified into an IOP-increase group and an IOP-stable group, according to whether they had an IOP increase post-phacoemulsification. Pre-phacoemulsification IOP, time interval between trabeculectomy and phacoemulsification, and changes in 3D AS-OCT parameters, including maximum bleb height, maximum bleb wall thickness, and the ratio of the hypo-reflective space of the bleb wall, were compared. The subjects were also divided into a low-IOP group (<10 mmHg) and a high-IOP group (\geq 10 mmHg), based on the pre-phacoemulsification IOP, and the subjects were evaluated for changes in IOP and 3D AS-OCT parameters.

Results: There were no significant differences in pre-phacoemulsification IOP, time interval, and the 3D AS-OCT parameter changes between the IOP-increase and IOP-stable groups. The low-IOP group showed a significant IOP increase along with a significant decrease in maximum bleb wall thickness, whereas the high-IOP group showed no significant increase in IOP despite substantial decreases in all the 3D AS-OCT parameters.

Conclusion: Morphological changes in filtering blebs may not be a major factor for an IOP rise after phacoemulsification.



P008

OUTCOMES OF PHACOEMULSIFICATION COMBINED WITH TWO ISTENT INJECT TRABECULAR MICROBYPASS STENTS WITH AND WITHOUT ENDOCYCLOPHOTOCOAGULATION

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Purpose: Comparison of results after combining two iStents insertion with phacoemulsification and endocyclophotocoagulation (ICE2) vs phacoemulsification-iStents alone.

Methods: Longitudinal study (December 2017-June 2018) in eyes with ocular hypertension or early-to-moderate glaucoma. Level of disease, intraocular pressure (IOP) and tolerance of glaucoma medication were considered before surgery was planned. Best corrected visual acuity (BCVA), IOP, number of medications were assessed at baseline, then week 1, week 5, month 3, 6, 12 post-op. Main outcome: percentage in IOP reduction at 12 months vs medicated baseline. Secondary outcomes: absolute values of IOP/medication reduction, BCVA and post-op complications.

Results: ICE2 group included 63 eyes and Phaco-iStent group 46 eyes. Baseline IOP was higher in the ICE2 than phaco-istent group (19.97 ± 4.31 mmHg vs 17.63 ± 3.86 mmHg, $p = 0.004$) and MD lower (-7.20 ± 2.58 dB vs -4.94 ± 4.51 dB, $p = 0.037$). Number of medications were comparable at baseline: 2.22 ± 1.06 (ICE2) vs 2.07 ± 1.02 (phaco-iStent), $p = 0.442$. At month 12 post-op, IOP in the ICE2 group decreased with 35% from baseline vs 21% in the phaco-iStent group ($p = 0.03$); absolute values of IOP reductions were significantly lower than baseline in each group ($p < 0.001$), yet final IOP was lower in the ICE2 group than phaco-iStent group (13.05 ± 2.18 mmHg vs 14.09 ± 1.86 mmHg, $p = 0.01$). Similar results were found for glaucoma medication (1.24 ± 1.05 in ICE2 group vs 1.39 ± 1.03 in phaco-iStent group, $p = 0.01$). Final BCVA was 0.11 ± 0.18 logMAR (phaco-iStent group) vs 0.08 ± 0.08 (ICE2 group), $p = 0.309$. Safety outcomes were comparable between groups.

Conclusion: ICE2 procedure offers better results in IOP/medication reduction at 12 months than phacoemulsification-iStents alone.



P009

THREE-YEAR OUTCOMES OF COMBINED ISTENT AND CATARACT SURGERY

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Purpose: To assess safety and efficacy through 3 years following iStent implantation with concomitant cataract surgery in patients with open-angle glaucoma (OAG) and cataract.

Methods: 80 patients with OAG with different stages of cataract were included in this retrospective study. Patients were taking at least 2 glaucoma medications. Following washout of glaucoma medication, all eyes underwent uncomplicated surgery of phacoemulsification, IOL implantation and stent implantation. Assessments through 36 months included intraocular pressure (IOP), best corrected visual acuity (BCVA), visual field, pachymetry and cup to disc (C/D) ratio.

Results: At the baseline exam, unmedicated IOP ranged from 24 mmHg to 36 mmHg. At 3 years, 73% of patients had IOP ranging from 12 mmHg to 15.5mmHg, representing a greater than 18 mmHg IOP reduction from baseline IOP. In the remaining 27% of patients, IOP ranged from 16 mmHg to 19 mmHg. No patients restarted glaucoma medication after surgery. No intraoperative or postoperative complications were observed; BCVA, VF, pachymetry and C/D ratio were stable over 3 years. Three patients underwent Nd:YAG capsulotomy for posterior capsular opacification.

Conclusion: iStent implantation with cataract surgery provides safe outcomes through 3 years, with sustained reduction in IOP and medication, improvement in BCVA, and stable visual fields.



P010

GONIOSYNECHIALYSIS WITH INTERNAL LIMITING MEMBRANE FORCEPS - A NOVEL METHOD

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Purpose: Various surgical techniques for achieving goniosynechialysis have been described. Here we outline our results using internal limiting membrane peel forceps to release peripheral anterior synechiae from the angle following temporal approach phacoemulsification.

Methods: A retrospective case notes review was performed. 13 cases of combined cataract surgery and goniosynechialysis performed by a single surgeon (SW) were analysed. Gonioscopy was performed using a disposable Swan Jacobs direct gonioscope. A 25 gauge internal limiting membrane forceps (Grieshaber Revolution DSP) was advanced through the main incision and visible synechiae were removed. We aimed for around 180 degrees of goniosynechialysis in the nasal angle in one sitting.

Results: The average preop vision was 0.22 logMar preop and 0.18 postop. The mean IOP pre-operatively was 21.5 (11-33 mmHg), at the appointment nearest to 4 weeks postop this was 18mmHg (10-23 mmHg). No patients at this point had an IOP higher than baseline. The average number of IOP agents patients were taking was unchanged (2). 1 patient experienced hypotony (IOP of 4 mmHg). 3 patients developed an IOP spike of 5mmHg or more from preop IOP. All of these resolved by 4 weeks. Average duration of follow-up was 27 weeks (4-67).

Conclusion: We describe a safe and effective method for removing peripheral anterior synechiae with the use of ILM peel forceps.

Acknowledgement: Mr Imran Masood (Birmingham and Midlands Eye Center) for introducing us to this technique.



P011

AHMED-VALVE GLAUCOMA DRAINAGE DEVICE MODEL FP7 COMBINED WITH GONIOSCOPY ASSISTED TRANSLUMINAL TRABECULOTOMY: A NOVEL TECHNIQUE FOR ADVANCED GLAUCOMA

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Purpose: To describe a novel surgical combination for intraocular pressure (IOP) lowering in advanced cases of glaucoma.

Methods: We describe one case of advanced glaucoma with failed trabeculectomy on maximally tolerated medical therapy. The authors feared a potential IOP spike following gonioscopy assisted transluminal trabeculotomy (GATT) might have devastating visual consequences. To help protect against an IOP spike following GATT the authors performed a combined GATT and Ahmed FP7 glaucoma valve procedure.

Results: Preoperative IOP was 25 mmHg in the involved eye following a failed trabeculectomy. On post-operative day one, following right eye Ahmed valve FP7 combined with GATT, the Snellen visual acuity was 20/50 and the IOP was 11 mmHg (Tonopen). Subsequent IOP measurements were all below 10 mmHg. At 3 months the IOP remained at 9 mmHg. No surgical complications occurred.

Conclusions: Previous glaucoma drainage devices combined with minimally invasive glaucoma surgeries have been described, most notably the Baerveldt and Xen implant. Using a GATT and Ahmed glaucoma valve may present a more cost-effective solution with less risk of post-operative complications. Furthermore, for patients travelling from rural centres for glaucoma care this may be a useful procedure given reduced risk of post-operative complications and interventions when compared to trabeculectomy and Baerveldt glaucoma drainage device. This procedure may improve chances of lowering IOP below that of an Ahmed valve alone, while protecting against potential post-operative IOP spikes.



P012

OUTCOMES OF PHACOTRABECULECTOMY VS TRABECULECTOMY IN A SINGLE SURGEON, SINGLE UNIT SETTING

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Purpose: The combined procedure of phacotrabeculectomy may be viewed as problematic as it is thought it may have greater complication rates and affect long term outcomes. We aim to report the outcomes of phacotrabeculectomy compared to trabeculectomy carried out by a single surgeon in a single centre.

Methods: A retrospective study was carried out. Inclusion criteria were all patients who underwent either phacotrabeculectomy or trabeculectomy between January 2014 and March 2018. The primary outcomes assessed were change in IOP, number of topical medications and complication rate.

Results: 41 patients were included in the phacotrabeculectomy group and 255 patients were included in the trabeculectomy group. There was no significant difference in age ($p = 0.2732$) or pre-operative IOP ($p = 0.28$) between the two groups. There was a significant difference in the mean number of drops pre-operatively ($p = 0.027$) with the phacotrabeculectomy group being on fewer drops (2.3 vs 2.5). There was no difference in the mean number of topical glaucoma medications used post-operatively ($p = 0.61$). There was no difference in post-operative IOP at 12 months ($p = 0.26$), 18 months ($p = 0.96$) or at final follow up ($p = 0.86$). Complication rates were 19.5% in the phacotrabeculectomy group and 9.01% in the trabeculectomy group.

Conclusion: The change and long term control in IOP is the same regardless of whether the patients underwent a combined procedure or trabeculectomy alone. Although the complication rate appeared higher in the phacotrabeculectomy group only three of these patients required any intervention for these including one bleb revision for hypotony and kenlog injections for macular oedema.



P013

LASER AND SURGICAL COMBINED TECHNOLOGY IN GLAUCOMA AND CATARACT TREATMENT**Tatiana Sokolovskaya¹, Boris Malyugin¹, Valeriya Yashina¹***¹The S. Fyodorov Eye Microsurgery Federal State Institution, Moscow, Russian Federation*

Purpose: To compare phacoemulsification alone and phacoemulsification with YAG-laser activation of trabecula (YAG-LAT) in eyes with primary open-angle glaucoma and coexisting cataract.

Methods: The study included 70 patients (70 eyes) with initial and advanced stages of primary open-angle glaucoma and coexisting cataract. The follow-up period is 24 months after the treatment. The patients were divided into two groups: combined group - 36 patients (36 eyes) who underwent YAG-LAT and phacoemulsification and the control group - 34 patients (34 eyes) who underwent phacoemulsification alone. YAG-LAT were realized by Tango Laser unit (Laserex, Australia): Nd-YAG laser, 1064nm, 0.9-1.5MJ, 30NS pulse duration, a spot diameter of 10-15µm, in the quantity of 55-70 pulses in the lower semicircle. Phacoemulsification was carried out 30-60 minutes later. The baseline IOP in the combined and control groups was 20.95 ± 2.98 mmHg and 20.50 ± 3.01 mmHg respectively. The mean medication use was 1.53 ± 0.65 in the combined group and 1.44 ± 0.50 in the control group.

Results: No complications were noted. At 24 months, the mean IOP was 15.21 ± 1.45 mmHg after combined treatment ($p < 0.001$) and 17.52 ± 1.83 mmHg after phacoemulsification alone ($p = 0.001$). By the end of the follow-up period, the mean medication use decreased from 1.53 ± 0.65 to 0.64 ± 0.56 after combined treatment ($p < 0.001$), and increased from 1.44 ± 0.50 to 1.92 ± 0.28 after phacoemulsification alone ($p = 0.001$).

Conclusion: Combined phacoemulsification and YAG-LAT was effective in reducing IOP and/or medication burden in POAG patients.



P014

**BENCHMARKING POSTERIOR CAPSULE RUPTURE RATE IN
GLAUCOMA PATIENTS BEFORE AND AFTER PATIENT-SURGEON
RISK MATCH****Fernanda N. Susanna¹, Renata Puertas²***¹University of São Paulo, São Paulo, Brazil, ²Moorfields Eye Hospital, London, United Kingdom*

Purpose: To investigate posterior capsule rupture (PCR) rate in glaucoma patients before and after the implementation of patient risk and surgeon match system.

Methods: The study included patients from the Glaucoma service between 2010 - 2017 that had phacoemulsification. Rates of PCR are analysed annually for internal reporting use and were compared before and after implementation of patient risk and surgeon match system.

Results: The rate of PCR was 1.75% in 2010-11, 1.04% in 2012-13, 1.30% in 2014, 0.91% in 2015, 1.01% in 2016 and 1.03% in 2017. The mean rate before matching system was 1.36%; after intervention the PCR rate dropped to 0.98%, showing a reduction of 27.9% in the unadjusted PCR rate.

Conclusion: The PCR rate was within national standards (1.95%) at all time. It also concurred with the 30% reduction in National Ophthalmic Database between first reporting in 2010 and subsequent one in 2016-2017. This shows how a robust reporting system with feedback can aid to patient safety, boosting performance with benchmarking.



P015

COMPARATIVE OUTCOMES OF AB INTERNO CANALOPLASTY VS GOLD STANDARD TRABECULECTOMY IN UNCONTROLLED OPEN ANGLE GLAUCOMA

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Purpose: To compare the efficacy and safety of AB interno Canaloplasty (ABiC) with the gold standard Trabeculectomy in patients with uncontrolled primary open angle glaucoma (POAG).

Methods: Patients with uncontrolled POAG who received the surgical intervention studied were included: 26 eyes underwent trabeculectomy (GI), 16 eyes phacotrabeculectomy (GIII), 13 eyes ABiC (GII) and 30 eyes phacoABiC (GIV). Outcomes measures included IOP, glaucoma medication, visual acuity, complications and postoperative reoperations.

Results: This study included 85 eyes. Baseline IOP \pm SD was 22.4 \pm 8.7 mmHg in GI, 19.6 \pm 3.8 GII ($p=0.236$) and at 12 months were 12.6 \pm 2.2 and 13.4 \pm 2.7 respectively ($p= 0.372$). Mean preoperative IOP \pm SD was 18.9 \pm 6.2 in GIII and 22.0 \pm 8.3 in GIV ($P= 0.266$), which decreased to 14.10 \pm 4.9 mmHg and 12.10 \pm 2.1 mmHg respectively ($P= 0.372$) at 12 months follow up.

Conclusion: Both procedures have similar efficacy in reducing IOP, canaloplasty and phacocanaloplasty showed more safety results, with less postoperative visits. The trabeculectomy stand-alone procedure showed decrease in visual acuity clinically significant.



P016

A COMPARATIVE STUDY OF THREE SURGICAL TECHNIQUES IN MANAGEMENT OF PRIMARY CONGENITAL GLAUCOMAKübra Gül Ölke¹, Elif Erdem¹, Inan Harbiyeli¹, Meltem Yagmur¹, Reha Ersöz¹¹Cukurova University, Ophthalmology, Adana, Turkey

Purpose: To compare the outcomes of three surgical techniques in children with primary congenital glaucoma (PCG).

Methods: This is a retrospective study of patients diagnosed with PCG (68 eyes, 45 patients) who underwent trabeculotomy, trabeculectomy or combined trabeculectomy–trabeculotomy (CTT). The primary outcome was intraocular pressure (IOP) in the early (1th month), mid-term (6th month), and long-term (2th year) postoperative period. The effect of antimetabolite use and additional surgical procedures were also evaluated.

Results: There was no difference in the effect of surgical procedures on IOP in early period whereas the effect of CTT on trabeculotomy in the middle period was found to be statistically significant ($p = 0.013$). In the long-term period, both CTT and trabeculectomy were found statistically more effective than trabeculotomy ($p = 0.036$, $p = 0.029$).

Conclusion: According to this study, It was seen that the CTT can effectively reduce the intraocular pressure and control the progression of glaucoma in cases of congenital glaucoma and needs less additional surgery than the other techniques; It is an effective and reliable method that should be considered first in PCG management.



P017

WAVEFRONT ABERROMETRY AND HIGHER ORDER ABERRATIONS IN PRIMARY CONGENITAL GLAUCOMA

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Purpose: Most primary congenital glaucoma (PCG) patients have visual deprivation, not only because of advanced glaucoma but also due to associated ocular changes like Haab's-striae, astigmatism, corneal-opacity and lenticular changes. We aim to highlight the magnitude of ocular aberrations {higher (HOA) and lower order aberrations (LOA)}, including component contributions by corneal and lenticular aberrations in PCG.

Methods: Cross-sectional study. Thirty-four consecutive PCG patients (12 unilateral, 22 bilateral) who were co-operative for ocular examination, were enrolled over 6 months. 51/56 PCG eyes had undergone trabeculectomy plus trabeculotomy and 5 were on medical therapy. Best corrected visual acuity, cycloplegic refraction and applanation intra-ocular pressure were recorded. Wavefront aberrometry and topography findings using iTrace (Tracey technologies, USA) were compared with age and gender matched controls.

Results: Median age of PCG patients was 11.5 years. Total, corneal and lenticular, HOAs and LOAs were significantly higher in PCG patients ($p < 0.001$), and HOAs were positively correlated. Astigmatism was predominant in 63.04% PCG patients and 82.60% controls. Amongst HOAs, coma and trefoil contributed maximally. PCG subjects with corneal opacity/Haab's-striae had significantly higher HOAs than those with clear cornea; also associated with poor vision ($p:0.05$). Difference in HOAs between PCG and fellow-eyes was not significant. Lenticular aberrations contributed most in fellow eyes.

Conclusion: Increased total and higher order ocular, corneal and lenticular aberrations comprise an important cause of poor visual quality in PCG. Understanding the type and distribution of these aberrations can help provide optimal visual rehabilitation and improve the quality of life of PCG patients.



P018

LOCATING THE PATHOGENIC GENE FOR A PEDIGREE WITH PRIMARY ANGLE-CLOSURE GLAUCOMA

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Objective: To collect and analyse the clinical phenotypes of a pedigree with primary angle-closure glaucoma, and to determine the genetic characteristics by whole-exome sequencing, so as to identify the potential causative genes.

Methods: 1. Collected data of family members through field visits and field surveys, detailed the medical history, analyzed and determined the phenotype and mode of inheritance; 2. Selected 3 diseased members (cases group) and 2 normal members (controls group) from this pedigree, obtained their peripheral blood, extracted blood DNA, and assessed the quality of DNA. 3. Captured and enriched exons areas by using capture chips, sequenced all exons after the preparation of qualified library, filtered the raw data to obtain the valid data, then carried on the precision of bioinformatics analysis, detailed annotations and advanced analysis, finally got the potential causative genes, and verified these candidate gene mutations.

Results: 1. A pedigree with primary angle-closure glaucoma was collected, which had more than 20 members from 5 generations; And 15 members existed from 3 generations. 2. DNA samples from 5 family members were extracted for quality testing, and their quality, concentration and purity met the requirements; 3. Completed whole exome sequencing in all of these DNA samples, found five potential specific causative genes, including KIF5B/PCK2 / UNCI3C/DSGI / PSEN2 respectively, and these genes were verified eventually.

Conclusions: 1. A typical PACG family was collected with clear genetic relationship, large number of patients and prominent phenotypic characteristics; 2. Completed whole exome sequencing for this family, and 5 potential specific pathogenic genes were finally identified, providing a basis for further elucidation of pathogenic genes of primary angle-closure glaucoma.



P019

RISK STRATIFICATION STRATEGY OF TREATING OCULAR HYPERTENSION (OHT) THAT IS BASED ON ADVANCED OCULAR IMAGING TECHNIQUE

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Purpose: To investigate a treatment strategy guided by the detection of progressive retinal nerve fibre (RNFL) thinning by ocular coherence tomography trend-based progressive analysis (OCT-TPA) technique for ocular hypertension (OHT) patients.

Method: OHT patients were assessed at baseline, month 4, 8 and 12. OHT was defined as per the ocular hypertension treatment study (OHTS). The costs of treating all patients with OHT, patients who consistently had > 15% risk of developing glaucoma in 5 years, and patients who had progressive RNFL thinning were hypothetically calculated.

Results: 310 OHT patients were involved. 109 patients (of 310, 35%) had a calculated risk of > 15% and 2 patients (of 310, 0.65%) showed progressive RNFL thinning on OCT-TPA. We assume that all OHT patients were able to achieve a 20% IOP reduction with prostaglandin analogue alone, 1 bottle of medication is required per month and cost approximately 155 USD per bottle. With the assumption, the cost of treating (1) all patients with OHT, (2) patients who have a > 15% risk of glaucoma development in 5 years, and (3) patients who showed progressive RNFL thinning were US\$ 576,600, 202,740 and 3720 in the first year, respectively. None of the patients developed glaucomatous visual field defects.

Conclusion: OCT-TPA could guide treatment of OHT patients safely and reduce medication costs. Randomised control trial will be required to provide evidence for the application of OCT-TPA in OHT patients.



P020

TREATMENT OF ENDOPHTHALMITIS AFTER BAERVELDT GLAUCOMA IMPLANT SURGERY USING IMMEDIATE TUBE WITHDRAWAL AND TEMPORARY SUBCONJUNCTIVAL TUBE PLACEMENT

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Purpose: To report a case of endophthalmitis secondary to tube erosion following Baerveldt glaucoma implant surgery that was successfully treated using prompt tube withdrawal and temporary subconjunctival tube placement.

Method: A case report.

Results: A 65-year-old male with secondary glaucoma underwent Baerveldt glaucoma implant surgery with sclera patch graft in the inferonasal quadrant of his right eye, which resulted in an intraocular pressure (IOP) decrease to the low teens. Ten months following surgery, his right eye presented with a conjunctival dehiscence over the tube along with tube exposure. Eleven days after tube erosion, mild inflammation was found in the anterior chamber (AC) and anterior vitreous body, with plaque surrounding the tube in the AC. He was diagnosed with endophthalmitis secondary to tube erosion; medical therapy was started. Two days later, the tube was removed from the AC and tucked into the subconjunctival space. The growth of *Corynebacterium* species was identified on the specimen of an AC needle aspiration. Complete resolution of the infection was achieved 1.5 months later; thereafter the tube was reinserted into the AC nasally and covered with donor sclera. No infection has recurred since tube reinsertion.

Conclusion: Immediate tube withdrawal and temporary subconjunctival tube placement may be an effective treatment for endophthalmitis following Baerveldt glaucoma implant surgery.



P021

BLEB COMPRESSION SUTURES IN MANAGEMENT OF OVERFILTRATION AFTER ANTIGLAUCOMA SURGERY

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Purpose: The aim of the study was the assessment of efficacy and safety of compression sutures in patients with overfiltrative hypotony after glaucoma surgery.

Methods: The study analyses outcomes of compression sutures for 17 patients with ocular hypotony. Only patients with hyperfiltration hypotony defined as IOP \geq 6mmHg with a reduced BCVA were included. In 13 patients maculopathy decreasing BCVA was observed and in 4 choroidal detachments. The compression single sutures were performed in all patients.

Results: Mean IOP before suturing was 2.3 ± 1.57 mmHg and increased to 14.2 ± 7.03 mmHg ($p = 0.00065$) in 7 days after and after one year 9 ± 4.7 mmHg ($p = 0.0117$). Mean BCVA before the sutures was 0.18 ± 0.13 and increased to 0.53 ± 0.25 ($p = 0.0004$) in 3 months; after 6 months 0.46 ± 0.31 ($p=0,005$), after one year $0,31 \pm 0,22$ ($p=0,025$).

Conclusion: The transconjunctival compression sutures placement seems to be efficient and safe technique for managing with ocular hypotony after glaucoma surgery.



P022

**RECURRENT CONJUNCTIVAL EROSION AFTER AHMED VALVE:
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Purpose: To show the therapeutic alternatives applied in a recurrent conjunctival erosion of an Ahmed valve tube. We present a 56-year-old male patient with pseudophakia and ExPress[®] implant presenting uncontrolled IOP with medical treatment in left eye, reason why an Ahmed valve was placed with tube in the anterior chamber and pericardial patch covering.

Methods: Two weeks after surgery, conjunctival retraction with pericardium exposure was observed. Suture and conjunctival autograft was performed. A new exposure of pericardium edge appeared 1 month after. Medical treatment was applied. The patch was cut and covered with amniotic membrane. Due to no improvement, the implant tube was relocated in sulcus.

Results: Medical treatment, pericardium patch cutting and conjunctival closure failed. The amniotic membrane managed to close the defect despite the fact that after 15 days it came off. A new tube exposure was successfully treated with retroiridian surgical repositioning.

Conclusion: The treatment for the Ahmed valve tube and pericardial patch exposed in eyes which underwent several surgeries are a challenge. In our patient, the technique with the best results was the repositioning of the tube.



P023

INCIDENCE OF GLAUCOMA SURGERIES RELATED TO ANTI-VEGF INJECTIONS

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Purpose: To highlight the elevated number of Glaucoma surgeries related to intravitreal antivascular endothelial growth factor over a period of 18 months (from January/2016 to July/2017), under the care of one glaucoma surgeon in Vancouver.

Methods: All Glaucoma surgeries performed were retrospectively reviewed. The patients who were undergoing Anti-VEGF treatment at the time of surgery were. Those who developed Neovascular Glaucoma or required intravitreal steroid were excluded. Patients' epidemiology was collected, as well as lens status, previous diagnosis of glaucoma, subtype of anti-VEGF and retinal disease. The mean drops, visual acuity and intraocular pressure (IOP) before, 6 and 12 months after the surgery were also assessed.

Results: A total of 430 Glaucoma surgeries were performed. From which 121 (28.14%) were having anti-VEGF treatment. Of the cases, 41 (33.88%) were previously known to have glaucoma or were glaucoma suspects and 80 (66.11%) did not have glaucoma or ocular hypertension before starting the Anti-VEGF treatment. The mean IOP before surgery was 37.18 mmHg. There was a decline of 63.28% after 12 months, leading to a final mean pressure of 13.65 mmHg.

Conclusion: A surprisingly elevated rate of Glaucoma surgeries has been observed among patients on anti-VEGF treatment in Vancouver. To the best of our knowledge, this inflated number of surgeries has not been reported worldwide. Additional data on Visual outcomes and Visual Fields are being collected.



P024

MICROPULSE TRANSCLERAL CYCLOPHOTOCOAGULATION IN A 26-YEAR OLD FEMALE WITH BILATERAL ADVANCED GLAUCOMA SECONDARY TO STURGE-WEBER SYNDROME

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Purpose: To present a case of bilateral advanced glaucoma secondary to Sturge Weber Syndrome and highlight the use of Micropulse Transcleral cyclophotocoagulation(MP-TSCPC) as an effective treatment option

Methods: This is a case of a 26 year old female who presented at the emergency department with severe left eye pain and loss of vision associated with headaches. On examination, right eye vision was counting fingers and no light perception on the left. There was note of well-defined dusky red to violaceous plaques with areas of telangiectasias on the forehead, bilateral malar regions, eyelids and chin. There was note of patchy scleral pigmentation on both eyes with dilated and tortuous episcleral vessels. IOP was 50mmHg on the right and 71mmHg on the left. Disc examination showed advanced glaucomatous optic neuropathy on both eyes. Patient was given oral acetazolamide and topical medications which offered relief from symptoms. On follow up visits, pressure was still noted to be elevated. Tube surgery was offered but patient opted for less invasive procedure. MP-TSCPC was done on both eyes, which offered optimal IOP lowering. Patient was maintained on topical medications.

Results: Over 1 year of follow up, patient achieved stable IOP and maintained vision on the right eye without requiring surgery.

Conclusion: This report highlights the use of MP-TSCPC as an effective alternative to usual surgical treatment options and may also lessen the use of topical medications.



P025

SHORT-TERM OUTCOMES OF MICRO-PULSE TRANSSCLERAL CYCLOPHOTOCOAGULATION IN JAPANESE REFRACTORY GLAUCOMA

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Purpose: To evaluate 6 months post-operative outcome of micro-pulse transscleral cyclophotocoagulation (MP-CPC) for Japanese refractory glaucoma.

Methods: We retrospectively investigated patients who underwent MP-CPC from July 2017 to November 2018 at the University of Tokyo. IOP, medication score and complications were examined at baseline and 6 months after the treatment. MP-CPC procedure was delivered with 2000 mW applied for 80 seconds. The duty cycle was 31.3 %, which translated to 0.5 ms of “on time” and 1.1 ms of “off time.”

Results: 33 eyes of 31 patients were enrolled in the current study. (SOAG: 11, NVG: 7, POAG: 7, PE: 5, other: 3). The mean age of patients was 64.2 ± 16.6 years (mean \pm SD). The mean IOP and medication score was 34.5 ± 9.8 and 4.2 ± 1.2 at baseline, respectively. The mean IOP and medication score was 19.6 ± 7.2 and 4.2 ± 3.2 at 6 months after the treatment, respectively. ($P < 0.01$, paired t-test with bonfferoni correction) No complications such as ocular hypotension, choroidal detachment, expulsive hemorrhages, and phthisis bulbi were happened. The reduction of IOP and the medication score were not significantly different in all types of glaucoma.

Conclusion: In Japanese refractory glaucoma, MP-CPC was effective to lower the IOP and medication score, and no significant complications were happened.



P026

LONG-TERM RESULTS OF SUCCESS RATE AND FACTOR ANALYSIS OF SUCCESS AND FAILURE ON PATTERNED LASER TRABECULOPLASTY IN REFRACTORY GLAUCOMA PATIENTS

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Purpose: To assess outcomes of patterned laser trabeculoplasty (PLT) in refractory glaucoma patients and evaluate risk factors of failure.

Methods: A retrospective study was done for 42 refractory glaucoma patients who have undergone patterned laser trabeculoplasty over 1 year follow-up. Complete success was defined as intraocular pressure(IOP) reduction more than 20% without additional laser or surgery. Qualified success was defined as cases who had to get additional lasers for target IOP. Patients' age, sex, systemic condition, baseline IOP, type of glaucoma, laser power, pigmentation grade of trabecular meshwork on gonioscopy, and history of intravitreal steroid injection were analyzed with cox regression analysis.

Results: IOP reduction of success patients were 40.5, 43.0, 45.5, 46.9, 43.6, 45.4% at week 1, and 1, 3, 6, and 12 months follow-up. Success rate of PLT was 69.15% (29 patients). Patients who need to receive the filtering surgery within 1 year after PLT were 13. Baseline IOP, type of glaucoma, laser power, pigmentation grade of trabecular meshwork, and history of intravitreal steroid injection were revealed as risk factors in univariate analysis. Baseline IOP(HR = 1.071, p-value = 0.010) and pigmentation grade of trabecular meshwork (HR = 0.348, p-value = 0.069) were statistically significant in multivariate analyses.

Conclusion: Patterned laser trabeculoplasty was effective on refractory glaucoma patients with high pigmentation of trabecular meshwork.



P027

CLINICAL OUTCOMES AFTER MICROPULSE TRANSSCLERA CYCLOPHOTOCOAGULATION IN UNCONTROLLED GLAUCOMA PATIENTS: 2-YEARS RESTROSPECTIVE STUDY

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Purpose: To evaluate the use of micropulse transsclera cyclophotocoagulation (MP-TSCPC) in patients with uncontrolled glaucoma in Cipto Mangunkusumo Hospital.

Methods: A retrospective review was performed for all patients who underwent a MP-TSCPC at Cipto Mangunkusumo Hospital, Jakarta, Indonesia from January 2017 - December 2018.

Results: A total of 55 eyes were treated with MP-TSCPC in this study with follow up to 6 months. The mean age of treated patients was 49.65 years and 30 (54.5%) were female. Preoperative visual acuity were profound visual impairment (1/55), near total blindness (19/55) and total blindness (35/55). Neovascular glaucoma (21.8%) was the most common diagnosis. Pre-operatively, mean intraocular pressure (IOP) was 46.57 mmHg and mean number of ocular antihypertensive medications used was 2.07. Mean postoperative IOP at week 1, months 1, 3, and 6 were lowered to 33.2, 34.2, 34.0 and 31.8 respectively. Postoperative ocular antihypertensive medication was lowered to 1.49 at the end of month 6. Success was achieved in 63.6% patients, in which IOP between 6 and 21 mmHg or at least 20% reduction in IOP at the final follow up with or without IOP lowering medication. Complication included hypotony in 3 patients (5.5 %).

Conclusion: Micropulse transscleral cyclophotocoagulation was effective in lowering intraocular pressure. Patients can expect significant IOP lowering along with reduction in number of topical glaucoma medications required for IOP control.



P028

EFFICACY OF SELECTIVE LASER TRABECULOPLASTY IN PRIMARY ANGLE CLOSURE GLAUCOMA (PACG) WITH PSEUDOPHAKIAJyoti Shakrawal¹, Arpit Sharma¹, Dewang Angmo¹, Ramanjit Sihota¹¹RPC, AIIMS, Ophthalmology, India

Purpose: Evaluation of outcomes of selective laser trabeculoplasty (SLT) in mild to moderate primary angle closure glaucoma (PACG) with pseudophakia.

Methods: 30 eyes of PACG who had underwent cataract surgery, had an intraocular pressure (IOP) > 21 mmHg with gonioscopically visible posterior trabecular meshwork for at least 180 degrees were enrolled. SLT was done to the visible angle segments. Patients were followed up to 6 months.

Results: 30 eyes of 21 patients were enrolled. The mean age of the patients was 51.72 ± 6.3 years. The mean baseline IOP was 23.2 ± 5.3 mmHg. 63.33% of eyes had 360° treatment. At 6 months, mean IOP was 17.3 ± 4.8 mmHg ($p = 0.001$). The success rate of achieving IOP reduction of 20% or more from baseline, or discontinuation of one or more of glaucoma medications was obtained in 56.67% eyes at 6 months. 3 eye had a transient posttreatment IOP spike greater than 6 mmHg. The drop in IOP was significantly more in the eyes treated with 360 degrees SLT (5.3 mmHg) than the eyes treated with 180-270 degrees (3.9 mmHg) ($p = 0.032$). The number of medications decreased significantly from 3.8 ± 0.77 at baseline to 2.1 ± 0.81 at 6 months. No other significant complications noted.

Conclusion: SLT can be used as an alternative procedure for mild to moderate PACG eyes with pseudophakia in which sufficient trabecular meshwork is visible. Long term therapeutic effectiveness needs further evaluation.



P031

TRANSSCLERAL CYCLOPHOTOCOAGULATION IN REFRACTORY GLAUCOMA IN PATIENTS WITH GOOD VISION**Natalia Palarie¹, Tatiana Pasenco², Natalia Palii¹***¹International Clinic, Ophthalmology, Orhei, Moldova, ²State University of Medicine and Pharmacy “Nicolae Testemitanu”, Ophthalmology, Chisinau, Moldova*

Purpose: This study was conducted to evaluate the efficacy and safety of transscleral diode laser cyclophotocoagulation (TSCPC) in eyes with refractory glaucoma and BCVA better than 0,3.

Methods: The study included 30 eyes with refractory glaucoma of 27 patients treated with TSCPC. BCVA varied from 0,3 to 0,5; mean IOP prior to procedure was 40 ± 12 mmHg. The 810nm diode laser was delivered at 1200 mW for 4 seconds over 270° - 300° . The power was increased in 150 mW increments until an audible “pop” was heard, followed by a decrease of 150 mW to complete the treatment. A reduction in the number of antiglaucoma drops (AGD) and an IOP of 11-21 mm Hg at the last follow-up visit was defined as success. Patients were followed at baseline, week 1, month 1, 3 and 6.

Results: A mean of 1.3 treatments were given per eye, with 8 eyes (26%) requiring retreatment at the 1st month of follow up. Mean IOP decreased to 26.5 ± 5.0 mmHg at 1 week, 20.0 ± 5.3 mmHg at 1 month, 18.2 ± 2.7 mmHg at 6 months. The overall success rate was 84%. AGD were reduced from 2.0 ± 1.0 at baseline to 1.1 ± 1.2 at 1 month and 2.2 ± 1.2 at 6 months follow-up. No patient had hypotony. 3 patients with neovascular glaucoma failed the procedure.

Conclusions: This study suggests TSCPC as an effective, safe and rapid method of treatment in patients with refractory glaucoma with good vision over a 6-month period. IOP becomes stably reduced only by the 3rd month after the TSCPC.



P032

SMALLER ANTERIOR CHAMBER VOLUME IS ASSOCIATED WITH HIGHER RISK OF INTRAOCULAR PRESSURE ELEVATION AFTER LASER IRIDOTOMY: A 1-YEAR FOLLOW UP STUDYFei Li¹, Xiulan Zhang¹¹Zhongshan Ophthalmic Center, Clinical Research Center, Guangzhou, China

Purpose: There was no data about the efficacy of volumetric parameters such as anterior chamber volume in the follow-up of PACD patients. This study is designed to explore the efficacy of volumetric parameters during the follow up of PACD.

Methods: In this single-center study, PACD patients who underwent laser peripheral iridotomy (LPI) were recruited. Anterior segment images of the patients were captured using swept-source OCT before and at one week, one month, three months, six months and one year after LPI. IOP elevation was defined as IOP greater than 21 mmHg at any time point after LPI. The changes in trabecular iris surface area, anterior chamber volume and iris volume with time and their relationship with IOP elevation were analyzed.

Results: Ninety eyes of 81 subjects were included. ACV, IV and mean TISA750 of the four quadrants significantly increased at one week after LPI and did not decrease during the first year. ACV and mean TISA750 were significantly smaller in those with IOP elevation when compared to the control (coefficient = -5.17, $p < 0.001$ and coefficient = -22.40, $p = 0.01$, respectively). Correlations between TISA750 and IOP elevation varied across different quadrants and were significant only in the superior and inferior quadrants ($p < 0.001$ and $p = 0.03$, respectively).

Conclusion: ACV is a reliable and accurate parameter for the follow up of PACD. ACV is a better representation of the status of the anterior chamber in PACD patients than traditional angle width parameters such as TISA750.



P033

MICROPULSE TRANSSCLERAL CYCLOPHOTOCOAGULATIONRita Basto¹, Joana Roque¹, Susana Henriques¹, Fernando Trancoso Vaz¹¹Hospital Professor Doutor Fernando Fonseca, Ophthalmology, Lisbon, Portugal

Introduction: Micropulse transscleral Cyclophotocoagulation (MPTSCPC) allowed to target melanin in a non-destructive way in ciliary body tissues, minimizing adjacent tissue damage. This abstract's main purposes are to describe the procedure and demonstrate the results from 1 year of treatment with MPTSCPC.

Methods: A retrospective review of 26 glaucoma patients submitted to MPTSCPC. Medical records were consulted to obtain all data.

Results: MPTSCPC was performed with peribulbar anaesthesia. The probe used was MicroPulse P3[®], with predefined parameters: 810 nm diode laser, power of 2000 mW, duty factor of 31.3% (0.5 ms on and 1.1 ms off) and total treatment duration of 160 seconds (80 for each hemisphere). The 3 and 9 o'clock meridians were spared, along with any area of thinned sclera. In week one, successful reduction in IOP ($> 20\%$ and $PIO \leq 21$ mmHg) was achieved in all cases except one (96.2%). Success rate, despite always good, decreased progressively to 76.9% at month 1 and 3 and to 73.1% at month 6. The percentage of IOP reduction was $43.4 \pm 16.2\%$ (8.9% - 70.6%). There were no records of serious complications. Some cases described subconjunctival haemorrhage or light pain post-procedure.

Conclusion: MPTSCPC is an efficient and safe strategy and can be used in all spectrum of glaucoma disease. The procedure is easily performed and can be repeated with good results. We consider necessary a larger sample and longer follow-up period to better understand the real impact of MPTSCPC in glaucoma treatment.



P034

ANGIOGRAPHIC BIOMARKERS OF FUNCTIONAL FILTERING BLEBS AFTER XEN GEL IMPLANTATION FOR GLAUCOMALorenza Brescia¹, Luca Agnifili¹, Leonardo Mastropasqua¹¹Ophthalmology Clinic, Department of Medicine and Aging Science; University G. d'Annunzio of Chieti-Pescara, Chieti, Italy

Purpose: To evaluate and describe, using optical coherence tomography angiography (OCTA), the angiographic biomarkers of good bleb function after XEN gel stent implantation for glaucoma.

Methods: Forty-three consecutive patients (43 eyes) who underwent XEN gel stent implantation, were enrolled. According to the intraocular pressure (IOP) reduction, patients were classified into Group 1 (21 eyes; success) and 2 (22 eyes; failure). OCTA was performed to image the vascularization of the conjunctival bleb wall. The main outcomes were: presence and number of vessel displacement areas (NVDA), major displacement area (MDA; mm²), non-flow whole area (NFWA; mm²), and bleb wall vessel density (BWVD; %).

Results: Mean post-operative Group 1 and 2 IOP were 16.2 ± 2.7 and 26.3 ± 2.1 mmHg, respectively. Higher MDA (0.32 ± 0.03 ; $p < 0.05$), NVDA (3.8 ± 1.3 ; $p < 0.001$), and NFWA (1.66 ± 0.61 ; $p = 0.001$), and lower BWVD (46.19 ± 3.82 ; $p < 0.001$) was found in Group 1 compared to Group 2. MDA negatively correlated with BWVD ($r = -0.437$; $p = 0.026$) and positively with NFWA ($r = 0.712$; $p = 0.000$); BWVD negatively correlated with NFWA ($r = -0.617$; or $p = 0.001$). Post-operative IOP positively correlated with BWVD ($r = 0.567$; $p = 0.003$), but negatively with NFWA and MDA ($r = -0.581$; $p = 0.002$; and $r = -0.619$; $p = 0.001$, respectively).

Conclusions: OCTA is a useful tool to investigate the bleb wall vascular features after XEN gel implantation. The presence of large areas of vessel displacement within the bleb wall, along with a reduced vascular network can be considered as angiographic biomarkers of a good bleb filtration ability.



P035

GONIOTOME FIRST YEAR OUTCOMES**Daniel Gosling¹, Vipul Ramjiani¹, Graham Auger¹***¹Sheffield Teaching Hospitals NHS Trust, United Kingdom*

Purpose: Goniotome (Neomedix, California) is a new ab interno dual-blade device, with an irrigation and aspiration feature, for the lowering of intraocular pressure by excision of trabecular meshwork. We report the first year data on the first European cohort treated with the device.

Methods: Data was extracted retrospectively from Medisoft for all patients treated with Goniotome, between March 2018 and July 2019. Intraocular pressure (IOP) and number of IOP lowering medications were recorded. Complications are reported to indicate the safety profile. IOP was measured with Ocular Response Analyser G3 (Reichert inc, New York).

Results: 29 eyes in 26 patients had been treated as of July 2019. Mean follow up was 25 weeks (range 4-67). Mean pre-operative IOP was 30.6 mmHg (standard deviation 6.6). Mean IOP reduction was 12.3 mmHg (SD 7.8) or 39% (SD 20%) reduction from baseline. Mean number of medication classes reduced from 2.6 to 1.6. 19 eyes (66%) had IOP lowering greater than 30% and 5 eyes (17%) were medication free. 5 eyes (17%) had significantly raised post-operative IOP at the first post-operative visit, related to hyphaema. There were no cases of severe vision loss. Two eyes subsequently required penetrating surgery.

Conclusion: Goniotome is an effective treatment at lowering IOP in this initial cohort, with follow up duration of up to 1 year. The possibility of a post-operative pressure spike may alter patient selection.



P036

EARLY OUTCOMES OF SEMI-OPEN SUBTENON AB INTERNO XEN STENT INSERTION COMPARED TO STANDARD TECHNIQUE

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Purpose: Novel Semi-open XEN insertion aims to (1) dissecting a potential space for filtration (2) avoid intra-tenon insertion (3) ensure adequate tissue above stent to avoid erosion (4) avoid anterior bleb leak. Early (6 month) post operative outcome is reported.

Methods: Semi-open technique involves (1) small posterior incision ~2mm in length, ~8mm from limbus to reach subtenon space (2) dissect subtenon pocket with thin blunt dissector (3) maintain pocket using viscoelastic (4) insertion of XEN ab interno into pocket (5) conjunctival closure with single 10-0 vicryl. Standard technique involves ab interno insertion and primary needling. Retrospective analysis of Semi-open (n = 44) and Standard technique (n = 25) was performed. All cases received subconjunctival injection of mitomycin C (0.01-0.02%).

Results: The two groups had statistically similar IOP at baseline (Semi-open 21.0 ± 7.1 mmHg vs Standard 22.7 ± 8.8 mmHg), postoperative day-1 (6.8 ± 5.5 mmHg vs 7.9 ± 5.0 mmHg) and week-1 (8.6 ± 7.7 mmHg vs 9.9 ± 4.3 mmHg). The IOP were statistically different for postoperative week-4 (10.7 ± 4.1 mmHg vs 16.0 ± 7.9 mmHg, $p = 0.001$), 2-months (11.6 ± 3.9 mmHg vs 15.6 ± 5.7 mmHg, $p = 0.007$) and 3-months (12.6 ± 5.1 mmHg vs 16.6 ± 6.2 mmHg, $p = 0.05$). Similar trend was observed at 4-months (13.9 ± 5.1 mmHg vs 18.8 ± 7.0 mmHg, $p = 0.06$) and 6-months (9.8 ± 3.0 mmHg vs 15.1 ± 6.1 mmHg, $p = 0.06$). Semi-open technique had lower needling rate (14% vs 60%) but more transient choroidal effusion (21% vs 16%). Standard technique had 2 stent erosions and 5 revisions.

Conclusion: Early outcomes showed Semi-open achieved lower IOP compared to Standard technique with lower needling and revision rates.



P037

SHORT-TERM OUTCOMES AND PROGNOSTIC FACTORS OF ISTENT IN SOUTH KOREA

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Purpose: To evaluate the intraocular pressure (IOP) reduction, success rate and prognostic factors after trabecular micro-bypass stent implantation in patients with open angle glaucoma.

Methods: We retrospectively reviewed 33 eyes of 33 patients with open angle glaucoma who were followed up for more than 6 months after trabecular micro-bypass stent implantation. Success of surgery was defined as IOP \leq 21 mmHg and IOP reduction \geq 20% from baseline regardless of whether glaucoma medication was used or not.

Result: During follow-up at 6 months after trabecular micro-bypass stent implantation, IOP was significantly decreased from 25.33 ± 9.20 mmHg before surgery to 18.03 ± 4.64 mmHg after 6 months and glaucoma medication was significantly decreased from 3.73 ± 0.67 before surgery to 3.43 ± 0.67 after 6 months ($p < 0.001$, 0.027 , respectively). Success rate at 6 months was $30.7 \pm 5.2\%$. Using multiple regression analysis of the risk factors, age was associated with success rate (OR, 1.076; 95% CI, 0.996-1.164, $p = 0.045$).

Conclusions: In Koreans, trabecular micro-bypass stent implantation is effective surgery for IOP reduction and shows a better surgical success rate in younger patients.



P038

EFFICACY AND SAFETY OF XEN GEL STENT AS PRIMARY SURGICAL PROCEDURE: EARLY EXPERIENCE IN KOREAJaewan Choi¹¹Central Seoul Eye Center, Department of Glaucoma Service, Seoul, South Korea

Purpose: To evaluate the efficacy and safety of XEN[®] Gel Stent as primary surgical procedure in Korean eyes with medically uncontrolled glaucoma.

Methods: This retrospective, open-label, single-center study analyzed 43 eyes of 39 Korean glaucoma patients who had XEN[®] Gel Stent implantation. Every patient had no prior glaucoma surgery history, and required a minimum follow-up period of 3 months for the enrollment. Intraocular pressure (IOP), the number of glaucoma medication, and best-corrected visual acuity (BCVA) were evaluated at baseline and at each follow-up to 9 months.

Results: Mean medicated IOP (number of medication) was reduced from 21.3 ± 7.8 mmHg (3.5 ± 0.7) at baseline to 12.9 ± 6.0 mmHg (1.0 ± 1.2) at 3 months, and 11.7 ± 4.2 mmHg (0.7 ± 1.0) at 9 months ($p < 0.001$). BCVA loss > 2 lines at postoperative 1 month was observed in 4.7% ($n = 2$). Postoperative complications included hyphema ($n = 4$), cystic bleb ($n = 2$), cataract progression ($n = 2$), choroidal effusion ($n = 1$), and stent dislocation ($n = 1$). The bleb needling rate was 39.5% ($n = 17/43$), and 5 eyes required secondary glaucoma surgical intervention due to uncontrolled IOP.

Conclusion: The XEN[®] Gel Stent effectively reduced IOP and the need of medication as a primary surgical procedure in Korean patients with medically uncontrolled glaucoma. The postoperative safety profile seems to be acceptable, with minimal vision-threatening complications.



P039

ONE-YEAR RESULTS FOR ISTENT INJECT FOR GLAUCOMA AND OCULAR HYPERTENSION IN A REAL-WORLD NHS SETTINGHarikesh Kaneshayogan¹, Sri Vamshi Merugamala¹, Adam Booth¹, Salman Waqar¹¹University Hospitals Plymouth NHS Trust, Ophthalmology, Plymouth, United Kingdom

Purpose: We present 1-year results of patients with all types of glaucoma and ocular hypertension who underwent iStent Inject surgery, and aim to guide clinicians in making an informed decision on its effectiveness, within a typical NHS glaucoma service.

Methods: Data was collected retrospectively from a single hospital for 43 patients with a diagnosis of glaucoma or ocular hypertension who had an iStent Inject procedure, with or without cataract surgery over a 1-year period. The primary outcome was reduction in intraocular pressure and number of glaucoma medications at 12 months post operatively. Other aims included reporting complications from surgery, achieving target pressure or 20% reduction in IOP and requirement for further pressure lowering surgery

Results: Mean IOP reduced from 20.7 mmHg preoperatively to 15.4 mmHg (26% reduction, $p < 0.0001$) at 12 months. 65% achieved a drop of at least 20% from their pre-operative IOP. Overall there was no difference in the average number of topical antihypertensive agents pre (2.14) and post stent insertion (2.14).

Conclusion: iStent Inject is an effective treatment modality in moderate to severe glaucoma of varying aetiology and ocular hypertension, with a good safety profile. Patients on maximal topical therapy and previous laser trabeculoplasty can be counselled to expect a 20-25% reduction in post-operative IOP reduction at 1-year; however it is difficult to recommend to patients that they will have a significant drop reduction based on these results.



P040

FIVE-YEAR OUTCOMES OF TRABECULAR MICRO-BYPASS STENTS (ISTENT INJECT) COMBINED WITH TRAVOPROST IN GLAUCOMA EYES ON 2 PREOPERATIVE MEDICATIONS

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Purpose: To assess 5-year outcomes following standalone implantation of 2nd-generation trabecular mi-cro-bypass stents (iStent inject[®]) combined with topical travoprost, thereby addressing both trabecular and uveoscleral aqueous outflow.

Methods: This 5-year prospective multi-surgeon study enrolled subjects with OAG on 2 ocular hypoten-sive medications and preoperative intraocular pressure (IOP) of 18-30 mmHg (medicated) and 22-38 mmHg (post-washout). Subjects underwent standalone iStent inject implantation and started topical travoprost one day postoperatively. Annual medication washouts were performed.

Results: All 53 enrolled subjects underwent uncomplicated iStent inject implantation and completed 5-year follow-up. At Month 60 (M60) postoperative, mean IOP on travoprost was 12.1 mmHg, a 39% reduction vs preoperative IOP of 19.7 mmHg on 2 medications ($p < 0.0001$). At M61 (post-washout), mean unmedicated IOP was 16.1 mmHg, a 35% reduction vs preoperative washout IOP of 24.9 mmHg ($p < 0.0001$). Mean medicated IOP remained ≤ 13.1 mmHg at all postoperative visits through M60. 92.5% of eyes achieved M60 IOP ≤ 18 mmHg and 88.7% achieved IOP ≤ 15 mmHg on travoprost. 4 eyes required additional medication, but all remain-ing eyes used travoprost alone throughout follow-up. Visual acuity, cup-to-disc ratio, and visual fields were stable throughout.

Conclusion: In glaucomatous eyes with IOP uncontrolled on 2 medications, the combination of standalone iStent inject implantation with topical prostaglandin (thereby enhancing both trabecular and uveoscleral outflow) resulted in consistent and safe 5-year IOP and medication reductions.



P042

18-MONTH OUTCOMES OF THE OPTIMISED XEN IMPLANTATION (OXI TECHNIQUE): A SINGLE-SURGEON INTERVENTIONAL CASE SERIES OF 150 AB-INTERNO XEN IMPLANTS WITH AND WITHOUT COMBINED PHACOEMULSIFICATION IN GLAUCOMA PATIENTS

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Purpose: To characterise the intraocular pressure (IOP) lowering effect, and reduction in glaucoma medication use of an optimised Xen implantation (OXI) technique in glaucoma patients.

Methods: Retrospective chart review of patients (150 eyes of 119 patients) undergoing Xen implantation by a single experienced glaucoma surgeon from June 2016 to July 2019. Diagnoses included primary open angle glaucoma (n = 81), primary angle closure glaucoma (n = 24), normal tension glaucoma (n = 14) and secondary glaucomas (n = 31).

Results: The OXI technique significantly lowered the IOP regardless of glaucoma severity and subtype. The overall mean pre-operative IOP decreased from 18 mmHg to 9.9 mmHg at month 12 and 13.2 mmHg at month 18 ($p < 0.0001$). The percentage of patients achieving ³ 20% reduction in IOP from baseline while remaining medication-free was 85.7% at 12 months and 66.7% at 18 months. Overall medication usage reduced from 2.5 pre-operatively to 0.1 at 12 months and 1 at 18 months. 23 cases (15.3%) required post-operative bleb needling or antimetabolite injection and 12 patients (8%) required further surgical glaucoma procedures.

Conclusion: The OXI technique is effective in reducing IOP and medication burden at 18 months. Further data is required to assess the longer-term efficacy.



P043

EARLY RESULTS OF PRESERFLO MICROSHUNT IN PATIENTS WITH GLAUCOMA**Lauren Van Lancker¹, Paolo Meier¹, Mohammed Abu-Bakra¹, Avi Kulkarni¹**
*¹King's College Hospital NHS Trust, London, United Kingdom***Purpose:** Evaluate the efficacy and safety of PreserFlo MicroShunt in patients with glaucoma**Methods:** PreserFlo was inserted with a standard technique including mitomycin C 0.4 mg/mL for control of intraocular pressure (IOP) in patients with refractory glaucoma despite maximally tolerated medication. Observational study using electronic medical records. Age range was 31-89 years. Patient ethnicity: 8 Afro-Caribbean, 2 Asian, 12 Caucasian, 5 not stated.**Results:** 27 patients had the implant. Diagnoses were: 18 primary open angle glaucoma, 2 normal tension glaucoma, 5 secondary open angle glaucoma, 1 neovascular glaucoma, 1 congenital glaucoma. Mean pre-operative IOP was 25.6 (range 15-41) and number of glaucoma agents was 3.7. 4 eyes had had prior non conjunctival-sparing glaucoma procedures. Mean post-operative IOP was 6 on day 1, 10 on day 7 and 13 at the date of last follow-up. Mean IOP drop was 45% and number of glaucoma agents was 0.6 at last follow-up. Mean follow-up duration was 53 days (range 1-120). 12/27 eyes had additional procedures (5-flourouracil or steroid injection except for one requiring anterior chamber viscoelastic injection). Additional procedures were more common in those of Afro-Caribbean heritage. The only significant complication was transient clinical hypotony in one patient.**Conclusion:** Early results indicate that PreserFlo MicroShunt has great efficacy and a good safety profile. This study adds to the relatively sparse data on outcomes in Afro-Caribbean patients.



P044

2-YEAR OUTCOMES FOLLOWING 2ND GENERATION TRABECULAR MICRO-BYPASS (iSTENT INJECT) IMPLANTATION WITH CATARACT SURGERY: A MULTI-CENTRE, MULTI-SURGEON STUDY

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Purpose: To evaluate effectiveness and safety of 2nd-generation trabecular micro-bypass stents (iStent inject[®]) implanted with cataract surgery. This multi-surgeon, 2-year dataset is one of the largest yet reported, providing useful information for the growing numbers of surgeons using iStent inject.

Methods: Multi-surgeon, multi-centre, retrospective case series. Outcomes included intraocular pressure (IOP), medications, visual acuity, cup-to-disc ratio, visual fields, adverse events and complications.

Results: 309 eyes underwent iStent inject implantation with cataract surgery and completed 2-year follow-up, with most eyes having primary open-angle glaucoma (71%), ocular hypertension/glaucoma suspect (9%), appositional angle-closure glaucoma (8%), and normal-tension glaucoma (6%). Preoperatively, mean IOP was 16.4 ± 4.9 mmHg on 1.47 ± 1.21 mean medications (range 0-5 medications), and 42% of eyes had prior glaucoma procedures. Two years postoperatively, mean IOP was 13.7 mmHg (16% reduction; $p < 0.0001$), and 77% of eyes had IOP ≤ 15 mmHg (vs. 51% preoperatively). Mean medication number reduced by 66% to 0.50 medication ($p < 0.0001$), with 74% of eyes medication-free (vs. 26% preoperatively). Intra-operative and postoperative adverse events were generally infrequent, mild, and resolved without sequelae. A total of 7 eyes (all with more advanced glaucoma) had filtering surgery during 2-year follow-up.

Conclusion: This 2-year multi-centre study showed sustained and significant IOP and medication reductions after iStent inject implantation with cataract surgery for glaucoma or ocular hypertension. This comprises one of the largest real-world cohorts to-date, and confirms existing evidence of the efficacy and safety of iStent inject.



P045

EARLY COMPLICATIONS OF XEN GEL STENT IN KOREAN POPULATION

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Purpose: To describe early complication cases of XEN gel stent (XEN45, Allergan, CA, US) during the first three months postoperatively in Korean open-angle glaucoma (OAG) population.

Methods: This single-center, retrospective study included a total of 20 eyes of OAG with XEN gel stent implantation. Various complications were described including hypotony (< 6 mmHg at any time point postoperatively), choroidal detachment, corneal wound leak, implant displacement, postoperative hyphaema, intraoperative bleb hemorrhage and etc. None of the severely complicated cases were included.

Results: Hypotony was the most common complication of XEN gel stent implantation (16/20, 80%). Early hypotony should be managed using intracameral viscoelastic injection because prolonged hypotony of globe could be followed by choroidal detachment resulting in unexpected severe vision loss. Although the intraocular pressure (IOP) of all hypotony cases were normalized in 3 days - 3 weeks after viscoelastic injection, two eyes showed choroidal detachment. One case presented an IOP spike after second viscoelastic injection which needed an I&A of residual viscoelastic in the anterior chamber. There was one case of corneal wound leak, implant displacement and postoperative hyphaema, respectively.

Conclusion: XEN gel stent implantation is minimally invasive in terms of the conjunctival wound healing process and highly effective at least in the early postoperative period in Korean OAG population. However, Korean surgeons should be aware of the higher chance of hypotony rate after Xen gel stent implantation than previous studies reported from other countries.



P046

A SYSTEMATIC REVIEW AND META-ANALYSIS OF OUTCOME IN MINIMALLY-INVASIVE GLAUCOMA SURGERIES

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Purpose: We have investigated the cumulative reported change in intraocular pressure (IOP) and glaucoma medications using different subconjunctival and suprachoroideal minimally-invasive glaucoma surgeries (MIGS) devices (XEN, InnFocus, Cypass, iStent supra, STARflo, SOLX) as a solo procedure or in association with phacoemulsification.

Methods: A systematic literature search was performed to identify randomized control trials (RCT) and non-RCT (non randomized comparative studies, NRS, and before-after studies) with at least 12 months of follow-up. Outcome data regarding overall qualified response (OQR), IOP, and number of glaucoma medications at 12 months were extracted and compared across all devices.

Results: A total of 30 studies were identified which included 2.289 eyes. MIGS surgery seemed effective in lowering both IOP and glaucoma drug use at 12 months with a reported OQR ranging between 76.8% and 91.0%. Stratified meta-analysis of observed mean IOP difference at 12 months revealed the highest mean IOP reduction at 12 months for the Innfocus device (11.049), followed by the SOLX (10.545) and XEN device (10.464). Efficacy of the STARflo device was in a similar range (10.269), whereas iStent supra and Cypass showed much lower IOP reduction at 12 months (8.400 and 6.718). The change in the number of glaucoma medication was highest in the studies which used the XEN and InnFocus device (2.449 and 2.190) contrasting the suprachoroideal devices.

Conclusion: MIGS show in general a good safety profile and effective reduction of IOP and glaucoma medication, however, the evidence on the efficacy of MIGS compared to other therapies is still limited.



P047

ONE-YEAR TREATMENT OUTCOMES OF A NOVEL GLAUCOMA TUBE SHUNT IMPLANT FOR REFRACTORY GLAUCOMA

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Purpose: To investigate the one-year efficacy and safety of a novel glaucoma tube shunt, PAUL[®] Glaucoma Implant (PGI) in the treatment of eyes with refractory glaucoma

Methods: This is an interventional cohort study involving 6 international centers and 60 eyes (60 participants) between October 2017 and September 2019. The primary outcome is complete success at one-year post-operatively, defined as intraocular pressure (IOP) not exceeding 21 mmHg (without any IOP-lowering medications) and not below 6mmHg, did not lose light perception vision and without further reoperations. The other outcome measures included IOP, the number of IOP-lowering medications and complications.

Results: The mean age was 63.0 ± 12.6 years, 77.4% male and 41.9% had secondary glaucoma. At one-year after surgery, the complete success rate was 71.0 (44/62 eyes) %. Compared to the mean pre-operative IOP (36.8 ± 11.4 mmHg), the post-operative IOP at 6 and 12 months were 14.0 ± 3.5 and 13.4 ± 3.4 mmHg respectively ($p < 0.001$). The mean number of pre-operative and one-year post-operative number of IOP-lowering medications were 3.4 ± 0.8 and 0.4 ± 0.7 respectively ($p < 0.001$). Significant post-operative complications included hypotony requiring intracameral injection of viscoelastic gel ($n = 6$, 9.7%), tube shunt occlusion ($n = 3$, 4.8%), tube exposure ($n = 2$, 3.2%) and endophthalmitis with resultant loss of vision ($n = 1$, 1.6%)

Conclusion: The PGI is effective and safe in lowering IOP with close to three-quarters of the eyes with refractory glaucoma achieving complete surgical success after one year of follow-up.



P048

2 YEAR OUTCOMES OF THE XEN IMPLANT WITH MINIMAL BLEB NEEDLING

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Purpose: The Xen implant is a form of minimally invasive glaucoma surgery. Although use of the device has increased over the past few years, there is still limited long term data available regarding its efficacy. We aim to report the 2 year outcomes of the XEN implant with minimum bleb needling.

Methods: A retrospective study was conducted at East Lancashire Teaching Hospital. Inclusion criteria was patients who underwent implantation with a Xen device between May 2016 and December 2017. The primary outcome assessed was complete success defined as when the patient was without glaucoma medications and had an IOP of 18mmHg or less, and had a 20% reduction in IOP compared to baseline. Qualified success was defined as the same change in IOP but with medications.

Results: 67 patients were included. Male to female ratio was 37:30. The majority had primary open angle glaucoma. There was a significant difference ($p < 0.001$) between preoperative IOP and IOP at 24 months. Mean number of topical medications was 2.3 pre-operatively and 1.2 at 24 months. Bleb needling was done in 4.5% which is significantly lower than other reports. At 24 months complete success was obtained in 12% and qualified success was achieved in 64%.

Conclusion: The XEN has good long term outcomes even with minimal bleb needling. Patients maintained a lower IOP postoperatively with a lower number of medications. Should their IOP rise, the patient has more treatment options available to them compared to pre-operatively including increasing topical medications or opting for further surgery.



P049

CAN WE REDUCE NEEDLING AFTER XEN IMPLANTATIONClaudia Quijano¹, Shaista Giny¹, Dan Lindfield²*¹Royal Surrey County Hospital NHS Healthcare Trust, Ophthalmology, Guildford, United Kingdom, ²Royal Surrey County Hospital NHS Healthcare Trust, ophthalmology, Guildford, United Kingdom*

Purpose: Describe findings after subconjunctival 5FU at 3rd week post-operative of XEN-45 Gel Stent (XEN).

Methods: Retrospective review of 21 patients (26 eyes) that underwent XEN implantation standalone or combined phacoemulsification followed by routine 5FU (0.1ml of 50 mg/ml) injection at 3/52 post-operative. Data collected on demographics, BCVA, IOP, glaucoma drops, medical interventions, conjunctival appearance and associated complications. Patients reviewed on week 1, 3 and months 1, 3, 6. Primary outcome was rate of needling during the first 6 months post-operative. Secondary outcome was reduction in the IOP and glaucoma drops use.

Results: A total of 26 eyes (21 patients) included. All patients received 5FU at 3rd week. After month 1, 1 patient required needling and none thereafter. A mean of 1.4% of needling throughout the 6 months. At month 6th IOP was reduced to 14.8 mmHg with mean reduction of -7.9 mmHg or 34% was achieved. At month 1 none of the patients were using glaucoma drops. At month 3 and 6, 91 % of patients were free drops. The most frequent adverse event was conjunctival inflammation in 38%. One patient had corneal toxicity secondary to 5FU which resolved after 1 week.

Conclusion: Routine 5FU at 3rd week post XEN is safe and make post-operative more predictable. Just 1.4% needed needling after routine 5FU. Glaucoma medication usage was lower or stopped due to improved function. No adverse events were found.



P050

EVALUATION OF ISTENT INJECT IN PSEUDOPHAKIC EYES WITH OPEN ANGLE GLAUCOMA : PRELIMINARY RESULTS

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Purpose: To evaluate the efficacy and safety of iStent inject implantation in the treatment of progressive open-angle glaucoma (OAG) in pseudophakic eyes.

Methods: A retrospective analysis of records of patients that underwent istent inject implantation since March 2018 was done for intraocular pressure (IOP) reduction and glaucoma medication load reduction. Safety outcomes included intraoperative and postoperative complications, secondary surgeries and best-corrected visual acuity (BCVA).

Results: Records of 55 eyes that underwent the iStent implantation were analysed with a mean age of 77 years (51- 97). The average IOP preoperatively in the analyzed eyes was 20.2 ± 6.4 mmHg. IOP decreased by $\geq 20\%$ compared to preoperative IOP in 22 eyes completing 3 months and 11 eyes completing 6 months follow up. 11 (67%) of the 17 eyes that completed 6 months follow up revealed significantly decreased medication burden. Out of 55 eyes evaluated 9 eyes were steroid responder, 3 eyes had malpositioned stents ,5 had over implanted stents and 1 eye had an episode of iris prolapse.

Conclusion: The early result of istent inject implant look promising with significant reduction of IOP and medication load in eyes with coexistent primary open angle glaucoma.



P051

EFFECTIVENESS AND SAFETY OF THE IMPLANTATION OF TRABECULAR MICRO-BYPASS DEVICE “iSTENT INJECT W” IN COMPARISON WITH “iSTENT INJECT” ACCOMPANIED WITH PHAKO SURGERY

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Purpose: Retrospective study to evaluate the effectiveness and safety of the implantation “iStent inject w” in comparison with “iStent inject” accompanied with phako surgery.

Methods: Group1: iStent inject w (4 eyes). Group2: iStent inject (4 eyes). Both have cataract and POAG with at least one anti-glaucoma eyedrops. We evaluated the reduction in IOP and the eye drops with BCVA after 1 week from the surgery.

Results: Group 1: mean IOP before the surgery was 21. Median IOP reduction was 7.75. Median BCVA improved from 0.425 to 0.725. Group 2: median IOP before the surgery was 20.25. Median IOP reduction was 4.25. Median BCVA improved from 0.45 to 0.825. in both groups mean reduction of eyedrops was 1 and no complication happened. Mild residual blood over the iris were detected in the group1 but no Hyphema. The Blood reflux after implantation of iStent inject w was significantly more. No Patient from both groups needed second surgery.

Conclusions: Both iStents were safe and and effective in lowering IOP. iStent inject w has a more hypotensive effect (p value 0.0171). Hyphema is more probable in iStent inject w. a long follow up with a larger number of patients is recommended. The results of this study will be updated after 3 months.



P052

TWO-YEAR POOLED SAFETY OUTCOMES FROM THREE STUDIES FOLLOWING MICROSHUNT IMPLANTATION IN PATIENTS WITH PRIMARY OPEN-ANGLE GLAUCOMA (POAG)

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Purpose: Pooled analysis of three prospective, single-arm studies to further assess the safety of the MicroShunt (8.5-mm-long subconjunctival/Tenon's capsule device) in patients with POAG.

Methods: The MicroShunt was implanted ab externo (0.2–0.4 mg/mL Mitomycin C, 2-3 minutes) in patients inadequately controlled on maximum tolerated medical therapy (medicated intraocular pressure [IOP] $\geq 18 - \leq 35$ mmHg). Outcomes included adverse events (AEs), reoperations and needling rates.

Results: The MicroShunt was implanted in 125 patients. Common procedure-related AEs ($\geq 5\%$) by Year 2 were investigator-reported increased IOP (30/125; most treated with medication [$n = 14$]), transient hypotony (< 6 mmHg; 17/125), keratitis (13/125) and hyphaema (12/125); devicerelated AEs were investigator-reported increased IOP (15/125; most treated with medication [$n = 8$]). The mean resolution times for procedure- and device-related AEs were 53 and 39 days, respectively. The majority of AEs occurred within the first month. Nine patients had procedure-related serious AEs (SAEs) and four had device-related SAEs. Five patients (4.0%) required reoperation (trabeculectomy [$n = 2$], sclerectomy [$n = 1$], flap resuture [$n = 1$], implantation of a second MicroShunt [$n = 1$]). Seven patients (5.6%) required bleb revision; 13 (10.4%) required postoperative needling.

Conclusion: In this analysis, MicroShunt implantation was associated with low rates of reoperations and needling events, and no long-term sight-threatening AEs.



P053

XEN® GEL IMPLANT IN A PATIENT WITH POSNER-SCHLOSSMAN SYNDROME. A CASE REPORT**Enara Etxabe Agirre¹, Mayerling M. Suriano¹, Irene Gregori Gisbert¹, Mireia Mascarell Vidal¹, Sara Mora Sáez¹***¹Ophthalmology, Hospital General de Castellón, Castellón de la Plana, Spain*

Purpose: To report a case of a patient with glaucomatocyclitic crises (also known as Posner-Schlossman syndrome) with increased intraocular pressure (IOP) which could not be stabilized with medical treatment and was treated surgically with a Xen® Gel implant.

Methods: A 45 year-old female patient was referred to our department with a blurry right eye. Examination revealed mild anterior chamber reaction with small diffuse keratic precipitates and IOP of 40 mmHg. Medical treatment did not manage to control the IOP, therefore surgery was offered to the patient and a Xen® Gel implant was placed on her right eye.

Results: After the implant was placed the IOP lowered to 4 mmHg during the first week, resulting in a high and diffuse filtering bleb. One year after surgery, the IOP remains stable at 20 mmHg and a well-functioning bleb is maintained.

Conclusion: In Posner-Schlossman syndrome, sometimes medical treatment is not sufficient to maintain normal IOP values and a surgical approach is needed. Xen® Gel implant may be a safe and effective therapy in glaucomatocyclitic crises when medical therapy fails to control IOP.



P054

HEADS-UP GLAUCOMA SURGERY USING A 3D VISUALIZATION SYSTEM

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Purpose: To investigate the feasibility of performing various kinds of glaucoma surgery including gonio surgery with double-mirror gonio lens, while viewing a three-dimensional (3D) image on a large display in a heads-up position.

Methods: In this case series, we retrospectively evaluated and share our initial impressions of the TrueVision 3D visualization system (Ngenuity 3D visual system, Alcon Surgical), when performing various kinds of glaucoma surgery, such as trabeculectomy (Trab), bleb needling, goniosynechialysis (GSL), and suture trabeculotomy / gonioscope-assisted transluminal trabeculotomy (GATT).

Results: All glaucoma surgeries were successfully performed under the heads-up system without any complications, not through the eye piece of a microscope. The field of view (FOV) is broad and stereopsis is excellent for the gonio surgery with high magnification. However, when working on the anterior segment such as Trab or bleb needling the digital latency becomes more evident and the surgeon's hands should slightly slow down to compensate for this. Also, FOV of the anterior segment is smaller with the heads-up platform compared to the standard operating microscope. Additionally, the shared viewing ability has helped many on the OR staff, as well as medical students and residents, to have a better understanding of the methods and goals of surgery.

Conclusion: Heads up surgery using a 3D visualization system is suitable for glaucoma surgeries, especially for the gonio surgery with double-mirror gonio lens including MIGS.



P055

MICROPULSE DIODE LASER CYCLOPHOTOCOAGULATION: INITIAL RESULTS AND SAFETY PROFILE**Brinda Shah¹, Apurva Goray¹, Safaa Mahmoud¹, Paritosh Shah¹***¹Yeovil District Hospital NHS Foundation Trust, Ophthalmology, Yeovil, United Kingdom*

Purpose: Micropulse transscleral cyclophotocoagulation (MCP) is a non-invasive treatment option believed to result in minimum tissue damage and is hypothesised to increase uveoscleral outflow. We aim to assess the safety and efficacy of MCP.

Methods: We retrospectively analysed eyes with early to advanced glaucoma of various aetiologies undergoing MCP using the IRIDEX Cyclo G6 Laser System with settings of 2000mw 31.3% cycles over 160-180 seconds.

Results: A total of 25 eyes, of patients aged 22 to 96 years with an average of 6.96 months follow up (3-12 months), post MCP were included; 7 of which had secondary glaucoma. We included 8 eyes with early (MD 0-6dB), 1 with moderate (MD 6-12dB) and 16 with advanced (MD > 12dB) glaucoma. The average mean deviation on a 24-2 visual field was -17.02dB. The mean Intraocular Pressure (IOP) decreased by 7.16 mmHg (29.11%) from 24.6mmHg pre operatively to 17.44 post operatively. The mean number of medications per eye reduced from 2.84 to 1.88. 3 eyes with end stage glaucoma (MD > 25dB) were noted to have further reduced vision post laser. Laser was repeated up to three times in 6 eyes and 7 eyes underwent further intervention due to inadequate IOP reduction. Dry eye and anterior uveitis were the other complications seen. No cases of hypotony, macular oedema, hyphaema, choroidal detachment or persistent inflammation were noted.

Conclusion: MCP appears to be a safe and repeatable option not only in eyes with advanced but also moderate glaucoma. More studies are needed to standardise patient selection.



P056

THE EFFECT OF GLAUCOMA ON DRIVING PERFORMANCEFang Helen Mi¹, Boon Ang Lim¹, Wei Leon Leonard Yip¹¹National Healthcare Group Eye Institute, Tan Tock Seng Hospital, Ophthalmology, Singapore, Singapore

Purpose: This study aims to investigate the difference in driving performance of glaucoma patients compared to normal subjects, using a driving simulator.

Methods: This was a prospective pilot study, using a custom-built driving simulator running on CarSim and UC-Win software. The driving proficiency outcome measures were trajectory control, maneuvering skills, steering control, pedals control, speed control, safety distance control and collision risk control. Overall scores were calculated (between A to E), and C or better was considered as pass. The Humphrey Visual Field (HVF) 24-2 test results of glaucoma patients were collected.

Results: A total of 40 normal subjects and 17 glaucoma patients were recruited. 5 glaucoma patients (29.4%) obtained a pass score, compared to 37 normal subjects (92.5%) ($p = 0.000$). There were statistically significant differences between the mean scores of the two groups, in trajectory control ($p = 0.000$), maneuvering skills ($p = 0.000$), steering control ($p = 0.023$), and speed control ($p = 0.002$). However, no significant differences were noted for pedals control ($p = 0.701$), safety distance control ($p = 0.376$) and collision risk control ($p = 0.141$). There was a statistically significant inverse correlation between the HVF mean deviation (MD) and collision risk control outcome, with Spearman's rho of -0.620 ($p = 0.008$).

Conclusion: The overall driving performances of glaucoma subjects were worse than normal subjects in this sample group. Glaucoma patients with worse HVF MD results performed poorer in the collision risk control outcome.



P057

HUMAN LIMBAL MESENCHYMAL STEM CELLS AUGMENTED TRABECULECTOMY IN HIGH-RISK GLAUCOMA: A PILOT STUDY**Rashmi Krishnamurthy¹, Sirisha Senthil¹, Sayan Basu², Vivek Singh³**

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Purpose: We performed a pilot trial to evaluate the safety and efficacy of hIMSCs augmented trabeculectomy in high-risk refractory glaucoma.

Methods: Prospective interventional pilot study. Inclusion criteria: age > 30 years, medically uncontrolled high-risk glaucoma (diagnosis of neovascular glaucoma, ICE Syndrome and non-resolving Acute angle-closure attack (AAC) where the risk of failure of Mitomycin-C augmented trabeculectomy is higher > 50%). Standard fornix-based trabeculectomy was performed. hIMSC's were placed after the scleral flap closure with single apical suture, around the Scleral flap in U-shape manner using fibrin glue followed by conjunctival closure. Primary outcome measure was intraocular pressure (IOP). Secondary measure was bleb morphology using Anterior segment Optical Coherence Tomography (ASOCT).

Results: We randomly assigned 5 eyes. Three eyes had neovascular glaucoma, one had ICE Syndrome and one had AAC. Pre-operatively, mean IOP (\pm standard deviation) was 41.6 (11.26) mmHg. Mean number of anti-glaucoma medication (AGM) was 4.6 (0.5). We noted significant reductions in the mean IOPs of 14 (\pm 6.16), 12.6 (\pm 4.7), 9.6 (\pm 5.54), 10 (\pm 6.2), 12.6 (\pm 4.6) mmHg at postoperative day-1, day-7, month-1, month-3 and month-6 respectively. At last follow-up (mean follow-up: 220 \pm 32 days), none of the eyes needed AGM nor had any complications. Bleb ASOCT revealed mean bleb wall thickness of 156 (\pm 58) microns and bleb cavity height of 108 (\pm 32) microns suggesting adequate functioning.

Conclusion: Human Limbal Mesenchymal stem cells as a potent anti-fibrotic and wound modulator in MMC-trabeculectomy seems to be safe and effective in high-risk refractory glaucomas.



P059

HIGH-INTENSITY FOCUSED ULTRASOUND TREATMENT IN MODERATE GLAUCOMA PATIENTS: RESULTS OF A 2-YEAR PROSPECTIVE CLINICAL TRIAL

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Purpose: To evaluate the safety and efficacy of the Ultrasound Cyclo Plasty (UCP) procedure using high intensity focused ultrasound (HIFU) in moderate glaucoma patients.

Methods: Sixteen eyes treated with HIFU. A thorough ophthalmic examination & IOP measurements were performed before the procedure and at 1 day, 1 week, 4w, 3m, 6m, 1 year and 2y. Surgical success ($\geq 20\%$ IOP reduction and IOP ≥ 5 mmHg) was measured at the last follow-up. Secondary outcomes were mean IOP, medications, complications, and re-interventions.

Results: IOP reduced from 27.7 ± 5.9 mmHg to 14.6 ± 4.8 ($p < 0.001$), 14.5 ± 4.1 mmHg ($p < 0.001$), 17.1 ± 5.2 mmHg ($p < 0.001$), 17.1 ± 3.4 mmHg ($p < 0.001$), 18.5 ± 3.5 mmHg ($p < 0.001$), 18.1 ± 3.6 mmHg ($p < 0.001$), 17.6 ± 4.4 mmHg ($p = 0.005$) at 1 day, 1w, 4w, 3m, 6m, 1y and 2y. Surgical success was 87%. Medication reduced ($2.5+0.8$ to $2.0+1.0$) after 2y ($p = 0.48$). No major complications.

Conclusion: Ultrasound Cyclo Plasty using HIFU is an effective and well-tolerated method to reduce IOP in patients with moderate glaucoma.



P060

EVALUATION OF ENDOTHELIAL CELL DENSITY AND LOSS FOLLOWING ITRACK AB-INTERNO CANAL BASED SURGERY

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Purpose: To evaluate stability of endothelial cell density over a three-year period in patients who have undergone ab-interno canal based surgery using the iTrack surgical system (Ellex, Adelaide, Australia).

Methods: Prospective, multi-center registry study with patients followed for 36 months following iTrack ab-interno canal based surgery, either as a standalone procedure or in combination with cataract surgery. Specular microscopy was performed preoperatively and at 1, 6, 12, 24, and 36 months postoperatively. Standard metrics for glaucoma surgery follow-up were also measured including visual acuity, intraocular pressure, visual fields, optic nerve OCT and glaucoma medication use. Endothelial cell density and loss were analyzed at each time point. Results from patients undergoing iTrack combined with cataract surgery were compared with results from age matched controls who underwent cataract surgery only. Six month results are being reported.

Results: Mean endothelial cell loss 1 month following iTrack surgery was 4%, 2% as a standalone procedure and 5% in combination with cataract surgery. Endothelial cell loss in the control group undergoing just cataract surgery was 5%. There was no additional endothelial cell loss between months 1 and 6 in any group.

Conclusion: iTrack canal based surgery causes minimal endothelial cell loss, comparable to cataract surgery alone. Future analyses will assess long term endothelial cell stability.



P061

GONIOSCOPY-ASSISTED TRANSLUMINAL TRABECULOTOMY (GATT): ONE YEAR FOLLOW-UP WITH EVALUATION OF SAFETY AND EFFICACY

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Purpose: To describe one year results of patients undergoing gonioscopy assisted transluminal trabeculotomy

Methods: Retrospective review of patients undergoing GATT with one surgeon (SS) between July 2017 and October 2018. The authors recorded preoperative intraocular pressure, number of medications, daily diamox use and degrees of goniotomy performed. The above information was reassessed at post-operative day 1, post-operative week 1, post-operative month 1, 3, 6, and 12. Data collection is ongoing.

Results: We identified 27 patients undergoing GATT with 6 months follow up data. Patients' ages ranged from 20-89 years, 51% identified as male. Preoperatively patients were on a mean of 3.25 glaucoma medications. Patients (n=18) were on an average daily dose of diamox equal to 660 mg. Average intraocular pressure (IOP) was 28 mmHg and following GATT, IOP was significantly lower across all follow up visits ($p < 0.05$). At one year follow up the average IOP was 16 mmHg (43% reduction). No patients remained on diamox. Average number of medications was reduced to 2.8. One patient required a wound burp on post-operative day one for elevated IOP. The most common significant complication was failure, requiring a second IOP lowering surgical procedure; which occurred in 15% of the cases.

Conclusion: GATT was successful in reducing IOP and medication burden in approximately 85% of cases. Failure to achieve adequate IOP control requiring further surgical intervention occurred in 15% of patients.



P064

MACULA MICROVASCULATURE CHANGES IN PATIENTS WITH PRIMARY OPEN ANGLE AND NORMAL TENSION GLAUCOMA; AN OCTA STUDY**Anna Dastiridou¹, Maria Samouilidou¹, Paraskevi Riga¹, Eleftherios Anastasopoulos¹, Sofia Androudi², Nikolaos Ziakas¹***¹Aristotle University of Thessaloniki, ²nd Ophthalmology Department, Thessaloniki, Greece, ²University of Thessalia, Ophthalmology Clinic, Larissa, Greece*

Purpose: To compare the macula vascularity characteristics in patients with primary open angle (POAG), normal tension (NTG) glaucoma and controls.

Methods: This was a cross-sectional study in an Academic Center. Patients with POAG and NTG from the Glaucoma Clinics were recruited. The control group comprised patients with mild cataracts or small refractive errors. OCT scanning of the macula and the disc and 6*6 HD macula OCT angiography imaging were performed with the RTVue XR Avanti with AngioVue software (OptoVue Inc). Retinal nerve fiber layer thickness (NFL), macula ganglion cell complex thickness (GCC) and macula vessel density (VD) were analysed.

Results: Seventy-six POAG, 44 NTG and 61 normal eyes were analysed. NFL thickness was 80.19 ± 15.02 in the POAG and 78.81 ± 15.13 μm in the NTG group ($p = 0.65$). GCC thickness was 81.55 ± 15.16 μm and 79.31 ± 14.04 respectively ($p = 0.59$). VD was 40.82 ± 6.61 in the POAG and 39.25 ± 5.21 μm in the NTG group ($p=0.15$). There was a significant correlation between VD and both GCC and NFL ($p < 0.05$). VD, NFL and GCC were lower in patients with POAG or NTG, compared to controls (all $p < 0.01$).

Conclusion: Macula VD is affected in patients both open angle glaucoma groups. However, NTG and POAG eyes show similar characteristics on OCT angiography.



P066

ONE YEAR EFFICACY AND SAFETY OF AB INTERNO TRABECULECTOMY WITH KAHOOK DUAL BRADE IN JAPANESE GLAUCOMA PATIENTS

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Purpose: To evaluate 1-year surgical efficacy and safety of ab interno trabeculectomy with Kahook Dual Blade (KDB surgery) in Japanese glaucoma patients.

Methods: A retrospective chart review was performed on glaucoma patients who underwent standalone KDB surgery at University of Tokyo Hospital from February 2017 to October 2018, with 12 months follow-up. The demographics, preoperative and postoperative intraocular pressure (IOP), visual acuity (VA) and medication score, the extent of incision, and postoperative complications were analyzed.

Results: Thirty-eight eyes of 34 patients with 14 POAG, 1 NTG, 19 exfoliation glaucoma, 1 congenital glaucoma and 3 secondary glaucoma were included. The mean age was 69.8 ± 16.7 years old. The trabecular meshwork was incised in 105 ± 15.1 degrees. The IOP and medication score significantly decreased from 25.8 ± 6.4 mmHg and 4.5 ± 1.1 at the baseline to 16.9 ± 5.6 mmHg and 2.0 ± 1.7 , 15.9 ± 4.3 mmHg and 2.9 ± 1.8 , 15.1 ± 4.3 mmHg and 2.8 ± 1.8 , and 18.4 ± 8.0 mmHg and 2.7 ± 1.7 at 1, 3, 6 and 12 months, respectively ($p < 0.05$, paired t-test with Bonferroni correction). VA in all visits was not significantly different. Hyphema was seen in 7 eyes (18.4%) on the first postoperative day. Additional surgery was needed in 9 eyes (24%) because of insufficient IOP reduction after the operation.

Conclusion: IOP and medication score were significantly reduced in KDB surgery during 1-year. There were some eyes which were needed for additional surgery.



P067

MANAGEMENT OF BLEB FAILURE AFTER TRABECULECTOMYElif Erdem¹, Inan Harbiyeli¹, Anil Uysal¹, Meltem Yagmur¹, Reha Ersoz¹¹Cukurova University Faculty of Medicine, Ophthalmology, Adana, Turkey

Purpose: To evaluate the surgical treatment options for the management of bleb failure after trabeculectomy.

Methods: A retrospective chart review was performed on patient records who underwent trabeculectomy and diagnosed bleb failure during the period March 2012 and March 2019. Surgical procedures for bleb failure were needling, argon laser suturolysis, bleb revision and re-trabeculectomy. Surgical timing, intraocular pressure values and complications were recorded.

Results: Sixteen eyes of 16 patients included in this study. Mean age was 60 years (25-84 years). Mean intraocular pressure was 31 mmHg (20-50 mmHg) after trabeculectomy. Mean duration between trabeculectomy and other surgical interventions was 4.8 months (1-24 months). Bleb revision was most common surgical procedure (8 patients, 2 of them underwent re-trabeculectomy finally), other surgical procedures were needling (4 patients, 1 of them need bleb revision during follow-up) and argon laser suturolysis (4 patients). Laser suturolysis was performed within one month after, needling 2 or 5 months later whereas there was no timing preference for surgical bleb revision (varying between 1 month to 24 months). Patients were followed mean 12 months (6-44 months) after surgical procedures. Intraocular pressure was under control 13 of 16 patients at the end of follow-up. There wasn't any complications that related with surgical procedures.

Discussion: Bleb failure is one of the challenges after trabeculectomy. Decision of surgical treatment options should be depend on particular features of patients. Repeated or combining procedures may be need for control intraocular pressure.



P068

NEW SUTURING TECHNIQUE IN TRABECULECTOMY**Mohsen Afroozifar¹, Mohammad Pakravan², Shahin Yazdani²***¹Khodadoust Eye Hospital, Glaucoma, Shiraz, Iran, ²Shahid Beheshti University of Medical Sciences, Ophthalmology, Tehran, Iran*

Purpose: Comparison of trabeculectomy in patients who operated by new suturing technique of Dr. Afroozifar (A.F. Suture) and the conventional trabeculectomy.

Methods: 18 patients with closed angle glaucoma who underwent conventional phaco-trabeculectomy (group A) compared with 12 patients treated with phaco-trabeculectomy using new suturing technique (A.F. Suture) (group B) for 4.5 years. Results compared based on post-operative mean ocular pressure, need for releasable suture removal, need for re-opening the trabeculectomy path (needling), need for choroidal tap. Pre-operation mean ocular pressure in group A was 28.3 mmHg with a mean of 3.3 drops and mean pre-operation ocular pressure in group B was 30.2 mmHg with average of 3.8 drops. mean age of the first group was 65.6 years and the mean age of the second group was 67.8 years.

Results: After 4.5 years, mean ocular pressure in group A was 14.4 mmHg with a mean of 1.5 drops and mean ocular pressure in group B was 12.7 mmHg with an average of 1.2 drops. In 65.6% of group A, releasable suture removal was required, only in 13.9% of group B needed to remove releasable sutures. 12.8% of group A, need to use needle to open the trabeculectomy duct, but only 1.3% of group B needed to use needle to open the trabeculectomy duct and choroidal tap in both groups was only one patient.

Conclusion: New suturing technique of Dr. Afroozifar (A.F. Suture) creates a better trabeculectomy outlet and better result in trabeculectomy.



P069

THE TENON'S LAYER REPOSITIONING APPROACH OF TRABECULECTOMY - A LONGITUDINAL CASE SERIES OF A MIXED GROUP OF GLAUCOMA PATIENTS

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Purpose: To investigate the effectiveness and safety of a Tenon's layer repositioning approach of trabeculectomy.

Methods: A prospective case series of 30 eyes of 30 Chinese patients with mixed types of glaucoma who underwent fornix-based trabeculectomy combined with intraoperative mitomycin C application. During conjunctival flap closure, Tenon's layer was separated and anchored on to the scleral surface, followed by conjunctival closure as a separate layer. All patients were followed-up for 1 year. Assessments, including intraocular pressure (IOP), vertical cup-disc ratio (VCDR), best-corrected visual acuity (BCVA) and visual field (VF), were performed before and after operation. Qualified and complete success were defined as IOP ≤ 21 mmHg in two consecutive visits with or without medication, respectively.

Results: 21 eyes (70%) and 28 eyes (93.3%) achieved complete and partial success at one year, respectively. There was significant reduction of IOP (28.5 ± 9.6 to 15.5 ± 2.6 mmHg, $p < 0.001$) and medication use (4.4 ± 0.9 to 0.8 ± 1.2 bottle per eye, $p < 0.001$). There were no significant changes to BCVA, VCDR and VF indices. No wound leaks were identified throughout the study. Other postoperative complications, including 2 eyes (6.7%) with transient hypotony and 1 eye (3.3%) requiring cataract surgery, were of relatively low rate.

Conclusion: The Tenon's layer repositioning approach of performing trabeculectomy appears to be a safe and efficacious procedure for patients with mixed types of glaucoma.



P070

SHORT-TERM RESULTS OF COMBINED PHACOEMULSIFICATION AND AB INTERNO TRABECULECTOMY IN THE UNITED KINGDOMDeva Loganathan¹, Ejaz Ansari¹¹University of Kent, Canterbury, United Kingdom

Purpose: To describe short-term outcomes of combined Phacoemulsification and Ab Interno Trabeculectomy with the Kahook Dual Blade (KDB; New World Medical, Inc, Rancho Cucamonga, CA) in adults with cataract and open-angle glaucoma (OAG).

Methods: Retrospective chart review of existing medical records. Data collected included intraocular pressure (IOP) and IOP-lowering medication use preoperatively and through up to 9 months postoperatively. Paired t-tests were utilized to compare preoperative to postoperative IOP and medication use values.

Results: Data from 32 eyes of 32 subjects were analyzed. Subjects were predominantly Caucasian (31/32) had mean (standard error) age of 80.0 (1.2) years, and had moderate-advanced OAG (mean cup-disc ratio 0.75 [0.03], mean visual field mean deviation -8.3 [1.2]). Mean IOP was 19.8 (0.8) mmHg at baseline and 15.8 (0.6) mmHg ($p < 0.0001$) at last follow-up (mean 5.8 [0.3] months); IOP reductions of $> 20\%$ were achieved in 17/32 eyes (53.1%). Mean IOP medication use declined from 2.4 (0.2) medications per eye at baseline to 0.06 (0.04) medications per eye ($p < 0.0001$) at last follow-up; 30/32 eyes (93.8%) were medication-free at last follow-up. No vision-threatening complications were observed.

Conclusions: Combined phacoemulsification and ab interno trabeculectomy with the KDB safely provided mean IOP reductions of $\sim 20\%$ and mean IOP medication reductions of $\sim 98\%$ after mean follow-up of ~ 6 months in eyes with moderate to advanced OAG. This procedure provides medication-independence in most eyes with statistically and clinically significant IOP reductions in the short-term.



P071

COMPARISON OF CORNEAL ENDOTHELIUM ANALYSIS BEFORE AND AFTER SURGERY IN PATIENTS UNDERGOING TRABECULECTOMY WITH MITOMYCIN-C

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Purpose: To evaluate the possible effects of trabeculectomy on endothelial cell survival and to reveal the pre-postoperative factors associated with endothelial cell loss after trabeculectomy.

Methods: This prospective cross-sectional study involved 25 eyes of 22 glaucoma patients who underwent trabeculectomy with mitomycin-C between December 2017- May 2019. Baseline patient data included age, gender, type and duration of glaucoma, number of topical/oral medications, preoperative intraocular pressure, lens status and preoperative analysis of central corneal endothelium with non-contact specular microscopy (Cellcheck, Konan Medical, Inc.). Postoperative data included duration of follow-up, all medications, complications, additional interventions and postoperative analysis of endothelium.

Results: The mean age of 22 patients (6 female, 16 male) was 55.2 ± 18.6 years. The mean follow-up period was 8.5 ± 8.1 months. Preoperative endothelial cell density was 2598.2 ± 203.6 , this value changed as 2430.1 ± 359.3 postoperatively and this difference was statistically significant ($p: 0.05$). Coefficient of variation and hexagonality values did not differ significantly after trabeculectomy ($p > 0.05$ for both). There was no significant effect of demographic and clinical parameters on endothelial cell survival and morphology ($p > 0.05$ for all). Monthly endothelial cell loss (cell loss / month) were similar between patients with a follow-up ≤ 6 months and patients with longer follow-up ($p > 0.05$).

Conclusion: Endothelial cell loss may develop after trabeculectomy therefore periodic evaluation of endothelial cells during postoperative follow-up may be helpful in predicting postoperative corneal complications. Larger case series with longer follow-up are required to reveal demographic and clinical factors that may have an impact on endothelial survival after trabeculectomy.



P072

TRABECULECTOMY FAILURE RATES BETWEEN PHAKIC AND PSEUDOPHAKIC PATIENTS WITH OPEN ANGLE GLAUCOMA**Sónia Torres-Costa¹, António Melo¹, Sérgio Estrela-Silva¹, Fernando Falcão-Reis¹, João Barbosa Breda^{1,2}**¹*Centro Hospitalar Universitário de São João, Ophthalmology, Oporto, Portugal,*²*KULeuven, Research Group Ophthalmology, Department of Neurosciences, Leuven, Belgium*

Purpose: To evaluate whether previous clear-cornea phacoemulsification affects the surgical outcomes of trabeculectomy in open angle glaucoma (OAG) patients.

Methods: Retrospective cohort study comparing phakic and pseudophakic eyes at 1 and 2 years of follow-up. The primary outcome was the probability of surgical failure. Failure was defined as IOP > 21 mmHg or reduced < 20% from baseline, IOP ≤ 5 mmHg, need for further glaucoma surgery, phthisis or loss of light perception vision due to glaucoma. Secondary outcome measures included: visual acuity, postoperative hypotensive medications, needlings, intraoperative and postoperative complications and need for further glaucoma surgery.

Results: In total, 87 eyes from 87 patients (63 phakic and 24 pseudophakic) were included. Patients in the pseudophakic group were significantly older than those in the phakic group, 76 vs 66 years ($p < 0.001$). No other statistically significant differences between groups were found at baseline. The probability of surgical failure in the phakic vs pseudophakic group was 22% (12 in 54) vs 37% (7 in 19) at 1 year and 22% (11 in 50) vs 37.5% (6 in 16) at 2 years. No significant differences of surgical failure between phakic and pseudophakic eyes were found at 1 and 2 years.

Conclusion: Prior clear-corneal phacoemulsification may not significantly increase the rate of trabeculectomy failure.



P073

VISUAL FIELD CHANGES FOLLOWING TRABECULECTOMY: A RETROSPECTIVE STUDY**Mubashir Siddiqui¹, Tawfeeq Hakim¹, Pornjitra Rattanasirivilai¹, Vikas Shankar¹***¹East Lancashire Hospitals NHS Trust, Ophthalmology, Burnley, United Kingdom*

Purpose: This study aims to determine whether trabeculectomy surgery in glaucoma patients would lead to an improvement in visual fields.

Methods: We retrospectively looked at patients with a diagnosis of primary open angle glaucoma (POAG) who underwent trabeculectomy surgery in one or both eyes from April 2015 to March 2018. Out of a total of 340 surgeries, 40 were trabeculectomies with phacoemulsification while 300 were just trabeculectomies. 36 cases were selected at random where 7 were trabeculectomies with phacoemulsification while 29 were just trabeculectomies. The pre-op, 6-month post-op, 1-year post-op and 2-year post-op visual field results were recorded. Improvement was defined as an increase in mean defect (MD) and pattern standard deviation (PSD) value by > 0.50 DB while deterioration was defined as a decrease by > 0.50 DB. Any change in the values between those two parameters was considered stable. The patients who showed stability or improvement in their visual fields from pre-op to post-op were divided into mild, moderate and severe visual field defect. Their pre-op and post-op intra-ocular pressure (IOP) was recorded and the percentage change in IOP was calculated.

Results: Out of 36 trabeculectomies, 16 (44%) showed an improvement, 13 (36%) showed a deterioration while 7 (19%) remained stable. The average reduction in IOP from pre-op to post-op was 14 mmHg which was a 59% decrease.

Conclusion: Trabeculectomy in POAG patients is known to stabilise visual fields. However, these results show that some patients can show improvement, which will prove to be invaluable when consenting patients for trabeculectomies.



P075

A DECADE OF DIFFERENCE: A 10-YEAR COMPARISON OF TRABECULECTOMY SURGERY**Haaris Shiwani¹, Salman Naqvi², Cristina Cristian², Leon Au², Anne F. Spencer², Cecilia H. Fenerty², Karl J. Mercieca²***¹Royal Lancaster Infirmary, University Hospitals Morecambe Bay Foundation Trust, Lancaster, United Kingdom, ²Manchester Royal Eye Hospital, Manchester University NHS Foundation Trust, Manchester, United Kingdom*

Purpose: Trabeculectomy techniques have evolved significantly over the decades. We compare 2-year outcomes obtained from primary trabeculectomy in two cohorts, ten years apart, performed at a large UK teaching eye hospital.

Methods: Retrospective descriptive analysis of clinical records for patients undergoing trabeculectomy at Manchester Royal Eye Hospital from 1st August 2004 to 31st July 2005 (cohort 1, C1) and from 1st August 2014 to 31st July 2015 (cohort 2, C2). Pre-defined IOP success rates and survival curves were applied.

Results: 186 cases were analysed; 52 from C1, 134 from C2. Mean pre-operative IOP was 24 ± 10 mmHg (mean \pm SD) in C1 and 21 ± 7 mmHg in C2 ($p = 0.01$). 37 patients (80%) achieved absolute IOP success in C1 compared to 95 (75%) in C2 at two-year follow-up ($p = 0.63$). Intra-operative 5-fluorouracil (5-FU) was used in 62% of cases in C1; mitomycin C (MMC) was used exclusively in C2 ($p < 0.0001$). Post-operative antimetabolite injections were required in 56% versus 28% of patients in C1 and C2 respectively ($p = 0.0006$) whereas theatre needling rates were not statistically different (35% versus 31% for C1 and C2) ($p = 0.80$).

Conclusion: MMC has replaced 5-FU as the intra-operative antimetabolite with resulting similar IOP success rates but a lower degree of post-operative antimetabolite administration. MMC use did not result in increased post-operative complications.



P076

COMPARATIVE EVALUATION OF TRABECULECTOMY VERSUS TRABECULECTOMY COMBINED WITH DEEP SCLERECTOMY- A RANDOMIZED CONTROL TRIAL

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Purpose: To evaluate the efficacy of deep sclerectomy combined with trabeculectomy as compared to trabeculectomy alone in primary open angle glaucoma.

Methods: Trial conducted at the tertiary eye care center, out of 68 patients with moderate to advanced glaucoma (Hodapp-Parish-Anderson classification), 35 were operated for trabeculectomy alone (Group 1) and 33 operated for trabeculectomy with deep sclerectomy (Group 2). Subconjunctival Mitomycin C 0.1 mg/ml for 1 minute was used in both groups. Kaplan–Meier plots were constructed to assess time to failure. Outcome measure included reduction in intraocular pressure (IOP) by absolute and qualified success criteria (less than or equal to 15 mm Hg without medication and with medication respectively).

Results: Mean postoperative IOP at 9 months was 12.8 ± 2.2 mmHg in the Group 1 and 11.4 ± 1.3 mmHg in Group 2 ($p .003$). Significantly higher absolute and cumulative success (absolute plus qualified success) was achieved in the Group 2 (57.5% and 87.8%, respectively), when compared to Group 1 (31.42% and 51.42% respectively), ($p .012$ and $.001$ respectively). On bleb Ultrasound Biomicroscopy at 9 months, suprachoroidal flow was noted more frequently in Group 2 (6.5%) vis-à-vis Group 1 (0%) ($p .23$). Median, minimum and maximum height of the intrascleral lake (mm) in Group 1 and Group 2 at 9 months was 0.02, 0.01, 0.2 and 0.01, 0.01, 0.3 respectively ($p .4$).

Conclusion: Combination of trabeculectomy with deep sclerectomy lead to significantly lower IO, improved success rate in terms of IOP control.



P078

LONG TERM OUTCOMES OF TRABECULECTOMY IN UNCONTROLLED ADVANCED OPEN ANGLE GLAUCOMA PATIENTSAnca Pantalon¹, Dorin Chiselita¹*¹"Sf. Spiridon" University Hospital, Ophthalmology, Iasi, Romania*

Purpose: Trabeculectomy success in advanced uncontrolled open angle glaucoma (OAG) eyes.

Methods: A retrospective cohort study in OAG cases. Indications for trabeculectomy were: uncontrolled IOP, progressive disease, general status/life span of the patients, status of the fellow eye. Clinical parameters included: demographics, best corrected visual acuity (BCVA), type of glaucoma, baseline/final IOP, number of medications, intra/postop complications. Complete success, was defined if medicated IOP < 21 mmHg; whereas qualified success was defined for unmedicated IOP < 21 mmHg. Failure was declared if eyes lost light perception or if medicated IOP ≥ 21 mmHg, respectively IOP ≤ 5 mmHg. Statistical analysis included odd ratio (OR) calculations and Kaplan-Meier survival analysis. $p \leq 0.05$ was significant.

Results: 165 eyes were selected and followed-up for 24.34 ± 13.67 months; mean age was 64.72 ± 14.6 years, baseline BCVA = 1.38 ± 1.09 logMAR. Initial IOP was 34.54 ± 12.31 mmHg, under 3.16 ± 0.89 topical medications. After trabeculectomy, postop IOP dropped to 12.33 ± 8.81 mmHg ($p < 0.001$ vs baseline). Effect of trabeculectomy was sustained at the last available visit (IOP = 15.52 ± 8.45 mmHg), with an overall IOP reduction of 43.66% from baseline. Reduction in postop medication was also notable (0.5 ± 1.01 , $p = 0.000$). Overall success of trabeculectomy was 84% at 12 months, 77% at 24 months and 51% after 36 months. Success of trabeculectomy was influenced by sex, male patients having better chances to "survive" OR = 2.1, 95%, [CI] = 1.13-3.10, the number of 5FU postop injections OR = 1.8, [CI] = 0.88-2.7 and tenonectomy OR = 1.19, [CI] = 0.2-2.06.

Conclusion: Success in trabeculectomy was achieved in a high proportion of cases (> 75%) at 12 and 24 months; male patients, tenonectomy or anti-fibrotic treatment (5FU injections) were related to a better surgical outcome.



P079

CORNEAL BIOMECHANICAL BEHAVIOR AFTER GLAUCOMA SURGERY

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Purpose: The purpose of this study is to assess how the corneal biomechanical properties are affected after two antiglaucoma procedures (trabeculectomy and the insertion of the Ex-PRESS mini shunt).

Methods: Thirty eyes were included in the study. Eighteen eyes had an Ex-PRESS shunt inserted (Group 1) and 12 had trabeculectomy (Group 2). IOP, CH, CRF were recorded preop and postoperatively. The follow up period was 12 months.

Results: In both Groups CH increased at all time points compared to baseline values. In Group 1 from preop 7.98 to 8.89 at 12 months. In group 2 from 8.15 preop to 9.25 at 12 months. CRF was also increased at all time points from preoperative 9.99, to 11.85 at 12 months in Group 1 and from 10.35 preop to 12.05 at 1 year. No difference between the two groups was recorded, but CH and CRF postop increased more in PEXG.

Conclusion: Both surgical techniques have shown to cause a decrease of IOP and an increase of the CH and CRF postoperatively more pronounced in PEXG eyes.



P080

USE OF INTRACAMERULAR BEVACIZUMAB IN TRABECULECTOMY, ADVANTAGE OR NOT?**Maria Elisa Luís¹, Diogo Hipólito-Fernandes¹, Rita Serras-Pereira¹, Catarina Xavier¹, Nuno Moura-Coelho¹, Maria Reina¹, Joana Cardigos¹***¹Centro Hospitalar Universitário de Lisboa Central, Ophthalmology, Lisbon, Portugal*

Purpose: To evaluate morphological and imaging characteristics of filtration blebs in non-neovascular glaucoma patients undergoing trabeculectomy combined with intracameral bevacizumab injection.

Methods: Cross-sectional study of 17 eyes submitted to trabeculectomy abexterno combined with 50µL bevacizumab (1.25 mg / 0.05 ml) intracameral injection and 17 eyes undergoing trabeculectomy abexterno without bevacizumab. Filtration blebs were evaluated according to the Moorfields Bleb Grading System (MBGS) classification and *in vivo* confocal microscopy (ivCM).

Results: Mean follow-up time was 6.5 ± 5.0 months for study group and 17,6% were non-functional blebs. According to MBGS classification, 46% of study blebs were cystic, while 50% of control blebs were diffuse. ivCM showed a mean number of intraepithelial cysts of 31.7 for study blebs and 12.9 for control blebs ($p < 0.05$). A difference in cysts density between the 2 groups were also observed (mean 206.9 for study group and 83.4 for control group) ($p < 0.05$). A higher vascularisation were detected in study group. 60.5% of study blebs and 50% of control blebs presented a loose or mild connective tissue on ivCM, respectively.

Conclusion: The use of bevacizumab in neovascular glaucoma is well described in the literature, but the results in non-neovascular cases still lacks consistent outcomes. Our study shows a higher number of intraepithelial cysts and cysts density in bevacizumab group, which is usually associated with better bleb function. Larger studies are needed.



P081

LONG-TERM CHANGES OF THE CORNEAL ENDOTHELIAL CELL DENSITY AFTER EX-PRESS® DRAINAGE DEVICE IMPLANTATION FOR JAPANESE GLAUCOMA PATIENTS

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Purpose: To investigate the changes of corneal endothelial cell density (CECD) after initial EX-PRESS® drainage device implantation surgery (EX-PRESS) for Japanese open angle glaucoma (OAG) patients.

Methods: We retrospectively investigated the CECD after EX-PRESS of OAG patients who were followed up for three years and well-controlled under the target IOP. Pre (baseline) and postoperative (3, 6, 12, 24 and 36 months) CECD were examined by corneal specular microscopy, and the changes of CECD were analyzed.

Results: Thirty eyes of 30 patients (mean age 67.5 ± 15.2 years; male 21, female 9) including 14 eyes with stand-alone surgery and 16 eyes with combined surgery were included. The types of glaucoma were 13 POAG, 14 NTG, 2 pseudo-exfoliation glaucoma, and 1 secondary glaucoma. The mean CECD was 2535 ± 173 (mean \pm SD) at the baseline and 2458 ± 189 , 2515 ± 197 , 2480 ± 234 , 2429 ± 253 and 2414 ± 286 cells/ mm² at 3, 6, 12, 18, 24 and 36 months, respectively. The reduction rate of CECD after the surgery from the baseline was 3.0, 0.8, 2.2, 4.2, and 4.8%, respectively. Statistically, CECD in all subjects significantly decreased after the surgery only at 24 months, and CECD of triple surgery decreased at 6 and 36 months ($p < 0.05$, paired t-test). However, there was no differences among CECDs of the 6 post-operative points, and stable for 3 years.

Conclusion: CECD transiently decreased after EX-PRESS surgery, but stable for 3 years. Ex-PRESS surgery was clinically safe for CECD in post-operatively well-controlled patients.



P083

EFFECT OF MODIFIED POST-SURGICAL CARE ON OUTCOMES OF AHMED GLAUCOMA VALVE (AGV) AND BAERVELDT GLAUCOMA IMPLANT (BGI) SURGERY FOR NEOVASCULAR GLAUCOMA (NVG)Mayumi Minami¹, Etsuo Chihara¹¹Sensho-kai Eye Institute, Ophthalmology, Uji, Japan

Purpose: To report postoperative care techniques and outcomes of AGV and BGI for NVG.

Methods: We retrospectively reviewed the medical records of NVG patients who underwent AGV (19 eyes) BGI (39 eyes) between 2001 and 2019. We used modifications such as absorbable suture to ligate tube, combination of the stent and ripcord, stepwise release of ligation, and massage, and the outcome was compared with that of the Ahmed Baerveldt Comparison study (ABC study). Main outcome measures were IOP, visual acuity (VA), rate of failure.

Results: The mean follow-up period was 54.7 ± 48.5 months in AGV and 33.7 ± 23.2 months in BGI. Baseline IOP in AGV and BGI cohorts were 37.4 ± 16.5 and 37.0 ± 11.1 mmHg ($p = .90$), which lowered to 14.6 ± 2.6 and 13.0 ± 4.0 mmHg ($p = .08$) at 5 years. Baseline logMARVA in AGV and BGI cohorts were 1.39 ± 0.90 and 1.43 ± 1.01 ($p = .86$), which changed to 1.46 ± 0.62 and 0.86 ± 1.03 ($p = .20$) at 5 years. Even though we enrolled only NVG, the cumulative probability of failure at 5 years were 33.9% in AGV and 35.0% in BGI ($p = .80$), which was comparable or even better than the probability of 44.7% and 39.4% in the ABC study.

Conclusions: Modified techniques might have contributed to better outcome after long tube surgery for NVG.



P084

COMPARISON OF MITOMYCIN-C USE AS AN ADJUNCTIVE THERAPY IN BAERVELDT TUBE SURGERY

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Purpose: To investigate outcomes of glaucoma patients undergoing Baerveldt tube surgery with/without Mitomycin-C (MMC).

Methods: Retrospective, single centre analysis of 24 consecutive patients who underwent Baerveldt tube surgery with or without MMC. The decision to use MMC was the surgeons choice.

Results: 24 eyes with a mean age of 64.6 years and mean follow up of 11.5 months. Subconjunctival application of sponges soaked in 0.4mg/ml MMC for 5 minutes were used in 14 (58%) eyes. 30% had secondary glaucomas and 50% prior conjunctival involving glaucoma surgery. Of the 10 eyes in the non-MMC group only 20% had prior conjunctival involving glaucoma surgery and 10% had secondary glaucomas. The MMC group had a 40% reduction in mean intraocular pressure (IOP) from 23.9 mmHg to 14.3 mmHg ($p < 0.005$) and 60% reduction in IOP lowering medications from 3.9 to 1.5 ($p < 0.005$). The non-MMC group had a 44% reduction in IOP from 24.5 mmHg to 13.7 mmHg ($p = 0.01$) and a non-significant 19% reduction in medications from 3.6 to 2.9 at latest follow-up ($p = 0.10$). Reduction in IOP was similar in both groups but the MMC group had a significantly greater reduction in the number of IOP lowering medications at latest follow-up ($p = 0.02$) with 29% drop free compared to none in the non-MMC group. Both groups had a similar low number of complications.

Conclusion: Baerveldt tube surgery with adjunctive MMC resulted in similar post-operative IOP as non-MMC, however this was achieved using significantly fewer IOP lowering medications, despite a higher proportion of patients with secondary glaucomas and previous glaucoma surgery.



P085

NASAL AHMED GLAUCOMA VALVE IMPLANTATION A FINAL SOLUTION TO SUPERIOR TEMPORAL QUADRANT FAILURE**Carolina Madeira¹, Gonçalo Godinho¹, António Melo¹, Fernando Falcão-Reis¹, Sérgio Silva¹***¹Department of Ophthalmology, Centro Hospitalar de São João, Porto, Portugal*

Purpose: To evaluate the long-term efficacy and complications of inferior (IN) and superior (SN) nasal Ahmed Glaucoma Valve (AGV) implantation in patients with refractory glaucoma.

Methods: Retrospective review of clinical records of 10 eyes of 10 patients who underwent uneventful SN or IN AGV implantation with a minimum follow-up of 2 years. An operation was defined as successful when (1) postoperative IOP remained between 5 and 21 mmHg and was reduced 30% compared to baseline, with or without medication, (2) there was no loss of light perception or vision-threatening severe complications, and (3) no additional filtering or aqueous drainage surgery was required.

Results: The current study included 10 eyes of 10 patients with uncontrolled IOP despite maximum tolerated medical therapy. Pre-operative mean IOP was 28 (19-40) mmHg. The superotemporal (ST) quadrant wasn't available for valve implantation in any of these eyes. Patients underwent SN (n = 5) and IN (n = 5) AGV implantation. Median follow-up period was 3 [2-12] years. Postoperative IOP at the end of follow-up was 12 [6-34] mmHg. Success rate was 90%. One patient with a SN AGV presented with a vision-threatening complication: wound dehiscence, exposure of the patch graft and endophthalmitis.

Conclusion: AGV implantation in the nasal quadrants seems to be an effective option for IOP control in patients with refractory glaucoma, when the ST quadrant is not available, the nasal location is an effective option.



P086

INTRALUMINAL STENT CHOICE FOR THE BAERVELDT GLAUCOMA IMPLANT**Lina Danieliute¹, Anindyt Nagar¹, Henrietta Ho¹, Ian Rodrigues¹***¹Guy's and St Thomas' NHS Foundation Trust, Ophthalmology, London, United Kingdom*

Purpose: Flow restriction is critical in preventing early hypotony with the valveless Baerveldt glaucoma implant (BGI). We compared outcomes of BGI surgery using 3-0 Supramid[®] and 4-0 Prolene sutures as intraluminal stents.

Methods: Consecutive patients operated by a single surgeon were retrospectively reviewed. Failure was defined as post-surgery intraocular pressure (IOP) > 21 mmHg, or < 20% reduction from pre-operatively. 4-0 Prolene was the surgeon's standard intraluminal stent and 3-0 Supramid[®] was used if the patient was within a clinical trial.

Results: 24 patients (12 in each group) were included. Mean age was 64.6 years and mean follow-up 11.5 months. With 3-0 Supramid, mean IOP reduced from 23.3mmHg to 14.8 mmHg ($p < 0.001$) and mean number of IOP-lowering medications reduced from 3.5 to 2.5 ($p = 0.026$). With 4-0 Prolene, IOP reduced from 25.0mmHg to 13.1 mmHg ($p < 0.001$) and IOP-lowering medications reduced from 4.0 to 1.8 ($p < 0.001$). 25% with Supramid were classified as failures compared to 8% with Prolene stents. Post-operatively, laser suturelysis of ligating sutures were required in 41% with Supramid and 67% with Prolene stents ($p = 0.41$), however significantly more patients required removal of Supramid (100%) compared to Prolene stents (17%), $p < 0.001$. One patient in the Prolene group had early overdrainage with hypotony, requiring an additional ligation suture.

Conclusion: Final IOP and number of IOP-lowering medications were similar when using 3-0 Supramid[®] and 4-0 Prolene intraluminal stents in BGI surgery. However this was achieved with significantly less frequent intraluminal stent removal when using 4-0 Prolene which can therefore be considered a safe and effective alternative intraluminal stent.



P087

OUTCOMES OF COMBINED BAERVELDT GLAUCOMA IMPLANT AND TRABECULECTOMY WITH MITOMYCIN C IN PATIENTS WITH ADVANCED GLAUCOMA

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Purpose: To describe our surgical experience with combined Baerveldt glaucoma implant (BGI) and trabeculectomy with mitomycin C (MMC), and present our clinical outcomes.

Methods: Consecutive eyes with advanced glaucoma (mean deviation (MD) <-12dB) and uncontrolled intraocular pressure (IOP) or progression on maximal medical treatment were recruited. All patients were deemed to be at high risk of trabeculectomy failure. Data was prospectively collected. Mean IOP reduction, use of ocular hypotensive medications and surgical complications were recorded.

Results: 28 eyes of 25 patients were included. Most patients had POAG (89.3%), and a mean age of 61.7 ± 12.4 years and mean preoperative MD of -20.9 ± 7.2 dB. The mean duration of follow-up was 26.1 ± 13.5 months. Mean medicated IOP was 22.6 ± 7.9 mmHg at baseline, 14.3 ± 4.8 mmHg at 1 month post-operatively, 12.1 ± 4.8 mmHg at 3 months post-operatively and 11.0 ± 3.2 mmHg at last follow-up ($p < 0.001$). Mean number of medication reduced from 3.5 ± 0.6 to 1.3 ± 1.4 ($p < 0.001$). Complications included one eye with endophthalmitis, two eyes with late hypotony (> 6 months post-operative) and one eye with exotropia. No eyes lost light perception in this cohort.

Conclusions: Our surgical technique of combined BGI with trabeculectomy significantly lowered IOP and reduced medication use to provide good early and intermediate IOP control in eyes with refractory advanced glaucoma.



P088

OUTCOMES AND RISK FACTOR FOR FAILURE AFTER AQUEOUS SHUNT IMPLANTS - ANNUAL REVIEW OF ONE SERVICE RESULTS AND BENCHMARK

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Purpose: Report annual benchmark exercise of aqueous shunt implants (tubes) outcomes and risk factors for failure over 4 years.

Methods: Retrospective cases series: Annual reporting of outcomes of tube implants. A total of 332 eyes were included in this study. The main outcomes were intra-ocular pressure (IOP), loss of visual acuity (VA), number of medications and failure/visually threatening complications at 1-year follow-up.

Results: Surgical success rate was 93% at a mean follow-up of 13.3 months. Compared to preoperative IOP (25.8 ± 7.9 mmHg), the mean postoperative IOP was significantly lower (14.4 ± 5.5 mmHg, $p < .00001$) on significantly fewer ocular hypertensive medications (from 3 ± 1 to 1.4 ± 1.3 , $p < .00001$). There were 2 (0.6%) cases of loss of light perception.

Conclusion: Annual reporting of tube implant within a service provides an exceptional tool for monitoring outcomes in line with major literature. It allows to monitor safety as well as new trends in surgical technique.



P089

EFFICACY AND SAFETY OF THE AB-INTERNO XEN GEL STENT AFTER FAILED SHUNT SURGERY IN ADVANCED GLAUCOMA PATIENTS

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Purpose: To assess the efficacy and safety of the Xen gel stent in reducing intraocular pressure (IOP) in eyes with prior failed shunt surgeries and determine the frequency of complications.

Methods: Retrospective case review of all patients with prior shunt surgeries who had undergone Xen surgery from May 2017 to April 2019.

Results: Seven surgeries were reviewed. Average IOP was reduced from 24.5 mmHg to 10.8 mmHg. Medication usage was reduced from an average of 3.5 to 0.5. Adverse events included: numerical hypotony in 2 cases, one requiring anterior chamber reformation. Postoperative bleb needling was required in three cases.

Conclusion: The Xen Gel Stent reduces IOP and the number of medications in eyes with failed shunt surgeries. Detailed preoperative conjunctiva, sclera, angle assessment and preparation, together with a targeted stent placement, are required.



P090

COMPREHENSIVE BIOINFORMATIC EVENT SIMULATION STUDIES ON WOUND HEALING IN TRABECULECTOMY BY UTILIZING FUNCTIONAL GENE ASSOCIATION AND CELLULAR EVENT ANALYSIS: A FOCUS ON GENE MODULATION TO IMPROVE SURGICAL OUTCOMES

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Purpose: Success of trabeculectomy is profoundly hampered by postoperative fibrotic scar formation. Although mitomycin C (MMC) is currently used to prevent scar formation but it often leads to complications. With this premise, we aimed at identifying the molecular and genetic signatures that could be employed to improve surgical outcomes.

Methods: We did comprehensive data mining using databases, search engines, meta-analyses, repositories, individual studies, and Human Metabolome Database. A perioperative and postoperative chronology of molecular events that enhance fibrotic scar formation (α -Nodes) and those that inhibit (β -Nodes) was constructed. Disgenet, Metacore, Genespring, Cytoscape, Netpath, Cell Collective and E-cell were used for analysis and event simulation in Tenon's capsule, episclera and subconjunctival areas.

Results: 209 genes belonging to 24 pathways were identified. Simulation yielded 12 cellular events relevant to fibrotic scar formation viz. surgical trauma, fibrinogen/fibronectin/plasminogen release, fibrin-fibronectin matrix induction, infiltration of proinflammatory cells, induction of angiogenesis, lymphocyte and fibroblasts infiltration/activation, T-cell activation/cytokine release, fibroblast proliferation, fibrin-fibronectin matrix dissolution, fibrovascular granulation and scar formation. Pathway enrichment was carried (FDR < 0.001) which identified 19 genes (CTGF, ROCK1, MMP9, PDGF, IL1B, FAS, IL1A, NGF1, BCL2LI, NTRK1, NFKB1, CASP3, TP53, TGF- β , TNF- α , XIAP, BAD, VEGF and MAPK3) and 1731 interactions. Functional annotation revealed that MMP9, CASP3, BCL2LI, TGF β , TNF and VEGF expression signature modulates fibrosis around Tenon's capsule, episclera and subconjunctival areas.



Conclusion: This is the first bioinformatic study that identifies the gene expression signature that could be regulated to improve surgical outcomes in trabeculectomy.



P092

5-FLUOROURACIL VS MYTOMICIN-C IN BLEB REVISION**Fernando Trancoso Vaz¹, Rita Basto¹, Joana Roque¹, Susana Henriques¹***¹Hospital Professor Doutor Fernando Fonseca, Ophthalmology, Lisbon, Portugal*

Introduction: Subconjunctival antifibrotic injection allows to restore the bleb's filtration function without further destruction of the conjunctiva.

The aim is to compare the efficiency between 5-fluorouracil (5-FU) and mytomicin-C (MMC) in postoperative bleb revision.

Methods: A retrospective comparative review was made with 53 patients, divided into two groups: 34 eyes injected with 5-FU (50 mg/mL) and 19 injected with MMC (0.04 mg/mL).

Results: Successful reduction in IOP ($> 20\%$) was achieved in 88.7% of all cases, with no difference between groups ($p = 0.113$). Absolute success (IOP ≤ 21 mmHg with no medication) tended to be higher in the MMC group, with significance ($p = 0.013$) only after 3 months of follow-up (14.7% in 5-FU group and 52.6% in MMC group at 3 months, 24.2% and 50.0% at 1 year). Failure (IOP > 21 mmHg) tended to increase in 5-FU group, with no cases of failure with MMC and 20.6% with 5-FU after 6 months. Repeated injection was performed in 41.2% of eyes in 5-FU group, compared to 15.8% with MMC. The need for a new surgery was similar (38.2% in 5-FU and 36.8% in MMC). There was no statistical difference in the complication rates between groups.

Conclusion: Antifibrotic injection is safe and an effective intervention to rescue filtration blebs. MMC seems to be more effective than 5-FU, without significant increase in complications. Patients receiving MMC had a shorter follow-up period which may justify the higher MMC success rate and the lower need for re-intervention.



P093

PROLONGATION OF IMMUNOSUPPRESSANTS DELIVERY FOR WOUND HEALING MODULATION IN GLAUCOMA SURGERY: EXPERIMENTAL IN VITRO STUDY

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Purpose: To develop a method to prolong delivery of selective immunosuppressants in the surgery area for wound healing modulation in glaucoma interventions.

Methods: We analyzed the ability of poly(lactic-co-glycolic) acid glaucoma drainage samples to cumulate cyclosporine A (CsA) from solutions with decreasing drug concentrations from 50,0 to 1,0 mg/ml for 5-60 minutes. Other drainage samples were enriched with everolimus with the help of ultrasound. Then drainage samples were lyophilized and amount of incorporated immunosuppressants was evaluated by means of chromatography-mass spectrometry. The dynamics of immunosuppressants desorption was analyzed in vitro: drainage samples enriched with CsA and everolimus were placed in containers with 9 ml balanced salt solution and kept at constant temperature 37 C° in a shaker (50-100 rpm). At specific times from 12 hours to 14 days drainage samples were removed from the solutions and residual content of the drugs was evaluated by means of chromatography-mass spectrometry.

Results: poly(lactic-co-glycolic) acid glaucoma drainage turned out to be a good substrate for enrichment with both immunosuppressants. It incorporated 3.87 µg of CsA and 240 µg of everolimus. Drainage samples released therapeutic concentrations of CsA for 7 ± 0.5 days and everolimus for 12.0 ± 0.8 days.

Conclusion: We developed a method to maintain therapeutic concentrations of CsA and everolimus in vitro in close to real conditions for a period of time long enough to overlap the moment when T-cells and macrophages reach their peak amount and trigger fibroblast proliferation. Implantation of glaucoma drainages enriched with selective immunosuppressants can potentially modulate wound healing in glaucoma surgery.



P094

RESCUE OF A NON-FUNCTIONING XEN®**Mireia Mascarell Vidal¹, Mayerling M. Suriano¹, Irene Gregori Gisbert¹,
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Purpose: Expose the rescue maneuver used to recover an old Xen® device surgery.

Methods: It is decided to make a surgical revision of the failed Xen®. Conjunctival dissection was performed in fornix-based, visualizing the subconjunctival portion partially sectioned. The functionality of the device was tested by introducing Vision Blue® in the anterior chamber. We performed partial tenectomy and mitomycin 0.02% was applied.

Results: After 3 months of follow-up, the intraocular pressure was stable in 13mmHg without medical treatment and with filtering bleb grade 3.

Conclusion: Surgical revision is an effective option for restoring Xen® function. It is a fragile implant, which can fracture during surgical revision, which, in our case, probably favoured the release of the nonfunctioning obstructed end, thus restoring drainage. Mitomycin and tenectomy can prevent reobstruction.



P095

ACUPUNCTURE EFFECTS ON PRIMARY OPEN ANGLE GLAUCOMASiham Fahmy¹¹Military Hospital, Traditional Chinese Medicine Departement, Cairo, Egypt

Background: Glaucoma is the second leading cause of irreversible blindness. Open angle glaucoma is more common affects African people. Over 8.4million of glaucoma patients are bilaterally blind rising to 11.1million by 2020.

Purposes: To determine the therapeutic efficacy of acupuncture therapy on intraocular pressure and visual field in primary open angle glaucomatous patients.

Methods: Fifty one eyes with Primary open angle glaucoma participated in this study. Their age ranged from 40 to 80 years, IOP ranged from 20 to 45 mmHg, these eyes were divided randomly into two groups; Acupuncture group: This group consisted of twenty six eyes whose received acupuncture therapy and Control group: This group consisted of twenty five eyes whose did not receive any kind of acupuncture therapy. Both groups received their standard topical antiglaucoma medications. Assessment depended on two aspects: IOP which was measured by Goldman Applanation Tonometry and Visual field which was measured by Octopus Perimetry.

Results: There were a significant decrease in IOP in the acupuncture group compared to control group where the level of significance was ($p < 0.05$) with 76.9% stabilization of visual field in the acupuncture group compared to 8% in control group.

Conclusion: Acupuncture can be considered as additional to standard antiglaucoma medications and effective for POAG in reducing IOP and stabilize visual field.



P096

CLINICAL EVALUATION OF BLOOD-FILLING PATTERNS IN SCHLEMM'S CANAL FOR TRABECTOME SURGERYKae Sugihara¹, Akiko Narita¹, Naruka Mitsui¹, Seido Okuda¹, Tomoko Ishikawa¹, Miki Noso¹, Jiro Seguchi¹¹Okayama Saiseikai General Hospital, Department of Ophthalmology, Okayama, Japan

Purpose: To assess the relationship between blood-filling patterns in Schlemm's canal and surgical results after Trabectome surgery combined with phacoemulsification.

Methods: A retrospective cohort study. 105 eyes of 95 primary open angle glaucoma (POAG) patients who had undergone Trabectome surgery combined with phacoemulsification were included. Provocative gonioscopy was performed at the beginning of the surgery to classify the blood-filling patterns in Schlemm's canal: no filling (grade 1), incomplete filling (grade 2), and complete filling (grade 3). Subjects were classified into 3 groups according to the grade of the blood-filling patterns in Schlemm's canal in order to compare the clinical data, including age, visual field mean deviation (MD), intraocular pressure (IOP), number of glaucoma medications, IOP reduction, and surgical success rate. Surgical success was defined as an IOP ≤ 15 mmHg and $\geq 20\%$ reduction in IOP.

Results: Mean pre-operative IOP of 17.1 ± 3.6 mm Hg significantly decreased to 13.3 ± 3.1 mm Hg at 1 year after surgery. There were no significant differences between the three groups in age ($p = 0.523$), MD ($p = 0.356$), pre- and post-operative IOP ($p = 0.941$ and 0.483 , respectively), pre- and post-operative number of glaucoma medications ($p = 0.805$ and 0.079 , respectively), percentage IOP reduction ($p = 0.284$), or surgical success rate ($p = 0.468$).

Conclusion: Trabectome surgery is an effective procedure for POAG patients regardless of the blood-filling patterns in Schlemm's canal.



P097

A RARE CASE OF GLAUCOMA IN FAMILIAL AMYLOIDOSIS POLYNEUROPATHY DUE TO TRANSTHYRETIN VARIANT, P.GLU74GLY

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Purpose: We present a complex case of glaucoma due to Transthyretin-related Familial Amyloidosis Polyneuropathy (TR-FAP), p.Glu74Gly. To-date, this is the only case reporting management of TR-FAP glaucoma with a combination of glaucoma tube surgery, cyclodiode laser and the latest systemic gene therapy Partisiran[®].

Methods: Retrospective case note review was undertaken.

Results: A 50-year-old gentleman presented to eye casualty with a painful left eye and misty vision. Examination revealed raised pressure of 51mmHg, corneal oedema and open angles on gonioscopy. He was subsequently treated for unilateral glaucoma secondary to TR-FAP. This became refractory to topical intraocular pressure (IOP) lowering medication. As both of his brothers had previously undergone unsuccessful trabeculectomy surgery for TR-FAP related glaucoma, it was decided he should undergo Baerveldt tube implantation with Mitomycin C 0.4 mg/ml. Over the course of 6 months, the IOP in the left eye increased from 3 mmHg to 44 mmHg. Cyclodiode laser to 270 degrees was performed and for over 1 year his pressure has remained successfully controlled at 12mmHg. He is also treated systemically with Partisiran[®], a rubonucleic acid interference molecule, which has been shown to prevent the formation of Transthyretin protein by the liver.

Conclusion: This case highlights the importance of integrating novel gene therapy interventions with established models of glaucoma treatment for optimised clinical outcomes.



P098

BURDEN AND QUALITY OF LIFE AMONG PRIMARY CAREGIVERS OF GLAUCOMA PATIENTSDeeksha Rani¹, Vivek Gupta¹, Arjun Desai¹, Tanuj Dada¹¹Dr. R P Center for Ophthalmic Sciences, AllMS, New Delhi, India

Purpose: To assess caregiver burden among primary caregivers of glaucoma patients at a tertiary hospital in North India

Methods: Fifty primary caregivers of 50 patients with glaucoma were enrolled. Participants completed 12-item Zarit Burden Interview (ZBI) to assess caregiver burden, Caregivers Congenital Glaucoma QOL Questionnaire (CarCGQol) for quality of life (QOL) and Patient Health Questionnaire-9 (PHQ9) for depression.

Results: Patients included 15 congenital, 15 primary open angle (POAG), 6 primary angle closure (PACG) and 14 secondary glaucoma. Caregivers were aged 41.2 ± 14.7 years, 74% were females and 44% were (grand)parents. High caregiver burden (ZBI score ≥ 17) was observed in 46% (95% CI: 31.8, 60.7), and moderate depression (PHQ9 score ≥ 10) in 34% (95% CI: 21.2, 48.8) caregivers. Median rasch-scaled CarCGQol score was -0.25 logits (interquartile range: -0.91, 1.2) among congenital glaucoma caregivers which is worse than other studies from India and Iran. Adjusting for caregiver's sex, age and patient's sex, high caregiver burden was associated with PACG diagnosis ($b = 4.49, p = 0.02$), and patient age < 20 years ($b = 4.6, p = 0.02$). Patient age < 20 years ($b = 6.7, p = 0.01$) was also associated with moderate depression.

Conclusion: Glaucoma is associated with high caregiver burden, poor QOL, and depression in primary caregivers. Glaucoma management must include psychosocial interventions, meditation and mindfulness-based stress-reduction techniques for caregivers to help overcome this high burden.



P099

EVALUATION OF RETINAL NERVE FIBER LAYER AND GANGLION CELL-INNER PLEXIFORM LAYER LOSS IN PATIENTS WITH PRIMARY OPEN ANGLE GLAUCOMA

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Purpose: This study aims to compare the rates of Peripapillary retinal nerve fiber layer (RNFL) and macular retinal ganglion cell-inner plexiform layer (GC IPL) changes in patients with POAG with control subjects by Swept Source OCT.

Methods: This was a comparative cross-sectional study included 40 eyes with POAG and 40 eyes of 40 control subjects. After detailed eye examination and measurement of intraocular pressure, Visual field examination by using Humphery (2003 Carl Zeiss Meditec), Germany. ALL subjects were scanned using swept source Optical Coherence Tomography device (Triton, Topcon, Tokyo, Japan), imaging OCT to measure Macular GC-IPL thickness, Peripapillary RNFL thickness.

Results: The mean age of the patients with POAG was 58.20 ± 9.12 years; 26 eyes (65.0%) were male and 14 eyes (35.0%) were female. The average age of control subjects was 54.10 ± 9.11 years; 14 eyes (35.0%) were male and 26 eyes (65.0%) were female, average of VFMD was -11.30 ± 6.88 dp, average Spherical equivalent(SE) was -3.43 ± 1.08 , average CMT was 164.3 ± 16.62 and average IOP was 15.25 ± 1.33 in patients with POAG, whereas average of VFMD was -0.97 ± 0.39 , average SE was -3.23 ± 1.04 , average CMT was 170.6 ± 9.21 and average IOP was 13.20 ± 1.18 in control subject.

Conclusion: Evaluation of RNFL and Ganglion Cell-Inner Plexiform Layer by Swept-source OCT showed significant differences between the normal and glaucomatous eyes.



PI00

ENDOTHELIN-I AND NITRIC OXIDE LEVELS IN PATIENTS WITH GLAUCOMA**Asaad A. Ghanem¹**¹*Ophthalmology, Mansoura Ophthalmic Center, Mansoura University, Mansoura, Egypt*

Purpose: To investigate the levels of endothelin-I (ET-I) and nitric oxide (NO) in the aqueous humor and plasma of human eyes with different types of glaucoma: primary openangle glaucoma (POAG) and chronic closed-angle glaucoma (CCAG).

Methods: Patients were classified into 3 groups: groupI comprised 35 patients with POAG, groupII comprised 25 patients with CCAG, and 30 patients with senile cataract (groupIII) were used as a control group. Aqueous humor and corresponding plasma were analyzed for ET-I and NO concentrations by ELISA. Bonferroni correction for multiple comparisons was performed.

Results: ET-I and NO were significantly elevated in the aqueous humor of patients with CCAG and POAG compared to the corresponding value in patients with cataract ($p < 0.001$). ET-I and NO concentrations in the aqueous humor were more marked in CCAG than in POAG. NO levels were correlated with ET-I in the aqueous humor of patients with glaucoma ($p < 0.001$).

Conclusion: Increased concentrations of ET-I and NO in aqueous humor may be useful with POAG and CCAG. In addition, ET-I and NO may have useful metabolite levels in the aqueous humor of POAG and CCAG patients as a result of glaucoma damage and may not be a cause of it.

