

Cataract**PP001****Safety Outcomes of MicroShunt Implantation versus Trabeculectomy in Patients with Primary Open-angle Glaucoma****Presenting author:** Marlene Moster, United States**Purpose:**

The MicroShunt is a controlled ab-externo glaucoma filtration surgery device that aims to reduce intraocular pressure (IOP) by draining aqueous humour from the anterior chamber to a bleb under the conjunctiva and Tenon's capsule. This analysis reports 1-year safety outcomes following MicroShunt surgery or trabeculectomy.

Setting:

This 2-year, prospective, randomised, single-masked, multicentre study (NCT01881425), conducted across 29 sites (24 in the USA and one each in France, Italy, Spain, The Netherlands and the United Kingdom), assessed the effectiveness and safety of standalone MicroShunt surgery versus trabeculectomy in patients with primary open-angle glaucoma (POAG).

Methods:

Patients aged 40–85 years with IOP (≥ 15 – ≤ 40 mmHg) and POAG inadequately controlled on maximum tolerated therapy were randomised 3:1 to MicroShunt surgery or trabeculectomy, both performed with intraoperative Mitomycin C (0.2 mg/mL applied for 2 minutes). Safety outcomes included early (on/before Month 3) and late (after Month 3) postoperative adverse events (AEs), needlings, bleb revisions and reoperations. Response to needling or bleb revision was defined as post-event IOP lower than pre-event IOP without secondary intervention (eg revision, surgery, needling). P values calculated using Farrington-Manning test with Hochberg adjustment for early/late AEs and no multiplicity adjustments for other outcomes.

Results:

Most common early AEs were hypotony (IOP < 6 mmHg at any time; MicroShunt 26.3% [n=395] versus trabeculectomy 48.1% [n=131]; $P < 0.001$) and increased IOP requiring treatment (25.3% versus 49.6%; $P < 0.001$). Most common late AEs were increased IOP requiring treatment (32.9% versus 13.7%; $P < 0.001$) and confirmed visual field worsening ≥ 2.5 dB (10.4% versus 15.3%; $P = 0.982$). Year 1 needling rates were 19.0% and 8.4% ($P = 0.005$); 45.3% and 72.7% responded. Bleb revision rates were 5.8% and 6.9% ($P = 0.664$); 56.5% and 44.4% responded. Reoperations included glaucoma drainage device placement (4.8% versus 3.0%; $P = 0.386$) and secondary trabeculectomy (2.3% versus 0.8%; $P = 0.268$).

Conclusions:

In this study, MicroShunt surgery was associated with significantly lower rates of hypotony and increased IOP requiring treatment than trabeculectomy within the first 3 months following surgery. After Month 3, trabeculectomy had a significantly lower rate of increased IOP requiring treatment compared with the MicroShunt group. Few needlings, bleb revisions and glaucoma reoperations were required post surgery following both treatments.



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PP002

Three-year results of a Supraciliary Drainage Device in Patients with Open Angle Glaucoma

Presenting author: Philippe Denis, France

Purpose:

To describe the long-term safety and efficacy profile of a novel, supraciliary, micro-invasive glaucoma surgery (MIGS) drainage implant, MINject (iSTAR Medical, Wavre, Belgium), in eyes with medically-uncontrolled open-angle glaucoma up to 5 years post-implantation.

Setting:

The initial trial (STAR-I) was carried out as a prospective, multicenter, international, interventional, single-arm trial in 2 sites with 24-month follow-up; results have been published. After trial completion, patients were invited to enroll into the STAR-GLOBAL study in order to continue follow-up until 5 years.

Methods:

In the STAR-GLOBAL study, patients are followed at 3, 4 and 5 years post-implantation of a 5mm long supraciliary device in a stand-alone, ab interno procedure. The device is made of biocompatible STAR® material which is soft and flexible silicone in a micro-porous network design. Intraocular pressure (IOP) measurements and use of IOP-lowering medication are recorded annually, and safety evaluation includes the nature and frequency of adverse events, including the measurement of corneal endothelial cell density (ECD). Interim, preliminary results at 3 years from a single site are reported here.

Results:

Mean baseline diurnal IOP was 23.2 ± 2.9 mmHg with a mean 2.0 ± 1.1 IOP-lowering medication classes. At 24-month follow-up, mean diurnal IOP was 13.8 ± 3.5 mmHg (-9.6 mmHg, -41%) with 1.0 ± 1.3 medications. Interim results at 3 years include 14 patients from one site who completed follow-up. Mean diurnal IOP was 14.4 ± 3.0 mmHg (-8.2 mmHg, -36%) with 0.8 ± 1.3 medications. Furthermore, 86% patients achieved an IOP reduction of $\geq 20\%$ from baseline, and 86% had IOP ≤ 18 mmHg at 3 years. No serious ocular adverse events or additional glaucoma surgery have been reported. Mean central ECD remained consistent with two-year results (4% reduction from baseline) with no patient exhibiting $\geq 30\%$ ECD loss.

Conclusions:

Interim, preliminary 3-year results of the STAR-GLOBAL study demonstrate that this supraciliary MIGS device implanted in a standalone procedure is a powerful treatment option to significantly reduce IOP and substantially reduce the need for medication in patients with open-angle glaucoma at 3 years post-implantation. There were no serious ocular adverse events and no additional glaucoma surgeries were required. ClinicalTrials.gov: NCT04524416

Cataract**PP003****YAG-shots in IOLs****Presenting author:** Andreas Borkenstein, Austria**Purpose:**

To assess differences in Nd:YAG induced defects in hydrophilic and hydrophobic IOLs and describe optical and surface properties of YAG-shots/pitting. Describing and measuring the iatrogenic produced defects should achieve higher awareness on this topic and change the mindset of such a trivial procedure to be proceeded with more caution and calmness in the future.

Setting:

Borkenstein & Borkenstein, private practice at Privatklinik d. Kreuzschwestern Graz & Technische Universität Graz

Methods:

12 IOLs from different manufacturers made of hydrophilic and hydrophobic materials were evaluated before and after treatment with Nd:YAG laser. Microscopy and ESEM (Environmental scanning electron microscope) images were used to visually analyze the defects. Additionally, wavefront measurements were taken for power mapping and Raman spectroscopy was performed. Vertical and horizontal dimensions of the defects were analyzed and compared, and Raman line scans assessed the chemical changes in the defect area.

Results:

Microscopically, pitting of the surface could be observed in both lens types. Defects in hydrophobic lenses appeared bigger and were visible with less magnification than in hydrophilic lenses. Similar results were obtained with ESEM images where the hydrophobic defects seemed to be frayed while hydrophilic defects were of circular shape. Raman spectroscopy revealed deeper defects in hydrophobic lenses. Vertical dimensions of the defects were statistically significant ($p=0.036$) greater in hydrophobic materials while horizontal dimensions did not reach significance ($p=0.056$). The area of chemical changes was greater than the visible defect area and smaller in hydrophilic than in hydrophobic materials.

Conclusions:

Nd:YAG shots (iatrogenic bombardment) seems to have greater impact on hydrophobic IOL materials as those damages were greater and more frayed than in hydrophilic materials. Moreover, there seems to be larger, distinctive damage area in IOLs than is visually recognizable. Therefore, a very cautious approach is recommended when performing capsulotomy, as permanent defects can occur. This might come along with problems in quality of vision in monofocal and primarily premium IOLs (multifocal, enhanced depth of focus and toric IOLs).



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PP004

The EuReCCa registry within EUREQUO

Presenting author: Marie-José Tassignon, Belgium

Purpose:

The aim of the European Registry Childhood Cataract (EuReCCa) is to create the first European registry on paediatric cataract. It will collect prospective data on biometrics, surgical procedure, and visual and refractive outcome under the EUREQUO platform (co-funded by ESCRS and the EU in 2008).

Setting:

The registry will be launched very soon. The registry is open for members and non-members of the ESCRS.

Methods:

The registry includes forms on patient-, preoperative-, surgical-, and follow-up data. Patient data includes cause, consanguinity, laterality, diagnosis, and genetic tests performed. The preoperative form collects information on visual acuity (conversion options included), objective refraction and biometric values (different measurement options), presence of nystagmus, strabismus, and protest on occlusion. The surgical form biometrical measurements and cataract type, the different steps of the surgical procedure, and if applicable, the type of implanted IOL and complications. Recording of postoperative treatment, additional contact lens fitting and patching. The follow-up forms records evolution in visual performance, visual rehabilitation and training, follow-up of the biometrical parameters.

Results:

The aim of EuReCCa is to draw conclusions on visual outcomes after cataract surgery and define the predictors thereof, to understand emmetropization in childhood cataract and factors influencing it, answer at what age IOL implantation can be performed, and which are the complications.

Recommendations on optimal time for surgery, optimal type of IOL, optimal surgical technique regarding surgical complications, postoperative complications, and number of re interventions. Identifying the risk factors for preoperative and postoperative complications. Participating centers will receive their personal report compared to the total registry comparable to what is done for adult EUREQUO registry.

Conclusions:

EuReCCa is a multivariate risk model registry for paediatric cataract. It ultimately will allow better information to the parents about surgical planning and outcomes per type of cataract and per age group.



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PP005

The EUREQUO Annual Report 2020

Presenting author: Mats Lundström, Sweden

Purpose:

To demonstrate the result of the 2020-year data of cataract and refractive surgery reported to the European Registry of Quality Outcomes for Cataract and Refractive Surgery (EUREQUO). Further to demonstrate trends in baseline data, surgery data and outcomes data since the start of the registry in 2008.

Setting:

Clinics in 15 European countries reporting their data to the EUREQUO

Methods:

The registry includes baseline data, surgical data, and follow-up data. When a clinic signs up for participating an agreement is made about either reporting complete data with follow-up or only preoperative and surgical data. Consecutive cases must be reported, and coding guidelines decide how data should be reported. Data entry can be through transfer from existing registries or electronically through interface or manually via the web. Every participating clinic/surgeon can take out standard reports with their own data and aggregated data for the whole database. Patient-reported outcomes data can also be reported.

Results:

The number of cataract extractions reported to the database in 2020 was 267,168. The mean age was 73 years and 56 % were women. In 9.2% of the cases the preoperative CDVA was 0.1 or below and in 58.2% the CDVA was 0.5 or better. In 25.4% there was a co-existing eye disease in the surgery eye. The registry also contains data about surgical difficulties, type of operation, IOL optic biomaterial and surgical complications. For 139,642 cases follow-up data was also reported. A refractive surgery was reported for 17,950 eyes.

Conclusions:

More than 260,000 cataract extractions and 17,000 refractive surgery data were reported to the EUREQUO in 2020. It means that more than 3.4 million cataract extractions and almost 155,000 refractive surgeries have been reported to the registry since start. The trend of cataract patients being younger with better preoperative visual acuity and good outcomes continues.

Cataract**PP006****Immediate versus delayed sequential bilateral cataract surgery in the Netherlands (the BICAT-NL study): a multicenter non-inferiority randomised controlled trial**

Presenting author: Lindsay Spekrijse, Netherlands

Purpose:

Cataract surgery is one of the most frequently performed types of surgery. Most patients undergo cataract surgery in both eyes on separate days, referred to as delayed sequential bilateral cataract surgery (DSBCS). An alternative procedure involves operating both eyes on the same day, known as immediately sequential bilateral cataract surgery (ISBCS). Potential benefits of ISBCS include fewer hospital visits (lower contamination risks during the COVID-19 pandemic), faster recovery and lower costs. The aim of this first part of the BICAT-NL study is to evaluate safety and effectiveness of ISBCS vs. DSBCS, in order to test whether ISBCS is non-inferior to DSBCS.

Setting:

Ten medical centers in the Netherlands (Maastricht University Medical Center+, University Eye Clinic Maastricht, Maastricht; Zuyderland Medical Center, Heerlen; Canisius Wilhelmina Hospital, Nijmegen; Gelre Hospital, Zutphen; Deventer Hospital, Deventer; Elisabeth TweeSteden Hospital, Tilburg; Amphia Hospital, Breda; Medical Center Haaglanden, Den Haag; Medical Spectrum Twente, Enschede; Isala Clinic, Zwolle)

Methods:

The study was designed as a prospective multicenter non-inferiority randomised controlled clinical trial. Patients undergoing expected uncomplicated bilateral cataract surgery were included and randomised to ISBCS or DSBCS. The primary endpoint was the proportion of patients with a refractive outcome in the second eye ≤ 1.0 dioptre (D) from target refraction at four weeks after surgery. Secondary outcomes included a refractive outcome ≤ 0.5 D, complications, best corrected distance visual acuity (BCDVA) and uncorrected distance visual acuity (UCDVA).

Results:

A total of 865 patients were included in the study. No cases of endophthalmitis occurred and complication rates did not differ significantly between groups. At four weeks after surgery, the percentage ≤ 1.0 D and ≤ 0.5 D of target for ISBCS vs. DSBCS was 96.9% vs. 97.6% ($p=0.526$) and 79.4% vs. 77.2% ($p=0.450$), respectively. The difference in proportion of eyes with an UCDVA and BCDVA ≤ 0.1 LogMAR for ISBCS vs. DSBCS [$\pm 90\%$ CI] was 2.1% [-3.7%, 7.9%] and 0.2% [-3.3%, 3.7%], respectively. Non-inferiority analysis showed that ISBCS was non-inferior to DSBCS regarding refractive outcomes, UCDVA and BCDVA.

Conclusions:

The BICAT-NL study showed comparable safety and effectiveness outcomes for ISBCS compared to DSBCS. Implementation of ISBCS will lead to a paradigm shift in the organisation of the annual number of 180.000 cataract surgeries in the Netherlands. Cost-effectiveness of ISBCS will be investigated further in a second part of this study.



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PP007

Real-world NHS experience with 2nd-generation trabecular micro-bypass stents (iStent inject®) – outcome at a regional ophthalmic centre in the UK

Presenting author: Lin Lu, United Kingdom

Purpose:

With the increasing utilisation of iStent inject in the UK National Health System (NHS) and around the world, real-world clinical outcomes on the device are particularly valuable. Our previous study on the outcome of iStent inject implantation as standalone procedure and combined surgery with cataract removal for glaucoma patients at 1 year showed promising results. In this study, we evaluate the efficacy of the device over 18-24 months in our regional ophthalmic centre.

Setting:

Ophthalmology department at the Buckinghamshire Healthcare NHS Trust (Stoke Mandeville Hospital), United Kingdom

Methods:

Between November 2018 and March 2020 all standalone iStent and combined procedures with cataract surgeries, performed under the care of two glaucoma consultant surgeons were identified. Pre-operative intraocular pressures (IOPs) and number of topical glaucoma agents were recorded. Primary and secondary outcomes evaluate the change in IOP and the number of topical glaucoma agents, post-operatively at 18 months (18M) and 24 months (24M). Last follow-up analysis takes into consideration all available data at different follow-up timepoints (mean 21M, range 18-24M). Follow-up continues, with the intent of presenting a larger and longer-term dataset at the congress.

Results:

Eighty-four eyes were identified, 40 eyes had met the 18-24M period follow-ups time frame. Mean pre-operative IOP was 18.5 ± 4.9 mmHg, with average of 2.13 ± 1.02 topical agents; 43% of patients had substantial medication burden (defined as ≥ 3 medications). At the latest follow-up (average 21M), mean IOP had reduced to 14.6 mmHg (21% reduction, $p < 0.001$), and medication burden had reduced by 34% to 1.40 medications ($p < 0.001$). Safety was favourable throughout. Five patients were deceased, 20 patients did not wish to attend to hospital for appointments due to COVID-19 concerns and 11 patients are due for 18-24M follow-ups later this year.

Conclusions:

iStent inject contributes an efficacious and safe treatment option or adjunct to existing therapies for glaucoma. Real-world outcomes through two years within a standard NHS clinical setting and patient population show statistically and clinically significant reductions in IOP and medication burden, consistent with published literature. Our main limitation on this study is patients' reluctance on visiting hospitals during the COVID-19 pandemic; however we are actively continuing the follow-ups at our unit during this challenging time and we intend to present a bigger sample size with more follow-ups by August 2021.

Cataract**PP008****Evaluation of differences in safety and efficiency between Ex-PRESS shunts P50 and P200.**

Presenting author: Christina Skatharoudi, Greece

Purpose:

To present a retrospective analysis from a period of 2015-2019 for the safety and efficacy of Ex-PRESS shunt implant types P50 and P200

Setting:

University Hospital of Heraklion Crete – Department of Ophthalmology

Methods:

Retrospective analysis of 57 patients with or without previously cataract extraction surgery who underwent P50 or P200 shunt implantation with random choice of each type. Exclusion criteria for the analysis were patients with neovascular or uveitic glaucoma and patients who had less than 3 months follow up. Intraocular pressure (IOP), glaucoma medications and complications such as Central Macula Edema (CME), choroidal detachment (CD), loss of anterior chamber (ATHAL), hyphema (HYPH), leakage of wound (SEIDEL), were examined. Descriptive statistics and paired sample T-test were performed with SPSS 25.

Results:

Fourteen cases of P50(group1) and 43 of P200(group2) were included, 42.9% of group1 and 69.8% of group2 were pseudophacic, preoperative IOP was 33.92 mmHg(group1-SD 8.18) and 30.14 mmHg(group2-SD 12.80). IOP measurements 1 month after surgery were 16.15 mmHg(group1- $p<0.0001$) and 15.35 mmHg(group2- $p<0.0001$) and 6 months later were 18 mmHg(group1- $p<0.002$) and 17.58 mmHg (group2- $p<0.0001$) respectively. 61.5% (group1) and 62.8%(group2) have no need of topical therapy post-op neither oral 92.3%(group1) and 86% (group2). CME was detected in 7.1% (group1) and 4.7% (group2), CD in 14.3%(group1) and 9.3%(group2), ATHAL in 28.6% (group1) and 25.6%(group2), HYPH in 7.1%(group1) and 11.6%(group2) and SEIDEL in 2.3%(group1) and 11.4%(group2).

Conclusions:

Both types reduce the IOP with almost the same outcomes and low need of oral extra medications after implantation. The most common complication in this cohort is early anterior chamber loss whereas CME was observed in only a small number of patients.



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PP009

Changes in corneal topography and biometrics after glaucoma filtering surgery using an ab-interno SIBS microshunt implant.

Presenting author: Marta Ibarz Barberá, Spain

Purpose:

To determine the changes in corneal topographic and biometric parameters after the implantation of the PRESERFLO MicroShunt in patients with primary open angle glaucoma (POAG).

Setting:

Oftalvist Madrid, HLA Hospital Moncloa, Madrid, Spain.

Methods:

Patients diagnosed with primary open angle glaucoma (POAG) who required an ab-externo SIBS microshunt implantation were recruited. The central corneal thickness (CCT), the intraocular pressure (IOP), best corrected visual acuity (BCVA), refraction, biometrics and corneal topography with a Scheimpflug topographer were analyzed preoperatively and 24 hours, 1 week, 1 month and 3 months after surgery.

Results:

28 eyes were included. The IOP decreased from baseline at every postoperative visit ($p < 0.01$). Anterior surface astigmatism (ASA) and posterior surface astigmatism (PSA) increased $\sim 1D$ and $\sim 0.2D$ in the first week, anterior and posterior corneal elevation (ACE, PCE) also increased in the first week. The corneal astigmatism and elevation returned to baseline at 3 months. The axial length (AL) and anterior chamber depth (ACD) showed a slight decrease from baseline to the third month. There was a significant correlation between the IOP and the maximum elevation of the posterior surface of the cornea at the preoperative examination ($r = 0.93$, $p = 0.02$).

Conclusions:

The PRESERFLO MicroShunt implant significantly decreases the IOP in POAG patients. Corneal astigmatism, elevation, axial length and anterior chamber depth show mild and transient changes in the very early postoperative period that do not persist 3 months after surgery.

Cataract**PP010****Minimally invasive glaucoma surgery: 5 years - results with the iStent injection in Combination with Cataract Surgery****Presenting author:** Karsten Klabe, Germany**Purpose:**

A large number of minimally invasive micro-bypass systems have come onto the market in recent years. Given encouraging initial results, the question of a long-term sustainable effect on the intraocular pressure reduction remains. In this context, we report on our 5-year results with the iStent inject from our clinic.

Setting:

This retrospective 5-year data analysis examined the effectiveness of the combined iStent operation in patients with open-angle glaucoma and cataracts.

Methods:

The iStent inject was used in combined surgery with phacoemulsification and IOL implantation for patients with open angle glaucoma and cataract. 164 eyes of 103 patients were included into this retrospective data analysis. We monitored the development of visual acuity, intraocular pressure and number of postoperative medications in our patients. In addition, the complication rate and necessary further other glaucoma surgery were analyzed.

Results:

In the context of combined surgery, the intraocular pressure dropped significantly. A significant reduction in medication requirements was also achieved. After 5 years, we can have an average IOP drop of 21% (from 19,6 mmHg preop. to 15,5 mmHg after 5 years) and average drug use 0.19 instead of 1.47 preoperatively. As complication we have 11 eyes with hyphema, 7 eyes with iStent occlusion and 2 eyes with hypotension and incarceration of the iris. With 5 eyes within 5 years, a new glaucoma operation was necessary.

Conclusions:

The iStent injection shows a good pressure-reducing effect in our patient population, which remains stable over a period of more than 5 years. This reduction in intraocular pressure is accompanied by a significant and sustained reduction in medication. With appropriate patient selection, the number of necessary second interventions is also very small. In our experience, the iStent injection thus confirms the positive results even over a longer postoperative period (> 5 years).

Cataract**PP011****Incidence of pseudophakia cystoid macular edema with and without subconjunctival injection of dexamethasone during cataract surgery****Presenting author:** Gilles Lesieur, France**Purpose:**

To study the incidence of PCME with and without systematic injection of subconjunctival dexamethasone (DEX) during cataract surgery.

Setting:

Centre Ophtalmologique IRIDIS, Albi, France.

Methods:

Retrospective analysis of eyes who had undergone phacoemulsification between 2013 and 2020 by one surgeon, using the same operating protocol. Two groups were defined; the control group consisted of eyes operated before 06/12/2018 without DEX injection, and the test group eyes operated after this date and with systematic intraoperative injection of DEX 4mg 0.50mL.

Results:

4649 eyes were enrolled: n=3748 control, n=901 test. There was no significant difference in age between the groups ($p=0.361$). The incidence of PCME was statistically significantly lower ($p=0.035$) in the test group (1.22%) compared to the control group (2.35%). After additional exclusion of eyes who had received triamcinolone acetonide in the control group, no significant difference in PCME incidence was found between the two groups: 1.27% for the control. However, the mean change in macular central thickness in eyes diagnosed with PCME was statistically significantly lower in the test group: $89.5 \pm 75.7 \mu\text{m}$ versus $157.8 \pm 112.1 \mu\text{m}$ in the control group, $p=0.032$.

Conclusions:

To our knowledge, this is the first report to show the effect of subconjunctival injection of DEX during cataract surgery on the incidence of PCME. Although DEX did not reduce the incidence of PCME in uncomplicated eyes, it reduced the severity of the edema and the impact on visual acuity.

Cataract**PP012****Late-onset Toxic Anterior Segment Syndrome after possible aluminum and silicon contaminated intraocular lens implantation.**

Presenting author: Dries Wijnants, Belgium

Purpose:

To describe an outbreak of late-onset toxic anterior segment syndrome (TASS) after the implantation of a specific hydrophilic acrylic intra-ocular lens (IOL).

Setting:

University Hospitals of Leuven, Belgium.

Methods:

All eyes undergoing cataract surgery with a monofocal, toric or enhanced depth of focus (EDOF) Synthesis (Cutting Edge®) IOL between August 2019 and March 2020 were reviewed. Data were collected on the surgical procedure, postoperative course, time until onset of symptoms, clinical features, additional treatment and corrected distance visual acuity (CDVA) before and after treatment. A laboratory surface analysis of all three IOL subtypes was performed in the Intermountain Ocular Research Center at the University of Utah, USA. Furthermore, other possible causes of prolonged postoperative inflammation rather than the IOL itself were investigated.

Results:

Among the 203 eyes included, 28 TASS cases were identified (13.8%), among which 25 received a monofocal IOL, and 3 received an EDOF IOL. The mean time until onset was 28.9 (± 19.9) days. Patients presented with anterior chamber cells (92.9%), deposits on the IOL (57.1%), or fibrinous inflammation (35.7%). Four eyes (14.3%) underwent a surgical intervention, whereas 24 eyes showed a resolution of inflammation with topical therapy alone. Laboratory analysis showed the presence of both aluminum and silicon particles on the monofocal IOL, silicon particles only on the EDOF IOL, and no particles on the toric IOL surface.

Conclusions:

This report describes an outbreak of late-onset TASS after cataract surgery, possibly correlated to aluminum and silicon contamination of the IOL surfaces.

Cataract**PP013****Comparison of Refractive Prediction Error after Cataract Surgery in Long- and Short-Axial length Eyes between Optical Biometer with Segmented Refractive Index and Traditional Optical Biometer Using Equivalent Refractive Index**

Presenting author: Takashi Kojima, Japan

Purpose:

To compare the postoperative refractive prediction error (RPE) after cataract surgery in long axial length (≥ 26 mm: group L, 90 eyes) and short axial length (≤ 22 mm: group S, 44 eyes) eyes between optical biometer using segmented refractive index (SRI) and a traditional optical biometer using equivalent refractive index (ERI).

Setting:

Multicenter study with 5 sites in Japan

Methods:

The study included 461 eyes of 461 patients (mean age 73.8 ± 8.4 years) who underwent cataract surgery. IOL power calculation was performed using Barrett UII, and RPE was compared between SRI biometer (ARGOS) and ERI biometer (IOLMaster700). The cases were randomly divided into two groups, a learning group and a validation group, and the optimization constants were determined in the learning group for the SRI biometer. The optimization constants were then applied to the validation group and compared with the results of ERI biometer.

Results:

The RPE (mean $\pm$ standard deviation diopter (D)) in the ERI and SRI biometer were significantly different in group L (90 eyes) with 0.08 ± 0.41 D and -0.09 ± 0.42 D, respectively, and in group S (44 eyes) with 0.19 ± 0.53 D and 0.31 ± 0.47 D, respectively (group L: $p < 0.0001$, group S: $p = 0.033$). The RPE of the validation group using optimization constants for SRI biometer in the group L was significantly smaller than that using ERI biometer (0.00 ± 0.41 D, $p = 0.0014$), and no difference in the group S (0.18 ± 0.53 D, $p = 0.892$).

Conclusions:

The RPE using the SRI biometer values was slightly myopic in the long axial length eyes and hyperopic in the short axial length eyes compared to that using the ERI biometer, and optimization of the Barrett formula constants for SRI biometer achieved the better RPE in the long axial length eyes than the traditional ERI biometer and similar accuracy in short axial length eyes.

Cataract**PP014****Clinical outcomes in a large Portuguese pediatric cataract cohort.**

Presenting author: Celso Miguel Furtado Cabral Gomes Costa, Portugal

Purpose:

To describe a large Portuguese pediatric cataract cohort and report on clinical outcomes, including visual axis opacification (VAO).

Setting:

Unidade de Oftalmologia de Coimbra (UOC), Coimbra, Portugal; Ophthalmology Department, Centro Hospitalar e Universitário de Coimbra (CHUC), Coimbra, Portugal; Clinical Academic Center of Coimbra (CACC), Coimbra, Portugal; Faculty of Medicine, University of Coimbra (FMUC), Coimbra, Portugal.

Methods:

Single-center retrospective chart review of 340 eyes from 245 children who underwent cataract surgery between 1990 and 2019. Preoperative data included age, sex, visual acuity, type of cataract, laterality, and associated systemic and ocular conditions. The surgical technique for each case was noted and included pars plana phacophagia (PP) or phacoemulsification (FACO), as well as whether anterior vitrectomy (AV), posterior capsulorhexis (PC) and IOL implantation were performed. We focused on a sub-analysis of 4 groups: 1 - less than 3 months; 2 – 3 to 12 months; 3 – 1 to 5 years; and 4 - more than 5 years.

Results:

The median surgical age was 39,34 months (32,4% group 1/2, 37,1% group 4) and mean follow-up of 66,5 months. Most had congenital cataract (67,7%) vs 19,4% traumatic and 7,3% uveitic; 51,9% bilateral. IOLs were implanted in 73,8%, primary in 55,7%, mostly on group 3/4 (4,1%; 17,0%; 70,0%; 81,3%). AV was associated with lower VAO (4,7% vs 16,7%, $p=0,001$) and reoperation or YAG-laser (3,4% vs 15,3%, $p=0,001$). Complications were not related to technique (PP vs FACO $p=0.542$). Glaucoma was seen in 5.3%, more in group 1 ($p=0.03$). Predictors for better visual acuity were older age, primary IOL and AV (all $p=0,03$).

Conclusions:

Age at surgery, primary IOL implantation and anterior vitrectomy are determinant factors to visual prognosis, with the latter being associated with significantly lower VAO rates needing reoperation or YAG laser. Continued follow-up of these patients is important to assess the long-term outcomes, namely glaucoma development.



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PP016

Improving the Patient Decision Making Experience for Cataract Surgery During the Covid-19 Era

Presenting author: Kai Man Lily Xu, Canada

Purpose:

COVID-19 related safety precautions can make informed decision-making a more challenging process for patients. For example, by limiting family member assistance and/or support in healthcare facilities and by facial masks concealing lip-reading or muffling communication. On the other hand, these unique circumstances also provide an opportunity for healthcare providers to integrate patient decision aids into practice, an intervention that has the potential to enhance patient experience while upholding patient safety during the pandemic. This study explores whether the implementation of video-based patient decision aids (VBPDA) in the cataract surgery consent process during COVID-19 can help facilitate patients in decision making.

Setting:

This is a single centre prospective cohort study completed in Hamilton, Canada.

Methods:

Prior to the clinical encounter, Patients watched the VBPDA, which outlined the process of cataract surgery and the decisions that need to be made (ie. biometry, intraocular lens, and focus). During the clinical encounter, patients had a consultation with an ophthalmologist and were able to ask questions they had from watching the VBPDA, engaging in shared decision making. At the end of the encounter, all patients completed a questionnaire assessing the effects of COVID-19 safety precautions on their appointment. In addition, patients proceeding with surgery completed the Decisional Conflict Scale (DCS).

Results:

For patients proceeding with cataract surgery (n=111), the median DCS score was 9.4 (0-54.7, min-max) on a scale of 0 to 100 (low to high decisional conflict). Of these, 76 participants (68.5%; 95% CI: 0.60-77.0%) scored < 25, 30 participants (27.0%; 19.0-36.0%) scored between 25-37.5, and 5 participants (4.5%; 1.5-10.0%) scored > 37.5, representing low, medium, and high decisional conflict, respectively. The DCS can also be separated into various subscales: the informed subscale (median= 8.3, min-max= 0-66.6), values subscale (16.6, 0-58.3), support subscale (8.3, 0-50.0), uncertainty subscale (8.3, 0-83.3), and effective decision subscale (0, 0-37.5).

Conclusions:

COVID-19 health precautions have made it more difficult to communicate the decisions that patients need to make before their cataract surgeries, presenting challenges to the consent process. Our study found that VBPDA to be an effective tool to enhance the patient decision-making process for cataract surgery.



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Cataract

PP017

Wrong intraocular lens (IOL) implantation in the United Kingdom: analysis of the 'never event' incidence rates from 2011-2020

Presenting author: Yan Ning Neo, United Kingdom

Purpose:

Wrong IOL insertion during cataract surgery was categorised as 'never event' in the United Kingdom since 2011. Never events are 'serious, largely preventable patient-safety incidents that should not occur if available preventative measures have been implemented'. Since then, the use of surgical safety checklist has been mandatory in the National Health Service (NHS). In recent years, national guidelines for correct IOL implantation were produced and promoted. It remained unclear if timing of these interventions coincides with patterns of incidence for wrong IOL events. We aim to describe and analyse the incidence rates and trends of wrong IOL events from 2011-2020.

Setting:

All cataract surgery performing centres in the United Kingdom.

Methods:

Data from wrong IOL implantation never events published by the NHS Improvement and patient safety incidents submitted to the National Reporting and Learning System (NRLS) from 2011 to 2020 were reviewed retrospectively. Number of cataract surgeries performed each year were derived from the NHS performance data made available to the public. Incidence rate of wrong IOL never events for each financial year was calculated. Trend test was used to determine the statistical significance in the differences of incidence rates between the financial years. Incidence rates over the last 10 years were plotted against developments in ophthalmology related to never events.

Results:

Overall the annual incidence rate of wrong IOL never events within the NHS setting was less than 0.01% throughout the past 10 years. There was a 3-fold drop in the incidence rate from 2017-18 to 2018-19 (0.0063% to 0.0019%; $p < 0.001$) and the drop was sustained in 2019-20 (0.0022%). Incidence rates were highest in the first 3 years of recorded wrong IOL never events between 2011-14 (0.0094%; 0.0089%; 0.0080%).

Conclusions:

Over the past decade wrong IOL never events, although rare, continue to occur in the NHS setting despite a widespread adoption of World Health Organisation surgical safety checklist or similar variations of it locally. The observed marked reduction in incidence rates over the past 2-3 years coincided with timing of the recent on-going promotion of national guidelines such as that of NICE (National Institute for Health and Care Excellence), Royal College of Ophthalmologist and United Kingdom Ophthalmology Alliance. Reporting of never events to the NRLS may have facilitated learning from past events on a national level.



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Cataract

PP018

Intraocular lens power calculation formulas accuracy in combined phacovitrectomy – an 8-formulas comparison study

Presenting author: Diogo Maleita, Portugal

Purpose:

Our study aimed to assess and compare the accuracy of 8 intraocular lens (IOL) power calculation formulas (Barrett Universal II, EVO 2.0, Haigis, Hoffer Q, Holladay 1, Kane and PEARL-DGS) in patients submitted to combined phacovitrectomy for vitreomacular (VM) interface disorders.

Setting:

Ophthalmology Department, Centro Hospitalar Universitário de Lisboa Central, Lisbon, Portugal

Methods:

Retrospective chart review study including axial-length matched patients submitted to phacoemulsification alone (Group 1) and combined phacovitrectomy (Group 2). Using optimized constants in both groups, refraction prediction error of each formula was calculated for each eye. The optimised constants from Group 1 were also applied for patients of Group 2 – Group 3. Outcome measures included the mean prediction error (ME) and its standard deviation (SD), mean (MAE) and median (MedAE) absolute errors, in diopters (D), and the percentage of eyes within $\pm 0.25D$, $\pm 0.50D$ and $\pm 1.00D$.

Results:

A total of 220 eyes were included (Group 1 – 100; Group 2 – 120). In Group 1, the difference in formulas absolute error was significative ($p=0.005$). The Kane Formula had the lowest MAE (0.306) and MedAE (0.264). In Group 2, Kane had the overall best performance, followed by PEARL-DGS, EVO 2.0 and Barrett Universal II. The ME of all formulas in both Groups 1 and 2 were 0.000 ($p=0.934$; $p=0.971$, respectively) In Group 3, a statistically significant myopic shift was observed for each formula ($p<0.001$).

Conclusions:

Surgeons must be careful regarding IOL power selection in phacovitrectomy considering the systematic myopic shift evidenced - constant optimization may help eliminating this error. Moreover, newly introduced formulas and calculation methods may help us achieving increasingly better refractive outcomes both in cataract surgery alone and phacovitrectomy.

Cataract**PP019****Refractive outcomes of combined endothelial keratoplasty and cataract surgery for eyes with focal corneal edema in Fuchs dystrophy.****Presenting author:** Elena Franco, Italy**Purpose:**

To report the refractive outcomes of eyes with cataract and focal corneal edema in Fuchs dystrophy after endothelial keratoplasty (EK) combined with phacoemulsification and intraocular lens (IOL) implantation (triple procedure).

Setting:

Tertiary Care Referral Center (Ospedali Privati Forlì “Villa Igea”, Forlì, Italy).

Methods:

In this retrospective case series, 39 eyes with Fuchs dystrophy and clinically significant focal corneal edema were evaluated. Triple Descemet stripping automated endothelial keratoplasty (DSAEK) was performed in 14 eyes while triple Descemet membrane endothelial keratoplasty (DMEK) was performed in 25 eyes. IOL calculation was determined using SRK/T formula. The main outcome measures were best spectacle corrected visual acuity (BSCVA) and refractive mean absolute error (MAE).

Results:

Clinically significant focal corneal edema corresponded to localized asymmetric corneal steepening with tomographic pattern of focal anterior elevation and posterior depression. Mean preoperative keratometry in the steep (Ks) and flat (Kf) meridians were 45.55 ± 2.29 D and 43.79 ± 2.12 D, respectively. Three months postoperatively, mean Ks and Kf significantly decreased to 43.30 ± 1.82 D and 41.63 ± 3.27 D ($p < 0.001$). BSCVA improved from 0.60 ± 0.41 to 0.09 ± 0.18 ($p < 0.001$). Mean refractive target was -0.98 ± 0.62 (-0.84 ± 0.46 D for DMEK, -1.22 ± 0.76 D for DSAEK). MAE was 2.20 ± 2.74 D (1.78 ± 0.97 D for DMEK and 3.10 ± 4.76 D for DSAEK, $p = 0.622$). At final follow-up, hyperopic arithmetic error was >0.75 D in 86% of cases, >1.25 D in 68% and >2.00 D in 50%.

Conclusions:

Eyes with focal corneal edema in Fuchs dystrophy present with asymmetric corneal steepening. Resolution of focal edema results in marked changes in corneal curvature and contributes to significant hyperopic shift.

Cataract**PP020****Predictability of refractive outcome of combined descemet membrane endothelial keratoplasty and cataract surgery (triple DMEK) in eyes with Fuchs endothelial corneal dystrophy (FECD).**

Presenting author: Julian Langer, Germany

Purpose:

Analysis of morphological and biometric variables to improve the predictability of refractive outcome after triple DMEK

Setting:

Multi-center retrospective study; University Eye Hospital, Munich, Germany; University Eye Hospital, Frankfurt, Germany

Methods:

This retrospective study included 153 eyes of 103 patients who underwent combined descemet membrane endothelial keratoplasty and cataract surgery (triple DMEK). Cause for the necessity of surgery was Fuchs endothelial corneal dystrophy (FECD) and cataract in all patients. Biometric and topographic corneal data was assessed using IOL-Master (Zeiss) and Pentacam (Oculus). IOL power calculation was performed with Haigis IOL formula. Prediction and absolute error were compared after 3 months based on manifest refraction and compared with Raytracing (Okulix). Furthermore, corneal morphological dataset was compared and analysed.

Results:

All patients show an increase in visual acuity postoperatively. The absolute error (AE) of the Haigis IOL overall was $0.98 \pm 0.87D$ and for Raytracing $1.11 \pm 1.18D$. Postoperative overall spherical equivalent was $-0.85D \pm 4.64D$ after 3 month and $-0.57D \pm 3.75D$ after 6 months. Overall, pachymetric values showed no influence on refractive outcome. On the other hand corneal back configuration in Scheimpflug imaging seems to have an impact on refractive outcome in our cohort. The complete results of your ongoing study analyses will be presented at the congress.

Conclusions:

The triple-DEMCK procedure is well suited for patients with Fuchs endothelial corneal dystrophy and cataract. However, a higher risk of unexpected refractive outcome compared to a two-step procedure is a limiting factor. Therefore, there is a need for a better predictability of the refractive outcome. In our study, a closer examination of the corneal posterior surface configuration is shown to be a potentially suitable factor.

Cataract**PP022****Safety and Efficacy of Automated Direct Selective Laser Trabeculoplasty: First-In-Human Study Results. A Single center, single arm, masked clinical study****Presenting author:** Modi Goldenfeld, Israel**Purpose:**

To evaluate the safety and efficacy of automated Direct Laser Trabeculoplasty (DSLT) applied without a gonioscope at various energies to the peri-limbal area overlying the trabecular meshwork (TM) in lowering intra-ocular pressure (IOP) in open angle glaucoma (POAG) and ocular hypertension (OHT).

Setting:

The Sam Rothberg Glaucoma Center, Goldschleger Eye Institute, Sheba medical Center, Tel Hashomer, Israel

Methods:

15 eyes of 15 patients (1 eye with exfoliative glaucoma, 10 with POAG and 4 with OHT) were treated by the DSLT device in one center. 66% were males, mean age was 66.2 ± 8.2 years. Pre-medicated patients were washed out from their glaucoma medications. The DSLT included 100-120 sequential non-contact shots applied automatically directly on the scleral limbus using image analysis of the target and eye tracking monitoring. Laser energy between 0.8 to 1.4 mJ/shot were used. The duration of the irradiation was 1.5 seconds/100 shots. Mean baseline IOP in patients treated with 1mJ/shot was 26.8 ± 2.5 mmHg (n=13).

Results:

The IOP at 3- and 6-months post-op was significantly reduced to 20.7 ± 2.4 and 20.8 ± 3.8 mmHg respectively ($p < 0.01$). In six patients treated with 1.4 mJ/shot, the 3- and 6- months follow up showed mean absolute reduction from baseline of 6.8 ± 4.1 and 7.3 ± 2.5 mmHg ($p < 0.05$) respectively. There was a significant reduction in hypotensive medications from 1.6 ± 1.0 to 0.4 ± 0.7 . Four cases of transient mild sub-conjunctival hemorrhages occurred (resolved in one day to one-week post-op without treatment). No SAE was observed. 4 sub conjunctival hemorrhage in four patients were observed, all cleared without therapy.

Conclusions:

DSLT applied directly to the limbus without a gonioscopy lens is as an effective, safe and well-tolerated new modality to reduce IOP in OAG patients. Higher energy gave better sustained results. This novel technique simplifies and shortens the procedure and reduces corneal side effects. A multicenter, international randomized controlled study is being carried out to verify the results reported herein.

Cataract**PP023****Phacoemulsification combined with Micropulse cyclodiode LASER in glaucoma patients: efficacy and safety****Presenting author:** Arij Daas, United Kingdom**Purpose:**

This study was designed to assess the efficacy and safety of cataract surgery combined with Micropulse cyclodiode laser (MP-TSCPC) in patients with coexistent cataract and glaucoma at 12 months follow up.

Setting:

Cataract surgery combined with MP-TSCPC were performed at St. Thomas' Hospital between October, 2018 and July, 2019.

Methods:

Population: Patients with Primary Open Angle Glaucoma who had cataract surgery with Micropulse laser between August 2018 and April 2019 with a 12 month follow-up. Treatment: All the combined procedures were performed under peri-bulbar anaesthesia, patients initially had Micropulse cyclodiode laser using the following parameter: 2W delivered over 160 seconds with a sweeping motion avoiding the 3 and 9 o'clock, followed by uncomplicated cataract surgery. The effect on visual acuity (VA), intraocular pressure (IOP) and number of anti-glaucoma drops were evaluated at 6 and 12 months in addition to any complications that occurred during any time point of the study.

Results:

42 eyes were included in the study. Mean IOP was reduced from 19.5 ± 5.4 mmHg by 22.5% to 15.1 ± 4.6 at 6 months post-operatively and by 19.5% to 15 ± 6.6 mm Hg at 12 months ($p < 0.001$ at both time points). The number of anti-glaucoma medications also reduced significantly from 2.8 ± 1.3 to 1.6 ± 1.2 at 6 months and to 2.2 ± 1.3 at 12 months ($p < 0.001$ at both time points). The success rate was 56% at 6 months and 54% at 12 months. VA was unchanged post-operatively.

Conclusions:

This is the first study evaluating the effect of cataract surgery combined with MP-TSCPC in glaucoma patients. We demonstrated that this led to a reduction in IOP and the number of anti-glaucoma medications at 6 and 12-month postoperatively, without any significant effect on VA.



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Cataract

PP024

Method of surgical treatment of glaucoma by the drainage “alloplant for conjunctiva plasty”

Presenting author: Sergey Kuznetsov, Russian Federation

Purpose:

Analysis of the long-term results of surgical treatment of glaucoma on an author's method (RF Patent № 2540918, № 2541057), using the “Alloplant for conjunctiva plasty” as a membranous biological drainage.

Setting:

Penza Institute for Further Training of Physicians - Branch Campus of the Federal State Budgetary Educational Institution of Further Professional Education «Russian Medical Academy of Continuous Professional Education» of the Ministry of Healthcare of the Russian Federation.

Methods:

78 eyes (72 patients) with open-angle glaucoma were under observation up to 10 years (at mean $6,34 \pm 3.12$ years) after surgical treatment (penetrating and non-penetrating sinustrabeculectomy). Standard research methods were used in all patients. Surgical technique: after conjunctiva and Tenon capsule incision of 7-8 mm from the limbus subconjunctival pocket of 2-3 mm by depth around all the perimeter was formed. Performed a standard sinustrabeculectomy. The inner drainage (1,5×5,0×0,2 mm.) was placed intrascleral, the outer drainage (10,0×10,0×0,2 mm.) was stacked on the sclera and smoothed into the subconjunctival pocket, locking by four interrupted sutures. Conjunctival suture ended the surgery.

Results:

In all cases, surgery and postoperative period were uneventful. In the early postoperative period formation of diffuse filtration cushions was observed. For the whole period of follow-up cystic pads was not mentioned IOP remained normal in 73 eyes (93,59%), repeated surgical intervention was performed in 5 cases: bled needling on 2 eyes, reoperation on 3 eyes.

Conclusions:

“Alloplant for conjunctiva plasty” prevents further formation of scleroconjunctival adhesions and allows a fluid coming from intrascleral space to circulate freely in all directions. The methods contributes to a spilled filtration cushions and IOP normalization, reduces patient's subjective discomfort and definitely prevents relapse of increasing IOP in the distant period.

Cataract**PP025****Optical and predicted visual performance of two intraocular lenses designed to extend depth of focus****Presenting author:** Gerd Auffarth, Germany**Purpose:**

To compare image contrast and predicted visual performance provided by two different extended depth of focus (EDOF) intraocular lenses.

Setting:

The David J. Apple Laboratory for Intraocular Pathology - Dept. of Ophthalmology University of Heidelberg

Methods:

Preclinical testing was performed under clinically relevant conditions for two EDOF IOL designs: TECNIS Symphony (lens A) and Acrysof IQ Vivity (lens B). Through focus and frequency modulation transfer function (MTF) was measured in white light for 3mm and 5mm pupil in an eye model that reproduces average corneal spherical and corneal chromatic aberrations. Binocular simulated visual acuity (VA) was calculated from the area under the MTF (MTFa) up to 50 cycles per mm. Simulated defocus curves were compared to the defocus curves measured in patients bilaterally implanted with the same IOL models.

Results:

MTF measurements for lens A were more than 60% for 3mm pupil and more than 95% higher for 5mm pupil, indicating consistent higher image contrast for both pupil sizes. Simulated visual acuity predicted an intermediate and near acuity of at least half a line higher for Lens A, resulting in a greater range of vision for this EDOF IOL. Clinical and simulated defocus curves were comparable for lens A. For lens B, simulated defocus curves were up to 0.08LogMAR higher than clinical defocus curves, indicating a greater difference between both lens models than predicted by preclinical data.

Conclusions:

The optical quality and simulated visual performance of two extended depth of focus IOLs was assessed using optical bench data. While simulated distance visual acuity was comparable. Lens B (Acrysof IQ Vivity) lowered contrast, intermediate and near simulated acuity, and reduced range of vision as compared Lens A (TECNIS Symphony). Clinical defocus curves further stress the differences between both lens models

Cataract**PP026****The application of chromatic aberration to extend the depth-of-focus in patients with monofocal IOLs****Presenting author:** Grzegorz Labuz, Germany**Purpose:**

A recently introduced concept where the IOL corrects the eye's longitudinal chromatic aberration (LCA) has become a new trend in the IOL market. Laboratory-derived optical quality improvement has been the primary rationale, but clinical studies have not yet shown clear benefits of this technology. This study aims to test how LCA affects the patients' visual quality and their depth-of-focus.

Setting:

International Vision Correction Research Center, Department of Ophthalmology, University of Heidelberg, Germany.

Methods:

Chromatic-aberration effects were studied monocularly in 25 patients implanted with a monofocal lens. LogMAR corrected distance visual acuity (CDVA) and defocus curve were assessed using a computerized vision-testing system for optotype randomization. Defocus was induced using trial lenses with a power range of +1 D to -2 D (in 0.5 D steps). Contrast sensitivity was evaluated at far and at four spatial frequencies. The eye was measured in its natural conditions, as well as with chromatic aberration corrected and increased two-fold compared to the physiological level. LCA was altered by the introduction of zero-power lenses.

Results:

The mean ($\pm$ standard deviation) CDVA was -0.1 ± 0.07 for the natural condition, -0.1 ± 0.10 for the LCA-corrected eye, and -0.05 ± 0.08 for the eye with increased LCA. A sharp decline of the defocus tolerance was found after the LCA-correction with the VA value of 0.28 ± 0.16 at -1 D. But for the natural and increased LCA, it was 0.20 ± 0.11 and 0.11 ± 0.12 , respectively. Contrast sensitivity was slightly improved at all spatial frequencies after the LCA correction, which was closely followed by the natural-eye performance. Increased LCA resulted in minimally reduced contrast sensitivity, mainly at higher spatial frequencies.

Conclusions:

We demonstrated that chromatic aberration increases the depth-of-focus of a pseudophakic eye with a monofocal IOL. A doubled amount of chromatic aberration resulted in a nearly one-line improvement of VA at -1 D and nearly two-line improvement compared to the LCA-corrected eye. Although increased LCA minimally, on average, worsens far VA. Still, it was above the 20/20 level, which shows chromatic aberration's potential to enhance the defocus tolerance without affecting the patients' overall quality of vision.

Cataract**PP027****One- piece foldable intraocular lens versus three- piece foldable intraocular lens in scleral fixation technique****Presenting author:** Ghada Samir, Egypt**Purpose:**

Evaluate the postoperative IOL stability between one- piece foldable IOLs and three- piece foldable IOLs in scleral fixation technique

Setting:

Giza Memorial institute of ophthalmic researches

Methods:

This RCT study includes 118 eyes divided into 2 groups: Group A composed of 59 eyes received one-piece foldable IOL, Group B composed of 59 eyes received three- piece foldable IOL. All the patients were followed up every 3 months for total of 12 months. UBM was used to quantify the postoperative IOL stability through measuring the horizontal and vertical IOL optic tilt from iris plane in millimeters. The 12th month postoperative UBM measures of the IOL position, BCVA, spherical and cylindrical errors were compared between 2 groups.

Results:

No significant difference in the IOL inclination between two groups neither in vertical tilt $p=0.148$ nor horizontal tilt $p=0.888$. In Group A, 69.5% of haptics were posterior to the ciliary body while 12.7% were anterior to the ciliary body and 17.7% were in the ciliary sulcus. In Group B, 94.9% of haptics were positioned correctly in the intrascleral tunnel while 5.08% migrated to the ciliary sulcus. Only in group B, 8 haptics were broken during surgical manipulation. No statistic significant differences in postoperative spherical error $p=0.530$, cylindrical error $p=0.179$ and BCVA $p=0.160$ between the 2 groups.

Conclusions:

1-piece foldable IOL provides a good postoperative stability similar to 3-piece foldable IOL in scleral fixation technique, i.e 1-piece foldable IOL achieves a good postoperative stability with the advantage of lower incidence of haptic breakage during surgical manipulations.

Cataract**PP028****Ethnicity and risk of anterior uveitis following routine cataract surgery; a multi-centre retrospective cohort study****Presenting author:** Alexander Silvester, United Kingdom**Purpose:**

Topical corticosteroids are used following cataract surgery to control ocular inflammation. Despite standard regimes of potent corticosteroids, some patients appear to be at an increased risk of developing anterior uveitis following routine cataract surgery and may benefit from an enhanced post-operative regime. Few papers have explored a link between ethnicity and anterior uveitis following routine cataract surgery, however it has been hypothesised that darker irises with increased melanin augment ocular inflammation. The aim of this retrospective cohort study was to determine whether ethnicity was a risk factor for developing anterior uveitis following routine cataract surgery.

Setting:

21 eye hospitals in the United Kingdom

Methods:

Retrospective analysis of electronic medical records (mediSIGHT) of all patients that underwent routine cataract surgery from 01/01/2020 to 31/12/2020. Patients who had complicated cataract surgery were excluded. All patients received Predforte 1% drops four times a day for 3 weeks and all had routine follow up at 4 weeks post-surgery.

Results:

21,907 patients underwent routine cataract surgery. 2.93% were found to have anterior uveitis. 23.99% of patients were Black, Asian and Minority Ethnic (BAME). There was an increased risk of post-operative anterior uveitis in BAME patients compared to white patients (relative risk 3.78, $p < 0.0001$). Age and sex were not identified as risk factors for post-operative uveitis.

Conclusions:

BAME patients have an increased risk of anterior uveitis following routine cataract surgery. The ethnicity of a patient should be taken into consideration prior to cataract surgery to support the consent process by providing the patient with an accurate risk profile and for consideration of an enhanced post-operative drop regime.



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PP029

Silodosin as a predisposing factor of Intraoperative Floppy Iris Syndrome (IFIS): an observational propensity score-matching cohort study

Presenting author: Nikolaos Ziakas, Greece

Purpose:

To evaluate the correlation between silodosin and Intraoperative Floppy Iris Syndrome (IFIS) and compare it with other α_1 -adrenergic receptor antagonists (α_1 -ARAs) and other factors predisposing to IFIS.

Setting:

2nd Department of Ophthalmology, Aristotle University of Thessaloniki, Greece

Methods:

From the cases that underwent phacoemulsification between 2014 and 2020, we identified all patients who, during their preoperative assessment, reported an α_1 -ARAs intake (exposed group). These patients were matched utilizing a propensity score matching analysis, with an otherwise homogenous group of patients (control group), based on demographics and systemic/ocular comorbidities.

Results:

350 patients were included in each group. In the exposed group, 177 (50.6%) patients were exposed to tamsulosin, 105 (30%) to alfuzosin, 43 (12.2%) to silodosin. Regarding IFIS, it was observed in 21.5% of patients on tamsulosin (38/177), 11.4% on alfuzosin (12/105), 37.2% on silodosin (16/43), and 3.4% in the controlled group (12/350). In a multiple regression model analysis, the only two factors that were significantly associated with IFIS development were silodosin and tamsulosin yielding an adjusted odds ratio of 8.471 (95%CI: 4.005-17.920), and 3.803 (95%CI: 2.231-6.485), respectively.

Conclusions:

Silodosin has been demonstrated as a predisposing factor, strongly correlated with IFIS development. These results should increase awareness to cataract surgeons to carefully assess their patients preoperatively for exposure to silodosin, and employ the appropriate prophylactic measures to ameliorate the impact of silodosin intake on the surgical outcome.

Cataract**PP030****EXTRA CO-AUTHORS: Cataract surgery complicated by a posterior capsule rupture as reflected in the European Registry of Quality Outcomes for Cataract and Refractive Surgery (EUREQUO)**

Presenting author: Maartje Segers, Netherlands

Purpose:

To analyze risk factors and outcomes of cataract surgery complicated by a posterior capsule rupture (PCR).

Setting:

Clinics affiliated with the European Registry of Quality Outcomes for Cataract and Refractive Surgery (EUREQUO).

Methods:

Data were obtained from the EUREQUO between January 1, 2008, and December 31, 2018. The registry contains data on demographics, comorbidities, intraoperative complications, including PCR, refraction, corrected distance visual acuity (CDVA) in decimal (for analyses converted to logMAR), and postoperative complications. Univariate and multivariate logistic regression analyses were performed to estimate the (adjusted) odds ratio and 95% confidence intervals. The Students T-test was used to analyze continuous variables and the Pearson Chi-square test was used for categorical variables.

Results:

Data was available of 2,853,376 cataract surgeries and 31,749 (1.1%) were complicated by a PCR. The PCR rate ranged from 0.60 to 1.65%, with a decreasing trend ($p < 0.001$). Risk factors most significantly associated with PCR were corneal opacities (aOR 3.21, 95% CI 3.02–3.41, $p < 0.001$), diabetic retinopathy (aOR 2.74, 95% CI 2.59–2.90, $p < 0.001$), and poor preoperative CDVA (aOR 1.98, 95% CI 1.88–2.07, $p < 0.001$). The visual outcomes following PCR were worse than in cases without PCR (87.1% better postoperative than preoperative CDVA vs. 92.3%). Patients with a PCR also had significantly more postoperative complications ($p < 0.001$).

Conclusions:

Many risk factors for PCR were identified based on the EUREQUO and the incidence of this complication is decreasing over time. Moreover, patients with PCR have significantly worse visual outcomes and more postoperative complications than patients without a PCR. However, the vast majority of patients achieved better postoperative visual acuity than before surgery. These results can be used for risk stratification, benchmarking, and informing patients and ophthalmologists.

Cataract**PP031****Efficacy of the perioperative use of hyaluronic acid/trehalose ophthalmic solution in reducing post-cataract surgery dry eye symptoms and signs****Presenting author:** Eleonora Favuzza, Italy**Purpose:**

To evaluate the effects of a hyaluronic acid (HA) 0.15% and trehalose 3% ophthalmic solution in reducing post-cataract surgery dry eye symptoms in patients with mild/moderate dry eye disease (DED).

Setting:

Eye clinic, Careggi Hospital, University of Florence, Italy

Methods:

120 patients affected by mild-moderate DED, scheduled for unilateral cataract surgery were enrolled. All patients followed the same antibiotic and anti-inflammatory postoperative topical regimen. They were randomly divided in three groups: 1) group A: HA/trehalose ophthalmic solution 3 times/day in the preoperative week and for 5 postoperative weeks; 2) group B: HA/trehalose only for 5 postoperative weeks; 3) group C (control group): no additional artificial tears. At the preoperative visit, the day of surgery, and at 1 and 5 postoperative weeks OSDI (Ocular Surface Disease Index) questionnaire score, invasive tear Break-up Time (BUT), non-invasive BUT (NIBUT) and fluorescein staining score (Oxford scale) were evaluated.

Results:

In groups A and B OSDI scores were significantly lower than group C at the postoperative visits. In group A OSDI scores were significantly lower than group B 1 and 5 weeks after surgery ($p=0.01$). In groups A and B BUT was significantly higher than group C in the whole postoperative period ($p=0.001$). While in group A BUT remained stable compared to the preoperative values after surgery, in group B and C it significantly decreased, especially in group C. More patients showed a corneal fluorescein staining equal or higher than 1 in group C than groups A and B at the postoperative visits ($p=0.01$).

Conclusions:

Hyaluronic acid 0.15% and trehalose 3% ophthalmic solution was effective in reducing post cataract surgery dry eye symptoms and signs in patients with mild/moderate DED, particularly if also administered in the preoperative period.



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PP032

Choosing the most appropriate three-piece IOL for patients with posterior-capsular rupture – do we have a problem?

Presenting author: Sunil Mamtora, United Kingdom

Purpose:

Cataract surgery complicated by posterior capsular rupture (PCR) usually necessitates the insertion of a three-piece lens in the ciliary sulcus rather than a single-piece lens in the capsular bag. This anterior change in effective lens position requires modification of the intraocular lens (IOL) power. The purpose of this study was to compare the number of cases with correct sulcus lens power between two regional hospitals in the South West of England.

Setting:

Cheltenham General Hospital, Cheltenham, United Kingdom Royal United Hospital, Bath, United Kingdom

Methods:

A retrospective audit was performed of 22,975 patients undergoing cataract surgery in the previous 5 years using the Medisoft Electronic Medical Record (EMR) at three hospitals. In patients identified as having posterior capsular rupture with the implantation of a three-piece IOL, documentation was reviewed to identify the pre-operatively determined IOL and intended refractive aim, the intra-operatively selected three-piece IOL and whether or not there was optic capture. IOL selection was reviewed as per local guidelines, based on Warren Hill's website (<https://www.doctor-hill.com/iol-main/bag-sulcus.htm>).

Results:

The data from 137 patients was included in our study. Patient records with incomplete or missing data were excluded from the analysis. Ninety-five patients with posterior capsular rupture who had a three-piece IOL implanted were identified in Cheltenham General Hospital (CGH), forty-two in the Royal United Hospital, Bath (RUH) and 199 in the Bristol Eye Hospital (BEH). In CGH, 19 out of 95 patients (20%) were identified as having had the correct IOL implanted whilst in the RUH 15 out of 42 (36%) had the correct IOL implanted. The median error was +0.5D (interquartile range 0-1D) in both centres.

Conclusions:

We have identified widespread incorrect selection of the appropriate three-piece IOL in patients with PCR, irrespective of grade of surgeon across three separate and unlinked hospitals. At the time of writing, national guidance related to three-piece IOL selection in this patient group does not exist. Additional learning resources to aid clinician understanding are required. This issue is unlikely to only affect our departments and other units should also audit their outcomes.



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PP034

Liquified after cataract and its surgical management

Presenting author: Mohit Garg, India

Purpose:

To describe liquified after cataract (LAC) and its surgical management following an uneventful phacoemulsification with posterior chamber in-the-bag intraocular lens (IOL) implantation and continuous curvilinear capsulorhexis (CCC).

Setting:

Tertiary eye care hospital in North East India

Methods:

Eleven patients with LAC, following uneventful phacoemulsification with CCC and in-the-bag IOL implantation were evaluated. After the basic slit lamp examination, each case was investigated with Scheimpflug photography and ultrasound biomicroscopy (UBM). Each case was treated with capsular lavage. Biochemical evaluation of the fluid and electronmicroscopic evaluation of anterior capsular opacity was done.

Results:

The cases presented with blurring of vision after 6-8 years of cataract surgery with IOL implantation. All cases had IOL microvacuoles, 360° anterior capsule, and anterior IOL surface touch along with ACO, ring of Soemmering, and posterior capsule distension filled with opalescent milky fluid with whitish floppy or crystalline deposits. Biochemically, the milky fluid contained protein, albumin, sugar, and calcium and was sterile. Histologically, the dissected ACO showed fibrous tissue. All cases were successfully treated with capsular lavage with good visual recovery and with no complication. There was no recurrence of LAC during 2 years postoperative follow-up.

Conclusions:

LAC is a late complication of standard cataract surgery. Capsular bag lavage is a simple and effective treatment for LAC and a safe alternative to neodymium-doped yttrium aluminum garnet (Nd-YAG) capsulotomy.

Cataract**PP035****Corneal incision enlargement in two preloaded intraocular lens injectors: an intraindividual in-vivo study****Presenting author:** Timur M. Yildirim, Germany**Purpose:**

The wound architecture, size and location of the corneal incision contributes to the amount of surgically induced astigmatism (SIA) in cataract surgery. The aim of this study was to assess enlargement of the clear corneal incision site and functional outcome in cataract patients, following the use of two preloaded intraocular lens (IOL) injectors.

Setting:

The David J Apple Center for Vision Research, Department of Ophthalmology, Heidelberg University Hospital, Heidelberg, Germany

Methods:

In this prospective, randomized, intraindividual comparative, clinical study, 58 paired-eyes were randomly assigned for implantation with two preloaded injectors: the AutonoMe with a Clareon IOL (Alcon, Fort Worth, USA) and the iSert with a Vivinex IOL (Hoya, Tokyo, Japan). The size of the corneal incision, 2.0 for the iSert and 2.2 for the AutonoMe, was measured before and after phacoemulsification, and after IOL implantation. Patients were examined 3 months after surgery to assess keratometry, subjective refraction, and visual acuity.

Results:

The incision enlargement was 0.20 (± 0.10) mm for the AutonoMe and 0.29 (± 0.10) mm for the iSert, with statistically significant difference, $P < 0.05$. The final wound size after IOL implantation with the AutonoMe was 2.41 mm, with the iSert 2.35 mm. The mean absolute SIA in the iSert eyes, was 0.50 (± 0.25) D, and in the AutonoMe eyes, it was 0.45 (± 0.20) D, $P > 0.05$. The 3-month postoperative uncorrected and corrected distance visual acuity (UDVA and CDVA) were similar in both groups, with a UDVA of 0.10 and 0.12 logMAR and CDVA of -0.04 and -0.03 logMAR, respectively for Clareon and Vivinex.

Conclusions:

The iSert injector caused more enlargement of the corneal wound during IOL implantation compared to the AutonoMe. Despite the initially different incision sizes, the final incision size was similar in both groups. Functional outcomes were similar in both groups.

Cataract**PP036****Comparison of power calculation formulas and residual objective post-surgery refraction for a trifocal intraocular lens (IOL)****Presenting author:** Jorge Donís de la Torre, Spain**Purpose:**

To evaluate the precision of five different formulas for a trifocal IOL power calculation. To evaluate the accuracy of five different formulas when compared to residual post-surgery objective refraction results.

Setting:

Power IOL calculation is essential to assure refractive success after cataract surgery. There is a wide variety of formulas to calculate IOL power when planning surgery and IOL selection. An in-depth analysis to compare pre-surgery calculations and post-surgery results with all these formulas should be conducted.

Methods:

This is a retrospective case study. 121 patients who underwent cataract surgery and trifocal IOL implantation (IQ PanOptix IOL implant AcrySof TFNT00) on both eyes (222 eyes) were selected. All patients underwent surgery on both eyes between March and May 2019 in a private eye care centre in Madrid. Emmetropia was considered the post-surgery refraction success. All patients were treated by the same surgeon. Five different power calculation formulas and planned residual refraction results (Barrett Universal II, Hill-RBF, Panacea, Kane, Evo) were compared to those obtained three months after surgery (implanted IOL power was selected with Haigis formula).

Results:

According to Tau b Kendall and Rho Spearman analysis, a strong correlation was observed between Barrett Universal II and Hill-RBK and between Kane and Evo residual refraction predictions. For Barrett Universal II and Hill-RBK comparison, Tau b Kendall ($p=0.811$) and Rho Spearman ($p=0.909$). For Kane and Evo comparison, Tau b Kendall ($p=0.674$) and Rho Spearman ($p=0.794$). When post-surgery objective residual refraction was compared with that obtained with all five formulas, Wilcoxon test showed a high correlation only for Barrett Universal II and Hill-RBF results ($p>0.05$).

Conclusions:

When comparing post-surgery objective refraction after trifocal IOL implantation (IOL selected according to Haigis formula) with residual refraction previously calculated with Barrett Universal II, Hill-RBF, Panacea, Kane and Evo formulas, Barrett Universal II and Hill-RBF showed the most predictable results. A strong correlation was also observed between Barrett and Hill-RBK and between Kane and Evo pre-surgery residual calculation formulas.

Cataract**PP037****Surgical therapy of secondary glaucoma after cataract surgery in children****Presenting author:** Nina Zelenayova, Czech Republic**Purpose:**

To determine a proportion of glaucoma surgeries performed on paediatric patients who underwent surgery for congenital or infantile cataract prior to surgery for open angle glaucoma in tertiary paediatric ophthalmology department. We selected this group of patients to focus on this specific glaucoma with unclear mechanism of development.

Setting:

Department of Ophthalmology, 2nd Faculty of Medicine, Charles University in Prague and Motol University Hospital

Methods:

In this retrospective study we collected data about all patients who were indicated for glaucoma surgery from March 2018 to March 2021 performed by one surgeon in tertiary paediatric ophthalmology department and selected patients who underwent cataract surgery prior to glaucoma surgery. All cataract surgeries were performed by the same technique- small corneal incision, extracapsular cataract extraction, anterior vitrectomy and iridectomy. Patients were examined under general anaesthesia before cataract surgery and regularly after the surgery including intraocular pressure measurement, refraction, axial length, corneal diameter, gonioscopy and fundus examination. Indication for glaucoma surgery was progressive glaucoma despite maximal medical therapy.

Results:

Sixty-four eyes of 52 patients underwent glaucoma surgery, 89 surgeries were performed. From this group, 21 eyes of 18 patients had cataract surgery prior to glaucoma surgery, 16 aphakic, 2 pseudophakic. Three patients had uveitis present at birth and 5 persistent fetal vasculature. Mean age at time of cataract surgery was 2.5 months (range 1 - 7 months), mean period from cataract to primary glaucoma surgery was 31 months (range 3 months to 13 years). Thirty-eight surgeries were performed - majority of primary glaucoma surgeries were deep sclerectomies with implants (36%), majority of reoperations were transscleral diode laser cyclophotocoagulations (50%).

Conclusions:

Secondary glaucoma after cataract surgery represents large proportion of glaucoma surgeries in paediatric population. Since the mechanism of development of glaucoma in these patients is unknown there is no causal treatment that would control intraocular pressure in most patients. So far, the only significant risk factor for glaucoma development seems to be age at cataract surgery. Glaucoma surgery is also more challenging due to changed anatomical proportions of eyes, there is higher incidence of complications and a lot of cases are refractory even after several glaucoma surgeries.

Cataract**PP038****Instant mydriasis and sustained intraocular anesthesia with intracameral injection of the fixed combination Tropicamide, Phenylephrine and Lidocaine****Presenting author:** Lionel Raj Daniel Ponniah, India**Purpose:**

To compare the effect of topical and intracameral mydriatic agent tropicamide with phenylephrine and its effect on endothelium post-surgery in uncomplicated phacoemulsification procedures

Setting:

A randomized controlled clinical trial comparing topical and intracameral Tropicamide with Phenylephrine at the Department of Cataract surgery, in a tertiary eye care hospital, in South India.

Methods:

Randomized controlled clinical trial. Adult cataracts not denser than Gr III NS, healthy endothelium, normal ACD (2 to 3 mm), AL (23 to 25 mm) with no preexisting pupillopathy were randomized into two groups in 1:1 ratio. Gr-1 were dilated with topical fixed combination Tropicamide 0.8%, Phenylephrine 5% before surgery followed by intracameral 1% Lidocaine injection. Gr-2 received 0.2cc intracameral injection of fixed combination of Tropicamide 0.02%, Phenylephrine 0.31% & Lidocaine 1% intraoperatively. Gr-2 subjects were preoperatively tested for tropicamide hypersensitivity. Time for maximum pupillary dilation in seconds, maximum dilation in mm, endothelial cell loss by 1 month were analyzed

Results:

46 eyes randomized in 1:1 ratio. No significant difference in preoperative variables of age, ACD, and AL in both groups. Time taken for maximal dilation in Gr-1 after drug application was 2604 +/- 455 seconds (43.4 +/- 7.5 mins) whereas 7.09 +/- 1.72 seconds in Gr-2 ($p < 0.0001$). Maximal pupillary dilation in Gr-1 was 7.53 +/- 0.48 mm and 7.57 +/- 0.51 mm in Gr-2 ($p = 0.81$). Endothelial cell loss (mean difference) after 1 month was statistically not significant between the two groups ($p = 0.07$). Neither drug-related toxic reactions in immediate post-op nor cystoid macular edema in late post-op periods was noticed in Gr-2

Conclusions:

This RCT demonstrated instant mydriasis and sustained anesthesia with a single intracameral injection of fixed combination Tropicamide, Phenylephrine & Lidocaine within seconds, which could change practice patterns by reducing patient preparation time prior to surgery and had no adverse effects post-surgery. Its use may be a challenge in children, subjects with tropicamide hypersensitivity, and a pre-operative evaluation of pupillopathy is required.

Cataract**PP039****‘Off the shelf’ Toric Intraocular Lenses (TIOs) for patients in the National Health Service: Preliminary Data of a Randomised Controlled Trial.****Presenting author:** Khayam Naderi, United Kingdom**Purpose:**

TIOs implantation is associated with additional chair time and financial expenditure, which is important in a public healthcare setting. We present preliminary data of a randomised controlled trial comparing ‘fully-tailored’ (FT) TIOs, and an ‘off the shelf’ (OTS) approach with 2.00 or 4.00 dioptre cylinder (DC) corrections with additional opposite clear corneal incisions.

Setting:

Single-centre, prospective single-masked randomised case-controlled trial in a university hospital.

Methods:

Patients with pre-existing regular corneal astigmatism of 1.50 dioptres or more were recruited. 20 patients have been randomised to the FT group, with 21 patients in the OTS group. Primary outcomes include uncorrected distance visual acuity (UDVA), best corrected visual acuity (BCVA), post-operative refractive cylinder (RC). Secondary outcomes include validated patient reported outcome measures (PROMs) using CATPROM-5 and EQ-5D-3L questionnaires, and adverse events. Follow up was at four weeks and six months.

Results:

At 4 weeks, mean UDVA(+/-SD) was 0.20 (0.15) in the FT (n=20) and 0.14 (0.12) in the OTS (n=21) group (p=0.21). Mean BCVA was 0.0035 (0.092) in FT and 0.0095 (0.12) in OTS (p=0.85). Mean RC was 0.93 (0.53) in FT, and 0.60 (0.33) in OTS (p=0.021). Mean vector difference was 0.90 (0.48) in FT and 0.60 (0.33) in OTS (p=0.023). There were no differences in PROMs between groups. In those patients who have thus far reached 6-month follow-up (FT (n=8) and OTS (n=4)) there are no differences in the primary or secondary outcomes.

Conclusions:

The use of ‘off the shelf’ 2.00DC and 4.00DC TIOs with additional opposite clear corneal incisions may improve UVA and allow patients to achieve spectacle independence for distance vision. Our preliminary data suggests that it may not be inferior to using fully tailored TIOs.



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PP040

Practice Patterns of Canadian Ophthalmological Society members in Cataract Surgery – Survey 2020

Presenting author: Lindsay Ong-Tone, Canada

Purpose:

This was the twelfth annual survey on the practice patterns of Canadian Ophthalmological Society (COS) members in cataract surgery.

Setting:

Saskatchewan Health Authority, Regina, Saskatchewan

Methods:

In January 2020, the COS office sent an email with a link to the survey on Red Cap to its 272 members whose primary focus is cataract surgery. Two reminders were sent at 2 weeks interval. Approval for the survey was obtained from the Regina Qu'Appelle Health Region Ethics Board. All responses were collected anonymously.

Results:

All the respondents used povidone iodine preoperatively and most (66.3%) waited one to two minutes before draping. 62.8% of the respondents corrected astigmatism at the time of cataract surgery. The majority (91.8%) used a Toric intraocular lens. 42.9% of the respondents used intracameral antibiotics. The most popular one was moxifloxacin (78.8%). 43.6% of the respondents aimed for monovision and 55.8% of them aimed for between 1.25 to 1.75 diopters of difference. Presbyopia correcting lenses were used by 57.7% of the respondents. Most participants (77%) reviewed their patients on the day after surgery while 22% did so on the same day.

Conclusions:

Most respondents waited at least 1 minute for the povidone iodine to dry before draping. More than 57% of the respondents used Presbyopia correcting lenses while monovision was used by nearly 45%. Most participants see their patients on the day following surgery. It would be interesting to see how this evolves with the current COVID-19 pandemic.

Cataract**PP041****Clinical outcomes of uveitic cataract surgeries in the era of biologics****Presenting author:** Fehim Esen, Turkey**Purpose:**

Management of uveitic cataracts is both a surgical and medical challenge. Uveitis complications (such as iris atrophy and posterior synechiae) harden the surgery requiring synechiolysis and management of intraoperative floppy iris syndrome. The use of iris hooks can help during the surgery but ends up with increased postoperative inflammation, which is always stronger in these cases compared to regular cataract cases. The aim of this study was to analyze factors that affected the prognosis of the uveitic cataract surgery patients.

Setting:

Uveitis Division, Department of Ophthalmology, Istanbul Medeniyet University, Goztepe Prof.Dr. Suleyman Yalcin City Hospital

Methods:

The files of 800 uveitis patients that presented between 2015-2020 were retrospectively reviewed. Patients that had cataract surgery between 2017-2020 were included, (n=35, 13 male, 22 female, mean age: 44.8±15.9 years). Best-corrected visual acuity (BCVA), intraocular pressure (IOP), central macular thickness (CMT) and development of cystoid macular edema (CME) were specifically recorded. Ocular inflammation was well controlled well before surgery (except for Fuchs uveitis). Preoperative oral steroids were not used (except for two severe cases) and all cases received posterior Sub-Tenon injection triamcinolone acetonide (except for viral uveitis cases).

Results:

LogMAR BCVA improved significantly at postoperative week one (1.09 ± 0.13 vs. 0.35 ± 0.10 , $p=0.001$) and remained high at 6th month (0.14 ± 0.05 , $p=0.001$). IOP decreased slightly (2mmHg) at week one ($p=0.039$) and this difference disappeared at 1st month ($p=0.85$) and the following visits ($p=0.42$). CMT tended to increase at postoperative week one (250 vs. 286um, $p=0.23$) and was significantly higher at 1st (269um, $p=0.05$) and 6th months (291um, $p=0.012$). CME rate was higher following the use of iris hooks (25%). None of the patients treated with biologics (n=8) developed CME, while four patients developed CME in the remaining patients (n=27).

Conclusions:

The prognosis of uveitic cataract surgery was well and BCVA improved significantly postoperatively. Postoperative hypotony or phytisis bulbi did not occur. However, four cases developed CME (11.4%). Reducing surgical trauma (refraining from iris hooks) decreased postoperative inflammation. Strict control of preoperative inflammation (especially with biologics) improved patient outcome. In patients with mild inflammation (e.g. Fuchs uveitis) and well-controlled autoimmune disease with immunosuppressives/biologics, the conventional use of preoperative oral steroids could be omitted and postoperative CME rate could be reduced by a single intraoperative Sub-Tenon injection of triamcinolone acetonide to refrain from the systemic side effects of steroids.

Cataract**PP042****Influence of the anterior chamber depth on the accuracy of IOL optical power calculation in short eyes****Presenting author:** Alexander Tsygankov, Russian Federation**Purpose:**

Determination of the relationship between the anterior chamber depth and the accuracy of the IOL optical power calculating in the eyes with an axial length of less than 22 mm.

Setting:

"Excimer" eye center, Moscow, Russian Federation "Excimer" eye center, Novosibirsk, Russian Federation Tashkent medical academy, Tashkent, Uzbekistan

Methods:

A total of 86 patients (133 eyes) with a short axis (from 18.54 to 21.98 (20.7±0.9) mm) were included in the study. Group I (n = 40) consisted of patients with an ACD of less than 2, 5 mm. Group II (n = 49) included patients with ACD from 2.5 to 2.9 mm Group III (n = 44) included patients with ACD greater than 2.9 mm The calculation of the IOL optical power was carried out according to the formula SRK / T, retrospective comparison - according to the formulas Hoffer-Q, Holladay II, Olsen, Haigis, Barrett Universal II and Kane.

Results:

In group I, there were no differences in MedAE ($p < 0.05$). The highest MedAE (0.51, 0.49 and 0.52, respectively) and the smaller MNE range (-0.03 ± 0.89 , -0.01 ± 0.97 and 0.04 ± 0.74 , respectively) are shown for formulas Haigis, Barrett Universal II and Kane. In group II, MedAE for Haigis, SRK/T and Olsen were 0.45, 0.59 and 0.66. For the Haigis formula, the lowest MNE value (0.05 ± 0.69) is shown. The lowest MedAE (0.17 and 0.19) and the best MNE values (-0.01 ± 0.58 and 0.01 ± 0.48) are shown for Haigis and Kane formulas.

Conclusions:

For eyes with an ACD of less than 2.4 mm, none of the formulas showed a significant advantage, while with an ACD of 2.4-2.9 mm and higher, the use of the Haigis and Kane formulas is recommended, and the SRK/T formula showed the worst result. The refractive index ± 0.25 and ± 0.50 D for the Haigis and Kane formula were significantly higher. The data obtained dictate the need to review existing standards for calculating the IOL optical power in patients with short eyes depending on ACD.



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PP043

A new method to improve refractive outcomes in post refractive surgery IOL power calculation with unknown preoperative parameters: Advanced Lens Measurement Approach (ALMA)

Presenting author: Ferdinando Cione, Italy

Purpose:

To test the Advance Lens Measurement Approach (ALMA), a new method to calculate the Intraocular Lens (IOL) power that combines R Factor and ALxK methods in eyes that underwent corneal refractive surgery.

Setting:

University Eye Clinic, Department of Medicine, Surgery and Dentistry, “Scuola Medica Salernitana”, University of Salerno.

Methods:

Seventy-two eyes of 72 patients previously treated with Photorefractive Keratectomy (PRK) or Laser-Assisted in Situ Keratomileusis (LASIK) with subsequent phacoemulsification and IOL implantation in the capsular bag, were analyzed. The Mean Errors (ME) were zeroed out for each formula and for selected IOL models, to eliminate the bias of the lens factor (A-Constant). The median absolute error (MedAE) and percentage of eyes within ± 0.5 and ± 1.0 diopters (D) of the refraction prediction error (RPE) for each method were calculated and compared.

Results:

MedAE was 0.65 D with R Factor method, and 0.71 D with ALxK method, respectively. With R Factor, 35 eyes (48.6%) reported a RPE ± 0.5 D, and 52 eyes (72.2%) reported a RPE ± 1.0 D. With ALxK method, 32 eyes (44.4%) reported RPE ± 0.5 D, and 54 eyes (75.0%) reported a RPE ± 1.0 D. ALMA method reported a lower MedAE of 0.58D and a higher number of patients with a RPE ± 0.5 D (37 eyes, 51.4%), and with a RPE ± 1.0 D (57 eyes, 79.2%), with a statistically significant differences compared to both R Factor and ALxK ($P < 0.05$).

Conclusions:

Based on the results obtained from this study, ALMA method gives better results than R Factor and ALxK methods. This improvement is confirmed by zeroing out the ME.



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PP044

Dual Blade Goniotomy and Direct Viscodilation of the Collector Channels combined with Cataract Surgery: 4yr results

Presenting author: Jane Gilmore, United States

Purpose:

Combined Kahook Dual Blade Goniotomy and Direct Visco Dilation of the Collector Channels with cataract surgery technique was evaluated for its effect on IOP and dependence on glaucoma drops in all levels of glaucoma. The “clean the gutter and power wash the downspouts” technique not only removes trabecular meshwork but forcibly viscodilates the collector channels.

Setting:

This report is a retrospective study of glaucoma patients who presented for cataract surgery in a private practice. All surgery was performed by one surgeon (L.L.B.)

Methods:

After cataract surgery, the Dual Blade removed 180° of trabecular meshwork. Viscoelastic was injected into the exposed ostium of the Collector Channels as the perpendicular viscoelastic cannula was held firmly against the outer wall and dragged through the gutted canal. IOP was monitored every 3 months and treated with glaucoma meds as needed. Moderate to severe glaucoma comprised 64% of the 177 eyes followed at least 2 years. 32% had previous glaucoma surgery. 71% were African American. 44% were diabetics. 50% were on an anticoagulant.

Results:

Initial IOP was 18.5mmHg(SD+/-7.2)on 1.6 medications. At 3mos the IOP was 15.6mmHg(SD+/-5.1). Throughout the first year the IOP hovered around 16.5mmHg. IOP decreased to 15.5mmHg (SD+/-4.4) in 74 of the 177 eyes that were seen for 3yrs. Although the IOP was reduced by 15%, 85-90% of the eyes had all drops stopped. All eyes had ≤ 15 mmHg AND no meds in 71% (1yr), 59% (2 and 3yr), and 78% (4yr). The moderate to severe group had ≤ 15 mmHg AND no meds 70% (1yr), 50% (2yr), 55% (3yr), and 75% (4yr). Medications were reduced by 1.5 to 1.0 drops per eye over 4yrs.

Conclusions:

Over the course of 48mos. 77 patients had a reduction of 1.5 drops per month, resulting in decrease of over 5000 bottles. At \$50 per bottle this equals a cost savings of over \$250,000 in 4yrs in this population. The synergy of Goniotomy and Direct ViscoDilation of the collector channels markedly reduces the intraocular pressure and medications in all levels of glaucoma. This combination of two MIGS procedures is a safe and effective approach for compliance issues and the financial burden associated with glaucoma management.



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PP045

Phacoemulsification with Ab externo Schlemm's canal surgery in management of open angle glaucoma in cataract patients - Long-term result.

Presenting author: Dushina Galina, Russian Federation

Purpose:

To evaluate the effectiveness of segmental Schlemm's canal (SC) distension using Kumar's Schlemm's canal expander (SCE) in decreasing intraocular pressure (IOP) in cataract patients suffering from open angle glaucoma (OAG).

Setting:

People's Friendship University of Russia (RUDN University), Moscow, Russian Federation. Moscow City Clinical Hospital after V.M. Buyanov, Ophthalmic unit

Methods:

October, 2012 and March, 2021 in a prospective interventional case series study. SCE device, made from 0.04mm thick medical grade stainless steel wire, having inner lumen diameter of 0,12mm and outer 0,2mm, 4-5 mm long was implanted into SC ab externo after completion of cataract surgery of 59 patients (38 male and 21 female; average age – 75,47+/-6,2 years) suffering from OAG. Outcome measures were IOP change, number of glaucoma medications pre- and postoperatively and complications. Success rates were evaluated using World Glaucoma Association guidelines. A paired t-test was used for analysis. Results were significant when p less than 0,05.

Results:

Mean preoperative IOP was 28+/-4.7mmHg and mean number of medications - 2,4+/-0,8. At 5 years mean IOP reduced by 27%+/-15.5% and was 20,4+/-4,9 (n=59; p=.0000006) use of medications reduced to 1+/-1,2(p=.0000001). Complete success was achieved in 24% (14/59) cases and partial in 49% (29/59) respectively. Intraoperatively, microperforation occurred in 5 cases (8,5%). Postoperatively, 6 cases (10%) required YAG laser trabeculopuncture to control IOP. Postoperatively, specific complications related to SCE were rare. In one case the body of SCE ruptured TM because of extra pressure put on eye ball while inserting gonioscopes. Both ends of the expander were embedded in SC.

Conclusions:

Results of combined surgery – phacoemulsification with intraocular lens implantation and SCE implantation in surgical management of OAG in cataract patients show significant reduction in IOP from the baseline and in hypotensive medication(s) use in long term period.

Cataract**PP046****Astigmatism reduction with femtosecond laser-assisted corneal arcuate incisions combined with cataract surgery: comparison of two nomograms****Presenting author:** Paula Casas, Spain**Purpose:**

To compare the effectiveness of two nomograms of femtosecond laser arcuate corneal relaxing incisions (CRIs) in reducing corneal direct astigmatism during cataract surgery.

Setting:

Clinical University Lozano Blesa Hospital, Zaragoza, Spain

Methods:

All selected eyes were subjected to LenSx (Alcon) femtosecond-assisted cataract surgery and treatment for astigmatism was added in the same surgical act. NOMOGRAM 1, based on Donnenfeld nomogram, place CRIs at 9 mm with 80% depth. where the Arc arc length was 35° or 44° depending on preoperative astigmatism. NOMOGRAM 2, based on Woodcock nomogram, place CRIs at 8.0 mm with 90% depth where the. Aarc length was 42° or 50° depending on preoperative astigmatism. The primary outcome measure was the change in corneal astigmatism from preoperative to one month after surgery using Alpíns vector analyses.

Results:

Twenty-eight eyes of 28 patients with cataract and Placido disk-measured direct corneal astigmatism between 1.5 D and 2.5 D were included. Nineteen eyes were treated with nomogram 1 and 9 eyes with nomogram 2. The mean correction index (CI) was 0.36 ± 0.21 in nomogram 1 and 0.77 ± 0.22 in nomogram 2 ($p = 0.06$). The flattening index (FI) was 0.26 ± 0.26 in nomogram 1 and 0.88 ± 0.71 in nomogram 2 ($p = 0.05$). There were no significant differences in success index (SI) between groups. All patients improved the uncorrected visual acuity after surgery.

Conclusions:

Femtosecond CRIs coadjuvant to cataract surgery allows to treat moderate degrees of keratometric astigmatism. Woodcock nomogram, with greater depth of action, less distance to the visual axis and longer arc lengths presents differences in results compared to Donnenfeld's nomogram. CI and FI closer to 1 in Woodcock nomogram show more predictable results than Donnenfeld's nomogram in moderate direct astigmatisms.



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PP048

Longitudinal outcomes of second-generation trabecular micro-bypass stent implantation (iStent inject®) with cataract surgery in a Saudi glaucoma population

Presenting author: Ahmed Alhabash, Saudi Arabia

Purpose:

As micro-invasive glaucoma surgery (MIGS) modalities such as iStent inject grow in utilization and availability, real-world data in diverse populations is increasingly important. To-date, the majority of MIGS studies have been conducted in the Americas, Europe, and Asia-Pacific, with relatively fewer studies completed in the Middle East. This retrospective case series analyzed the safety and efficacy of iStent inject implantation with concomitant phacoemulsification in Saudi patients with open-angle glaucoma and cataract and up to two years of postoperative follow-up.

Setting:

Ophthalmology department at King Fahad Hospital of the University in Khobar, Saudi Arabia

Methods:

This retrospective consecutive real-world case series assessed eyes with open-angle glaucoma (OAG, including primary OAG or pseudoexfoliative glaucoma) that underwent iStent inject implantation in the setting of cataract surgery. Patients were followed for up to 24 months (24M) postoperative, including assessments of intraocular pressure (IOP), medication usage, adverse events, and secondary glaucoma surgeries. Last follow-up analysis incorporates data from patients' final visits regardless of when they occurred during the study period (average follow-up 15M, range 1-24M). Since patient care is ongoing, a larger sample with longer follow-up data will be available by the time of the conference.

Results:

This cohort included 37 eyes with preoperative mean IOP of 18.3 ± 2.9 mmHg on 2.35 ± 1.18 mean medications. No eyes were medication-free, and 65% had high preoperative regimens (defined as ≥ 2 medications). Approximately 16% and 49% of eyes had baseline IOP of ≤ 15 mmHg or ≤ 18 mmHg, respectively. By last follow-up (average 15M), mean IOP was 14.4 mmHg (21% reduction, $p < 0.001$); the percent of eyes with IOP ≤ 15 mmHg had risen four-fold to 70%; and 100% of eyes had IOP ≤ 18 mmHg. Meanwhile, medications decreased by 64% to 0.84 mean medications ($p < 0.001$), with 57% of eyes eliminating medications entirely. Favorable safety included no stent-related complications and no secondary surgeries.

Conclusions:

This real-world longitudinal case series provides valuable data on the utility of iStent inject within a Saudi population with OAG. By final follow-up, all eyes had achieved IOP of 18 mmHg or less, over two-thirds of eyes had IOP of 15 mmHg or less, and over half had become medication-free. The safety profile was excellent, consistent with the existing robust evidence base supporting device usage.

Cataract**PP049****Safety and Efficacy of Three Variants of Canaloplasty With Phacoemulsification to Treat Open-Angle Glaucoma and Cataract: 12-month follow-up****Presenting author:** Marek Rekas, Poland**Purpose:**

A prospective observational study to compare clinical outcomes of three types of canaloplasty using the iTrack microcatheter (Nova Eye Medical, Fremont, California): ab-externo (C), ab-interno (ABiC) and minicanaloplasty (MC) combined with cataract surgery in primary open-angle glaucoma (POAG) patients over 12 months.

Setting:

All procedures were performed at a single centre, the Military Institute of Medicine, Warsaw, Poland by one surgeon MR.

Methods:

48 POAG patients underwent one of three canaloplasty procedures: C (16 eyes), ABiC (16 eyes) or MC (16 eyes) combined with phacoemulsification as part of a prospective efficacy study. MC is a novel, minimally-invasive procedure performed at our centre: it uses small scleral flaps and does not require excision of a deep scleral flap. Prior to surgery, antiglaucoma medications were washed-out. Intraocular pressure (IOP), slit-lamp examination and number of medications were assessed at baseline, at day 0-1-7 and at 1-6-12-months. Successful treatment was defined as an IOP reduction $\geq 20\%$. Statistical analysis included descriptive statistics and GLM repeated measure ANOVA

Results:

Mean pre-washout IOP (mmHg) was 16.8 ± 2.9 (C), 17.8 ± 2.3 (MC) and 17.9 ± 1.7 (ABiC) (mean $\pm$ SEM) and decreased 12-month postoperatively to 13.6 ± 2.8 ($p=0.002$), 14.2 ± 3.1 ($p=0.001$) and 15.1 ± 3.0 ($p=0.005$) respectively - successful treatment was achieved in approximately 30%, 35% and 30% of the groups respectively. There was a statistically significant difference in IOP between the C and ABiC groups at 3-month ($p=0.023$) and 6-month ($p=0.011$) in favour for C. Preoperatively the mean medications number was 2.0 ± 0.2 (C), 2.0 ± 0.3 (ABiC), 2.0 ± 0.2 (MC); 12-month post-operatively all medications were withdrawn except in 2 patients. The most frequent complications were microhyphema (44%), hyphema (25%), transient IOP > 30 mmHg (10%) and macular edema (4%).

Conclusions:

This 12-month prospective observational trial demonstrated that the three variants of canaloplasty (C, MC and ABiC) significantly reduced IOP and number of medications in patients with mild to moderate POAG and with no significant complications. MC demonstrates similar clinical efficacy and safety outcomes to C with a less invasive procedure.



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Cataract

PP050

Treatment optimization with iStent inject in the setting of cataract surgery in patients with mild to severe glaucoma and cataract

Presenting author: Bárbara González-Ferrer, Spain

Purpose:

Given the well-known detrimental impact of topical glaucoma medications on the ocular surface, there is increasing emphasis on medication reduction in addition to intraocular pressure (IOP) reduction in glaucoma treatment. Indeed, especially in patients undergoing micro-invasive glaucoma surgery (MIGS) procedures who have well-controlled medicated IOP preoperatively, the primary goal of surgery may be to reduce medication burden. This study evaluated the ability of iStent inject-cataract surgery to reduce patients' medication burden while maintaining IOP within normal levels and avoiding more invasive glaucoma procedures.

Setting:

Ophthalmology department at La Paz University Hospital in Madrid, Spain.

Methods:

This retrospective real-world case series assessed eyes with open-angle glaucoma (OAG) that underwent iStent inject implantation with concomitant phacoemulsification. Evaluations through up to 36 months (36M) include IOP, medications, and adverse events. Last follow-up analysis accounts for all available data at different timepoints (mean 23M, range 6-36M). Patient follow-up is ongoing, with the goal to present a larger and longer-term dataset by the conference.

Results:

The cohort includes 46 eyes with prior maximum IOP of 21.6mmHg that had been controlled with medication to 16.6mmHg by the time of iStent inject-cataract surgery. Nearly all patients (93%) were on medication preoperatively, and over half (51%) had moderate or severe disease. By the last follow-up visit (average 23M), the average medication burden had reduced four-fold, from 1.32 to 0.28 mean medications ($p<0.001$). Approximately 83% of eyes were medication-free, a twelve-fold increase from preoperative. Meanwhile, IOP remained controlled at mean 16.2mmHg. There were no intraoperative complications nor sight-threatening postoperative adverse events, and no eyes underwent subsequent filtration surgery.

Conclusions:

Implantation of iStent inject with cataract surgery resulted in significant and sustained medication reduction and avoidance of filtration surgery through up to three years of follow-up, while maintaining adequate IOP control and favorable safety. These outcomes were observed in a real-world clinical population with relatively well-controlled preoperative IOP but nearly universal reliance on medications. The findings underscore the potential role of iStent inject in meeting patients' customized treatment goals.

Cataract**PP051****Influence of glaucoma medical therapy on filtration surgery results****Presenting author:** Anastasiia Antonova, Russian Federation**Purpose:**

Analysis of previous topical treatment duration and regime impact on filtration surgery results.

Setting:

Russian Federation, Saint-Petersburg, Multifield Hospital № 2.

Methods:

This study involved 500 consecutive patients operated because of unstable glaucoma in 2016 – 2020 years and then kept for postsurgical care within 6 – 24 months. Patients' history, objective data, cumulative preservative (benzalkonium chloride, BAC) load and surgical outcomes (complete or partial success, complete failure) were estimated. Complete success was defined as IOP $\leq$ 21 mm Hg without medications, partial success - IOP $\leq$ 21 mm Hg with medications. Complete failure was defined as IOP $>$ 21 mm Hg on two consecutive follow-up visits after 6 months, reoperation for glaucoma, or loss of light perception.

Results:

Despite of intensive (3.2 ± 0.81 drops a day, the BAC cumulative doze 4386.8 ± 4167.75 μ g) and relatively long (5.7 ± 4.6 years) medical therapy, complete success was achieved in 325 patients. The partial success (73 patients) was characterized by elongation to 6.6 ± 4.84 years equally in-tense topical treatment (3.2 ± 0.71 drops a day, the BAC load was 4917.2 ± 4128.25 μ g). Finally, the complete failure due to loss of filtration (20 patients) was accompanied with the highest preservative load (7352.3 ± 4172.05 μ g during 6.83 ± 3.39 years of treatment with 3.7 ± 0.97 drops a day). Importantly, that near doubling of BAC dose resulted from too aggressive topical therapy.

Conclusions:

The duration of the effective and safe glaucoma medical therapy does not exceed five years. After six years of topical treatment two thirds of patients needed for surgery, whereas it was often overdue and denied the patients a possibility to reach the full success, predetermining inevitable return to medical therapy in the not-so-distant period.



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Cataract

PP052

Surgical outcomes of combined trabecular micro bypass stent (iStent[®], Glaukos Corp., USA) implantation with cataract surgery.

Presenting author: Alfredo Borgia, Italy

Purpose:

To study surgical outcomes of combined phaco-iStent procedures. This retrospective case study assesses safety and outcomes after implantation of iStent in combination with cataract surgery in eyes with stable Primary Open Angle Glaucoma (POAG) or Ocular Hypertension (OHT). The aim in all cases was to replace topical anti-hypertensive medications with a surgical solution and success was defined as being medication free at one year.

Setting:

Aintree University Hospitals, Liverpool, UK

Methods:

Data was collected retrospectively for 32 patients with a diagnosis of glaucoma or OHT (22 eyes with POAG, 5 with OHT, 4 with a suspect glaucoma, and 1 with a pigmentary glaucoma), who had undergone combined iStent implantation with cataract surgery over a 1-year period. Empirically, if the patient was on one eye drop, they received 1 iStent, 2 eye drops, 2 iStents. Thirty two patients underwent successful implantation of either one (n=20) or two (n=12) iStents by a single surgeon and completed one year follow-up. Intraocular pressure (IOP), glaucoma medication usage, and complications were assessed at follow up visits.

Results:

The overall success rate was 72%. Mean IOP reduced from 19.4 mmHg preoperatively to 15.9 mmHg at 12 months (-18%) in the group where 1 iStent was implanted, where the mean IOP reduced from 19.3 mmHg preoperatively to 13.7 mmHg at 12 months (-29%) in the group where 2 iStents were implanted. Patients with unsuccessful reduction of IOP were restarted with ocular hypotensive medications. One patient underwent SLT and later on viscocanalostomy at 1 year postoperative. A high safety profile was observed with no sight threatening complications. Five cases of intraoperative hyphema were noted, which resolved by first postoperative day.

Conclusions:

Outcomes from this series of patients implanted with iStent suggest that meaningful IOP and medication reductions can be achieved for at least one year, with a favourable safety profile. Although the sample size is small, these findings suggest that two iStents provided added reduction of IOP and the burden of medication.



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PP053

Analysis of the hypotensive efficacy of micropulse cyclophotocoagulation on patients with advanced and severe glaucoma.

Presenting author: Olga Ermakova, Russian Federation

Purpose:

To evaluate the decrease in intraocular pressure (IOP) in patients after performed MicroPulse cyclophotocoagulation IRIDEX CYCLOG6 with different stages of glaucoma, depending on the duration of the disease, the amount of antihypertensive drugs, the number of previous antiglaucoma operations, and history of phacoemulsification.

Setting:

“S.N. Fedorov's National Research Center “MNTK” EYE MICROSURGERY ”Novosibirsk branch of the Federal State Autonomous Institution of the Ministry of Health of the Russian Federation

Methods:

MicroPulse cyclophotocoagulation IRIDEX CYCLOG6 was performed on 52 glaucoma patients eyes. 2 groups were identified: 36 eyes in an advanced stage (IOP 20.4 mm Hg), 16 severe stage eyes (IOP 27.2 mm Hg). MicroPulse cyclophotocoagulation IRIDEX CYCLOG6 was performed (80 second 2000 mW laser energy) on two hemispheres. Patients were observed on the 1st postoperative day, then after 1, 3, months, we also assessed the level of IOP. We analyzed the amount of medication, the number of previous glaucoma operations, and phacoemulsification history. We found a dependence of the hypotensive effect of MicroPulse cyclophotocoagulation on these factors.

Results:

IOP decrease by 72.1% and 69.1% in advanced and severe glaucoma. 1 day postop 5.2 mm Hg (25.5%) and 7.5 mm Hg (27.3%), 1 month: 2.7 mm Hg (13.2%) and 8.4 mm Hg (30.88%), 3 months: 4.3 mm Hg (20.4%) and 8.4 mm Hg (30.88%). Drug amount: 2.4 and 2.3; glaucoma operations: 1.1 and 0.25; phacoemulsifications were in 50% and 30% cases respectively. In 27.9% and 30.9% without IOP decrease, drug amount: 2.6% and 2.5%; glaucoma operations: 1.6 and 0.25; phacoemulsifications: 20% and 15% respectively.

Conclusions:

MicroPulse cyclophotocoagulation IRIDEX CYCLOG6 depends on glaucoma severity and is less effective during severe stages of the disease. All patients received maximum medication therapy, which did not allow finding a correlation between efficiency and medication amount. A greater number of glaucoma operations performed earlier reduces the effectiveness of cyclophotocoagulation. Prior phacoemulsification increases the hypotensive effectiveness of the procedure.

Cataract**PP054****A comparative study of a disposable prismatic cone versus the prismatic cone standard.****Presenting author:** Salvatore Troisi, Italy**Purpose:**

Accurate measurement of intraocular pressure (IOP) is a fundamental parameter in any eye examination for its role in the detection and diagnosis of glaucoma. Goldmann applanation tonometry (GAT) has become the gold standard for routine measurement of IOP. However, the use of reusable cone in GAT presents sterility problems, especially in the current phase of the Cov-Sars-2 pandemic. We undertook a prospective comparative clinical study of the prismatic cone disposable (Easyton Plus (®), Italy) versus the traditional prismatic cone (Haag-Streit (®), USA) for the measurement of intraocular pressure (IOP) with applanation method according to Goldmann.

Setting:

Salerno Hospital University - Ophthalmologic Unit

Methods:

IOP was measured by Goldmann's tonometer in 90 eyes of 45 consecutive patients. Exclusion criteria: corneal pathologies, inflammations, astigmatism over 3 diopters, poor cooperation, previous eye surgery. Each patient was given the first tonometry with a prismatic cone disposable in one eye and the reusable cone in the other and the second measurement after 10 minutes by inverting the use of the devices. Statistical evaluation of the results was performed.

Results:

The measurement was performed in 24 women and 21 men, with a mean age of 51.3 years (range 14-85 years). The mean IOP at the first measurement was 16.3 mmHg (+/- 4.2), at the second 16.1 mmHg (+/- 4.1). In 7 eyes the value was > 21mmHg. There were no statistically significant differences between the measurements performed with the disposable device and with the reusable device (paired t-test <0.05%). No side effects were recorded with either method.

Conclusions:

In this study, IOP readings obtained with the disposable prismatic cone have shown a high concordance with IOP readings obtained by reusable device. The use of a disposable prismatic cone avoids risks related to device contamination and offers a reliability profile equal to the standard, reusable one. We therefore consider its use in clinical practice to be recommended.

Cataract**PP055****Increased Nd:YAG Laser Capsulotomy Rates in Toric Intraocular Lens compared to Nontoric Intraocular Lens****Presenting author:** Jung Wan Kim, Korea, Republic of**Purpose:**

We sought to investigate the early incidence of neodymium-doped yttrium aluminum garnet (Nd:YAG) laser capsulotomy according to intraocular lens (IOL) type (non-toric vs. toric) and surgical techniques (femtosecond laser-assisted cataract surgery vs. conventional phacoemulsification) in eyes with refractive multifocal IOLs.

Setting:

This was a retrospective cross-sectional study.

Methods:

Methods: Nine hundred thirteen eyes from 483 patients implanted with Lentis Mplus LS-313 MF20 (767 eyes) or Lentis Mplus Toric LU-313 MF20T (146 eyes) IOLs (Oculentis GmbH, Berlin, Germany) were enrolled. We compared the incidence of Nd:YAG laser capsulotomy between the non-toric and toric groups. In addition, the incidence of Nd:YAG laser capsulotomy was also evaluated according to the surgical technique used.

Results:

The overall incidence of Nd:YAG laser capsulotomy was 10.2% (93/913 eyes). The Nd:YAG laser capsulotomy rate was significantly higher in the toric group (24/146; 16.4%) than in the non-toric group (69/767; 9.0%; $P = 0.007$). Out of 913 enrolled eyes, 448 eyes (49.1%) underwent femtosecond laser-assisted cataract surgery and 465 eyes (50.9%) underwent conventional phacoemulsification cataract surgery. There was no significant difference in the incidence of Nd:YAG laser capsulotomy between eyes with femtosecond laser-assisted cataract surgery and eyes with conventional phacoemulsification cataract surgery.

Conclusions:

Patients with refractive multifocal toric IOLs had higher early incidence rates of Nd:YAG laser capsulotomy when compared to those with refractive multifocal non-toric IOLs. Furthermore, femtosecond laser-assisted cataract surgery could not reduce the early incidence of Nd:YAG laser capsulotomy in this study.

Cataract**PP056****Patient-reported visual function, spectacle independence and satisfaction after RayOne IOL diffractive multifocal binocular implantation in a long series of cases.**

Presenting author: FERNANDO Llovet-Osuna, Spain

Purpose:

Assessment of patient-reported visual function, spectacle independence and satisfaction after cataract surgery or refractive lensectomy and bilateral diffractive trifocal intraocular lens (IOL) implantation.

Setting:

Clinica Baviera - AIER Eye Group. Spain

Methods:

Retrospective study performed in 1048 patients who underwent phacoemulsification (cataract or refractive lensectomy) and bilateral implantation of a non toric diffractive trifocal intraocular lens (RayOne trifocal, Rayner Surgical, England). A complete ophthalmologic examination was performed before and after the operation. The minimum follow-up was 3 month. Main outcome measures were uncorrected distance (UDVA), corrected distance (CDVA), intermediate visual (UIVA), near (UNVA), manifest refraction, safety and efficacy. Spectacle independence, visual function and patient satisfaction were assessed using their own questionnaire and the Catquest-9SF.

Results:

The study included 1048 patients. Visual results were excellent in UDVA (0 ± 0.01), CDVA (0 ± 0.01), UIVA (0.21 ± 0.06) and UNVA (0.09 ± 0.07). Postoperative refractive status was within the range of ± 1.00 D in 93.5% of the eyes. Safety index was 1.01 ± 0.05 and the efficacy index was 0.96 ± 0.08 . Percentage of patients who declared not to use glasses to drive was 99.2%, 98.82% for computer and 95.94% for reading; 93.93% do not report discomfort in night vision; 97.94% said they were satisfied with the result and 98.4% would repeat the procedure.

Conclusions:

RayOne Trifocal Diffractive IOL provides good visual and refractive results, efficacy and safety. Patient-report a high independence of glasses, good visual function and satisfaction.



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PP057

To better understand and delineate indications for the use of multifocal implants in cataract surgery: A French Multicentric Study

Presenting author: Dominique MONNET, France

Purpose:

To identify the reasons for implanting or not a multifocal posterior chamber IOLs (MF-IOL) to patients undergoing a cataract surgery in France, where only 5 to 6% of patients actually benefit from MF-IOLs.

Setting:

The Galileo study investigators group included the following 10 participants Prof D. Monnet, Prof C. Dot, Dr M. Bonne, Dr P. Rozot, Dr P. Bouchut, Dr C. Albou-Ganem, Dr L. Khaitrine, Dr D. Jourdel, Prof D. Touboul, Prof. B. Cochener. The study has been sponsored by Alcon France, and conducted by Galileo Business consulting, Paris, France.

Methods:

The study was carried out by using a questionnaire to be filled in by 10 surgeons on their consecutive patients with an operative indication of cataract between Oct and Dec 2020. Surgeons had academic or private practice and were familiar with use of multifocality. This questionnaire was divided into 3 parts detailing: medical objective or subjective reasons not to propose a MF-IOL to the patient, as well as reasons for possible refusal of patients if multifocal implant could be offered. The final decision of type of lens implanted was collected. The study was conducted by a company specialized in surveys.

Results:

The questionnaire was completed for 732 patients. The mean age of the patients was 70.4 years old, with a 60% of female predominance. In 68% (495/732), the surgeons could not offer MF-IOL, mainly for objective medical reasons in 54% (397/732) of cases. Among the 32% of eligible patients, multifocal implant proposal was rejected by the patient in 41% of cases (98/237). In total, a multifocal lens was implanted in 19% of cases (139/732). Patients' decision to accept multifocality was significantly higher among those who had received information about MF-IOL before the visit: 74% (67/91) vs 48% (63/132), $p < 0.001$.

Conclusions:

This study, carried out on a population at the age of cataract, showed that multifocal implantation was possible in about one out of five cases. The main reasons for not offering PC-IOL MF were medical and objective (macular damages). We have shown that the level of acceptance of MF-PC IOLs by the patient depends on his level of knowledge of these implants. The objective criteria of eligibility for multifocal implants should be better defined. Finally, the level of therapeutic education in cataract surgery of patients can be improved with a direct impact on the acceptance of this technology.

Cataract**PP058****Trifocal IOL implantation after myopic corneal laser refractive surgery****Presenting author:** ROSARIO COBO-SORIANO, Spain**Purpose:**

BACKGROUND: Lens surgery with multifocal intraocular lens (IOL) implantation in postkeratorefractive eyes is a controversial subject with limited published experience. PURPOSE: To describe the visual and refractive outcomes of trifocal IOL implantation in eyes with previous myopic corneal laser refractive surgery and to ascertain the influence of the magnitude of laser refraction on post-lensectomy outcomes

Setting:

Clinica Baviera-AIER-Eye group, Spain.

Methods:

Retrospective case series METHODS: We investigated the visual and refractive results of (1) the whole cohort composed of 319 consecutive eyes that met inclusion criteria; (2) the sample stratified into one-diopter-steps subgroups of corneal laser-treatment; and (3) bivariate comparisons between low and high myopic (≥ -5.0 D vs < -5.0 D) laser-treatment subgroups. Measures at the last visit were the following: Mean corrected and uncorrected distance and near visual acuity (CDVA, UDVA, UNVA), safety and efficacy, and refractive parameters (mean MRSE and predictability results), and post-lensectomy enhancement and Nd:YAG-capsulotomy rates.

Results:

In the last postoperative visit, visual and refractive outcomes of the whole cohort were the following: mean CDVA (0.03 ± 0.04), UDVA (0.08 ± 0.06), UNVA (0.15 ± 0.14) and MRSE (-0.34 ± 0.30) with 68% and 89% of eyes within ± 0.5 D and ± 1.0 D respectively. Percentage of post-lensectomy enhancement was 17% and YAG-Capsulotomy rate was 13.7%. Stratification of the cohort by magnitude of laser-treatment refraction and comparison between low/high subgroups, showed that higher the degree of myopic corneal laser refraction, the higher the residual post-lensectomy myopic defect; by contrast, we found good post-operative visual outcomes even in the high range myopic of laser correction.

Conclusions:

Trifocal-IOL implantation in eyes previously treated with a prior myopic corneal ablation achieved excellent visual outcomes even in the high range (-5.0 D to -12.5 D) of laser correction, but worse predictability outcomes related to the degree of laser correction.

Cataract**PP059****Accuracy of toric intraocular lens calculation depending on different keratometry values****Presenting author:** Michaela Ramsauer, Germany**Purpose:**

To compare different corneal keratometry readings for calculation of toric intraocular lenses (IOL): Total keratometry (TK) and standard K values obtained by a swept-source OCT-assisted biometry system (IOL Master 700, Carl Zeiss Meditec AG, Germany) as well as total corneal refractive power 3 mm zone (TCRP) obtained by a Scheimpflug device (Pentacam, Oculus, Wetzlar, Germany).

Setting:

University Eye Hospital Munich, Germany.

Methods:

Twenty-four eyes undergoing toric intraocular lens implantation (AT-Torbi-709M/MP or AT-LISA-tri-toric-939M/MP) were included. Lens exchange was standardized performed with Zeiss CALLISTO eye in patients with preoperative regular corneal astigmatism of at least 1.00D. For each patient, the expected postoperative residual refraction was calculated depending on three different corneal parameters: standard-K-front (K) and total keratometry (TK) obtained by SS-OCT-assisted biometry (IOL Master 700), and total corneal refractive power (TCRP) obtained by a Scheimpflug device (Pentacam). Barrett's formula for toric intraocular lenses was used for all calculations. Results were statistically compared with the postoperative refraction calculated according to the Harris dioptric power matrix.

Results:

Swept-source OCT-assisted biometry achieved slightly more accurate results in toric IOL calculation compared to Scheimpflug technology. The standard K values (mean PE 0.55 D $\pm$ 0.46 D) and TK values (mean PE 0.55 D $\pm$ 0.43 D) of the IOL Master 700 reached statistically comparably good results ($p = 0.999$). By contrast, the prediction error in the IOL calculation using Pentacam's TCRP with adjusted refractive indices was statistically significantly greater (mean PE 1.06 D $\pm$ 0.538 D; $p = 0.005$ v. standard K and $p = 0.005$ v. TK).

Conclusions:

The most accurate refractive outcomes in toric IOL implantation were achieved by IOL calculations based on Swept-source OCT-assisted biometry. However, the TCRP obtained with Scheimpflug technology provides important information on the regularity of astigmatism and is therefore indispensable for confirming the indication of a toric IOL implantation. The results have to be confirmed by prospective controlled studies.

Cataract**PP060****Bag-in-the-Lens to Bag-in-the-Lens Exchange****Presenting author:** Diana Carmen Dragnea, Belgium**Purpose:**

To report the indications, outcomes, and complications regarding the Bag-in-the-lens (BIL) intraocular lens (IOL) exchanges over a period of 13 years in a tertiary ophthalmologic center.

Setting:

Department of Ophthalmology of the University Hospital of Antwerp (UZA).

Methods:

Between 2003 and 2020, 12 176 patients were operated using the BIL technique. We included adult patients who underwent an intraocular BIL exchange. Surgeries were performed between 2007 and 2020 (13 year-period). We recorded demographics, indications, outcomes, and complications in this patient cohort.

Results:

Fifty-nine eyes of 59 patients were included in the study (0.48%). The mean age was 61.15 ± 13.53 years. The mean time between primary surgery and IOL exchange was 25.73 ± 41.88 months. The main indication was postoperative refractive surprise. Preoperatively, the mean uncorrected distance visual acuity (UDVA) and corrected distance visual acuity (CDVA) were 0.36 ± 0.24 and 0.79 ± 0.24 respectively. Postoperative 1 month-UDVA and CDVA were 0.66 ± 0.28 and 0.86 ± 0.19 respectively. The improvement in UDVA was statistically significant (<0.0001). The most common preoperative complication was damage to the anterior hyaloid (9 eyes).

Conclusions:

BIL to BIL exchange is an easy and successful technique that provides good refractive results with few, manageable complications. Because of the tertiary profile of our center with referral of difficult cases, BIL implantation was our preferred IOL in patients with risk factors for postoperative refractive surprise. BIL to BIL exchange takes not more time than a regular primary cataract surgery on a surgical planning.



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PP061

Delivery performance of preloaded injectors in routine cataract surgery

Presenting author: Andreas Borkenstein, Austria

Purpose:

To evaluate the delivery performance of three different preloaded intraocular lens (IOL) injectors.

Setting:

Borkenstein & Borkenstein Private Practice at the Clinic of the Kreuzschwestern, Graz, Austria and International Vision Correction Research Centre (IVCRC), Department of Ophthalmology, University of Heidelberg, Heidelberg, Germany.

Methods:

We divided 132 eyes for phacoemulsification into three groups: IOL implantation performed with AutonoMe preloaded injector (group A: 63 eyes), CT LUCIA 621P preloaded injector (group B: 50 eyes), and Prosert preloaded injector (group C: 19 eyes). The behavior of the leading and trailing haptics on IOL insertion, haptic-optic adhesion, and the time required to deliver the IOL into the capsular bag were assessed.

Results:

Groups A, B, C showed 27%, 16%, and 0 problems in unfolding the leading haptic and 6%, 0, and 0 in unfolding of the trailing haptic. Haptic-optic adhesion occurred in A (70%), B (0), and C (16%) for group A, B, and C. The average time to achieve IOL position for group A, B, and C was (mean 23.8 ± 7.3 , 22 ± 2.6 , and 16.6 ± 4.1 [SD] seconds).

Conclusions:

Injectors showed different incidence of unfolding problems during IOL delivery and varied delivery times. Injectors varied in occurrence and style of adhesions and handshake phenomena.

Cataract**PP062****Evaluation of Axial Length modifications after cataract surgery****Presenting author:** Giulio Salerno, Italy**Purpose:**

The aim of this study is to investigate Axial Length (AL) and Corneal Power (Km) modifications after cataract surgery.

Setting:

University Eye Clinic, Department of Medicine, Surgery and Dentistry, “Scuola Medica Salernitana”, University of Salerno, Italy.

Methods:

320 eyes of 160 patients (81 males, 79 females) that underwent unilateral cataract surgery were recruited. Before surgery, each patient underwent a complete ophthalmic evaluation, including an optical biometry in both eyes. Preoperative and postoperative Km and AL measurements in operated eyes were compared to the fellow eyes measurements recorded during the same time. After cataract surgery, both IOL Master with pseudo phakic and aphakic options were utilized for the AL evaluation in the operated eye. Optical biometry was performed by IOLMaster (5.4.4.0006 by Zeiss). Paired t-test, a Bland-Altman evaluation, and R2 analysis were performed for the statistical evaluation.

Results:

In the operated eyes Km differences ranged from -2.28 to +1.96 D (mean $-0.01 \pm 0.47D$) ($p=0.55$); in fellow eyes they ranged from -0.86 to +2.49 D (mean $0.03 \pm 0.32D$) ($p=0.25$). In the operated eyes, AL differences with pseudophakic option ranged from 29.64 to 20.32 mm (mean -0.11 ± 0.1 mm, $p<0.001$). Mean AL differences with aphakic option ranged from 29.75 to 20.43 mm (mean 0.00 ± 0.1 mm, $p=0.76$). In fellow eyes, AL differences ranged from 29.81 to 21.44 mm (mean 0.00 ± 0.07 mm, $p=0.44$).

Conclusions:

One-month after cataract surgery, a reduction in AL measurement is observed with pseudophakic option, that nevertheless is not detected with the aphakic option. These results are probably due to an incorrect estimation of group refractive index in phakic or in pseudophakic eyes. The use of aphakic option instead of pseudophakic one could solve the AL mismatch in preoperative- and postoperative- cataract surgery evaluations.



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PP063

IOLzero: a web application for calculations, outcomes tracking and optimization in cataract surgery

Presenting author: Miguel Raimundo, Portugal

Purpose:

Cataract surgery results can be improved by a data-driven approach: outcome tracking (visual acuity, residual refraction, and complications) as well as optimization (formulas, constants, SIA, ...). Most health record systems in ophthalmology are not tailored to these specific tasks. Alternative software tools that implement some of these analyses are usually commercial in nature and/or locked to a specific biometer analysis pipeline. Many of these calculations are complex and error prone and some of them even impossible to replicate in standard spreadsheets. This hinders the adoption of outcome tracking and optimization by many cataract surgeons worldwide.

Setting:

Centro Hospitalar e Universitário de Coimbra, Coimbra, Portugal (tertiary center, university hospital)

Methods:

Development of a free web application, named IOLzero (available at <https://iolzero.com>), using a Python backend, optimized for both desktops, tablets and smartphones. The web application is seamlessly updated with new tools, IOLs and biometers. The surgeon can define his default preferences (preferred incisions, IOL models, formulas, ...). All analysis and calculations follow literature standards, which are properly referenced. Patient identifying data is processed locally (never leaves the browser), ensuring privacy. Individual case data can be exported to conventional text-based electronic health records by user-defined templates. All data can be exported to spreadsheets for further analysis by the surgeon.

Results:

The “Patients” module implements a cataract focused registry with preoperative biometry, surgical details, and a final post-operative evaluation. The “Analysis” module can evaluate clinical outcomes (visual acuity, complications, and residual refractive errors), formula comparison (prediction errors with graphical evaluation), formula optimization (A-constant optimization and mean target optimization for unpublished formulas) and SIA calculation (by laterality, incision type and location). Auxiliary calculators for IOL calculation (SRK/T, Holladay 1, Haigis and HofferQ), Wang-Koch optimization for axial myopia, second eye refinement, pediatric IOL calculator, multi-device keratometry vectorial averaging, sulcus power adjustment, among other tools, are also available on IOLzero.

Conclusions:

We believe IOLzero is a valuable tool for cataract surgeons interested in improving their results by a systematic process of data analysis and optimization, while not being locked down to a commercial solution or a specific biometer.



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PP064

Femto Second Laser Assisted Cataract Surgery FLACS ...my initial experience in Kolkata, India

Presenting author: Nandini Ray, India

Purpose:

Retrospective analysis of the first 160 cases of Femto Second Laser Assisted Cataract Surgeries over 24 months. Acceptance of the technology, the demographic profile of the patients, choice of IOLs premium or not, common reasons for not accepting the procedure over and above traditional phacoemulsification, choice of intra ocular lens IOL's. An analysis of the per operative difficulties, and advantages versus disadvantages of the procedure in the hands of an experienced phaco surgeon. Critical criteria for case selection for the beginner FLACS surgeon. Which cases to avoid and common pitfalls experienced

Setting:

Operations performed by a single surgeon in a stand alone private practice in Kolkata, India . FLACS performed on a Catalys machine with subsequent removal of the cataract with a Centurion machine with active fluidics

Methods:

Under topical anaesthesia and careful docking FLACS was performed with a Catalys machine. In some cases of smaller per operative pupils capsularrrhexis had to be pupil maximised . Nuclear fragmentation into sextants done ,LRI Limbal Relaxing Incisions performed with astigmatism 0.75D-1.23 D All CCC were completed, all main ports opened with blunt dissection however 40% of side ports needed opening with a micro keratome The stage of cortical aspiration was slow and the remnant cortical matter was more than in traditional phaco and needed expertise Placement of all IOLs were in the bag

Results:

Post operative results were satisfactory. 95% had clear corneas day 1 and post operative refraction was done day 4. Incisions were more stable ,anterior chambers more quiet. Post operative refraction remained stable in the two month follow up

Conclusions:

Advantages and disadvantages of the procedure in the hands of an experienced phaco surgeon are analysed A conclusion was made as to why patients opted or did not opt for FLACS as new technology in a third world country . How to carefully select the first 100 cases for a beginner surgeon and which cases to avoid are analysed



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Cataract

PP065

Displacement between anterior chamber width obtained by swept-source anterior segment optical coherence tomography and white-to-white distance

Presenting author: Teerajet Taechameekietichai, United Kingdom

Purpose:

To determine the relationship between the external limbal location, represented by white-to-white (WTW) distance, and the actual angle location, represented by spur-to-spur (STS) and angle-to-angle (ATA) distances.

Setting:

For this study, all individuals were enrolled from general ophthalmology and glaucoma clinics at the University of California, San Francisco.

Methods:

172 eyes from 172 participants were imaged using CASIA2 anterior chamber optical coherence tomography (AS-OCT) and LenStar LS 900 optical biometer. The horizontal ATA and STS were measured using the swept-source Fourier-domain AS-OCT (CASIA2). The horizontal WTW was automatically measured using LenStar. The displacement lengths (DL) between WTW-STS and WTW-ATA were calculated. Bland-Altman plots and intraclass correlation were performed.

Results:

The study showed that WTW has a positive correlation with STS ($r=0.818$, $p<0.001$) and ATA ($r=0.799$, $p<0.001$). The analysis demonstrated that the mean difference of WTW-STS is 0.104 mm (95% CI 0.063 to 0.144 mm) with limits of agreement of -0.422 to 0.629 mm between WTW and STS, and the mean difference of WTW-ATA is 0.090 mm (95% CI 0.046 to 0.133 mm) with limits of agreement of -0.483 to 0.662 mm between WTW and ATA. Linear regression with adjustment showed that a WTW value greater than 12.06 mm is associated with a greater DL.

Conclusions:

There were excellent correlations between WTW–STS and WTW–ATA. However, greater WTW was significantly associated with higher displacement of WTW from the two distances representing anterior chamber width. External limbal location may not accurately represent the actual angle location in eyes with larger WTW.

Cataract**PP066****Relationship between Body Mass Index and Glaucoma in Obese Children****Presenting author:** Gözde Aksoy Aydemir, Turkey**Purpose:**

To evaluate intraocular pressure (IOP), ocular pulse amplitude (OPA), retinal nerve fiber layer (RNFL) and retinal ganglion cell layer (RGC) in obese children.

Setting:

This prospective cross-sectional study was carried out in the Department of Ophthalmology at Adiyaman University Research and Training Hospital.

Methods:

Fifty-six obese children (Group 1) with an average body mass index (BMI) of 30.09 ± 5.62 and 60 healthy children (Group 2) with a mean BMI of 20.89 ± 4.79 at the same age and gender were included in the study. Randomized 116 eyes of 16 participants were included in the study. Routine ophthalmologic examinations of the patients and IOP and OPA values were obtained with Pascal Dynamic Contour Tonometer (DCT). Measurement quality score (Q score) 1 and 2 were included in the study. RNFL and RGC values were evaluated with the help of Spectral-Domain Optical Coherence Tomography (SD-OCT).

Results:

IOP and OPA values in obese children and healthy children were 17.20 ± 3.24 and 1.52 ± 0.23 , 14.80 ± 2.96 and 1.69 ± 0.29 , respectively. When compared with healthy children, a significant increase in IOP value and a significant decrease in OPA value were found ($p:0.001$, $p:0.001$). In the measurements taken with SD-OCT, RNFL value was 103.74 ± 13.18 and 114.96 ± 13.93 ($p:0.001$), RGC value was 1.13 ± 0.09 and 1.14 ± 0.08 ($p: 0.76$) in obese children and healthy children, respectively. There was no significant correlation between BMI and IOP, OPA, RNFL, RGC.

Conclusions:

In our study, a significant decrease in OPA and RNFL values and a significant increase in IOP were found in obese children. In the light of this information, we can say that obese children are in the risk group for glaucoma. Early diagnosis and treatment in glaucoma; It should be done without permanent nerve fiber damage, vision loss and visual field defects.

Cataract**PP067****Comparison of Lamina Cribrosa Features and OCT Angiographic Findings of Optic Nerve Head in Diabetic and Healthy Subjects****Presenting author:** Esin Ilhan, Turkey**Purpose:**

To compare the depth and thickness of the lamina cribrosa (LCD, LCT), lamina cribrosa curvature index (LCCI), and peripapillary vascular density gradient (pVDG) in diabetic and healthy subjects

Setting:

Department of Ophthalmology, Uludag University Faculty of Medicine, Bursa, Turkey

Methods:

Two hundred eighty eyes of 140 patients (79 patients with diabetes mellitus [DM] without diabetic retinopathy [DR] and 61 healthy subjects) were enrolled in this retrospective study. Visual acuity, intraocular pressure (IOP), central corneal thickness (CCT), axial length, slit-lamp biomicroscopy data were collected from patient files, and the optical coherence tomography (OCT) and OCT angiography (OCT-A) images of these patients were analyzed. The LCD, LCT, LCCI were revealed by enhanced depth imaging SD-OCT and pVDG by OCT-A.

Results:

The LCD was 308 (122-622) μ m in diabetics and 354 (158-677) μ m in healthy subjects. The LCT was 317.43 $\pm$ 43.169 μ m in diabetics, and 339.43 $\pm$ 37.688 μ m in healthy subjects, and both parameters were statistically significant ($p < 0.001$). The LCCI was 13.717 (5.74-33.91) in diabetics and 13.118 (5.53-27.05) in healthy subjects ($p = 0.181$). OCT-A revealed that the pVDG in the diabetic group was 123.82 (43.78-188.88), and the non-diabetic group was 163.20 (104.87-206.98), which was statistically significant ($p < 0.001$). A significant positive correlation was found between pVDG and LCCI ($p = 0.049$).

Conclusions:

There are early changes in pVDG and peripapillary vessel morphology in patients with DM. Although there are important differences in disease pathogenesis between diabetes and glaucoma, they share certain similarities in the angiographic abnormalities. Due to DM's effects on choroid, it is thought that the LCCI may be a more valuable parameter than the LCD for detecting early glaucomatous damage in diabetic patients.

Cataract**PP068****Increased risk of anterior uveitis and cystoid macular oedema post Selective Laser Trabeculoplasty laser in patients who had previous endoscopic cyclophotocoagulation.**

Presenting author: Pieter Gouws, United Kingdom

Purpose:

We report an increased risk of anterior uveitis and cystoid macular oedema post selective laser trabeculoplasty (SLT) in patients who had previously received endoscopic cyclophotocoagulation (ECP).

Setting:

The findings result from an audit of SLT laser performed in 2019 at the Spire Sussex Hospital.

Methods:

A retrospective audit of all SLT laser cases performed during 2019 at the Spire Sussex Hospital, UK was performed to evaluate the effect and side effects of the treatment following observation of severe uveitis in patients who had received ECP previously. All cases were included, and all procedures performed by a single surgeon. A review of the notes was used to extract all the relevant data. The ECP was also performed by the same surgeon (PG).

Results:

68 eyes (38 patients) had SLT laser treatments. There were no repeat treatments. 360 degrees with a mean of 120 ± 16 shots per eye with less than 50% of treatments producing bubbles. 8 patients (15 eyes) had received ECP previously 1 report of misting of vision lasting 1 day only in the standard group. In the ECP group, 3 patients presented after 2 - 3 days with anterior uveitis. 2 developed CMO. All patients were treated with topical steroid drops as well as topical non-steroidal drops for 4 to 6 weeks with complete resolution.

Conclusions:

We present evidence of an increased risk of anterior uveitis and cystoid macular oedema in patients undergoing SLT who had previously received an ECP procedure combined with cataract extraction. The mechanism of action is unclear, and we postulate that the ECP laser, which does cause more inflammation than standard phaco-emulsification, somehow makes the eyes more susceptible to uveitis post treatment to the trabecular meshwork. The importance of raising awareness of this possible link is to aid ophthalmologists with decision making in prophylaxis following SLT.

Cataract**PP070****Comparison of hypotensive effect of combined cataract and glaucoma surgery and solitary phacoemulsification in the same patient.**

Presenting author: Volodymyr Melnyk, Ukraine

Purpose:

To assess effectiveness of phacoemulsification in glaucoma patients in comparison with combined cataract and glaucoma surgery according to IOP changes.

Setting:

Society of Ukrainian Ophthalmic Surgeons/Clinic "Visiobud", Kyiv, Ukraine

Methods:

There were operated 48 patients (96 eyes) in age $69 \pm 6,4$ years. On one eye they had uncompensated open-angle glaucoma II-IV of stage, and we performed combined cataract and glaucoma surgery (Combined phacoemulsification with Modified Tunnel Trabeculopuncture). On the second eye they had cataract and compensated open-angle glaucoma I-II of stage. They were done solitary phacoemulsification. IOP dynamic we assessed during one year after operation.

Results:

Before operation the mean corrected IOP on combined surgery eyes was $27,1 \pm 4,4$ mmHg. After surgery we determined IOP reduction. Through the one week it was $15,9 \pm 5,6$ mmHg, through one month - $14,9 \pm 4,0$ mmHg, and it remained stable. During one year mean IOP was 14,9-15,8 mmHg. Before operation the mean corrected IOP on phaco alone eyes was $18,2 \pm 2,8$ mmHg. Through the one week we fixed IOP increase - $20,0 \pm 4,2$ mmHg, but through one month IOP reduced to $16,8 \pm 2,0$ mmHg, and became $15,6 \pm 2,2$ mmHg in one year.

Conclusions:

Combined cataract and glaucoma surgery is the necessary surgical procedure for patients with residual high IOP. Combined phacoemulsification with Modified Tunnel Trabeculopuncture allows to reduce IOP on 31-35%. If IOP is nice corrected, phacoemulsification can be operation of choice in patients with initial stage of glaucoma. According to glaucoma pathogenesis, it is possible to recommend phacoemulsification, as prophylactic procedure for open-angle glaucoma patients on the early stages.

Cataract**PP071****A new meniscus IOL provides better contrast sensitivity in the periphery****Presenting author:** Pablo Artal, Spain**Purpose:**

To evaluate peripheral contrast sensitivity in a group of patients implanted with a new type of IOL that was designed to provide better peripheral optics and compared results with a group of patients implanted with a standard IOL.

Setting:

Oftalvist clinics, Murcia & Alicante, Spain; University of Murcia, Spain

Methods:

A new type of IOLs (ArtIOLs, Voptica SL, Murcia, Spain) with an inverted meniscus shape designed to improve the optical quality of the pseudophakic eye in the periphery were implanted in a group of 87 patients undergoing cataract surgery. A control group of 38 patients were implanted with a standard monofocal IOL as reference. Peripheral refraction was measured using a scanning Hartmann-Shack wavefront sensor. Contrast detection thresholds at 45 degrees of visual angle (both horizontally and vertically) were measured psychophysically by means of an adaptive staircase technique, using a 30-arcmin round stimulus 1 m in front of the patient's eyes.

Results:

Patients implanted with ArtIOLs presented a reduced peripheral astigmatism as compared with the control group. At 30 degrees, the average cylinder in the control group was 3 D, dropping to 2 D in the ArtIOL's group. At 45 degrees, cylinder mean values were 6 D and 3.5 D respectively. In the horizontal meridian, average contrast sensitivity values were 0.07 (SD=0.04) and 0.10 (SD=0.05) for the control and ArtIOL groups respectively. In the vertical meridian, average sensitivity values were 0.06 (SD=0.03) and 0.08 (SD=0.03) for the control and ArtIOL groups respectively. In both directions the differences were statistically significant.

Conclusions:

Patients implanted with a new meniscus-shaped IOL present a reduced amount of peripheral astigmatism compared to patients implanted with standard lenses. This improvement in optical quality leads to a better contrast sensitivity measured at 45 degrees of eccentricity.



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PP072

Project Hyperopic Power Prediction: Accuracy of Thirteen Different Concepts for Intraocular Lens Calculation in Short Eyes

Presenting author: Jascha Wendelstein, Austria

Purpose:

To evaluate the accuracy of intraocular lens (IOL) power calculation in a patient cohort with short axial eye length and high intraocular lens power to assess the performance of IOL power calculation schemes in strong hyperopes.

Setting:

Augen- und Laserklinik Castrop-Rauxel, Germany (eye- and laser clinic Castrop-Rauxel)

Methods:

This was a single centre, retrospective consecutive case series including 269 eyes of 150 patients after uncomplicated cataract surgery with implantation of spherical (SA60AT) or aspherical (ZCB00) IOLs. Inclusion criteria were axial eye length <21.5 mm and/or emmetropising IOL Power >28.5 D. Data of one single eye per patient were randomly included. Optimized lens constants derived from a different cohort with a broad axial length spectrum were used. 13 IOL power calculation formulae were compared based on mean absolute prediction error (PE), PE and standard deviation of PE, median PE and median absolute PE.

Results:

150 eyes of 150 patients provided a statistically significant lower MAE in Okulix, PEARL-DGS, Castrop formula, and Kane when compared to Hoffer Q and SRK/T. The lowest SD and medAE was found in PEARL-DGS, Castrop, Okulix and Kane. The SRK/T showed systemic deviations and led to the highest MAE.

Conclusions:

Okulix, PEARL-DGS, Kane and Castrop formulae provide excellent results in hyperopic eyes, showing the lowest MAE of all formulae used. The Castrop formula is disclosed in this study.

Cataract**PP073****Optical performance of two presbyopia-correcting intraocular lenses combined with different corneal profiles.****Presenting author:** Carlos Lisa, Spain**Purpose:**

To assess the effect of prior myopic ablations on the optical performance of two presbyopia-correcting intraocular lenses (IOLs).

Setting:

Fernández-Vega Ophthalmological Institute, Oviedo, Spain.

Methods:

The extended depth of focus (EDoF) FineVision Triumf IOL (PhysIOL) and the trifocal diffractive FineVision IOL (PhysIOL) were analyzed standing alone and combined with a simulated myopic corneal ablation. The optical quality of the IOLs in both situations was evaluated with the PMTF optical bench (Lambda-X). The through-focus modulation transfer function (MTF) curves and the MTF were recorded.

Results:

The through-focus MTF curves showed three differentiated peaks for both IOLs. The trifocal IOL shows the highest MTF values were obtained for an object vergence of 0.0D, followed by the vergence of 3.0D and 1.5D. For the EDoF IOL, the first-highest MTF value was obtained for an object vergence of 0.0D, and the second-highest MTF value was for a vergence of 1.75D. The presence of simulated myopic corneal ablations induces a -0.50D shift on the overall through-focus curves and a drop in three peaks values, being more significant at the distance focus.

Conclusions:

The trifocal IOLs provides better optical quality at far and near distance. The EDoF IOL works better at intermediate distance. The optical quality of both IOLs decrease when a myopic ablation is introduced, mainly at the distance focus. Preoperative calculations should consider that prior myopic corneal ablations induce a -0.50D shift on their far peak quality.



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PP074

Clinical Outcomes with a Diffractive Trifocal Intraocular Lens – A Worldwide pooled analysis of prospective clinical investigations

Presenting author: Thomas Kohnen, Germany

Purpose:

To report the clinical and visual outcomes in a large cohort of subjects of different ethnicities implanted with a trifocal intraocular lens (IOL), the AcrySof PanOptix IOL Model (TFNT00) pooled from multiple clinical studies.

Setting:

Pooled analysis of six prospective, controlled, multicenter clinical trials conducted in Australia, Japan, Korea, India, Germany, Netherlands, Italy, France, Spain, Denmark, USA, Brazil, Chile and Colombia evaluating the 3 to 6 months postoperative visual outcomes of subjects implanted bilaterally with AcrySof PanOptix IOL Model (TFNT00).

Methods:

Descriptive summaries and graphical presentations of binocular Best-Corrected Distance VA (4m), Binocular Distance-Corrected intermediate VA (60/66 cm), Binocular Best Corrected Near VA (40cm), Binocular defocus curves were evaluated under photopic lighting conditions.

Results:

Across studies, the average age of the study subjects (n=551) was approximately 63 years and mostly females (~60%). The mean Defocus curve VA from 0.00D to -3.00D ranged from 0.1 to 0.0 logMAR. Mean binocular distance-corrected and uncorrected VAs of 0.1 logMAR or better were achieved at distance (4 m), intermediate (60/66 cm), and near (40 cm).

Conclusions:

The results from this pooled-analysis show very good visual performance (VA better or equal to 20/25) of the AcrySof IQ PanOptix IOL in photopic conditions across from distance to near distance and different levels of defocus. These benefits were observed in patients from different ethnicities and geographies around the World.

Cataract**PP075****Rotational and axial stability of the aspheric hydrophobic Rayner RAO800C Intraocular Lens****Presenting author:** Daniel Schartmüller, Austria**Purpose:**

To assess rotational stability and changes in aqueous depth (AQD) of the Rayner RAO800C single piece hydrophobic acrylic intraocular lens (IOL) with modified C-loop haptics from end of surgery to 6 months.

Setting:

Medical University of Vienna

Methods:

130 eyes of 68 patients with mono- or bilateral age related cataract received an aspheric hydrophobic Rayner RAO800C IOL. At the end of surgery (EOS) IOLs were either implanted to the 0 ± 10 , 45 ± 10 , 90 ± 10 or 135 ± 10 degree axis. The IOL axis at EOS was documented by capturing an image through the operating microscope. Axis alignment of the IOL was evaluated after 1 hour (1h), 1 week (1w), 1 month (1m) and 6 months (6m) by retroillumination pictures. Postoperative AQD at 1w and 6m was measured with an anterior segment SS-OCT (Casia 2).

Results:

The absolute median IOL rotation from EOS to 6m was 2.4 [0.0;85.0] degrees. IOL rotation from EOS to 1h, 1h to 1w, 1w to 1m and 1m to 6m were 1.6 [0.0;86.2], 1.1 [0.0;28.8], 0.6 [0.0;5.2] and 0.7 [0.0;2.6] degrees. Respective proportions of IOLs rotating more than 5, 10 and 20 degrees from EOS to 4m were 23.9, 11.0 and 6.4%. The difference in pseudophakic AQD from 1w to 6m was 0.052 ± 0.055 mm. AXL was negatively correlated with the difference in pseudophakic AQD from 1w to 6m (Spearman's $r=-0.29$; $p=0.002$).

Conclusions:

The Rayner RAO800C IOL showed a high propensity to rotate within the first postoperative week. After 1 week the IOL appeared to be stable. Comparatively high proportions of IOLs rotating of more than 5, 10 and 20 degrees were observed. Between 1w and 6m axial IOL optic shift was minimal and posteriorly directed and more pronounced in short eyes.

Cataract**PP076****Ray-tracing reveals discontinuous retinal illumination in clinical Negative Dysphotopsia model****Presenting author:** Luc van Vught, Netherlands**Purpose:**

The exact origin of Negative Dysphotopsia (ND) is yet to be identified. Theoretical simulations have identified incomplete peripheral retinal illumination as potential cause (Holladay et al, JCRS 2017), but this is still to be proven using clinical data. Recently, we used Scheimpflug imaging to show differences in anterior chamber anatomy between ND-patients and pseudophakic controls (van Vught et al., JCRS 2020). Additionally, MRI measurements showed no significant differences in their retinal shapes (van Vught et al., JCRS 2021). Using these clinical data, we designed average eye-models for ND-patients and controls, and assessed their far-peripheral retinal illumination using non-sequential ray tracing.

Setting:

Departments of ophthalmology and radiology, Leiden University Medical Center, Leiden, the Netherlands

Methods:

Two geometrical eye models were created in Zemax OpticStudio, one typical for patients with ND and one typical for pseudophakic controls. The pupil size, pupil centration and iris and IOL tilt of each model were set to the group averages determined with Scheimpflug imaging. These values were 2.4 mm, 0.17 mm and 6.3° for the ND group and 2.7 mm, 0.01 mm and 4.6° for the control group (van Vught et al., JCRS 2020). The IOL was modelled as a 19D ZCB00. The peripheral retinal illumination was determined per model using automated non-sequential ray tracing with a horizontally moving source.

Results:

Both typical models were successfully created and analyzed. Beams of light originating from the peripheral visual field were often partially refracted by the IOL and partially passing between the iris and IOL, resulting in a discontinuous retinal illumination when only one input angle was considered. Within the control model, these illumination gaps were filled by light originating from other angles, providing a continuous cumulative retinal illumination. Within the ND model, a distinct gap remained visible in the cumulative retinal illumination. This gap was estimated to be experienced from 94 to 98 degrees in the temporal peripheral visual field.

Conclusions:

In this study, we were able to identify a gap in retinal illumination in an eye-model that was typical for patients with ND, which was absent in the model typical for pseudophakic controls. The gap was estimated to be experienced as a temporal shadow of about 4 degrees. This study provides clinical data that supports the theory that ND is caused by illumination discontinuities due to light passing between the iris and the IOL.

Cataract**PP077****Stability of biometry in patients with meibomian gland dysfunction****Presenting author:** Andreas Schlatter, Austria**Purpose:**

Accurate biometry is essential in the preoperative cataract surgery setting to yield optimal postoperative refractive outcome. However, some recent studies indicate that preoperative biometry is influenced by dry eye disease (DED). Since meibomian gland dysfunction (MGD) is a major cause of DED, it is unclear if treatment of MGD prior to surgery affects biometry and may improve the postoperative refractive outcome. Recently, thermal pulsation - a novel treatment method for MGD - became available. The present study aims to investigate the effect of the therapy of MGD using thermal pulsation on biometry and selection of IOL power.

Setting:

Vienna Institute for Research in Ocular Surgery (VIROS), a Karl-Landsteiner-Institute, Hanusch Hospital, Vienna.

Methods:

Thirty-one patients suffering from DED caused by MGD will be enrolled in the study. One eye was selected as study eye, the second eye served as control eye. Thermal pulsation (Lipiflow®, Johnson&Johnson, USA) therapy was applied only to the study eye. Follow-up visits were scheduled two weeks and three months after treatment. Biometry was performed with the IOL Master700 (Carl Zeiss Meditec AG, Germany). In addition, Ocular Surface Disease Index, break up time (BUT) and lid margin assessment be performed at each study visit. Main outcome is the IOL power calculated at baseline and at the three months visit.

Results:

To date, data of 32 eyes of 16 patients were available for analysis. In this subset of patients there was better agreement of IOL selection between baseline and the 3 months visit in the study eyes as compared to the control eyes. OSDI significantly decreased from 43.3 to 31 (-12.3, $p = 0.004$). BUT significantly increased in study eyes ($p = 0.018$) and control eyes ($p = 0.034$).

Conclusions:

Preliminary analysis indicates tendencies towards better agreement of IOL selection in the treated eyes between baseline and the 3 months visit. Additionally, patient satisfaction as denoted by the OSDI score significantly improved during the study. Final results will be presented.



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PP078

Incidence and complications of retained lens fragment in the anterior chamber after uneventful cataract surgery

Presenting author: Maria Phylactou, United Kingdom

Purpose:

To analyse the outcomes of retained lens fragment (RLF) in the anterior chamber following uneventful cataract surgery.

Setting:

Moorfields Eye Hospital, NHS Foundation Trust, London, UK.

Methods:

Single-center, retrospective review to identify patients that underwent RLF removal after uneventful phacoemulsification surgery between October 2012 and November 2018. We identified 122 eyes from 121 patients. Patient characteristics, clinical findings, visual outcomes and need for subsequent surgical procedure were recorded. Main outcomes were change in Best Corrected Visual Acuity (BCVA), number and risk factors associated with additional surgery following RLF removal.

Results:

We identified 122 RLF over a total of 98467 uneventful phacoemulsification surgery, incidence was of 1 in 807 operations (0.124%). Mean BCVA improved significantly after RLF removal from 0.32 LogMar to 0.26 (SD 0.26) ($p=0.001$). 6 eyes (4.9%) had persistent corneal oedema that required endothelial keratoplasty (EK) after an average of 13 months after RLF removal (range 4-35). Risk factors for EK include alpha receptor blocker use, increased interval (month) between cataract surgery and diagnosis of RLF, increased interval between cataract surgery and RLF washout and RLF diagnosis on gonioscopy.

Conclusions:

RLF is a rare complication of uneventful cataract surgery and appears more frequent in more challenging cataract cases and myopic eyes. BCVA improved significantly after RLF removal but approximately 1 in 20 eyes needed additional surgery – mainly EK for corneal decompensation.



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PP079

Flanged intrascleral IOL fixation with double needle technique during primary 23 g sutureless vitrectomy

Presenting author: Miroslav Stamenkovic, Serbia

Purpose:

Estimation of results and complications of intrascleral flanged PC IOL fixation during primary sutureless 23G vitrectomy in dealing with luxated lens in vitreal cavity after contusion trauma of the eye.

Setting:

Eye Clinic University Medical Center Zvezdara, Belgrade, Serbia

Methods:

Eleven patients with dislocated lens in vitreal cavity after trauma of the eye have been operated in our Clinic between 2016-2020. Average age was 68 (47-75). Preoperative visual acuity was ranged from HM to 3/60. Intrascleral flanged fixation PC IOL during primary 23G pars plana vitrectomy, was performed in all cases. Follow-up period was 19,7 (14-29) months.

Results:

We analyzed the group of patients with luxated lens in vitreal cavity after contusion trauma of the eye. Visual acuity was better than 0,5 in 7 eyes (77.8%), 0,1-0,5 in 3 eyes(20%) and up to 0,1 in one eye (20%). Transient rise of IOP and inflammatory response were rare, but vitrectomy solved them.

Conclusions:

Dislocation of the lens in vitreal cavity after trauma is serious complication. Intrascleral flanged IOL fixation during primary sutureless 23G pars plana vitrectomy, resulted in better postoperative visual acuity and less complications because of early removal of the dislocated lens. Despite associated pathology like corneal oedema and transient rise of IOP, intrascleral flanged IOL fixation during primary vitreoretinal surgery showed satisfactory anatomical and functional result and shorter postoperative recovery.



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PP080

Chronic postoperative endophthalmitis with an unusual organism: Unconventional Approach

Presenting author: Kapil Shahare, India

Purpose:

To present the rare case of *Bacillus* sp. presenting as low-grade chronic postoperative endophthalmitis (CPE) with plaque-like precipitates over the intraocular lens (IOL) and in the bag and unconventional management approach with anterior chamber (AC) wash, explant with re-implant of IOL and two-port 23 G pars plana vitrectomy (PPV) with posterior capsulectomy under direct visualization.

Setting:

A 31-year-old male underwent uneventful phacoemulsification surgery in left eye (LE) for posterior subcapsular cataract, presented with indolent recurrent painless diminution of vision, manifested numerous typical plaques in the capsular bag, and was treated with an IOL explant, re-implant, and two-port 23G pars plana vitrectomy under direct vision with good results.

Methods:

31-year-old male pseudophakic patient reported two episodes of redness and blurring in the operated eye at 7 and 10 months after surgery with hypopyon in the second episode and both episodes managed conservatively elsewhere. He presented to us in September 2019 with painless diminution of vision in LE for 3 months. The eye was externally quiet with vision of 6/18 (6/9 with -1DC), cells in anterior chamber (AC), fine keratic precipitates, and centered IOL with multiple circular plaques on both the surfaces. The capsular bag also had plaques and vitreous was hazy. Ultrasound showed multiple low reflectivity echoes in vitreous.

Results:

Diagnosed as chronic postoperative endophthalmitis (CPE), he was taken up for surgery. He underwent AC wash, IOL explantation, endocapsular IOL re-implantation, and two-port 23G pars plana vitrectomy (PPV) under direct vision with posterior capsulectomy. Gram staining of AC aspirate revealed Gram-positive spore-bearing bacilli. Explanted IOL was inoculated on Robertson's cooked meat broth and blood agar. After aerobic incubation, confluent smooth cream-colored colonies of *Bacillus* species with aerobic spores were seen on blood agar. Postoperative recovery was uneventful and his vision improved to 6/6 on 2nd postoperative day. The eye was quiet with well-centered IOL and vision maintained at 6/6 at 6-month follow-up.

Conclusions:

Chronic postoperative endophthalmitis (CPE) following cataract surgery with the appearance of distinct plaques is most commonly caused by *Propionibacterium acnes* and the standard treatment is intraocular lens (IOL) explant and complete capsulectomy. However, possibility of *Bacillus* species as incriminating organism should be kept in mind which is the most common known cause of posttraumatic endophthalmitis and typically has a rapidly devastating course. Explant with re-implant of IOL and two-port 23G PPV with capsulectomy under direct visualization can achieve excellent result.

Cataract**PP081****Experimental study to compare the amount of residue after use of the vital dye trypan blue in the form of an ophthalmic dye and bound in a sodium hyaluronate by Raman spectroscopy****Presenting author:** Andreas Borkenstein, Austria**Purpose:**

In cataract surgery, viscoelastics protect the corneal endothelium against phacoenergetic and mechanical damage and ensure a stable space preservation. Vital dyes (trypan blue) are effective aids in anterior segment surgery, especially in challenging cases, but may lead to cytotoxic reactions depending on concentration and dose. A residue-free removal of the dye is of great importance. Recently, a new viscoelastic coloured with Trypan blue was introduced to increase the safety of ophthalmological procedures. The aim was to determine the residual amount of the dye that remains on a slide during the routine application of two commercial products by Raman spectroscopy

Setting:

Borkenstein & Borkenstein, private practice at Privatklinik d. Kreuzschwestern Graz and Technische Universität Graz

Methods:

For both products, a test sample (after application of the substance, the slides were flushed according to the clinical procedure) and a reference sample (the substances remained on the slide) were imaged using a Raman spectroscope (LabRam 800 HR spectrometer (Horiba Jobin Yvon GmbH, Bensheim, Germany)) and then analyzed.

Results:

The remaining residues of the reference samples of both substances were clearly detected by the spectroscopy measurement. In the mean spectrum of the Vision Blue[®] test specimen, the Raman bands of Trypan blue were clearly visible at a Raman shift of 1200-1600 cm⁻¹, indicating residues on the test specimen. The test sample of Pe-Ha-Blue[®]PLUS did not show any Raman bands in the typical Trypan blue Raman shift.

Conclusions:

The experimental results of the present work suggest that the combination of a vital dye with a viscoelastic may also be more residue-free in clinical use than the dye alone. Therefore, this could further increase the safety of dye-assisted ophthalmic procedures.

Cataract**PP082****Severe fibrinous pupillary membrane following cataract surgery using intraocular recombinant tissue plasminogen activator combined with Nd:YAG laser: A case report.**

Presenting author: Berta Sánchez Fernández, Spain

Purpose:

To report the clinical evolution and treatment of severe fibrinous pupillary membrane formation after cataract surgery, using recombinant tissue plasminogen activator (rtPA) followed by Nd:YAG laser treatment.

Setting:

The patient is currently followed up in Antonio Moreno Eye Clinic, Málaga.

Methods:

A healthy 75-year-old woman underwent uncomplicated cataract phacoemulsification and posterior chamber single-piece hydrophilic IOL implantation in her right eye. A dense fibrinous pupillary membrane was noted two weeks after surgery. An intracameral dose of 25 µg was injected. An incomplete resolution of the pre-pupillary membrane was noted within 24 hours after rtPA, measured by ANTERION® anterior segment optical coherence tomography. Nd:YAG laser was then used to perform a membranotomy of the persistent pupillary membrane.

Results:

The pupillary membrane was resolved after intraocular rtPA and Nd:YAG laser combined treatment, but the patient developed an intense anterior capsular phimosis, which was treated using Nd:YAG laser anterior capsulotomy with four relaxing incisions. Retroillumination images demonstrated a markedly enlarged anterior capsule opening after this treatment.

Conclusions:

To the best of our knowledge, this is the first report which relates anterior capsular phimosis syndrome following intracameral rtPA and Nd:YAG laser used for fibrin reaction after cataract surgery. Nd:YAG laser anterior capsulotomy was helpful in this case, and high-resolution multimodal imaging provided diagnostic confirmation and allowed follow-up postoperative evolution.



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Cataract

PP083

Retrospective analysis of functional outcomes and rate of complications in a cohort of patients treated with secondary Carlevale IOL implantation.

Presenting author: Maksymilian Onyszkiewicz, Poland

Purpose:

To evaluate the functional outcomes and the safety profile of a new generation of foldable sutureless scleral fixation intraocular lens (IOL), the Carlevale IOL (Soleko Inc., Rome, Italy) in aphakic patients who underwent secondary IOL implantation.

Setting:

Chair and Department of General Ophthalmology and Pediatric Ophthalmology, Medical University of Lublin, Poland.

Methods:

A retrospective, interventional case series of 24 consecutive aphakic patients who underwent a secondary implantation with Carlevale IOL at the Department of general Ophthalmology, University of Lublin, Lublin, Poland from January 2018 to December 2019. The primary outcome was the change in the best-corrected visual acuity (BCVA). The secondary outcome measured was the rate of intraoperative and postoperative complications. All included patients had a minimum follow-up of 12 months.

Results:

BCVA significantly changed from baseline to 1 month follow-up (Tukey HSD, p less than 0.5). No statistically significant changes were observed at 3, 6, and 12 months follow-up (p =NS, ANOVA). In two eyes we observed an intraoperative vitreous hemorrhage that disappeared within 1 month in both cases. During the postoperative follow-up period, three eyes developed a cystoid macular edema, one eye an ocular hypertony and one eye an ERM.

Conclusions:

Carlevale IOL implantation seems to be an effective and safe technique in aphakic eyes that require a secondary IOL implantation, ensuring good refractive outcome and a low rate of complications. Further prospective, randomized studies with a longer follow-up are necessary to verify the long-term outcomes and complications of this technique.



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PP085

Comparison three-dimensional heads-up system and traditional microscope oculars in cataract surgery - our experience

Presenting author: Suzana Konjevoda, Croatia

Purpose:

This study aimed to compare three-dimensional heads-up system and traditional microscope oculars during cataract surgery. To compare the complication, surgical duration, learning curve and surgeon satisfaction between a three-dimensional visualization system (heads-up surgery) and traditional binocular microscope in cataract surgery.

Setting:

Study was performed in March 2021 in Zadar General Hospital at Department of Ophthalmology

Methods:

We retrospectively evaluated 121 eyes of patients who were undergoing cataract surgery. We using a three-dimensional display system (n =60 eyes) (3D group) or a traditional binocular microscope (n =61 eyes) (traditional group). Cataract surgery was performed with 3D ARTEVO 800 (Carl Zeiss Meditec) by three surgeons. The video output was displayed at a distance of 3-4 feet from the surgeon ARTEVO systems and viewed using polarized glasses.

Results:

The 3D system was used in 60 eyes (3D group), and the a traditional binocular microscope was used in 61 eyes (traditional group). We did not observe significant difference in intraoperative complications between groups. Duration of surgery was slightly longer in 3D group due to the learning curve. Surgeons observed the following advantages: the ability to clearly observe the anterior segment image, especially in cases lower corneal transparency and without requiring focus adjustment. The surgeon's posture was more ergonomic in 3D group.

Conclusions:

In our experience the heads-up three-dimensional system for cataract surgery offers similar safety and efficiency as the traditional binocular microscope. Heads-Up Display decreases the proximity between the surgeon and patient without adversely affecting the surgical precision. It is important because of the aerosol generation during cataract surgery as a potential risk of SARS- CoV-2 infection



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PP086

Practice Styles and Preferences of Dutch Cataract and Refractive Surgeons, 2020 Survey

Presenting author: Ype Henry, Netherlands

Purpose:

To show the evolution of Practice Styles and Preferences of Dutch Cataract and Refractive Surgeons

Setting:

Dutch domestic nationwide Survey of all Cataract and Refractive Surgeons

Methods:

A questionnaire was sent to all registered Cataract and Refractive Surgeons in the Netherlands

Results:

Cataract Surgical Rate (CSR) is 11.000. Slow increase of High volume Surgeons. FLACS low numbers (3-5%). BSCS is less than 1%. Use of Multifocal IOL is 4%, Toric 5% and Multifocal Toric around 2%. Endophthalmitis (0.03%) and Dropped nucleus (0.07%) rates stable and low. Cefuroxime use, 83% routinely and 10% only in high risk patients. LASIK, PRK and PIOL numbers stable and RLE rising.

Conclusions:

Very valuable information on trends in Cataract and Refractive Surgery over the last 23 years is presented

Cataract**PP087****Real World Assessment of Physician Experience with a Hydrogel-based, Resorbable, Dexamethasone Intracanalicular Insert 0.4 mg for Postoperative Ocular Inflammation and Pain****Presenting author:** Sanjeev Dewan, United States**Purpose:**

Dexamethasone intracanalicular insert (DEX) (DEXTENZA; Ocular Therapeutix, Inc., Bedford, MA) is a physician-administered treatment for ocular inflammation and pain following ophthalmic surgery. It is placed through the lacrimal punctum into the canaliculus and delivers a sustained, tapered dose of 0.4 mg preservative-free steroid to the ocular surface over 30 days. Successful administration of DEX may require initial training and education due to structural differences when compared to traditional punctal plugs. In this study, we assess physicians' experience with inserting DEX and the impact on their practice.

Setting:

Phase 4, prospective, multicenter study at 23 ophthalmic practices (42 ophthalmologists) in the United States selected based on geographic location, presence of >2 surgical ophthalmologists and cataract surgery volume.

Methods:

Qualitative surveys on the preliminary use of DEX collected initial user experience and feedback from ophthalmologists, practice staff and patients. Here we evaluate data from physician surveys. After inserting at least 5 DEX, physicians completed an online survey capturing the number of insertions performed before becoming comfortable with administration in an operating room or outpatient clinic and incremental burden on staff time and logistics associated with utilizing DEX. The survey also captured their initial experience, level of comfort, ease of use and overall satisfaction associated with DEX administration on a 7-point Likert scale.

Results:

Forty-two ophthalmologists with a mean of 17 years of practice experience participated. A majority were at high-volume sites staffed by 2-5 ophthalmologists (55%) with a mean of 744 surgeries performed per year. Physicians (n=37) reported feeling comfortable inserting DEX after a mean of 3 insertions; no difference was observed between sites of care (operating room vs. outpatient clinic). Many ophthalmologists (86%) responded there was little to no incremental burden on staff time or logistics associated with using DEX. Overall, a majority of ophthalmologists were satisfied (90%), found their experience with DEX easy (86%) and were comfortable using DEX (89%).

Conclusions:

Real-world use of DEX demonstrates cataract surgeons quickly became proficient in inserting DEX after 3 insertions and reported negligible incremental burden associated with its use. Ophthalmologists had a positive experience using DEX, including comfort with insertion and overall satisfaction. Results from clinical trials and this study show DEX is an easy-to-use, effective and tolerable treatment for ocular inflammation and pain following ophthalmic surgery.



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PP088

The utility of macular OCT screening in the preoperative workup for cataract surgery - A systematic review

Presenting author: Taha Ahmed, Pakistan

Purpose:

The purpose of this study was to perform a systematic review of existing literature on preoperative OCT screening preceding cataract surgery. Available literature was evaluated and projections on how it could be applied to enhance postoperative outcomes of cataract surgery were summarized.

Setting:

Systematic Review of Literature

Methods:

The Pubmed, Embase, and Cochrane databases were searched for articles pertaining to preoperative OCT screening preceding cataract surgery. Selected articles were qualitatively and quantitatively analyzed through a meta-analysis.

Results:

Across 9 studies, the addition of OCT macular screening resulted in preoperative detection of macular pathology in 13.7% of eyes that were determined to be normal on fundoscopic examination alone. The types of pathology most frequently detected through preoperative OCT screening were interface abnormalities and macular degeneration. Comparative analysis of SS-OCT and SD-OCT found that SS-OCT had a sensitivity of 0.48-0.81 in the detection of macular pathology when compared to SD-OCT.

Conclusions:

OCT screening prior to cataract surgery results in the detection of occult macular pathology that may influence postoperative visual outcomes in approximately 1 in 10 eyes (13.7%). As a result, OCT screening is strongly recommended to be adopted in the routine preoperative workup for cataract surgery. While SS-OCT has does have utility in this regard, SD-OCT is the gold standard preoperative diagnostic intervention in eyes undergoing cataract surgery.



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PP089

Cataract Surgery after Ferrara rings implantation in Keratoconus patients: Clinical Outcomes

Presenting author: Afonso Murta, Portugal

Purpose:

To evaluate refractive, topographic and safety profile of phacoemulsification with IOL in patients with keratoconus after the implantation of Ferrara rings.

Setting:

Cornea Service, Ophthalmology Department, CHULC, Lisbon

Methods:

This is a retrospective study of 22 keratoconic eyes of 11 patients with different degrees of cataract that were submitted to phacoemulsification with IOL after Ferrara ring implantation. Previous to surgery all patients were submitted to slit lamp evaluation, Pentacam, specular microscopy and IOL calculation. Uncorrected visual acuity (UCVA), best corrected visual acuity (BCVA), spherical equivalent and endothelial cell count were assessed before and after surgeries at 6 months.

Results:

Mean UCVA and mean BCVA improved respectively from 0,69 (logMAR scale) and 0,82 preoperatively to 0,35 and 0,26 6 months after ICRS and then to 0,19 and 0,07 6 months after phacoemulsification with LIO. Mean spherical equivalent improved from -6,5 D preoperatively to -4 D 6 months after ICRS and then to -0,85 D 6 months after phacoemulsification with LIO.

Conclusions:

Phacoemulsification with IOL after Ferrara ring implantation in keratoconic eyes is a stable and safe procedure with good visual and refractive outcomes. Not only can resolve the cataract but also can correct the residual ametropia after the Ferrara ring implantation

Cataract**PP090****Analysis of seven formulas for intraocular lens optic power calculation precision in eyes with axial length 20-22 mm****Presenting author:** Nadezhda Pashinova, Russian Federation**Purpose:**

Comparative analysis of the accuracy of IOL optical power calculation for eyes with an axial length of 20-22 mm and 22-24 mm

Setting:

«Excimer» eye clinic, Moscow, Russian Federation «Excimer» eye clinic, Novosibirsk, Russian Federation

Methods:

147 eyes of 104 patients were included in the study. The study group (I) included 56 patients (81 eyes) with short eyes (average axial eye length 21.17 ± 0.56 (20.02-21.98 mm). Comparison group (II) consisted of 48 patients (66 eyes) with a normal axial length of 22.75 ± 0.46 (22.0-23.77) mm. The IOL optical power was calculated using the SRK / T formula, and the retrospective comparison was made using the Hoffer-Q, Holladay II, Olsen, Haigis, Barrett Universal II and Kane formulas.

Results:

The group I was characterized by statistically insignificant ($p < 0.05$) differences in the average estimation error for the formulas Holladay 2, Hoffer-Q, Haigis, SRK/T, Olsen, Barrett Universal II and Kane (0.19 ± 0.14 , 0.23 ± 0.08 , 0.11 ± 0.02 , 0.15 ± 0.09 , 0.21 ± 0.13 , 0.17 ± 0.21 and 0.12 ± 0.02 D, respectively). Haigis and Kane formulas had the smallest average estimation error (0.11 ± 0.02 and 0.12 ± 0.02) ($0.05 < 0.1$). A comparative analysis showed a significant ($p < 0.05$) advantage of the Haigis and Kane formulas compared to Holladay II and Olsen, and also significant at the trend level ($0.05 < 0.1$) compared to Hoffer-Q, SRK/T and Barrett Universal II. In group II, no significant differences were found.

Conclusions:

An analysis of the effectiveness of six modern formulas for IOL optical power calculation in eyes with axial length of 20-22 mm is presented. The advantage of using the Haigis and Kane formulas to achieve optimal target refraction is determined.



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PP091

Implanting monofocal low toric power IOL`S (T2) - Is it worth the extra work?

Presenting author: Kjell Gunnar Gundersen, Norway

Purpose:

To compare uncorrected and best-corrected visual acuity, low contrast acuity, residual refraction and ocular biometry after low cylinder power toric intraocular lens (IOL) or non-toric IOL implantation.

Setting:

Single surgeon eyeclinic

Methods:

This was a non-interventional comparative study of visual outcomes after uncomplicated cataract or refractive lens exchange surgery with either a low cylinder (T2) or non-toric (NT) IOL of similar design implanted (AcrySof® T2 IQ Toric IOL and AcrySof® IQ IOL). Subjects in both groups had to have been eligible for the low cylinder IOL based on biometry using Barretts toric calculator. They had to have uncorrected distance visual acuity (UDVA) of 20/32 (0.2 logMAR) or better at the time of their single diagnostic study visit. Clinical evaluation included the manifest refraction, visual acuity (VA), low contrast VA and ocular biometry.

Results:

51 eyes implanted with T2 and 43 with NT were enrolled. The mean manifest refractive cylinder was statistically significantly lower ($p < 0.01$) and significantly more eyes had 0.25 D or less of refractive cylinder in the T2group ($p = 0.03$). The difference between groups was more evident with astigmatism against the rule. Uncorrected high contrast VA was statistically significantly better in the T2 group ($p = 0.02$) as was the percentage of eyes with 20/20 visual acuity ($p = 0.05$). Uncorrected low contrast visual acuity was not statistically significantly different in mesopic or photopic conditions.

Conclusions:

Low cylinder power toric IOL (T2) provided better uncorrected visual acuity and lower residual refractive cylinder than a similar non-toric IOL after cataract surgery. Interestingly, the difference between groups was more evident with astigmatism against the rule compared to with the rule or oblique astigmatism. Investing the extra time to correct even low toric refractive errors provide better visual and refractive outcomes to the benefit for our patients.

Cataract**PP092****Impact of corneal graft diameter on the relation between sterile donor tomography in the eye bank and graft tomography after penetrating keratoplasty****Presenting author:** Adrien Quintin, Belgium**Purpose:**

The purpose of this study was to assess the impact of graft diameter on the relation between preoperative donor tomography and postoperative graft tomography after penetrating keratoplasty (PKP)

Setting:

Sterile donor tomography in the eye bank can be used to avoid refractive surprises after corneal transplantation.

Methods:

This retrospective study enrolled 164 eye bank corneal tissues that underwent elective PKP with application of a double-running suture. Donor and recipient trephination were performed using the 193nm excimer laser (Schwind Amaris 1050RS). Diameters were 7.5mm (16.5%), 8.0mm (70.1%) and 8.5mm (13.4%), with a graft oversize of 0.1mm. Preoperative measurements, taken through the cell culture flask using the anterior segment optical coherence tomograph Casia 2 (Tomey Corp., Nagoya, Japan), were repeated postoperatively in the patient after 6±4 months with all sutures in place. Differences between post- and preoperative values (Δ) were compared with respect to the graft diameter.

Results:

The Δ keratometric power (P) at the steep/flat meridian of the anterior corneal surface in the 7.5mm grafts (-2.7D / -6.8D) was significantly smaller than that in the 8.0mm grafts (+0.4D, $p < 0.01$ / -3.2D, $p < 0.01$), which at its turn was significantly smaller than that in the 8.5mm grafts (+1.7D, $p = 0.04$ / -0.9D, $p < 0.01$). Neither Δ astigmatism (+4.3D, +3.7D and +2.6D anteriorly; +0.9D, +0.5D and +0.4D posteriorly; respectively in the 7.5mm, 8.0mm and 8.5mm grafts; $p > 0.05$) nor Δ P at the steep and flat meridian of the posterior corneal surface (-1.1D, -1.0D, -0.9D; and -0.2D, -0.5D, -0.5D respectively; $p > 0.05$) did differ between groups.

Conclusions:

After penetrating keratoplasty (PKP) with both sutures in place, a smaller graft diameter seems to result in a flatter curvature at the anterior corneal surface, but does not affect the astigmatism. This confirms previous results, in which the impact of graft diameter on corneal power has been examined. However, this study goes further by investigating the impact of graft diameter on the differences between post- and preoperative keratometric values. This information may be indicative for IOL power calculation in relation to graft diameter in a triple PKP procedure, depending of the individual size of the cornea.

Cataract**PP093****Feasibility and Safety of Femto Flap Attachment Technique for Endothelial Protection in Eyes with Dense Cataracts Undergoing FLACS****Presenting author:** Sheetal Brar, India**Purpose:**

To report the feasibility and safety of femto flap attachment technique for endothelial protection in eyes with dense cataracts undergoing Femto-laser assisted cataract surgery (FLACS)

Setting:

Nethradhama Superspeciality Eye Hospital, Bangalore

Methods:

30 eyes with LOCS grade 4 nuclear sclerosis or above undergoing femto-assisted cataract surgery, were subjected to Femto flap attachment, wherein the free floating femto capsulotomy disc was deliberately floated up using a cohesive OVD, in order to attach it beneath the central endothelium. Phacoemulsification was carried out under this flap. A 4 quadrant template without softening was employed for nucleotomy. All procedures were uneventful. The flap was removed at the end of the IOL implantation using coaxial I/A. These 30 eyes were compared with another 30 eyes with same grade of cataract undergoing FLACS only.

Results:

The corneas had better clarity in the femto flap attachment group compared to only femto group at day 1 post-op. The pre-op endothelial counts (ECD) was matched between the two groups ($p=0.98$). However, the endothelial counts at 6 months post op showed significantly higher endothelial cell loss in the FLACS only group (2312 ± 98 cells/mm²) compared to the eyes with femto flap attachment group (2478 ± 78 cells/mm²), $p=0.04$. All eyes in both groups had clear corneas and endothelial morphology at 6 months.

Conclusions:

Femto flap attachment was found to be safe and resulted in comparatively lesser endothelial cell loss at 6 months. However, longer follow ups are required to study the long term effect on endothelial health using this technique.



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PP094

Ab externo valve cyclodialysis and implantation of a nonbiodegradable collagen implant as a supraciliary space-maintainer in management of glaucoma –long-term results

Presenting author: Vinod Kumar, Russian Federation

Purpose:

To evaluate long-term results of ab externo valve cyclodialysis with implantation of a porous, biologically inert and nonbiodegradable bone collagen implant (BCI) as a supraciliary space-maintainer in management of open-angle glaucoma

Setting:

Department of eye diseases Medical institute People's friendship university of Russia; Centre of eye microsurgery Pro zrenie.

Methods:

A total of 61 glaucoma cases (61 eyes) were operated upon. An ab externo valve cyclodialysis tunnel (4*4mm) was made superiorly and a strip of BCI (6.0X0.5X0.5mm) was inserted into it with its distal end entering anterior chamber. Among all cases, 20 cases (32.8%) had previously undergone filtering surgery; 24 cases (39.3%) had pseudoexfoliation syndrome; 43 cases (70.5%) had coexisting pathology – glaucoma and cataract and 33 cases (45.1%) had advanced glaucoma damage. Outcome measures were IOP change, use of hypotensive medication and complications. Follow up was > 18 months. Cases were evaluated as per World glaucoma association's guidelines.

Results:

Baseline IOP was 28.0 ± 5.5 mmHg and decreased to 19.2 ± 1.8 (a decrease by 31.4%; $p=2E-18$) and 18.9 ± 1.8 mmHg (a decrease by 32.5%; $p=6E-08$) at 18 (n=61 cases) and 24 months (n=30 cases) respectively. Medication use reduced by 78,1% (from 2.6 ± 0.9 to 0.5 ± 1.0). Overall success (with or without additional hypotensive medication) was achieved in 96.7% and 96.6% at 18 and 24 months respectively. There were two failure cases at 18 months and one case at 24 months. Complications observed in early postoperative period were easily manageable. Gonioscopically, implant maintained its position in the tunnel. No inflammation was noticed at the cleft site.

Conclusions:

Long term results of ab externo valve cyclodialysis with implantation of a nonbiodegradable porous collagen implant in the supraciliary space as a space-maintainer in management of OAG show that this procedure is safe and effective in decreasing IOP in glaucoma patients.

Cataract**PP096****Outcomes of combined micropulse transscleral cyclophotocoagulation and phacoemulsification cataract surgery in patients with primary open angle glaucoma**

Presenting author: Yuliya Evstigneeva, Russian Federation

Purpose:

To evaluate the results of using combined micropulse transscleral cyclophotocoagulation and phacoemulsification cataract surgery in patients with primary open angle glaucoma

Setting:

LLC “Dr. Kurenkov Clinic”, Moscow, Russia

Methods:

A retrospective study was carried out in 36 patients who underwent micropulse transscleral cyclophotocoagulation in combination with phacoemulsification cataract and implantation of intraocular lenses. The study included patients with primary open-angle glaucoma and uncomplicated cataract. Patients underwent phacoemulsification of cataracts with implantation of a posterior chamber IOL, then micropulse cyclophotocoagulation using a Cyclo G 6 MP3 (IRIDEX, USA) at a power of 2.0–2.5 W for 80 s per hemisphere with a duty cycle of 31.3%. The main criteria for evaluating the results were intraocular pressure (IOP), the number of anti-glaucoma drops used, and visual acuity.

Results:

A total of 36 patients (38 eyes) were included. 32 patients had previously not operated glaucoma. The average age was 68.29 ± 1.63 years. The mean preoperative IOP was 26.42 ± 4.80 mm Hg, and average number of initial anti-glaucoma medications was 3.1 ± 0.7 . IOP was significantly reduced to 13.8 ± 5.6 mm Hg (decrease by 47.0%) at 1 week and up to 16.0 ± 6.7 mmHg at 3 months. The mean number of anti-glaucoma drops decreased until 2.47 ± 0.7 . Final visual acuity improved by more than 3 lines in all cases.

Conclusions:

Micropulse transscleral cyclophotocoagulation is a non-invasive safe and efficacious treatment for glaucoma approach to glaucoma treatment that can be combined with cataract surgery. Our studies show that phacoemulsification and micropulse transscleral cyclophotocoagulation successfully reduce intraocular pressure and reduce drug burden. Also importantly, micropulse transscleral cyclophotocoagulation allow all future glaucoma surgery, including trabeculectomy or drainage surgery, if necessary.

Cataract**PP097****Correlation between Corneal Elevation Topography and Perimetric Changes in Patients with Primary Open Angle Glaucoma****Presenting author:** asaad Ghanem, Egypt**Purpose:**

The aim of this study is to assess Scheimpflug topographic elevation maps in patients with POAG and correlate the results with their perimetric changes

Setting:

Mansoura Ophthalmic Center, Mansoura University, Egypt.

Methods:

This was an analytical observational cross-sectional study. The study included 130 eyes of 70 subjects which were divided into 78 eyes of 44 patients diagnosed with POAG and 52 eyes of 26 control subjects. Measurement of IOP, visual field examination in patients with POAG using Humphrey Field Analyzer (2003 Carl Zeiss Meditec), Germany were done. Subjects were scanned using TMS-5 topographer (Topographic Modeling System, version 5. Tomey Corp. Nagoya, Japan) to measure central corneal thickness, mean anterior keratometry, maximum anterior and posterior topographic elevation maps in the central 3, 5, and 7 mm.

Results:

78 patients with POAG were included in the study. The mean age of the patients with POAG was 57.82 ± 7.78 years; 22 eyes were male and 22 eyes were female. The average age of control subjects was 56.62 ± 8.48 years; 12 eyes were male and 14 eyes were female, average CCT was $530.3 \pm 23.58 \mu\text{m}$, average mean anterior keratometry was $42.97 \pm 1.42\text{D}$, average maximum anterior elevation in 3, 5 and 7mm zone was 5.31 ± 2.28 , 12.10 ± 6.94 and $44.04 \pm 21.99 \mu\text{m}$ respectively and average maximum posterior elevation in 3, 5 and 7mm zone was 8.46 ± 2.10 , 19.90 ± 9.39 and $62.72 \pm 28.82 \mu\text{m}$ respectively in patients with POAG, whereas average CCT was $543.0 \pm 31.02 \mu\text{m}$, average MAK was $43.11 \pm 1.73\text{D}$, average MAE in 3, 5 and 7mm zone was 4.52 ± 1.97 , 5.90 ± 2.71 and $27.19 \pm 8.55 \mu\text{m}$ respectively

Conclusions:

Evaluation of corneal elevation topography by scheimpflug imaging showed forward shifting of the anterior and posterior corneal surfaces in POAG



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PP099

Ocular hypertension in pseudophakic eyes – Thinking outside the bag!

Presenting author: Catarina Guedes-Mota, Portugal

Purpose:

Cataract surgery with implantation of an artificial intraocular lens (IOL) in the lens capsular bag is one of the world's most common surgeries. It is a safe surgical procedure with a high rate of success and low surgical complication rate. Nevertheless, the IOL-capsule complex may dislocate and it represents one of the most serious complications, even after uneventful surgery. Several studies have found a clear association between IOL dislocation and increased intraocular pressure (IOP). The purpose of our study is to describe a case-series of patients with acute/subacute increment of IOP caused by IOL dislocation.

Setting:

Glaucoma Unit, Ophthalmology Department – Lisbon Central University Hospital Centre, Portugal

Methods:

Case-series of three patients, two females and one male, with a mean age of 53 years-old. Patients with previous glaucoma were excluded from the study. Patient 1 and patient 2 presented a past ocular history of cornea transplant due to infectious keratitis and bullous keratopathy, respectively; patient 3 had Fuchs heterochromic uveitis. In all patients, phacoemulsification with IOL implantation had been performed. Patient 1 experienced two consecutive episodes of acute onset of ocular hypertension associated with pigment dispersion. The others presented with subacute increase in IOP in consecutive visits, poorly controlled with topical treatment. All patients underwent ultrasound biomicroscopy (UBM).

Results:

Mean IOP measured at initial presentation was 38.0 mmHg and the mean time between cataract surgery and onset of ocular hypertension was 38.0 months. UBM was performed in all patients. Patient 1 had posterior-chamber IOL dislocation with its haptic positioned out of the capsular bag, in contact with the ciliary sulcus. Patient 2 presented with a dislocated piggyback ICL, with its haptic displaced onto the ciliary body and zonulae. Patient 3 had an in-the-bag anterior dislocation and IOL was in direct contact with posterior iris epithelium. Surgical treatment was considered for all patients.

Conclusions:

IOL dislocation is a serious complication of cataract surgery. It has been reported with an increasing frequency in recent years, probably due to wider indications for cataract surgery along with an increased lifespan. Additionally, an acute and severe increment of IOP is an unusual form of presentation. In cases of monocular hypertension in a previously cataract-operated eye, IOL dislocation is an important condition to be aware of as a differential diagnosis.

Cataract**PP100****Benefits beyond Restoring Vision: Should We Schedule the Phacoemulsification Earlier?****Presenting author:** Ana Ćurić, Croatia**Purpose:**

To investigate the changes of macular perfusion after uncomplicated phacoemulsification using OCT-angiography (OCT-A).

Setting:

OCT-A was performed before, 1 week, 1 month, and 3 months after surgery. Images with quality index (Q) ≥ 30 , as computed by integrated software, were further quantitatively analysed with AngioTool 0.6 software (National Institute of Health, National Cancer Institute, Bethesda, USA).

Methods:

Superficial vascular complex (SVC), nerve fiber layer vascular plexus (NFLVP) superficial vascular plexus (SVP), deep vascular complex (DVC), intermediate capillary plexus (ICP) and deep capillary plexus (DCP), as well as choroidal blood vessels and choriocapillaris (CC) were analysed for explant area (EA), vessels area (VA), vessels percentage area (VPA), total number of junctions (TNJ), junctions density (JD), total vessels length (TVL), average vessels length (AVL), total number of end points (TNEP), and mean lacunarity (ML). A comparison of pre- and post- operative values was made using non-parametric Friedman ANOVA test. The significance level was set to $P < 0.05$.

Results:

Significant changes of vascular parameters in 55 eyes of 55 patients mostly reached plateau 1 week after surgery and remained stable up to 3 months after surgery, occurring in all retinal layers but not in choroid and CC. A significant increase in VA, VPA, TNJ, JD, TVL and AVL was found, followed by the decrease in TNEP and ML manifesting rise in blood supply of the central macula after phacoemulsification. The greatest increase in VPA (22.79%), TVL (16.71%), AVL (166.71%) and JD (29.49%) was in SVC. On the contrary, the greatest change of ML (– 53.41%) appeared in DVC.

Conclusions:

For the first time, this study revealed that uncomplicated phacoemulsification significantly improved macular haemodynamics. This perfusion alterations are most likely due to functional hyperaemia instead of inflammatory process as the effect remained steady up to 3 months and average Q before and after phacoemulsification demonstrated no significant changes. We hypothesize that the effect is evoked by increased light intensity stimulation of retina after cataract removal. Thus, phacoemulsification in elderly population could have advantageous feature in addition to restoring visual acuity. This beneficial event could facilitate the decision-making process with regard to earlier timing for cataract removal in healthy aging patients.

Cataract**PP101****Adding prednisolone eye drops to NSAID eye drop monotherapy does not result in superior control of central macular thickening after standard cataract surgery****Presenting author:** Jesper Erichsen, Denmark**Purpose:**

Choice of prophylactic anti-inflammatory regimen parallel to cataract surgery is contested. We performed a randomized controlled trial to determine if combination of prednisolone- and non-steroidal anti-inflammatory drug (NSAID) eye drops was superior in preventing thickening of the central macula following uncomplicated cataract surgery compared with NSAID monotherapy and dropless surgery, and to test if preoperative initiation of eye drop prophylaxis was superior to initiation on the day of surgery.

Setting:

Investigator-initiated single-site trial conducted at Department of Ophthalmology, Rigshospitalet-Glostrup, Denmark.

Methods:

Low-risk patients scheduled for phacoemulsification were randomized to 1 of 5 prophylactic regimens: combination of prednisolone- (Pred Forte 1%) and ketorolac (Acular 0.5%) eye drops (Pred+NSAID-Pre (control) and Pred+NSAID-Post), ketorolac monotherapy (NSAID-Pre and NSAID-Post) or subtenon injection of dexamethasone (Dropless). Prophylaxis was initiated 3 days before versus on the day of surgery in “Pre”- and “Post”-groups, respectively. Eye drops were administered 3 times per day until 3 weeks postoperatively. Primary outcome was central macular thickness (CMT) 3 months postoperatively. Secondary outcomes were intraocular pressure (IOP) and visual acuity (VA) measured at baseline, 3 days, 3 weeks and 3 months postoperatively.

Results:

We included 94 participants in each group, mean age 72.2 (SD 7.0) years, 290 (62%) females. Three months postoperatively, CMT was (mean [95%CI]) 250.7 [247.6; 253.7] with Pred+NSAID-Pre, 250.7 [247.8; 253.7] with Pred+NSAID-Post, 251.3 [248.2; 254.4] with NSAID-Pre, 249.2 [246.2; 252.3] with NSAID-Post and 255.2 [252.0; 258.3] with Dropless. There were no significant differences from control and no differences between Pre- and Post-groups, but 56.6% in Dropless group had received additional anti-inflammatory treatment. IOP was significantly lower in groups not receiving prednisolone until 3 weeks postoperatively. There were no significant differences in VA.

Conclusions:

Adding prednisolone eye drops to NSAID eye drop monotherapy did not result in superior control of central macular thickening, whereas intraocular pressure was significantly higher during treatment. Subtenon depot of dexamethasone was inefficient as a dropless approach but was not associated with increased intraocular pressure. Initiating prophylactic treatment 3 days before surgery was not superior to initiation on the day of surgery. FINANCIAL DISCLOSURE: None



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Cataract

PP102

Safety and Efficacy of Topical, Transzonular, and Intracanalicular Corticosteroids for the Prevention of Postoperative Inflammation after Cataract Surgery

Presenting author: Seth Pantanelli, United States

Purpose:

To compare the safety and efficacy of topical prednisolone, transzonular triamcinolone-moxifloxacin, and intracanalicular dexamethasone ophthalmic insert for the prevention of post-operative inflammation after cataract surgery.

Setting:

Penn State Eye Center, Milton S. Hershey Medical Center, Hershey, Pennsylvania, USA.

Methods:

Retrospective consecutive case series of patients that underwent cataract surgery and received topical prednisolone acetate (01/2018 – 12/2019), transzonular triamcinolone-moxifloxacin (Tri-Moxi, ImprimisRx; 11/2016 – 01/2018), or intracanalicular dexamethasone (Dextenza, Ocular Therapeutix; 12/2019 – 11/2020). Patients with history of glaucoma suspect, glaucoma, intraocular pressure (IOP) elevation, or uveitis were excluded. Primary endpoints were proportion of eyes with 1) breakthrough inflammation requiring escalation of anti-inflammatory therapy and 2) IOP increase ≥ 10 mmHg at 4-8 weeks follow-up. Secondary endpoints included intra-operative complications. The Kruskal-Wallis test was used to compare groups. Data is reported as mean $\pm$ standard error.

Results:

Of 323 study eyes, 106 eyes from 67 patients received drops, 106 eyes from 74 patients received transzonular injection, and 107 eyes from 75 patients received intracanalicular insert. Seven (6.6%), 14 (13.2%), and 6 (5.6%) eyes from each group, respectively, developed symptomatic rebound inflammation ($p=0.10$). IOP increase ≥ 10 mmHg was measured in 0 (0.0%), 1 (0.0%) and 1 (0.0%) eye, respectively ($p=0.57$). Poor compliance with drops, incomplete transzonular injection, and intracanalicular insert extrusion occurred in 2, 1, and 3 eyes, respectively.

Conclusions:

“Dropless cataract surgery” may yield similar rates of breakthrough inflammation and IOP elevation as topical drops. Whereas drops are susceptible to non-compliance, transzonular and intracanalicular corticosteroids rely on delivery and sustained presence of the dispensed agent.



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PP103

Post-operative uveitis after cataract surgery in an ethnically diverse population: a retrospective case-control study

Presenting author: Jonathan Halim, United Kingdom

Purpose:

To evaluate the risk of post-operative uveitis in cataract surgery patients of different ethnicity in the presence and absence of co-morbidities as well as operative complications using multivariate analysis.

Setting:

Ophthalmology Department, The Royal London Hospital and Mile End Hospital, Barts Health NHS Trust, London, United Kingdom.

Methods:

A retrospective case-control study of patients undergoing phacoemulsification cataract surgery between January 2018 to December 2019 at two hospital sites. Differences in demographic and clinical characteristics were compared between two groups defined by the development of post-operative uveitis. Statistically significant factors in univariate analysis were further analysed using multivariate analysis to account for confounders.

Results:

1587 eyes had undergone phacoemulsification cataract operations with 104 (6.6%) developing post-operative uveitis. Compared to eyes of White/Mixed/Other ethnicity, Asian and Afro-Caribbean eyes were associated with a two-fold (OR 2.02, 95% CI 1.16-3.52, $P = 0.013$) and five-fold (OR 5.15, 95% CI 2.85-9.29, $P = 0.001$) risk of post-operative uveitis, respectively. Complicated surgery involving eyes with small pupil/iris hooks/Malyugin ring (OR 2.70, 95% CI 1.16-6.30, $P = 0.022$) and posterior capsular rupture (OR 6.00, 95% CI 2.55-14.12, $P = 0.001$) were associated with an increased risk of post-operative uveitis.

Conclusions:

The factors significantly associated with a post-operative uveitis outcome were patients of Asian and Afro-Caribbean ethnicity, small intra-operative pupil size, use of iris hooks or Malyugin ring and PCR. The post-operative management plan should be tailored in these group of patients with a view of early assessment and prompt management of symptoms. First published in Eye (2021) by Springer Nature: Halim, J., Westcott, F., Cascone, N. et al. Risk factors associated with post-operative uveitis after cataract surgery: a retrospective case-control study.

Cataract**PP105****Real world results of postoperative macular edema treatment in patients with diabetic macular edema****Presenting author:** Aliko Liaska, Greece**Purpose:**

Diabetes and postoperative inflammation are amongst the major causes of macular edema. Diabetic macular edema (DME) is primarily treated with Vascular Endothelial Growth Factor Inhibitors (antiVEGF). Intravitreal dexamethasone implant (DEX) can also be used in the treatment of macular edema in diabetic patients either pseudophakic or undergoing cataract surgery. The purpose of the study is to compare antiVEGF with DEX in the treatment of diabetic macular edema after cataract operation.

Setting:

Department of Ophthalmology, General Hospital of Lamia, Lamia, Greece

Methods:

Retrospective chart review of diabetic patients undergone cataract operation in General Hospital of Lamia (GHL) in 1999-2020. Twelve cataract patients with DME successfully treated with ranibizumab were identified (8 men-4 women, 64-72 years old, preoperative Central Foveal Thickness-CFT 265 μ m, range 245-296). All patients had undergone uneventful phacoemulsification with posterior chamber intraocular lens implantation. Visual Acuity (VA), CFT, number of injections (either ranibizumab or DEX) were recorded. Follow-up period lasted 4 to 26 months. Deterioration of macular edema was treated accordingly. Steroid responders (two patients), as identified from the intraocular pressure (IOP) elevation on postoperative topical steroid treatment were excluded from DEX implantation. Data were analysed with Wilcoxon signed rank sum test.

Results:

VA improved in all patients ($p=0.0277$) at the end of follow-up period. All patients showed deterioration of DME postoperatively. 6 patients had received DEX and 6 patients ranibizumab. It took almost two years (range 13-25 months) for DME to stabilize at the preoperative level. DEX patients received significantly lower number of IVT injections ($p=0.0256$) and responded significantly sooner (fluid free macula, 1 month versus 3-8 months) ($p=0.0273$). No patient lost vision.

Conclusions:

Intravitreal DEX implantation is superior to antiVEGF treatment of DME in newly pseudophakic patients in terms of functional and anatomic recovery and frequency of necessary treatment.

Cataract**PP106****Modification of iris anatomy and blood loss following iris capture during nanolaser photofragmentation and phacoemulsification cataract surgery****Presenting author:** Gangolf Sauder, Germany**Purpose:**

Intraoperative floppy iris syndrome is characterized by a flaccid iris that billows with intraocular fluid currents, with a propensity to prolapse towards the area of cataract extraction. It occurs in 4% of the general population and up to 86% in patients in therapy with tamsulosin. Capturing the iris during cataract removal typically causes bleeding and modification of the iris anatomy, further complicating the procedure. This study aimed to evaluate pupil outline and bleeding in photofragmentation with a nanosecond laser versus phacoemulsification.

Setting:

Charlottenklinik für Augenheilkunde, Stuttgart, Germany

Methods:

This retrospective single-center multi-surgeon study enrolled all patients with intraoperative floppy iris syndrome who had an incidence of iris capture during either nanolaser photofragmentation or phacoemulsification cataract surgery. Cases in which capture occurred only during irrigation/aspiration phase were excluded. Images of the iris pre and post capture were obtained from high-resolution intraoperative surgical microscope recordings. The pupil outline was manually segmented and modification of circularity was evaluated. The recordings were also reviewed for the occurrence of bleeding.

Results:

A total of 11 cases were enrolled: 4 with nanolaser photofragmentation and 7 with phacoemulsification. The procedures were performed by three staff surgeons and five residents. Given the number of cases, non-parametric statistical tests were used. This ratio is comparable to the proportion of cases performed for the two procedures. The difference in the number of cases with bleeding was statistically significant (0 (0%) and 6 (86%), respectively, two-tailed $p < 0.015$, Fisher's exact test). The mean percentage modification of circularity was 1.2 ± 0.5 and 5.9 ± 1.2 , respectively ($p = .006$, two-tailed Mann–Whitney U test).

Conclusions:

Nanosecond photofragmentation was reported to be gentler on the endothelial cells mainly due to the significantly reduced quantity of energy introduced into the eye, but also due to the lack of tip movement. The margin of the aspiration opening is also blunt. But, photofragmentation currently still requires slightly more fluidics, increasing the risk of iris capture in patients who present intraoperative floppy iris syndrome. This latter disadvantage is amply compensated by the negligible damage induced by iris capture during photofragmentation compared to phacoemulsification, as shown by the statistically significant lower number of patients with bleeding and less modified iris anatomy.

Cataract**PP107****A comparison of trocar-assisted sutureless scleral fixation and iris claw intraocular lens implantation in aphakia****Presenting author:** Fehim Esen, Turkey**Purpose:**

The most common approaches for the management of aphakic patients without capsular support include scleral fixation of the intraocular lenses (IOL) and implantation of iris fixated IOLs. Sutureless scleral fixation is a relatively new technique for scleral fixation of IOLs and has the advantage of refraining from suture related complications. The aim of this study was to compare the clinical outcome of trocar-assisted sutureless scleral fixation of IOLs and iris claw IOL implantation procedures.

Setting:

Department of Ophthalmology, Istanbul Medeniyet University, Goztepe Prof.Dr. Suleyman Yalcin City Hospital

Methods:

The files of the 40 patients that had a secondary IOL implantation were retrospectively reviewed. Patients with chronic corneal or retinal diseases were excluded from the study. Twelve patients that had trocar-assisted sutureless scleral fixation (SSF-IOL group) of IOLs (n=12, 7 male, 6 female, median age: 67.5 years) and iris claw IOL (IC-IOL group) implantation (n=15, 12 male, 3 female, mean age: 69.0 years) for the management of aphakia. Preoperative LogMAR best corrected visual acuity (BCVA), postoperative LogMAR BCVA, preoperative intraocular pressure (IOP), postoperative IOP, preoperative endothelial cell density and postoperative endothelial cell density (ECD) was specifically recorded.

Results:

Median LogMAR BCVA improved significantly in both SSF-IOL (1.15 vs. 0.39, $p=0.005$) and IC-IOL (1.3 vs. 0.15, $p=0.001$). There was no difference between the groups for preoperative and postoperative BCVA ($p=0.51$, $p=0.48$, respectively). There was no change between the preoperative and postoperative median IOP in the SSF-IOL (14.5mmHg vs. 16.0mmHg, $p=0.85$) and IC-IOL (17.0mmHg vs. 16.0mmHg, $p=0.27$). However, ECD decreased significantly in both SSF-IOL (2359 vs. 1773, $p=0.005$) and IC-IOL (1785 vs. 1706, $p=0.001$) groups. Median endothelial cell loss was significantly higher in the SSF-IOL group compared to IC-IOL group (507 vs. 103, $p=0.013$).

Conclusions:

Both secondary IOL implantation techniques were successfully improved visual acuity of the patients and long-term IOP did not change significantly. However, endothelial cell loss was significantly more in the SSF-IOL group. We suspect that routine use of anterior chamber maintainer and excessive anterior segment manipulations during SSF-IOL group might have induced endothelial cell loss. Although, IC-IOLs are not preferred in patients with reduced endothelial cell counts due to concerns of endothelial cell loss by many surgeons, we should keep in mind that trocar-assisted sutureless scleral IOL fixation surgery can induce significant endothelial loss as well.

Cataract**PP108****Intracameral use of triamcinolone acetonide increases endothelial cell loss following phacoemulsification cataract surgery combined with pars plana vitrectomy****Presenting author:** Fehim Esen, Turkey**Purpose:**

Postoperative inflammation is stronger in cataract surgeries that are combined with pars plana vitrectomy. Intracameral triamcinolone acetonide is widely used for the control of postoperative inflammation following uveitic cataract surgeries and cataract surgeries combined with PPV. The aim of this study was to compare the postoperative outcome of cataract surgeries combined with PPV, during which intracameral triamcinolone acetonide (TA) or subconjunctival dexamethasone (Dex) injection were performed.

Setting:

Retina Division, Department of Ophthalmology, Istanbul Medeniyet University, Goztepe Prof.Dr. Suleyman Yalcin City Hospital

Methods:

The files of patients that underwent cataract surgery combined with PPV were retrospectively studied. The patients who received intracameral TA (i-TA group; 13 male, 14 female, mean age: 59.8 ± 2.0 years) and subconjunctival Dex (s-Dex group; 8 male, 9 female, mean age: 57.9 ± 2.2 years) were studied. Only the cases that had nuclear cataract density equal to or less than NC3 (according to LOCS III) were included. Preoperative and postoperative LogMAR best corrected visual acuity, endothelial cell density (ECD) and central corneal thickness (CCT) were specifically studied.

Results:

LogMAR BCVA improved significantly both in i-TA (1.88 ± 0.21 vs. $0.30 \pm$, $p=0.001$) and s-Dex groups (1.73 ± 0.27 vs. 0.71 ± 0.23 , $p=0.009$). Inflammation was well-controlled and none of the patients developed fibrinous exudate or posterior synechiae. There was no significant change in IOP or in postoperative glaucoma medication numbers ($p=0.10$ and $p=0.77$). ECD significantly decreased in i-TA group (2354 ± 61 vs. 2136 ± 77 , $p=0.001$), but did not change significantly in s-Dex group (2489 ± 84 vs. 2448 ± 102 , $p=0.46$). Endothelial loss was significantly higher in i-TA group compared to s-Dex group ($p=0.044$). Central corneal thickness did not change significantly in both i-TA and s-Dex groups ($p=0.97$, $p=0.73$, respectively).

Conclusions:

Intracameral use of triamcinolone acetonide caused significant endothelial loss in patients that had phacoemulsification cataract surgery combined with PPV compared to subconjunctival dexamethasone. Intraoperative use of subconjunctival dexamethasone was an effective alternative to control postoperative inflammation without causing significant endothelial loss.

Cataract**PP109****Comparison of Dysphotopsia in Superior versus Temporal Corneal Incision Phacoemulsification Cataract Surgery****Presenting author:** Hamidreza Hasani, Iran, Islamic Republic of**Purpose:**

To compare positive and negative dysphotopsia after superior versus temporal corneal incision uncomplicated phacoemulsification cataract surgery in patients with healthy macula and identical intraocular lens.

Setting:

Bina eye hospital

Methods:

This randomized clinical trial study was conducted on 92 patients with a normal fundus examination, whom underwent uncomplicated phacoemulsification cataract surgery with a single piece acrylic hydrophobic Tecnis® intraocular lens, by single surgeon and the same surgical instruments. In group A, 46 patients underwent superior main corneal incision and group B, 46 patients tolerated temporal main corneal incision. Patients were evaluated for positive and negative dysphotopsia as primary outcome measure, and visual acuity, contrast sensitivity and astigmatism as secondary outcome measures on post op date 1,6 and 12 months after surgery.

Results:

49 patients (53%) were male and 43 (47%) were female. Positive dysphotopsia was much more in group B in contrast to group A ($p < 0.04$). Negative dysphotopsia ($p = 0.19$), visual acuity ($p = 0.44$) and astigmatism ($p = 0.21$) were not statistically different in both groups. Although, the mean contrast sensitivity increased after surgery ($P\text{-value} < 0.001$) in both groups, but no statistically significant difference seen between two groups ($p = 0.39$).

Conclusions:

Positive dysphotopsia is more prevalent with temporal corneal incision compared to superior one in an uncomplicated phacoemulsification cataract surgery. There is no difference in negative dysphotopsia, visual acuity, contrast sensitivity and astigmatism between two corneal incision sites. Superior corneal main incision is preferred to temporal incision regarding less post-operative positive dysphotopsia.



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PP110

Modified Flanged Scleral Fixation Technique using a standard cartridge and a 2.4 mm corneal incision

Presenting author: Idan Hecht, Israel

Purpose:

To report a new modified technique for intraocular lens (IOL) fixation using the four-flanged technique in which the IOL is inserted through a 2.4 mm corneal incision with a standard cartridge and injector.

Setting:

Shamir medical center, Israel

Methods:

Non-comparative Interventional case series. Included were consecutive cases with lack of capsular support who underwent IOL implantation through a 2.4 mm corneal incision and standard cartridge, and a scleral fixation with the Four-flanged technique with 6-0 polypropylene.

Results:

This technique was used in six eyes of five consecutive patients with absence of capsular support. Mean age was 66.80 ± 16.31 (median 71, range 39-82) years, two were female. Average BCVA improved from 0.96 ± 0.6 (Snellen equivalent 20/182) (median 0.87, range 0.54-2.00) to 0.36 ± 0.12 (Snellen equivalent 20/45) (median 0.30, range 0.30-0.54) ($P=0.043$). Mean follow-up time was 58 ± 16.53 (median 49, range 42-82) days. During all follow-up visits, the IOLs were well centered and the flanges were buried in the sclera and covered with conjunctiva. No intraoperative or postoperative complications were recorded.

Conclusions:

We describe a new method of IOL fixation which has the advantages of the flanged technique yet is based on IOL insertion using its designated cartridge through a small 2.4 mm corneal incision. This technique presents a reliable and relatively simple alternative for ACIOL implantation or other scleral fixation techniques as either primary or secondary IOL implantation.

Cataract**PP111****Effect of resting position of CCC (continuous curvilinear capsulorhexis) on CCC dimensions****Presenting author:** William Waldock, United Kingdom**Purpose:**

CCC size and position is important in cataract surgery, including for final lens position and posterior capsule opacification. The size has to be balanced to ensure safety of surgery. However, after lens insertion the CCC rests in a more posterior and less curved plane as the IOL is much thinner and less curved than the crystalline lens. This may affect the resting CCC size and position. To the authors knowledge this is the first time this has been investigated. This study photographically reviewed the initial CCC and resting CCC at the end of surgery for any significant changes.

Setting:

Moorfields Eye Hospital, Bedford, United Kingdom

Methods:

20 routine phacoemulsifications with sub tenon anaesthesia had their capsulorhexis compared immediately after CCC and at the end of surgery when the CCC is resting on the IOL. This was done subjectively and the relative horizontal length and vertical lengths compared between the 2 groups. Important variables included the size of the eye, the anterior chamber depth, the orthogonal axes, the relative surface area and corneal anomalies. Shortfalls of the technique included subtenon local anaesthesia meant the patient could not target coaxial light therefore images are not in the same position requiring more image alignment.

Results:

Subjectively there was no significant difference between the two CCCs. The limbal ratios demonstrate no spatial deviation as a result of 'recoil' of CCC. Images show linear overlap of limbal anatomy suggesting to reassure surgeons of the lack of significant movement.

Conclusions:

CCC recoil does not seem to significantly affect CCC size, shape or position; eccentric or non circular continuous curvilinear capsulorhexis (CCC) may behave differently to circular. Further work needs to be done on the effect of variables such as Future work could include an investigation of age from an elasticity viewpoint and size of the eye including, and how age, axial length and anterior chamber depth may affect CCC recoil. Future developments may include progress to an objective score, potentially with coloured line mapping, to quantify 'recoil' distance based on a standardised protocol.



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PP112

Cataract and uveitis: outcomes of cataract surgery in patients with chronic uveitis

Presenting author: Mekyna Synthia, Morocco

Purpose:

To evaluate the outcomes of cataract surgery in patients with history of uveitis.

Setting:

Ophthalmology A, Specialty hospital Mohammed V University, Faculty of Medicine and Pharmacy Rabat, Morocco.

Methods:

This is a retrospective study that including 23 eyes belonging to 14 patients with uveitis, operated on for cataracts between January 2016 and December 2020. We described the surgical techniques used, the implantation site. Then, we analyzed the development of visual acuity after the operation, the complications that arose, and their treatment.

Results:

We took care of 10 women and 4 men. The etiology appeared in 10 cases: 2 cases of sarcoidosis, 2 cases of tuberculosis, 1 case of juvenile idiopathic arthritis, 1 case of Behcet, 1 case of Vogt Koyanagi Harada, 1 case of syphilis, 1 case of Fuch, 1 case of sympathetic ophthalmia. Visual acuity has been improved for 15 eyes (65%). Visual acuity remained below 5/10 in eyes after the operation due to posterior segment involvement. The most common late complication was secondary cataract in 10 eyes

Conclusions:

Outcomes of cataract surgery depend of the uveitis etiology and the involvement of the posterior segment. Surgery allows better monitoring the posterior segment in severe uveitis. Implantation appears to be acceptable when the inflammatory reactions are under control before the surgery.

Cataract**PP113****The use of dexmedetomidine as an adjuvant during Sub-Tenon anesthesia in patients with complicated cataracts****Presenting author:** Oleg Mishchenko, Russian Federation**Purpose:**

Evaluation of the effectiveness of dexmedetomidine as an adjuvant in Sub-Tenon blockades in patients with complicated cataracts.

Setting:

Effective analgesia in elderly patients during phacoemulsification in the intra- and postoperative period should take into account both intraocular and concomitant general pathology. Sub-Tenon anesthesia is a safe and effective method for complicated cataracts. The use of dexmedetomidine as an adjuvant to local anesthetics prolongs and enhances their effect.

Methods:

Patients with complicated cataracts, grade II-III lens subluxation and pseudoexfoliative syndrome were operated on by phacoemulsification with elastic IOL. Group 1 (n=22), Sub-Tenon anesthesia was performed with lidocaine 2% 3.0 ml with dexmedetomidine at a dose of 0.25 mcg/kg. Group 2 (n=22), Sub-Tenon anesthesia was performed with Lidocaine 2% 3.0 ml. The time of the beginning of the blockade, the level of comfort of the operation by the patient and the surgeon, changes in hemodynamics at the stages of the operation were evaluated. Pain was assessed on the Verbal Rating Scale (VRS) during and after the surgery.

Results:

The effect of anesthesia in group 1 occurred on average 1 minute earlier. 8 hours after surgery, 54.5% of patients in group 1 and 18% of patients in group 2 had no pain. 82% of group 2 patients reported moderate pain (VRS 1), relieved by NSAIDs. In 77.3% of cases in group 1 and in 54.5% of cases in group 2, the comfort of the operation by the surgeon was rated as satisfactory; Patients rated the operation comfort as good in 90% of cases in group 1 and 60% in group 2.

Conclusions:

The use of dexmedetomidine, as an adjuvant of a local anesthetic, during Sub-Tenon anesthesia provides the necessary analgesia, the hemodynamic profile of the patient, the level of comfort of the patient during surgery and affects the quality of the surgeon's work.

Cataract**PP114****Clinical results after precision pulse capsulotomy****Presenting author:** Richard Potvin, United States**Purpose:**

To compare residual refractive error and complication rates between eyes undergoing a manual capsulotomy and those receiving a precision pulse capsulotomy using an automated device.

Setting:

Once clinical practice in Haugesund, Norway.

Methods:

This was a non-interventional two-arm retrospective chart review of clinical results after bilateral cataract surgery or refractive lens exchange (RLE) surgery with a monofocal toric intraocular lens (IOL) or a trifocal IOL where a manual capsulorhexis (Manual) or automated precision pulse capsulotomy (PPC) was performed. Results examined included the mean refractive spherical equivalent (MRSE), residual refractive cylinder, best-corrected distance visual acuity (BDVA) and reported complication rates.

Results:

Exams from 243 eyes of 124 patients were reviewed (122 PPC, 121 Manual); about 75% had a trifocal IOL implanted. There was no statistically significant difference in the MRSE by IOL type, or overall. The overall percentage of eyes with residual refractive cylinder ≤ 0.50 D was significantly higher in the PPC group (89% vs. 79% in the manual group, $p = 0.03$), primarily driven by results with the toric IOL. BDVA was not statistically significantly different by group. Capsulotomy-related complications were lower in the PPC group (4.1% vs. 6.6%), but this result was not statistically significant ($p = 0.38$).

Conclusions:

Significantly more eyes had refractive cylinder ≤ 0.50 D in the PPC group. For all other measures, the automated PPC device produced clinical results equivalent to those achieved with a manual capsulorhexis.

Cataract**PP115****Validation of a New Toric Marker for Intraoperative Alignment of Toric IOLs in Small Pupils during Phacoemulsification****Presenting author:** Sheetal Brar, India**Purpose:**

To evaluate the feasibility of using a new toric marker for intraoperative alignment of toric IOLs in small pupils during phacoemulsification

Setting:

Nethradhama Superspeciality Eye Hospital, Bangalore

Methods:

This randomized comparison study included 60 eyes from 60 patients with pre-op small or mid dilating pupils undergoing phaco/ FLACS surgery with a toric IOL. Group 1(n=30 eyes): wherein the new toric IOL marker was used and group 2(n=30 eyes): wherein the toric IOL marker was not used. In group 1, the intraoperative alignment of the toric IOL was assisted using a new marker, which created a linear indentation mark on the IOL optic, by applying pressure for 10 sec, before loading the lens. This mark then guided the accurate alignment of the toric IOL, using a markerless system.

Results:

The mark was visible on the toric IOL for up to 5 minutes, after which it faded. At 1 week, 96.6% (29) eyes in the new marker group were within 5 degrees from their intended axis (mean rotation = 3.56 degrees), as against 53.3%(16) eyes in the control group. The mean pre-op rotation in the control group was 8.23 degrees, which was significantly higher than the new toric IOL marker group 3.42 degrees ($p=0.03$). No patient in either group had complaints of post-operative dysphotopsia at 2 weeks. Three eyes in group 2 required re-rotation.

Conclusions:

In eyes with small pupils, the toric IOL marks tend to hide under the pupil, making their accurate placement challenging. The new toric IOL marker evaluated in the study, may be a safe and effective approach in this setting.



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PP116

Performance of a New Dual Mode Phacoemulsification System

Presenting author: Gabriel Quesada, El Salvador

Purpose:

To evaluate the overall clinical performance of a new dual mode phacoemulsification system and to confirm the overall surgeon acceptability

Setting:

Quesada Clinic, Colonia Escalón, San Salvador, El Salvador

Methods:

A prospective study was performed on 58 eyes from 41 patients who had undergone cataract surgery using a new dual mode phacoemulsification (phaco) system. Two surgeons evaluated the clinical performance and completed a questionnaire after each surgery using a rating scale of 1-5 (1- unsatisfied, 2- somewhat unsatisfied, 3- neither satisfied nor unsatisfied, 4- satisfied and 5- very satisfied). The proportion and the associated 95% confidence interval were computed

Results:

Surgeons rated satisfaction (scores of 4 or greater) on the overall clinical performance of the new phaco system in over 93% (CI 0.83, 0.98) of cases. Surgeons were satisfied in 100% of cases with cutting efficiency, usability of the system, and footpedal ergonomics (CI: 0.94, 1.00); in 98% of cases with anterior chamber stability, holdability, followability, overall satisfaction and 1-day post-operative clinical results (CI: 0.91, 1.00); and in over 93% of cases with swivel handpiece (CI: 0.83, 0.99) and 1-day post-operative corneal clarity (CI: 0.83, 0.98). Two intraoperative complications were reported, and both resolved without sequelae

Conclusions:

The new dual mode phacoemulsification system with new swivel handpiece, gas forced infusion and ergonomics/ workflow improvements had a high rate of user satisfaction regarding measures of clinical performance and ergonomics

Cataract**PP117****Comparison of cumulative dissipated energy and post op endothelial cell density with and without the use of miLoop for hard cataracts****Presenting author:** ANWESHA CHAKMA, India**Purpose:**

To compare the cumulative dissipated energy(CDE) and post op endothelial cell density(ECD) with and without the use of miLoop for hard cataracts in eyes undergoing phacoemulsification.

Setting:

Nethradhama Super Speciality Eye Hospital, Bengaluru, India

Methods:

This prospective study included 50 eyes of 50 patients with nuclear sclerosis grade 4 and above, undergoing cataract surgery with phacoemulsification using the Centurion system(Alcon surgicals). Eyes were randomised into two groups -gr.1 phaco only and gr.2 phaco with miLoop, wherein the miLoop instrument was used to assist in fragmentation of the hard brown nucleus. All surgeries were performed by single experienced surgeon using the same energy and fluidics parameters. Intra-operatively, the mean CDE value was noted at the end of the surgery. Post-operatively at day 1 and 6 months, the mean ECD was compared between both the groups

Results:

Pre operatively, both groups were matched in terms of mean age, grade of cataract and ECD($p>0.05$ for all parameters). Intra-operatively, the phaco only group had a mean CDE value of 28 (range 22-45) , whereas the phaco+ miLoop group had a CDE value of 16 (range 12-26)($p=0.040$). At 6 months, the mean ECD in phaco only group was 2125 ± 124 cells versus 2356 ± 143 suggesting a significantly higher ECD loss in phaco only group ($p=0.02$). No eye in either group had intra-op complications such as PCR, ZD or bag loss, post-op issues like irreversible corneal oedema or decompensation.

Conclusions:

miLoop may be a useful tool to assist in the management of hard brown cataracts and may lead to less ECD loss compared to routine phacoemulsification, when performed in such cases. Financial disclosure:- Dr.Sri Ganesh and Dr. Sheetal Brar are consultants from Carl Zeiss Meditech.



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Cataract

PP118

Cumulative Dissipated Energy in Eyes with and without Corneal Opacity

Presenting author: Cagri Ilhan, Turkey

Purpose:

To compare cumulative dissipated energy (CDE) parameter in phacoemulsification surgery for eyes with and without corneal opacity.

Setting:

University of Health Sciences, Ankara Ulucanlar Eye Research and Education Hospital

Methods:

In this retrospective comparative study, Group 1 was constructed with 25 cataract patients with corneal opacity and Group 2 was constructed with 35 cataract patients without corneal opacity or any other ocular co-morbidity. The mean values of CDE were compared.

Results:

The mean age was 72.72 ± 8.98 years (57-89) in Group 1 and 68.06 ± 5.85 years (57-80) in Group 2 ($p > 0.05$). The male-to-female ratio was 10/15 in Group 1 and 14/21 in Group 2 ($p > 0.05$). The mean CDE value was 16.23 ± 8.86 (4.78-42.65) in Group 1 and 9.57 ± 5.17 (3.77-25.38) in Group 2 ($p = 0.001$).

Conclusions:

Higher CDE is needed in phacoemulsification surgery for eyes with corneal opacity.



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Cataract

PP119

Preloaded injectors used in a clinical study: videographic assessment and laboratory analysis of injector nozzle damage

Presenting author: Ramin Khoramnia, Germany

Purpose:

A clinical comparison of current preloaded IOL injectors combining different safety and performance aspects has yet to be presented. The aim of the presented study was to evaluate quality and duration of implantation of 2 preloaded intraocular lens (IOL) injectors and assess postimplantation damage.

Setting:

The David J Apple International Laboratory for Ocular Pathology, Department of Ophthalmology, Heidelberg University Hospital, Heidelberg, Germany

Methods:

In this prospective, randomized, comparative study with laboratory investigation, implantation videos and postuse injectors from 60 paired eyes of 30 bilateral cataract patients were included. Patients' eyes were randomly assigned for implantation with 2 different preloaded injectors: the AutonoMe with a Clareon IOL (Alcon Laboratories, Inc.) and the iSert with a Vivinex IOL (Hoya Corp.). Videos were reviewed for events during the implantation procedure, and the duration of each step of implantation. Injectors' nozzles were examined under light and scanning electron microscopy. Damage was graded and correlated with the IOL power. Three-months postoperatively, IOLs were assessed for material changes.

Results:

IOL delivery was without any critical events. The implantation took 56 seconds with the AutonoMe and 44 seconds with the iSert ($P < .05$). Most AutonoMe injectors (97%) showed no damage or slight deformation. In most of the iSert injectors (80%), short or extended cracks were present, and damage lengths correlated with the IOL power. All IOLs were free of material changes, including glistening, 3 months postoperatively.

Conclusions:

Both preloaded IOL injectors allowed a safe and convenient IOL delivery. Implantation of the Clareon IOL took, on average, slightly longer than that of the Vivinex IOL, mostly due to a slower IOL unfolding. The AutonoMe showed less nozzle tip damage than that of the iSert.

Cataract**PP120****Evaluation of Refractive Results After Intraocular Lens Implantation in Pediatric Patients****Presenting author:** Çisil Erkan Pota, Turkey**Purpose:**

To evaluate the refractive results of pediatric patients who underwent primary or secondary intraocular lens (IOL) implantation due to congenital cataract.

Setting:

Akdeniz University Hospital Ophthalmology Department

Methods:

The data of 117 eyes of 71 patients who underwent surgery for developmental cataracts between 2014 and 2019 in the ophthalmology clinic of Akdeniz University Hospital and who underwent IOL implantation for at least 1 year were analyzed retrospectively. Gender, age of surgery, preoperative oculobiometric measurements (axial length [AL] and keratometric data [K]) were analyzed.

Postoperative follow-up time, best corrected visual acuity (BCVA) and spherical equivalent (SE) data were recorded. The distribution of these data by age was examined.

Results:

Thirty-seven boys (52.1%) and 34 girls (47.9%) patients had a mean follow-up period of 30.3(13-49) months. Surgical age was 0-1 in 50 (42.7%) patients, 2-4 in 20 (17.1%) patients, 4-6 in 28(23.9%) patients, and 6-10 years in 19 (16.2%) patients. 50 eyes underwent extracapsular lens extraction (ECCE) and secondary IOL implantation after 2 years of age, and simultaneous ECCE+IOL implantation in 77 eyes. Preoperative data 0-2, 2-4, 4-6 and 6-10 years; postoperative data were grouped as 2-4, 4-6, 6-9 and 10-15 years. Preoperative AL, biometric IOL (BM IOL) and implanted IOL (IMP IOL) values were statistically significantly different between age groups ($p < 0.05$). Postoperative SE and BCVA were statistically different between groups; There was a positive correlation between BCVA and age.

Conclusions:

It is possible to obtain good visual results with appropriate IOL implantation and follow-up in pediatric patients undergoing developmental cataract surgery. It is important to consider axial elongation, age of the patient and the amount of possible refractive change in the calculation of IOL power. We consider that the increase in BCVA with age may be due to the increased compliance of the patient with the examination.



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Cataract

PP121

Management of Pediatric Secondary Cataracts

Presenting author: ZINEB HAMMOUMI, Morocco

Purpose:

Secondary cataract or posterior capsule opacification is the most common postoperative complication in the long term of cataract surgery. It is quick and almost inevitable in children and it is due to the proliferation and modification of the cells of the lens epithelium. Its management in children is essentially based on its prevention. The aim of this study is to report the experience of our department in the management of secondary cataracts in children.

Setting:

Our study is retrospective, carried out at the Pediatric Ophthalmology Department of the 20 August 1953 Hospital in Casablanca-Morocco.

Methods:

Our study is spread over a period of 5 years, including 183 eyes of children operated for congenital cataracts complicated by secondary cataracts. Data collection was done using exploitation sheets

Results:

633 eyes were operated for congenital cataracts, of which 28.9% developed a secondary cataract. The average age of diagnosis for secondary cataract is 44.9 months. The sex ratio is estimated at 1.07 with a slight male predominance. The average age of congenital cataract surgery for patients who have developed secondary cataracts is 10 months. 158 eyes were implanted and posterior capsulotomy with anterior vitrectomy was performed in 153 eyes. The average time to onset of secondary cataracts is estimated at 10.2 months. 121 eyes received surgical capsulotomy and 62 eyes received YAG laser capsulotomy. The course after treatment is generally good.

Conclusions:

Improvements in surgical technique and developments in biomaterials used have reduced the incidence of posterior capsular opacification. Its treatment remains simple to perform but presents, like any procedure, risks that should not be ignored.

Cataract**PP122****Primary IOL implantation with posterior optic capture in infants****Presenting author:** Jaspreet Sukhija, India**Purpose:**

To study the outcome of posterior optic capture without anterior vitrectomy in infants undergoing cataract surgery

Setting:

Tertiary Eye Care Centre

Methods:

14 infants who underwent cataract surgery with primary intraocular lens(IOL) implantation were recruited. All had posterior optic capture of the IOL. Routine steps for paediatric cataract surgery were performed in all cases till removal of the lens matter. Thereafter large posterior capsulorhexis was fashioned with an utrata forcep. No vitrectomy was performed Preloaded foldable acrylic hydrophobic IOL was carefully guided in the bag considering the large posterior capsular openings. The optic was then gently nudged behind the margins of the posterior capsule with the haptics in the bag and the incisions were closed with 10-0 vicryl suture.

Results:

The IOL was fixed with the posterior rhexis margins in all cases. It was well centered at the follow up visits. Iridolenticular adhesion were observed in 2 cases and pigment over IOL was seen in 3 eyes. There was however no visual axis obscuration in any case.

Conclusions:

The technique of optic capture of IOL ensures a clear visual axis even without a vitrectomy in infants

Cataract**PP123****Comparing refractive outcomes of cataract surgeries performed by the same surgeon in the beginning and end of residency****Presenting author:** Rita Serras-Pereira, Portugal**Purpose:**

It is well documented that the lower the experience, the greater the risk of intraoperative surgical complications. Even though good visual outcomes can be obtained throughout residency training, other factors such as duration of surgery, wound creation and required phacoemulsification energy change with surgeon experience and may alter the outcome. The purpose of this work is to compare the refractive outcomes of the first and the last surgeries performed during the residency program by the same surgeon.

Setting:

Ophthalmology Department, Centro Hospitalar Universitário de Lisboa Central (Central Lisbon Hospital Center)

Methods:

Retrospective case-series. The records of consecutive patients submitted to age-related cataract surgery by the same resident surgeon in 2016 and 2019 were reviewed. A total of 60 eyes from 49 patients were included, the first (group 1) and the last (group 2) thirty surgeries performed during residency. Patients' age, sex, comorbidities, pre and postoperative visual acuity (VA), astigmatism and spherical equivalent (SE) were recorded. Exclusion criteria included presence of any corneal disease, high refractive errors, corneal astigmatism > 1.50D, irregular astigmatism, complicated surgeries with posterior capsular rupture, vitreous loss or IOL placement in the sulcus.

Results:

Postoperative VA was 1.0 in 93.3% (group 1) and 90% (group 2) of eyes. Mean targeted SE was $-0.26D \pm 0.20$ and $-0.25D \pm 0.18$ and mean final SE was $-0.27D \pm 0.66$ and $-0.10D \pm 0.41$ in groups 1 and 2, respectively. Difference between targeted and resultant refractive SE was 0.45D in group 1 and 0.33D in group 2 ($p=0.203$). Magnitude of astigmatism in groups 1 and 2 decreased in 43.3% and 53.3% of eyes, respectively, and in eyes where it increased, average increase was $0.53D \pm 0.65$ in group 1 and $0.49D \pm 0.61$ in group 2 ($p=0.173$).

Conclusions:

Phacoemulsification cataract surgeries performed during residency allow for excellent visual outcomes. In uncomplicated cataract surgeries, there were no statistically significant differences between final visual acuity, induced postoperative corneal astigmatism, final spherical equivalent and difference to preoperative target between surgeries performed in the beginning and at the end of residency. Supervised training for cataract surgery allows for good visual and refractive results throughout residency.



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PP125

Precision Pulse Capsulotomy to Perform Capsulorhexis with an Automated Method with Superior Outcomes and Decreased Complications Rate

Presenting author: Matteo Piovella, Italy

Purpose:

Radial tears in the capsulorhexis increase the rate surgical complications. Zepto precision pulse capsulotomy (PPC) technology (Mynosys - Fremont, California) is compared with manual continuous curvilinear capsulorhexis (CCC) outcomes by the reproducibility, uniformity, circularity, diameter size and complications rate

Setting:

Piovella Global Center for Ophthalmology - Monza- Italy

Methods:

An efficient capsulotomy method and technology called PPC and trade named Zepto was adopted on 256 consecutive eyes with cataract.

Results:

Results: The ACD was 2.69 ± 0.47 . ECC preop was 2330 ± 443 and 1 year postop 2262 ± 71 with a 2.91 % lost cells. We experienced 19 anterior radial tears during a difficult learning curve 6 month long

Conclusions:

The Zepto PPC technology creates a precise circular anterior capsulotomy. This technique allows cataract surgeons to reduce the rate of capsulorhexis and cataract surgery complications. Really helpful for white mature cataract and small pupils normally not possible to manage with femtolaser

Cataract**PP126****Trifocal IOLs to Correct Refractive Defects and Presbyopia after Cataract Surgery: New Guidelines for Use in the Majority of Patients****Presenting author:** Matteo Piovella, Italy**Purpose:**

To evaluate results in cataract eyes trifocal IOLs implantation to provide distance intermediate and near vision. Minimal post-op refractive defects provide high quality of vision and patients satisfaction. New center organization and preop eyes evaluation are key points to spread the use of trifocal lenses to the majority of cataract patients

Setting:

Piovella Global Center for Ophthalmology - Monza - Italy

Methods:

522 eyes were implanted with trifocal IOLs. 237 eyes(45.4%)with AT LISA tri 839MP and 285 (54.6%) eyes were implanted with AT LISA tri Toric 939MP - Carl Zeiss Meditec AG Jena. Bilateral implant 261 patients: 93 Patients implanted with both TRIFOCAL IOLs(35.7%)117 Patients implanted with both TORIC TRIFOCAL IOLs (44.8%) 51 Patients implanted with TRIFOCAL IOL in one eye and TORIC TRIFOCAL IOL in the other eye (19.5%) Mean Age 68.34 ± 11.66 IOL calculations were performed adopting advanced biometry and astigmatism axis alignment performed with digital system. Tears film quality and MGD was detected Lipiflow and Blephex were applied routinely

Results:

At 5 years monocular Trifocal IOLs results are UCDVA $20/22 \pm 2.40$ UCIVA $20/24 \pm 3.13$ UCNVA $20/27 \pm 5.37$, monocular Toric Trifocal IOLs are UCDVA $20/20 \pm 3.25$ UCIVA $20/35 \pm 4.75$ UCNVA $20/29 \pm 2.56$ Binocular results (178 patients) are UCDVA was 20/20, intermediate 20/20 and near vision 20/24 94 % OF PATIENTS IN THE RIGHT RANGE(Almost One Eye in the Right Range Sphere Equivalent Within - ± 0.50 Sph) It is necessary to determinate total corneal astigmatism to provide best refractive postoperative outcomes. We have adopted IOL Master 700 TK to measure anterior and posterior corneal curvature

Conclusions:

AT LISA tri toric 939MP and AT LISA tri 839 MP trifocal IOLs are the most efficient today development of multifocal IOLs family. Clinical outcomes indicate that this is an effective multifocal design to correct refractive defects and to defeat presbyopia after cataract surgery. Data show that it is possible to adopt them in the majority of patients



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PP127

Immediately Sequential Bilateral Cataract Surgery (ISBCS) in Canada as a result of COVID-19

Presenting author: Steve Arshinoff, Canada

Purpose:

To assess changes in frequency and perception of ISBCS in Canada with the COVID-19 pandemic

Setting:

York Finch Eye Associates, Toronto, Canada; Department of Ophthalmology and Vision Sciences, University of Toronto, Toronto, Ontario, Canada

Methods:

Colleagues and the Canadian Ophthalmology Society (COS) were questioned about ISBCS, and results tabulated

Results:

Academic teaching centers began performing routine ISBCS in 2020 and the COS rewrote their guidelines to be much more receptive to ISBCS

Conclusions:

Canada is likely relatively typical of western countries having increased their performance and acceptance of ISBCS dramatically in 2020

Cataract**PP128****Long-term results of cataract surgery with trifocal intraocular lens implantation****Presenting author:** Šárka Skorkovská, Czech Republic**Purpose:**

To evaluate long-term results of cataract surgery with implantation of the trifocal lens concerning objective visual functions, subjective patient satisfaction, contrast sensitivity, and numbers of laser capsulotomies in the postoperative period.

Setting:

NeoVize Eye Clinic, Brno, Department of Psychology, Faculty of Education, Masaryk University, Brno

Methods:

Retrospective study of randomly selected 55 patients (Ø 68.74 years) 31-36 months after bilateral cataract surgery with AT LISA® tri 839 MP or AT LISA® tri 939 MP implantation and PanOptix® or PanOptix® toric. The study evaluated binocular uncorrected (UDVA) and corrected long-distance visual acuity (CDVA), uncorrected near visual acuity (UNVA), and contrast sensitivity. A standardized Near Activity Visual Questionnaire (NAVQ) was used to assess subjective satisfaction with near and intermediate vision. We assessed laser capsulotomies numbers in the postoperative period as well.

Results:

The mean binocular UDVA was 0.08 ± 0.11 log MAR, the mean binocular CDVA was -0.04 ± 0.08 log MAR, mean UNVA was 0.09 ± 0.12 log MAR. Contrast sensitivity showed normal distribution under photopic conditions. Subjective satisfaction with near and intermediate vision was rated by standardized Rasch score. The average values of the Rasch score were 15.20 ± 12.15 (0 – 36.08), and the overall satisfaction rating was at 30% very satisfied, and at 22.5% satisfied according to results of NAVQ. Fifteen laser capsulotomies (25.30%) were performed in the study group of patients in the average time of 29 months.

Conclusions:

Long-term results of cataract surgery with a trifocal lens show a stable level of visual function and excellent long-term subjective evaluation of the operation result for far, intermediate and near vision. Implantations of the trifocal lens represent a significant part of cataract surgery nowadays.

Cataract**PP129****Intraocular lens exchange after cataract surgery at a tertiary referral center:
Indications and visual outcomes****Presenting author:** Burcin KEPEZ YILDIZ, Turkey**Purpose:**

To identify indications, complications and visual outcomes of intraocular lens (IOL) exchange after cataract surgery

Setting:

University of Health Sciences Beyoglu Eye Training and Research Hospital, Istanbul, TURKEY

Methods:

In this retrospective study, the patients who underwent IOL exchange surgery after uneventful cataract surgery were enrolled. The cataract type, clinical, refractive and visual features of the patients before cataract surgery were recorded. Furthermore, these cases were reviewed to determine the surgical indication, type and power of IOL removed, type and power of IOL implanted, time between surgeries, surgical complications, and visual outcomes. The measurements of axial length before cataract surgery and before IOL exchange surgeries were compared. Intraoperative or postoperative complications were recorded.

Results:

31 eyes of 31 patients were included to the study. The mean age of the patients was 60 ± 12.3 (26-81). 28 patients underwent phacoemulsification for cataracts and 3 patients for refractive purposes. 7 patients had degenerative myopia, 3 patients had history of keratorefractive surgery before. 11 patients had nuclear, 9 patients had mature cataract. Although the targeted spherical value was between 0.5 D and -1.50D, postoperative values were between +15.50 D/-18.75 D range and IOL exchange was planned. Most frequent source of error was improper measurements of axial lengths (%70). Lens exchange was performed 24.2 ± 19.06 days after cataract surgery. No intraoperative/postoperative complication occurred.

Conclusions:

Unsatisfactory refractive and visual outcomes occasionally occur after cataract surgery and in these cases, IOL exchange is required to achieve the best final visual outcome



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PP130

No hydro Phacoemulsification for Posterior polar cataract

Presenting author: Sreeni Edakhlon, India

Purpose:

To study the efficacy and results of Phacoemulsification without any hydro procedures in cases with Clinical Posterior Polar Cataract.

Setting:

A tertiary eye hospital in South India

Methods:

Forty one eyes with Posterior Polar Cataract diagnosed on slit lamp examination and posted for phacoemulsification between January 2020 and February 2021 were selected. Posterior polar cataract and associated nuclear sclerosis were graded according to severity . Phacoemulsification was done through a temporal clear corneal 2.2mm tunnel with low vacuum, aspiration and low bottle height. Nucleus management was done without any hydro procedures. Nucleus rotation was done after initiating phacoemulsification and emulsification was completed. In cases in which rotation was not possible an inside out hydro delineation was done. Incidence of posterior capsular rent during the surgery was studied

Results:

Nuclear rotation was possible in 34 cases. None of the cases developed posterior capsular rent (PCR) during phacoemulsification. Two cases developed PCR after Intra Ocular Lens implantation during wound hydration at the end of surgery. One case had a preexisting posterior capsular dehiscence . In this case the posterior capsular dehiscence did not get extended and there was no vitreous disturbance during the surgery. The seven cases in which nucleus rotation could not be done were very soft cataracts with mild Nuclear Sclerosis .

Conclusions:

Nucleus rotation can be safely done during phacoemulsification in cases of posterior polar cataract if hydrodissection or hydrodelineation procedures are not done. Avoiding hydroprocedures prevents the rise of intra lenticular pressure and protects the weak posterior capsule in these eyes during cataract surgery

Cataract**PP131****Cataract surgery outcomes in patients with amblyopia****Presenting author:** Jack Bradbury, United Kingdom**Purpose:**

Cataract surgery associated with amblyopia can be challenging. These eyes can be smaller or larger than normal causing increased operative complications and postoperative refractive surprise, there is uncertain visual potential in the amblyopic eye, and a risk of postoperative diplopia reported in the literature. The patient may choose to have the amblyopic eye operated on first. Surgical eye sequence, delay between surgery, as well as the target refraction can contribute to fixation switch diplopia. This study reviewed one year of cataract surgery in amblyopic patients at Moorfields Eye Hospital, Bedford, to assess visual potential and complications in this patient group.

Setting:

Moorfields Eye Hospital, Bedford, United Kingdom

Methods:

Data from 42 consecutive patients who underwent bilateral phacoemulsification with known amblyopia was extracted retrospectively from MediSoft for cases between March 2018 and March 2019. The target refraction in each case was emmetropia for both eyes. For each patient we collected and analysed: preoperative and postoperative refractive status, preoperative and postoperative visual acuity (logMAR, best corrected and pinholed), presence/absence of diplopia, type of amblyopia (anisometropic, strabismic, visual deprivation), any need for extra intervention/surgery, interval between surgery to fellow eye, and eye sequence (dominant vs non-dominant first), and vision after fellow eye operated.

Results:

The amblyopic eye was operated on first in 72% of cases, and no cases of postoperative diplopia were identified. The amblyopia group gained a mean of 0.31 logMAR compared to a non-amblyopia mean gain of 0.22 logMAR. 65% achieved visual acuity >6/12 postoperatively. Visual loss of 0.3 logMAR or more occurred in 4.5% in the amblyopia group, but 2% in the non-amblyopia group. Complication rate was 17% with amblyopia compared to 10.5% in the non-amblyopia group. PC rupture rate was 2.2% for amblyopia vs 0.8% in non-amblyopic eyes.

Conclusions:

Visual acuity in the amblyopic eye can improve considerably after cataract surgery which is often, perhaps inappropriately, delayed, leading to an increased risk of complications associated with dense cataract. Operating earlier would relieve symptoms such as blur and avoid potentially difficult surgery. We found no evidence for an increased risk of diplopia postoperatively.

Cataract**PP132****Effect of high perfusion pressure during phacoemulsification on visual acuity of patients with acute angle-closure glaucoma****Presenting author:** Marianna Kavalarakis, Greece**Purpose:**

To evaluate the effect of high perfusion irrigation during phacoemulsification on the postoperative visual acuity of patients with acute angle-closure glaucoma(AACG).

Setting:

Department of Ophthalmology, Athens Naval Hospital, Athens, Greece

Methods:

A total of 40 patients(42 eyes) with AACG and cataract were selected to undergo phacoemulsification surgery with goniosynechialysis. They were followed up for 6 months. The preoperative and postoperative(3-month and 6-month) best corrected visual acuity(BCVA), intraocular pressure, mean sensitivity(MS), mean defect(MD), and square root loss variance(sLV) were measured and compared.

Results:

In comparison to preoperative measurements, 3-month and 6-month BCVA were significantly improved and intraocular pressure was reduced postoperatively, with statistically significant differences($p<0.001$). There was no statistically significant difference between groups after surgery($p>0.05$). Postoperatively, 3-month and 6-month MS increased significantly, MD and sLV decreased significantly, and the difference was statistically significant($p<0.001$). No statistically significant difference was found between the groups after surgery($p>0.05$).

Conclusions:

High perfusion irrigation during phacoemulsification does not cause decrease of visual acuity of patients with AACG.



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PP133

Toric IOL implantation in patients with keratoconus using the ray-tracing technology

Presenting author: Ana Hervas Ontiveros, Spain

Purpose:

Cataract surgery in patients with keratoconus can be demanding due to difficulties in selecting the intraocular lens (IOL) and predicting the refractive outcome. We report a number of cases of cataract surgery in patients with keratoconus using objective Itrace (Tracey, Houston, Texas) technology.

Setting:

The study was done at Hospital La Fe. Valencia, Spain

Methods:

We present the number of cases of patients undergoing bilateral cataract surgery and advanced bilateral keratoconus treated with intracorneal rings (ICR) in both eyes (BE). Preoperatively, mean best corrected visual acuity (BCVA) was 20/100, with -3.5 sph -8 cyl 45° , in the right eye and 20/40, with -1.5 sph -3.5 cyl 100 in the left eye. The previous measurements were done with Itrace technology using the Previous Toric Check Alignment, the Tracey refraction, the Kappa and Alpha angle and the analysis of the Disfunctional Lens Display.

Results:

The patients were subjected to a correct phacoemulsification with implantation of a toric IOL in BE. BCVA postoperatively was 20/80 with $+0.5$ sph -2 cyl 60° in the right eye and 20/25 with $+1.5$ sph -2.5 cyl 63° in the left eye. All the Itrace measurements were done after surgery (Postoperative Toric Check Alignment, Tracey refraction, the Kappa and Alpha angle and analysis of the Disfunctional Lens Display)

Conclusions:

Correction of astigmatism and cataract with phacoemulsification and implantation of a toric IOL in patients with keratoconus can be an effective and safe choice. But predicting the refractive outcome is sometimes difficult. The measurements with the Itrace technology suppose a good system for evaluate assuming an improvement of the visual quality of the patient.



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PP134

R factor 2.0: evaluation of a new method for the IOL power calculation after refractive surgery

Presenting author: Alessia Coppola, Italy

Purpose:

To test a new IOL Power calculation method, axial length related, in eyes that underwent corneal refractive surgery (CRS), and to compare these results with those obtained by the so called R factor, another axial length related method previously published by the same group.

Setting:

University Eye Clinic, Department of Medicine, Surgery and Dentistry, “Scuola Medica Salernitana”, University of Salerno, Italy.

Methods:

A new correction factor for IOL power calculation, called R Factor 2.0, was obtained utilizing data from 418 eyes that underwent CRS, namely Photo Refractive Keratectomy (PRK) or Laser In Situ Keratomileusis (LASIK). This new formula was tested on 85 patients that underwent cataract surgery after CRS. The percentage of eyes with refractive error ≤ 0.5 D, ≤ 1.0 D, ≤ 2.0 D, and the median absolute error were calculated, using Nominal A-Constant, with both R Factor and the new R Factor 2.0.

Results:

Utilizing R factor, the number of eyes reporting a refractive error ≤ 0.5 D was 35 (41.2%), ≤ 1.0 D, was 46 (54.1%), ≤ 2.0 D, was 71 (83.5%). Utilizing R factor 2.0, the number of eyes reporting a refractive error ≤ 0.5 D was 39 (45.9%), ≤ 1.0 D, was 60 (70.6%), ≤ 2.0 D, was 78 (91.8%). The absolute median error was 0.97 D with R factor and 0.73 D with R factor 2.0.

Conclusions:

Based on the results achieved by this study, the R Factor 2.0 method can be used to improve the results obtained with R Factor.

Cataract**PP135****Intense trypan blue capsular landmark and its use in capsulotomy centration**

Presenting author: Pavel Stodulka, Czech Republic

Purpose:

A prospective consecutive case series to identify and locate the intense trypan capsular (ITC) landmark and investigate its potential benefits in capsulotomy centration.

Setting:

Gemini Eye Clinic, Zlin, Czech Republic

Methods:

The study comprised 56 eyes undergoing cataract surgery. All anterior capsules were stained with microfiltered 0.4% trypan blue solution and underwent selective laser capsulotomy. For the first 28 eyes (Group 1) the capsulotomies were centred on the mydriatic induced pupil; for the next 28 eyes (Group 2) capsulotomies were centred on the ITC landmark. Cataract surgery was completed using standard phacoemulsification and I/A techniques with multifocal IOLs implanted. The surgical videos were analysed to measure distances between key anatomical landmarks relative to the ITC landmark, coaxial Purkinje image, capsulotomy and IOL centre.

Results:

Of the 56 eyes enrolled over 92% had a defined ITC landmark that correlated and was coincident with the third Purkinje image with a displacement of less than 0.1mm. Likewise, the coaxial Purkinje image and IOL centration were also coincident within 0.1mm. The mydriatic pupil centred capsulotomies (Group 1) were noticeably decentred from the IOLs by 0.3mm. Whereas, the ITC centred capsulotomies (Group 2) maintained their superior correlation with the IOLs with a displacement of 0.1mm. All reported distance confidence intervals were less than 0.1mm for a P-value of 0.05.

Conclusions:

The ITC landmark is clearly visible on the vast majority of eyes and serves as a secondary landmark to the coaxial Purkinje image to guide capsulotomy and capsulorhexis centration. The benefits of the ITC landmark being located on the anterior capsule include lack of sensitivity to tilt, confirmation of patient fixation and serving as an alternate landmark to the Purkinje images. In general, the combination of coaxial Purkinje images and ITC landmarks was useful in centration, providing symmetrical 360-degree capsulotomy rim overlaps of the IOLs, which were superior to capsulotomies centred on the mydriatic pupil.

Cataract**PP136****Relationship between intraocular pressure measured by corneal biomechanical corrected and standard Goldmann prisms across the spectrum of primary open-angle glaucoma**

Presenting author: sean mccafferty, United States

Purpose:

To evaluate differences between intraocular pressure measured by a Goldmann applanation tonometry prism (IOPG) and a modified corneal correcting applanation tonometry surface prism (IOPC) across the spectrum of primary open-angle glaucoma (POAG).

Setting:

Multispecialty ophthalmology institute

Methods:

A retrospective cross-sectional study was completed on 1244 eyes in 628 patients: 122 normal[N], 195 glaucoma suspect[GS], 157 ocular hypertension[OHT], 154 primary open-angle glaucoma[POAG]), measuring paired IOPG and IOPC, Corneal hysteresis(CH), and central corneal thickness (CCT).

Results:

IOPC measurements were significantly greater than their paired IOPG measurements in POAG (IOPC-IOPG=1.58+/-1.88mmHg) compared to normal eyes (IOPC-IOPG=0.46+/-1.78mmHg)($p<0.001$). OHT and GS patients demonstrated significantly higher paired IOPC-IOPG measurements than N (1.19+/-2.24mmHg and 0.92+/-1.76mmHg)($p<0.001$; $p=0.002$). Both CH and CCT demonstrated a significant decrease in measurement from N to POAG patients ($p<0.001$).

Conclusions:

A modified Goldmann corneal biomechanical correcting prism demonstrates a significantly greater IOP than the standard Goldmann prism among glaucoma patients which increases across the spectrum of normal eyes to primary open-angle glaucoma.



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Cataract

PP137

One Year Evaluation of Endothelial Cell Density and Loss Following iTrack Ab-Interno Canal Based Surgery

Presenting author: David Lubeck, United States

Purpose:

To evaluate endothelial cell density, loss and stability over one year in patients who have undergone ab-interno canal based surgery using the iTrack surgical system (Nova Eye Medical, Adelaide, Australia) combined with cataract surgery.

Setting:

Prospective, multi-center registry study

Methods:

Patients were followed for at least 12 months following iTrack ab-interno canal based surgery combined with cataract surgery. Specular microscopy was performed preoperatively and at 6, 12 months postoperatively. Standard metrics for glaucoma surgery follow-up were also measured including; visual acuity, intraocular pressure (IOP), visual fields, optic nerve evaluation, OCT RNFL, glaucoma medication use, complications, and adverse events. 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 alone.

Results:

Mean endothelial cell density 1 year following iTrack surgery combined with cataract surgery was -4.8% +/- -6.5%. Endothelial cell loss in the control group, patients undergoing cataract surgery alone in FDA pivotal MIGS trials was -10.0 to -12.3% SD -11.0 to -12.7%. Endothelial cell loss occurred primarily in the initial 6 months postoperatively.

Conclusions:

There is a concern that canal based procedures that lower intraocular pressure are associated with manipulation of the cornea and adjacent structures in the anterior chamber. In this study, there were no intraoperative complications due to iTrack. iTrack canal based surgery caused minimal endothelial cell loss at one year, at a rate that is comparable to cataract surgery alone. The loss occurring primarily in the initial postoperative period suggesting that endothelial cell density will remain stable over longer time periods. iTrack appears to be a safe option for lowering IOP in patients with glaucoma.

Cataract**PP139****A prospective, 24-Month Study of Patients with Open Angle Glaucoma treated with the OMNI Surgical System as a Standalone Procedure****Presenting author:** Karsten Klabe, Germany**Purpose:**

In this prospective 24-month individual study, the safety and effectiveness of 360-degree viscodilation and the subsequent 360-degree trabeculotomy in patients with Open Angle Glaucoma are assessed in practice as an independent procedure. This data monitoring is based on the protocol of the Omni study.

Setting:

Drug use, intraocular pressure and the secondary surgery required to control intraocular pressure are analyzed during the follow-up period of at least 24 months after the OMNI procedure.

Methods:

In this data collection, ocular medical assessment, BCVA, slit lamp examination, IOP via applanation tonometry, gonioscopy, fundus examination, assessment of nerve abnormalities, imaging of the optic nerve head, C / D ratio, visual field pachymetry and endothelial cell morphology were recorded. Screening visit, subsequent washout phase (1d-48d) and baseline before the operation. Follow-up visits 1 day, 1 week, 1 month, 3 months, 6 months, 9 months, 12 months, 18 month and 24 month after the operation are planned.

Results:

We currently have 34 eyes from 22 patients included. We show the first results in an observation period of 24 months after surgery. The intraocular pressure was lowered from 24,7 mmHg preop. to 14,5 mmHg after 1 year and 14,2 mmHg after 2 years. The mean number of medications was reduced from 1,9 to 0,4 after 1 year and 0,6 after 2 years. The complication rate was low and showed only minor complications as hyphema or lens touch in phacic eyes. No second surgery was needed over 24 months.

Conclusions:

The OMNI procedure seems to be a safe and predictable surgical approach to lower intraocular pressure in patients with open angle glaucoma. 2 year data showed promising results but long term data needed.

Cataract**PP140****IOP reduction after repeated iStent® inject 'W' (3rd generation) implantation following previously successful iStent® inject (2nd generation) implantation—6 months of follow-up**

Presenting author: Florian Rufer, Germany

Purpose:

To evaluate the IOP reduction after 3rd generation iStent® inject 'W' implantation after previously successful 2nd generation iStent® inject implantation in glaucomatous eyes.

Setting:

Single center single surgeon study

Methods:

7 eyes of 5 patients with glaucoma aged 37–83 years (mean 54 ± 16 years) were included. All eyes underwent a primary 2nd generation iStent® inject implantation between 2015 and 2020. 4 eyes had combined cataract surgery. After a renewed gradual increase of IOP, in all eyes, 3rd generation iStent® inject 'W' were implanted into the trabecular meshwork (TM). The IOP was measured preoperatively, postoperatively after 1 day, and 1, 3 and 6 months after each implantation and the number of required antiglaucomatous drugs was recorded.

Results:

The mean baseline IOP (mmHg) before the first iStent® inject implantation was 21.4 ± 3.2 and 14.8 ± 1.5 after 6 months. The mean number of required antiglaucomatous drugs dropped from 2.3 ± 0.9 to 1.2 ± 1.0 during that first period. The mean baseline IOP before the repeated iStent® inject 'W' implantation was 21.9 ± 3.3 and 15.9 ± 1.6 after 6 months. Meanwhile, the mean number of required antiglaucomatous drugs was 1.7 ± 1.0 at baseline and was the same after 6 months.

Conclusions:

Repeated iStent® inject 'W' implantation was again successful after previously successful iStent inject implantation in this small cohort of eyes.

Cataract**PP141****Change in IOP from baseline after Selective Laser Trabeculoplasty in patients with POAG or OHT on medical therapy or naïve. The experience of 2 young ophthalmologists ‘delaying’ the surgery in Covid times. M.Pavel, V.Kayarkar, G.Jayamanne, W.Ahmed**

Presenting author: MADALINA PAVEL, United Kingdom

Purpose:

The primary aim of our study is to determine the reduction of the IOP in eyes with POAG or OHT after SLT in patients uncontrolled on glaucoma medication, non tolerant to it or naïve to any treatment. The secondary aim of our study was to determine how much time we could buy to delay the necessity of glaucoma surgery during the Covid pandemic.

Setting:

Prospective, non-comparative, uncontrolled, non-randomised, case series study in patients with OHT, uncontrolled mild, moderate or advanced primary open angle glaucoma with non tolerance to most or all glaucoma drops. Procedures performed by two speciality doctors at Doncaster and Bassetlaw Teaching Hospitals, Ophthalmology department, United Kingdom.

Methods:

52 patients (96 eyes) with OHT and POAG underwent SLT. Mean age of group was 63.20 years (38-80 years) and 52.01% were male and 47.99% were female. All patients underwent uneventful laser. The laser energy used varied between 0.7-0.9 mJ depending on pigmentation of TM, 80-100 applications on 360 degrees. Gutt. Apraclonidine were administered stat post SLT and IOP was checked 15 min post procedure. Patients continued with same IOP lowering drops, if applicable, and topical NSAIDs (Ketorolac trometamol) was prescribed three times a day for 5 days. Follow up visits planned at 3 months, 6 months and 9 months.

Results:

12 patients (24 eyes) were in the OHTgroup and 40 (72 eyes) in the POAGgroup. Baseline mean IOP for all eyes was 27.3mmHg in the OHT group and 25.7mmHg in the POAG group. Mean IOP at last follow up was 22.65mmHg in the OHT arm and 21.07mmHg in the POAG arm. 16.78% of patients experienced a transient rise in the IOP post SLT that was treated with a second instillation of stat Gutt. Apraclonidine. None of the IOP lowering eye drops were discontinued during postoperative visits. No additional SLT required. Significant correlation between successful SLT and baseline elevated IOP.

Conclusions:

IOP reduction was clinically and statistically significant: definition of success was considered an IOP reduction of more than 20% from baseline with no further IOP lowering interventions for a period of 9 months. Our study showed that SLT is an effective, compliance-free, repeatable and safe therapeutic modality having only minor, transient, self-limiting and easily controlled side effects with no sequelae. The average reduction in IOP from pretreatment IOP ranges from 15 to 40%, over a follow-up period of 3 to 9 months. Therefore, we must emphasize that SLT is not a cure, and all patients must remain under regular follow-up.

Cataract**PP142****Intraocular pressure variation post-cataract surgery in different stages of Primary open-angle and Pseudoexfoliation glaucoma****Presenting author:** Ricardo Machado Soares, Portugal**Purpose:**

To evaluate the intraocular pressure (IOP) variation after cataract surgery in primary open-angle glaucoma (POAG) and Pseudoexfoliation glaucoma (PXG), and assess its relation with different glaucoma damage stages.

Setting:

Centro Hospitalar Vila Nova de Gaia e Espinho, Portugal

Methods:

A retrospective cohort study of 102 patients (102 eyes) with POAG or PXG controlled under topical medication (without previous ocular surgery) and submitted to uncomplicated phacoemulsification was performed. IOP, visual field mean deviation, number of anti-glaucomatous drops and subsequent drainage surgeries were collected, over 2 years of follow-up post-surgery. Glaucoma was staged into 3 groups (early, moderate and advanced) based on a simplified modification of the Hodapp system. The analysis was performed using two-way mixed ANOVA. The assumption of sphericity was violated, therefore we used the Greenhouse-Geisser sphericity correction. We used Bonferroni method to adjust for multiple comparisons.

Results:

Mean IOP was 16.22 ± 2.73 and 16.85 ± 4.10 at baseline (before surgery) in POAG and PXG groups, respectively. IOP dropped 3.41 ± 0.37 ($p < 0.001$) after 1 year, and 3.07 ± 0.43 ($p < 0.001$) after 2 years from cataract surgery in the POAG group. In the PXG group, the IOP decrease was 3.17 ± 0.60 ($p < 0.001$) at year 1 and 3.68 ± 0.55 ($p < 0.001$) at year 2. There was no difference in the IOP variation between years 1 and 2 in both groups ($p > 0.05$). There was no statistically significant interaction between glaucoma damage stage and IOP variation after surgery ($p > 0.05$).

Conclusions:

Our results suggest that phacoemulsification alone has an effective role in lowering IOP in controlled POAG and PXG patients. The IOP drop is sustained for 2 years and is independent of the glaucoma damage stage.

Cataract**PP143****Secondary glaucoma and persistent corneal edema – when the answer hides in the angle****Presenting author:** Rita Serras-Pereira, Portugal**Purpose:**

The purpose of this work is to describe a case of unilateral secondary glaucoma and persistent corneal edema following ocular trauma in the setting of a car accident with window break. With this case report the authors would like to illustrate the importance of gonioscopy in everyday ophthalmology practice, not only for diagnosis, but also for the selection of the appropriate surgical interventions, and the need for imaging modalities after open globe injuries in order to exclude the presence of intraocular foreign bodies (IOFB).

Setting:

Emergency Department and Ophthalmology Department, Centro Hospitalar Universitário de Lisboa Central, Lisbon, Portugal.

Methods:

Patient case report with history, clinical findings, best corrected visual acuity (BCVA) records, biomicroscopy, gonioscopy and funduscopy records, Computed Tomography (CT) and ocular ultrasound imaging.

Results:

A 21-year-old male was evaluated after being involved in a car accident. Biomicroscopy revealed a vertical scleral wound with iris prolapse left eye (OS). The wound was surgically closed and after initially improving, he reported worsening VA and red eye. Biomicroscopy revealed corneal edema and aqueous flare, intraocular pressure of 30 mmHg and a herpetic keratouveitis was hypothesized. One week later, vision improved but inferior corneal edema persisted. A gonioscopy was performed, revealing a millimetric IOFB in the inferior iridocorneal angle. After the IOFB was removed, the patient improved significantly, with BCVA of 20/25 one week after surgery.

Conclusions:

The clinical presentation of intraocular foreign body injuries depends not only on the mechanism of the injury and type of foreign body involved, but also on the subsequent complications. Clinicians should always be alert to the possibility of an IOFB in a patient with an open globe injury and request imaging modalities to exclude its presence. In the presented case, a high index of suspicion after persistent localized corneal edema led to the identification of an IOFB in the angle with gonioscopy and its removal led to complete resolution of secondary glaucoma and corneal edema.

Cataract**PP144****Results of glaucoma surgical treatment (non-penetrating deep sclerectomy and implantation of collagen and bioresorbable drainages)****Presenting author:** Kirill Pershin, Russian Federation**Purpose:**

Comparative analysis of the results of implantation of collagen and bioresorbable drainages after non-penetrating deep sclerectomy in patients with glaucoma.

Setting:

«Excimer» eye clinic, Moscow, Russian Federation «Excimer» eye clinic, St.-Petersburg, Russian Federation «Excimer» eye clinic, Novosibirsk, Russian Federation

Methods:

A total of 109 patients (112 eyes) were examined and operated on as part of an open prospective study. All patients underwent non-penetrating deep sclerectomy with implantation of Xenoplast (n=72, group I) and Glautex (n=40, group II). In group I, in 15 cases (20.8%), stage I of glaucoma was identified, in 17 (23.6%) - stage II, in 38 (52.8%) - stage III, and in 2 (2.8%) - Stage IV. Among patients of group II, in 7 cases (17.5%) stage I was noted, in 8 (20%) - stage II, 21 (52.5%) - stage III and in 4 (10%) - stage IV.

Results:

In group I, IOP stabilization was noted, with a rise to 16.5 ± 2.2 mmHg 7 days after surgery, 17.2 ± 1.8 in a month and 18.6 ± 3.1 mmHg in 36 months. In group II, a low level of IOP was noted in 7 days, with a further increase to 16.1 ± 1.9 and 15.7 ± 2.0 mm Hg in 1 and 3 months, respectively. After 6 months of observation, group II showed an increase in the average IOP to 23.2 ± 1.7 mm Hg. IOP in group I was significantly lower in 6 months ($p=0.027$), 1 year ($p=0.046$), 2 years ($p=0.02$), and 3 years ($p=0.043$).

Conclusions:

The poster presents the results of a comparative analysis of the results of non-penetrating deep sclerectomy and implantation of collagen and bioresorbable drainages. In both groups, the amount of required drugs was significantly lower than before surgery ($p=0.01$). When analyzing the frequency of achieving target indicators ("complete" and "relative" success) during the follow-up period of 6 months, both groups achieved high values of "complete" success (94.4 and 92.5%, respectively). After 3 years of observation in group I, the frequency of "complete" success was 51%, and in group II only 35%, while the failure rate was 6.9% and 25%, respectively ($p=0.03$).

Cataract**PP145****Angle closure glaucoma due to microspherophakia in Weill-Marchesani syndrome****Presenting author:** Jorge Sánchez Molina, Spain**Purpose:**

To describe the clinical characteristics of a patient with angle closure glaucoma due to microspherophakia in a context of Weill-Marchesani syndrome

Setting:

Servicio de Oftalmología, Hospital Universitario Donostia, Donostia-San Sebastián, España

Methods:

A 41 years old man, with a history of chronic central serous chorioretinopathy (CSC), was referred to our Glaucoma unit due to enlarged cup to disc ratio in both eyes with affected visual fields. Examination revealed a bilateral shallow anterior chamber (despite a high myopic refractive error), appositional angle closure due to anterior displacement of the lens and phacodonesis. Fundus examination disclosed bilateral chorioretinal folds and subretinal fluid while macular optical coherence tomography exposed increased choroidal thickness. Biometry revealed normal axial lengths. We suspected a disorder of the lens, performing an ultrasound biomicroscopy (UBM) to assess the lens characteristics.

Results:

UBM revealed features suspicious of microspherophakia. A distinctive phenotype (brachydactyly and short stature) in conjunction with the ocular findings, oriented the case to genetic testing in order to detect a possible Weill-Marchesani syndrome. Next generation sequencing revealed a biallelic variant in the ADAMTS10 gene, considering highly probable the diagnosis of Weill-Marchesani syndrome.

Conclusions:

Microspherophakia should be suspected in high myopic patients in conjunction with a shallow anterior chamber or angle closure glaucoma. The clinician should pay attention to the patient phenotype since microspherophakia is a manifestation of different medical syndromes. In this patient, the microspherophakia was the source of glaucoma, inducing a pupillary block and angle closure related to forward displacement of the lens due to the zonulopathy of these eyes. In these cases, UBM is a useful technique in the diagnosis of microspherophakia. To this date, there has been no reports of CSC in association with Weill-Marchesani syndrome

Cataract**PP146****Cystoid Macular Edema and retinal capillary leakage following topical prostaglandin analog use: a case report****Presenting author:** Tarek Dridi, Tunisia**Purpose:**

To report a case of bilateral cystoid macular edema (CME) associated with retinal capillary leakage on fluorescein angiography following prostaglandin analogs (PGA) use for primary open-angle glaucoma.

Setting:

Department of Ophthalmology, Fattouma Bourguiba University Hospital, Monastir, Tunisia.

Methods:

A 56-year-old phakic female patient with chronic open-angle glaucoma initially treated with alpha 2-adrenergic agonist, was given topical latanoprost to better control intraocular pressure (IOP). Three months later, she presented to our department with bilateral progressive vision blurring. Best-corrected visual acuity (BCVA) was 20/32 in the right eye (RE) and 20/100 in the left eye (LE). There was no cells in the anterior chamber or the vitreous. IOP was 14 mmHg in both eyes.

Results:

Fundus examination showed the absence of the foveal reflex and a cup to disc ratio of 0.4 OU. Swept-source OCT revealed bilateral CME and fluorescein angiography showed bilateral retinal capillary leakage in the posterior pole and retinal periphery as well as optic disc hyperfluorescence. Results of uveitis work-up were unremarkable. PGA were withdrawn, and the patient received a combination of dorzolamide and timolol instead. Three month after PGA withdrawal, BCVA improved to 20/20 in RE and 20/20 in LE and SS-OCT showed the resolution of CME in both eyes.

Conclusions:

CME and retinal capillary leakage may rarely be a complication of topical prostaglandin analogs in phakic eyes. These drops may induce a proinflammatory state resulting in the disruption of the blood–aqueous barrier



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PP147

Algorithm for Planning Intraocular Lens based surgery in Keratoconus

Presenting author: Mayank Nanavaty, United Kingdom

Purpose:

Accurate intra-ocular lens selection and refractive outcome prediction is challenging in keratoconus due to variation in keratometry and astigmatism. We proposed a software algorithm to facilitate lens-based surgery in patients with keratoconus.

Setting:

Brighton & Sussex University Hospitals NHS Trust and University of Brighton.

Methods:

Comprehensive literature review was performed to prepare a software algorithm based on keratoconus cone location (central= within 3mm, paracentral=within 3-5mm and peripheral=outside the central 5mm), stability of keratoconus, level of best spectacle corrected visual acuity (BSCVA) and whether there is clear lens or cataractous lens. The software usability was assessed through a 10-question questionnaire and 2 hypothetical keratoconus case histories (one moderately simple and other moderately complex) given to 15 trainees. The usability questionnaires were graded on Likert scale (1=strongly disagree to 5=strongly agree) and two case histories (1=very difficult to 7=very easy).

Results:

The algorithm and usability survey can be found on <https://brighton.onlinesurveys.ac.uk/brightonkicolssurvey> using the password: kicol20. Thirteen trainees completed the questionnaire and 2 of these were incomplete and excluded. 91.9% would frequently use, for 100% it was easy to use independently without technical support, for 63.7% it was strongly integrated, for 100% it was consistent, 100% thought that most people will learn to use it quickly, 91.9% found the system not cumbersome to use, felt very confident to use it and need not learn a lot to use it. The first case was found easy by 63.7% and the second by 45%.

Conclusions:

We present a detailed algorithm with flowchart as a guide to surgeons for lens-based surgery in stable and progressing keratoconus which is classified based on cone location. This algorithm will help trainee and comprehensive ophthalmic surgeons in pre-operative planning for the surgery or referral to the corneal surgeon, taking into account factors such as progression, BSCVA, keratometry, topography and apex location of the cone in keratoconus patients.



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PP148

Intra scleral Four-flanged technique for in-the-bag IOL subluxation

Presenting author: Idan Hecht, Israel

Purpose:

Intraocular lens (IOL) subluxation is a well-documented complication of cataract surgery. Intra scleral flanged technique has previously been described as an effective alternative to trans scleral fixation for secondary IOL implantation. Our aim is to present a series of cases in which the Four-flanged technique was used in the management of in-the-bag IOL subluxation.

Setting:

Shamir medical center, Israel.

Methods:

Included were consecutive cases with secondary IOL subluxation that underwent scleral fixation with the Four-flanged technique using 6-0 polypropylene and low temperature cautery. Surgeries were performed during September 2019 to April 2020. Postoperative IOL angle tilt was evaluated using high-resolution optical coherence tomography.

Results:

Eleven eyes of 11 patients were included. Mean age was 82.7 ± 5.5 years and 60% were male. Pseudoexfoliation was noted in 82% of patients and only one case was related to trauma. Mean BCVA postoperatively was within one line of the original pre-subluxation BCVA (0.55 ± 0.41 vs 0.54 ± 0.6 LogMAR, $p=0.965$). Mean postoperative IOL tilt was 5.78 ± 3.85 Degrees. Surgery duration decreased from 70 ± 14 minutes to 39 ± 15 minutes (first to last operations). No intra operative complications were reported. Postoperatively, transient intraocular pressure elevation which resolved at one week was recorded in 45% of cases. Cystoid macular edema was seen in two patients.

Conclusions:

Among a cohort of patients with secondary in-the-bag IOL subluxation, the Four-flanged technique was safe and resulted in satisfactory visual outcomes and a stable IOL position, with a short learning curve. We recommend considering this technique when approaching secondary in-the-bag IOL subluxation.



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PP149

Calcium phosphate removal from hydrophilic intraocular lenses: An experimental approach

Presenting author: Panos Gartaganis, Greece

Purpose:

Late calcification of hydrophilic intraocular lenses (IOLs) can be to a large extent problematic. Is it feasible to eliminate calcific deposits from opacified hydrophilic IOLs?

Setting:

1. Department of Ophthalmology, 251 Hellenic Air Force General Hospital, Athens, Greece 2. Department of Chemical Engineering, Laboratory of Inorganic and Analytical Chemistry, University of Patras and FORTH-ICEHT, Greece 3. Department of Ophthalmology, Medical School, University of Patras, Greece

Methods:

Experimental hydrophilic IOLs calcification was induced in simulated aqueous humor (SAH) and/or simulated body fluid (SBF), both supersaturated with respect to calcium phosphate. Experiments were done in an eye chamber reactor (ECR). Opacification was monitored by microscopy (optical and scanning electron microscopy). The elimination of calcific deposits from opacified hydrophilic IOLs by dissolution in the absence and in the presence of 1.0 mM Ethylene diamine tetra-acetic acid (EDTA), citric acid and ascorbic acid, was evaluated at constant pH 7.40, 37.0°C. All test solutions were undersaturated with respect to calcium phosphates. The removal activity was monitored for up to 30 days.

Results:

Experimental opacified IOLs due to calcification were exposed, in solutions undersaturated with respect to calcium phosphate, resulted in the reduction of deposits over 30 days. All test compounds resulted in the reduction of calcific deposits. Most effective removal of calcific deposits was obtained in the presence of 1.0 mM ascorbic acid and EDTA (80 and 60% respectively). The removal of calcific deposits was not uniform. Highest removal was found in the center of the convex part of the lens. This was attributed to the local higher undersaturation calculated from the fluid dynamics profile. Repeated cycles resulted in more extensive dissolution.

Conclusions:

Our experiments showed removal of calcific deposits on hydrophilic IOLs formed by exposure in solutions simulating aqueous humor in the presence of 1.0 mM ascorbic acid, EDTA and citric acid, in this order. In addition, dissolution is highest on the top of the curvature of the IOLs, where at flow conditions undersaturation is highest.



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PP150

Corneal endothelial cell loss associated to phacoemulsification

Presenting author: Bisera Velkovska, Macedonia, the former Yugoslav Republic of

Purpose:

The aim of this paper is to point out the impact of phacoemulsification, using the Divide and conquer technique, on the morphology and function of endothelial cells, as well as its advantages and disadvantages.

Setting:

-

Methods:

Prospective analysis of patients referred to the Eye Disease Clinic - Skopje, for cataract surgery. All patients are over 60 years old, grouped by age and sex. Patients underwent specular microscopy with pachimetry, refraction, visual acuity determination, tonometry and fundus examination, preoperatively, 7 days after surgery and 1 month after surgery. Specular microscopy analysis took into account the values of: endothelial cell density per 1 mm square, coefficient of variation, hexagonality and central corneal thickness. All patients were operated on the Infinity phaco system, with the Divide and conquer technique, by the same surgeon.

Results:

endothelial cell density was significantly reduced postoperatively by 18% in the first 7 days and by 33.3% after 1 month. The coefficient of variation of the cells increased by 11% in the first 7 days and the hexagonality decreased by 26% in the first 7 days. The CCT postoperatively is increased by 2.10% and returns to normal (+0.07%) in the next month. In terms of gender, the loss of endothelial leaflets is more pronounced in men, and in terms of age, in patients in the 7th decade, the loss is 21.3% after 1 month, and in patients over 70 years is 36.9%.

Conclusions:

Phacoemulsification affects the morphology and function of endothelial cells. This can be demonstrated postoperatively through altered parameters: endothelial cell density, polymorphism, and polymegatism. Also this effect is more pronounced with advanced age and in patients with hypermature cataract.

Cataract**PP151****Assessment of intraoperative capsular polishing on the development of posterior capsule opacification****Presenting author:** Andreea Fisis, Austria**Purpose:**

The aim of our study is to evaluate the effect of intraoperative lens epithelial cell (LEC) wash-out ('jet-polishing') on the development of early posterior capsule opacification (PCO).

Setting:

Vienna Institute for Research in Ocular Surgery, Hanusch Hospital, Vienna, Austria

Methods:

This randomised trial that included 80 eyes of 40 patients. Patients with age-related cataract and without ocular or systemic comorbidities that affect the LEC proliferation were included. A hydro-capsular polishing technique aimed at removing LEC was used. Without making physical contact with the capsular bag, polishing was done using a 30 Gauge cannula, to wash away adherent epithelial cells. One eye was randomly assigned to receive a hydro-capsular polishing and the contralateral eye served as control. The same type of IOL was be implanted in both eyes. Retroillumination photos, laser-flare meter measurements, visual acuity and Purkinje meter evaluation were performed.

Results:

Thirty-six patients completed the 6 months follow-up. The mean age of patients is 73.8 ± 7.9 years. The corrected distance visual acuity (BCDVA) was 0.04 ± 0.07 logMAR in the study group and -0.03 ± 0.10 logMAR in the control group ($p=0.85$). Two patients had an intraoperative capsular rupture, both on the non-polished eye. The difference in anterior capsule opacification at 6 months between the two groups was not significant. The presence of cells on posterior capsule at 6 months follow-up was slightly higher in the control group.

Conclusions:

Good visual performance was found in both the control and study eye. The final analysis will be presented at the 39th ESCRS Conference.

Cataract**PP152****Direct ophthalmic healthcare resource utilization and costs associated with the different single-piece monofocal intraocular lens types implanted during cataract surgery: Real-world evidence from Spain.****Presenting author:** Derek O'Boyle, Spain**Purpose:**

Cataract surgery is the most frequently performed surgical procedure in Spain and posterior capsule opacification (PCO) is the most common complication following cataract surgery. While Nd:YAG laser capsulotomy is the only effective treatment for PCO, it can place a financial burden on healthcare systems and be associated with a number of complications. The objective of this research was to provide a health economic analysis to estimate the post-operative costs associated with PCO and its treatment, Nd:YAG laser capsulotomy, according to different intraocular lens (IOL) types implanted at the time of cataract surgery.

Setting:

This research is a health economic analysis adapting the results from a clinical study of anonymised electronic medical records of cataract patients from two large Spanish regional hospitals of the Ribera Salud group in the Torrevieja-Vinalopó healthcare area who are main providers of ophthalmic procedures in the Alicante region.

Methods:

Adjusted odds for Nd:YAG capsulotomy at three years post-cataract surgery from the clinical study findings underpinned the economic analysis. Compared with the AcrySof IOL, the odds of requiring Nd:YAG capsulotomy for the other IOLs implanted at the study site were as follows: Zeiss Asphina (OR: 5.21), IOL Tech (OR: 5.74), Medicontur (5.86) and AJL IOLs (OR: 8.85) ($p < 0.001$ for each pairwise comparison). The Nd:YAG procedure and associated additional consultation visit costs were sourced from Valencian Community tariffs (2016-2018).

Results:

For those eyes undergoing the Nd:YAG procedure to treat PCO, the total average cost associated with treating PCO was €242.48. Per each cataract surgery and stratifying by the type of IOL, the post-surgery costs associated with each IOL were as follows, AcrySof (hydrophobic): €12.01, Zeiss Asphina (hydrophilic-with-hydrophobic surface): €62.57, Medicontur: €70.38, IOL Tech: €68.94, and AJL: 106.29 (hydrophilic). The reduction in post-operative costs associated with AcrySof over other IOLs ranged from a factor of 5.21 (vs. Zeiss Asphina) to 8.85 (vs. AJL).

Conclusions:

In this research, AcrySof IOLs were associated with reduction in costs related to Nd:YAG laser and its complications, ranging from a factor of 5.2 to 8.9 compared with Zeiss Asphina and AJL IOLs, respectively. Highlighting that the choice of IOL for cataract surgery, as a direct consequence of lower Nd:YAG rates, may translate into significant financial savings for Spanish hospitals and the healthcare system more generally. Furthermore, reducing the requirement for Nd:YAG capsulotomy could result in freeing up resources that could be reallocated elsewhere within the hospital, thus offering an opportunity to help alleviate demand on ophthalmic services.



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PP153

A Real-World Registry Evaluation of Satisfaction, Spectacle Independence and Vision Outcomes in German Patients Implanted with a Novel Wavefront-Shaping Presbyopia-Correcting Intraocular Lens

Presenting author: Harald Gaeckle, Germany

Purpose:

To report Real World patient satisfaction, spectacle independence, visual disturbances and vision outcomes with the ACRYSOF IQ Vivity and ACRYSOF IQ Vivity Toric Extended Vision IOL models DFT015, DFT315, DFT415, and DFT515 in German patients evaluated through routine clinical practice.

Setting:

Multicenter, ambispective registry study conducted in Europe, the UK and Australia evaluating the performance of bilaterally implanted ACRYSOF Vivity and ACRYSOF Vivity Toric IOL in a real world setting through routine clinical practice.

Methods:

This is a sub-analysis of subjects enrolled from German sites to date. After a minimum of 3 months post-op follow up per local clinical practice standards, subjects implanted with the AcrySof IQ Vivity and/or Vivity Toric IOL underwent subjective vision satisfaction and spectacle independence with validated PROMs questionnaires and patient reports of visual disturbances. We present the first interim analysis of outcomes observed at the enrollment visit to date.

Results:

Currently 27 subjects are enrolled from four German sites of which 95.8% present with Binocular UCVA $\geq$ 20/25. The need to wear glasses is low with subjects reporting never/rarely needing to wear eyeglasses in bright light to see up close 61.5%, at arm's length 84.6% or far away 88.4%. 92% are very/fairly satisfied with their sight, 96% report none/some difficulty with their sight in their everyday lives, 88.5% no difficulty seeing to engage in an activity/hobby of their interest. Visual disturbances rates are low - None halos 92.3%, glare 84.6% or starbursts 96.2% There are no unanticipated AEs to date.

Conclusions:

In this first Real World assessment of patients bilaterally implanted in Germany with the ACRYSOF IQ Vivity and ACRYSOF IQ Vivity Toric Extended Vision IOL suggests high levels of post-operative patient satisfaction with low needs to wearing spectacles and experiencing mild to none visual disturbances.

Cataract**PP154****Isopure: Patient satisfaction after implantation of a Premium Monofocal intraocular lens.**

Presenting author: Rafael Bilbao Calabuig, Spain

Purpose:

ISOPURE (PhysIOL, Liège, Belgium) is an enhanced posterior chamber, premium monofocal intraocular lens (IOL) based on the patented ISOFOCAL concept. The optic displays polynomial complex surface design parameters to extend the Depth of Focus compared to standard monofocal IOLs. The lens is purely refractive and fine-tuned for each dioptric power. The purpose of this prospective clinical data collection is to investigate first clinical outcomes and patient satisfaction after implantation of ISOPURE IOL during cataract surgery.

Setting:

Clinical Baviera/AIER Group, Madrid, Spain

Methods:

In this prospective study, 37 eyes of 22 patients (37 eyes) have been implanted monocularly or binocularly with ISOPURE. Follow-up examinations included: uncorrected Visual Acuity (UDVA), corrected distance Visual Acuity (CDVA), uncorrected (UIVA) and distance-corrected intermediate Visual Acuity (DCIVA) at 66cm and 80cm. Distance-corrected defocus curves were recorded between -2.5D and +1.5D in 0.5 D steps, except for ± 0.25 D in order to test for intermediate behaviour of the IOL. Contrast sensitivity was performed under mesopic and photopic conditions. Post-operative patient satisfaction and spectacle independence were measured by subjective Quality of Life (NEI RQL-42) and PRSIQ Questionnaires.

Results:

6 months postoperatively Monocular Mean Distance Corrected Visual Acuity CDVA, DCIVA (66cm), DCIVA (80cm) in logMAR are 0.02 ± 0.06 , 0.24 ± 0.13 , 0.19 ± 0.10 respectively. Mean Monocular Uncorrected Visual Acuity values for UDVA, UIVA (66cm), UIVA (80cm) in logMAR are 0.07 ± 0.08 , 0.26 ± 0.15 , 0.19 ± 0.15 , respectively. Defocus curves confirm a broad defocus profile with a range of $VA \leq 0.2$ logMAR: Monocular: -1.3D to +0.9D (77cm to ∞). Binocular outcomes: -1.6D to +1.2D (62cm to ∞). In patients implanted bilaterally, subjective questionnaires indicate high spectacle independence at far and intermediate distances (90.9%) and no adverse dysphotopic phenomena (90%).

Conclusions:

Clinical results show this enhanced monofocal IOL allows patients to experience high-quality vision at far distances and improved useful vision at intermediate distances without inducing undesirable photic effects. A high level of patient satisfaction and a very reasonable spectacle independence outcomes were also obtained. Compared to conventional monofocal lenses, this Premium monofocal IOL shows an improvement in the uncorrected intermediate vision outcomes so often required for many daily tasks.

Cataract**PP155****First functional results a toric EDOF-IOL with wavefront technology****Presenting author:** Annette Stengele, Germany**Purpose:**

About one third of all patients requiring cataract surgery show a corneal astigmatism. More and more patients wish to become independent from glasses. The implantation of this innovative toric EDOF-IOL (Sifi Mini WELL TORIC Ready®, Sifi S. p. A., Italy) is said to enable patients with a corneal astigmatism an independence from spectacles.

Setting:

Bilateral implantation of Sifi Mini WELL toric – IOL has been performed with seven patients as part of a multicentric trial in the International Vision Correction Research Centre (IVCRC) at the University Eye Clinic Heidelberg

Methods:

So far, 6 eyes of 3 patients have been terminally examined 6 months post implantation. The IOL-Calculation has been done with the ASSORT®-Calculator. One week, one month and six month after implantation we measured uncorrected and corrected visual acuity of 4m, 66cm and 40cm (monocular/binocular) as well as a binocular distance-corrected defocus curve have been determined. Contrast sensitivity, glare sensitivity and reading capability have been examined, too. Data regarding photic phenomena have been gathered by means of a questionnaire.

Results:

After 6 months, on average, 3 patients reached an uncorrected binocular distance vision of -0,04logMAR. An intermediate vision of -0,07 logMAR was determined. Near vision of 0,03 logMAR was assessed. In the scope of +1,00 dpt up to -3,00 dpt, the binocular distance-corrected defocus curve showed a vision of 0,2 logMAR or better. No patient recognized photic phenomena. Until late May, first results of four more patients six month post implantation will follow.

Conclusions:

Sifi Mini WELL TORIC Ready® -IOL showed good functional results in distance, intermediate and near visual acuity. It can thus be considered an alternative to toric multifocal IOL. By means of this toric EDOF-IOL, a complete independence from spectacles can be reached.



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PP156

Clinical Outcomes of a New Technology Extended Range of Vision Intraocular Lens

Presenting author: Omur O. Ucakhan, Turkey

Purpose:

To evaluate the clinical and visual outcomes and occurrence of photopic phenomena in patients with a presbyopia-correcting, extended range of vision intraocular lens (IOL) that uses non-diffractive design called X-WAVE technology (Acrysof IQ Vivity, Alcon Laboratories Inc, USA).

Setting:

Department of Ophthalmology, Ankara University School of Medicine, Ankara, Turkey

Methods:

In this retrospective case series, the files of the initial patients who underwent bilateral implantation with Acrysof IQ Vivity IOL, and had at least one month follow-up were evaluated. Uncorrected visual acuity at distance (UCDVA, 4 m), intermediate (UCIVA, 60 cm), near (UCNVA, 40 cm), and contrast sensitivity function were measured. Quality of vision and spectacle independence were assessed using a patient-reported visual symptom questionnaire.

Results:

Seven patients with the mean age of 65.29 ± 9.12 years were included into the study. At postoperative 1-month, UCDVA was 0.0 ± 0.0 logMAR in all patients, UCNVA and UCIVA were 0.17 ± 0.1 logMAR and 0.10 ± 0.06 logMAR, respectively. Nearly all patients (6/7) had 20/25 or better visual acuity at all three distances. Contrast sensitivity outcomes were within the normal limits for the normal population in photopic conditions. “Very good” to “excellent” patient satisfaction was obtained in regards to quality of vision and spectacle independence at the last follow-up examination, with none of the patients reporting dissatisfaction with the visual outcomes.

Conclusions:

The Acrysof IQ Vivity IOL provided excellent distance, intermediate and near visual acuity, with very rare occurrence of mild visual disturbances or spectacle dependence.

Cataract**PP157****Visual acuity and patient satisfaction of patients implanted with three presbyopia correcting IOLs****Presenting author:** MERCÈ GUARRO, Spain**Purpose:**

To describe and compare the binocular visual acuities and the patient satisfaction of patients implanted with three different presbyopia correcting IOLs (PC-IOLs). A non-diffractive PC IOL (Vivity) and two diffraction based models: ATLara (Zeiss) and Symphony (J&J) and a control monofocal IOL (AcrySof IQ, Alcon).

Setting:

Vallès Ophthalmology Research. Barcelona. None of the other authors has a financial or proprietary interest in any material or method mentioned. This research is supported by an IIT Grant (IIT#52863693) from Alcon.

Methods:

Prospective Randomized Controlled Trial with 3 study groups Vivity (n=14), ATLara (n=12), Symphony (n=9) and a control group (n=13). Three months follow-up. Patients were implanted bilaterally with the same IOL model. All surgeries were performed by the same surgeon and all functional examinations by the same two experienced optometrist. Visual Acuities were performed using ETDRS charts at distance (4m), intermediate (66cm) and near (40cm). Patient satisfaction was assessed using McAllinden test.

Results:

Results shown for Vivity; AT.Lara; Symphony and monofocal. LogMAR VAs: • Binocular BDCVA: -0.06; -0.04; -0.02; -0.06. • Binocular BDCIVA: 0.11; 0.16; 0.23; 0.24. • Binocular BDCNVA: 0.24; 0.27; 0.36; 0.45 With the McAllinden test, patients reporting “never” perceiving: • Glare: 86%; 82%; 88% 92% • Halos: 93%; 55%; 63%; 82% • Starburst: 71%; 45%; 50%; 69% Spectacle independence at • Distance: 100%; 100%; 88%; 100% • Intermediate: 93%; 91%; 75%; 77% • Near: 50%; 27%; 38%; 15%

Conclusions:

All three PC-IOLs present good distance VAs and better intermediate and near than monofocal control group. Spectacle independence with PC-IOLs is higher than for the monofocal, being slightly better in the case of patients implanted with Vivity. Patient satisfaction when perceiving Halos and Starbursts was higher with Vivity than other PC-IOLs, with a percentage of patients reporting “never” similar to the monofocal control group. The study is designed to include 20 patients per group. At the moment of the submission of this abstract recruitment is still ongoing. Results will be updated before the congress including a more detailed statistical analysis.

Cataract**PP158****Visual function after bilateral implantation of the Vivity EDOF IOL.**

Presenting author: Noel Bauer, Netherlands

Purpose:

To prospectively evaluate the visual function and subjective experience after bilateral implantation of a novel EDOF IOL.

Setting:

Dept Ophthalmology, University Hospital Maastricht, The Netherlands.

Methods:

In 48 eyes of 24 cataract patients phaco was performed with bilateral implantation of a new EDOF intraocular lens (IOL), ie Vivity Extended Range of Vision (Alcon, Ft Worth, US). Refraction was targeted for mini-monovision (0.25-0.50D myopia in non-dominant eye; emmetropia in dominant eye). EDTRS visual acuity at 4 mtr, and 66 and 40 cm was established 3 month postoperatively, as well as patient reported photic phenomena and the use of reading glasses.

Results:

Monocular CDVA were -0.04 ± 0.11 LogMAR in the dominant eye and -0.02 ± 0.09 LogMAR in the non-dominant eye. Binocular UDVA, UIVA and UNVA were -0.05 ± 0.09 , 0.04 ± 0.09 and 0.23 ± 0.11 LogMAR respectively. Halos and glare were reported in 12.5% and 12.5% of cases respectively. Reading glasses were not necessary in 39% of cases.

Conclusions:

The Vivity EDOF IOL provides excellent visual acuity results for far and intermediate distances, with few optical complaints. Reading glasses were not necessary in 39% of cases whilst using mini-monovision. Added patients data will be presented.

Cataract**PP159****Visual performance of isofocal extended depth-of-focus lens versus standard monofocal intraocular lens****Presenting author:** Carla Charbel, Spain**Purpose:**

ISOPURE 1.2.3 (PhysIOL, Liège, Belgium) is an enhanced posterior chamber, premium monofocal IOL based on the patented ISOFOCAL concept. The optic displays polynomial complex surface design parameters to extend the Depth of Focus compared to standard monofocal IOLs. This premium monofocal intraocular lens allows patients to experience high-quality vision at far distances and improved useful vision at intermediate distances without the after-effect of photic phenomena, typical to a Multifocal IOL. The purpose of this study is to investigate clinical outcomes after bilateral implantation of Isopure 1.2.3 or Micropure 1.2.3 (control lens) in patients undergoing routine cataract surgery.

Setting:

Miranza IOA Madrid, Spain Complutense University

Methods:

This ongoing prospective, multicenter, randomised, controlled, single-blind post-market clinical follow-up study whereby randomized patients undergoing routine cataract surgery had bilateral implantation of either Premium monofocal intraocular lenses (Isopure 1.2.3) (14/16 eyes) or a monofocal lenses (Micropure 1.2.3) (8/14 eyes). Follow-up examinations included: uncorrected Visual Acuity (UDVA), Mean refractive outcomes (MRSE), corrected distance Visual Acuity (CDVA), uncorrected (UIVA) and distance-corrected intermediate Visual Acuity (DCIVA) at 66cm and 80cm. Objective scattering index (OSI), Modulation Transfer Function (MTF), Halos and contrast sensitivity (CS) under photopic and mesopic conditions were compared too

Results:

Interim results at 1-3M show MRSE $0.04 \pm 0.37D$ and $-0.08 \pm 0.16D$ for Isopure and Micropure. Monocular CDVA, DCIVA (66cm), DCIVA (80cm) in logMAR are -0.01 ± 0.13 , 0.23 ± 0.08 , 0.16 ± 0.11 , respectively for Isopure and -0.04 ± 0.07 , 0.19 ± 0.11 , 0.16 ± 0.09 , respectively for Micropure. Monocular UIVA (66cm), UIVA (80cm) in logMAR are 0.19 ± 0.11 , 0.14 ± 0.10 , respectively for Isopure and 0.22 ± 0.11 , 0.15 ± 0.10 , for Micropure. Defocus curve follows the expected course allowing for far and intermediate vision. No statistical significant differences were found when OSI, MTF or Halo were compared. Concerning the CS, the interim outcomes showed statistical differences for 3cpd ($p=0.04$) and for 1.5cpd ($p=0.07$) under photopic and mesopic conditions respectively

Conclusions:

The preliminary results of our study indicate that the lens with an isofocal optical design to offer the patient better visual acuity and spectacle-independence at intermediate distance, has no negative impact on the far distance quality of vision both measured and perceived by the patient, in terms of VA, optical quality, halos or contrast sensitivity when results were compared to a monofocal lens



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PP160

First Results with a Refractive Segmental Blue Light Filter Low Add EDOF (+2.0D Add) IOL

Presenting author: Lena Beckers, Germany

Purpose:

Until now there exists no refractive segmental low add EDOF IOL with a blue light filter and near add of +2.0D. Therefore, the aim of this investigation was to evaluate the clinical outcomes in patients implanted with this EDOF IOL with a blue light filter.

Setting:

All surgeries were performed by one surgeon at the Breyer-Kaymak-Klabe Eye Surgery and Premium Eyes in Duesseldorf, Germany, member of the International Vision Correction Research Center (IVCRC.net).

Methods:

20 eyes of 10 patients with cataract and expected postoperative corneal astigmatism of under - 0.75D were included. In all eyes, a new low add EDOF IOL with +2.0D addition (Visiotis Progress+; IOL-Expert, Germany) was implanted. We assessed defocus capacity after 3 months postoperatively and compared it with defocus curves of other EDOF IOL. Halo and glare phenomena were evaluated by a patient questionnaire.

Results:

The defocus curve showed better intermediate and near vision compared to monofocal IOL and other refractive EDOF IOL. Evaluation of the patient questionnaire indicated less halo & glare phenomena than in diffractive trifocal MIOL and bifocal EDOF IOL.

Conclusions:

Visiotis Progress provides a new optical design. Independence from glasses with less halo and glare than trifocal MIOL was achieved. We implanted this EDOF IOL as Mini Monovision. Thus, the patients can see far, work in PC and laptop distance and read usual book- and newspaper print without glasses without suffering from photopic phenomena. We also implant this EDOF IOL in the Duesseldorf Formula mode as blended vision (target refraction in dominant eye is emmetropia and in the non-dominant eye -1.5D). This even enables patients to read small print.

Cataract**PP161****Real-World Evaluation of Blended Vision with a Refractive Low Add EDoF IOL with Blue Light Filter****Presenting author:** Detlev Breyer, Germany**Purpose:**

To improve near vision, refractive segmental low add EDoF IOL with blue light filter and with good far and intermediate vision can be implanted in a blended vision model (target refraction in non-dominant eye: -1.5D, dominant eye 0.0D). The aim of this analysis was to assess the question whether patients also benefit from this blended vision model with regard to postoperative defocus capacity, halo and glare phenomena and stereoscopic vision.

Setting:

All surgeries were performed at the Breyer-Kaymak-Klabe Eye Surgery and Premium Eyes in Duesseldorf, Germany, member of the International Vision Correction Research Center (IVCRC.net).

Methods:

Patients (20 eyes of 10 patients) underwent bilateral implantation of refractive low add EDoF IOL with blue light filter (1.5D addition, Acunex Vario, AN6V; Teleon Surgical B.V., Netherlands). Target refraction was emmetropia in the dominant eye and -1.5D in the non-dominant eye. Three months after surgery, we assessed the real world binocular defocus capacity, halo and glare phenomena and stereoscopic vision.

Results:

The real world defocus curve showed significantly better intermediate and near vision compared to monofocal IOL. Halo & glare and stereoacuity were very similar to phakic eyes.

Conclusions:

Blended vision with Acunex Vario provides excellent visual outcomes across a wide range of distances from far to intermediate up to 60 cm. The photopic phenomena are comparable with other refractive EDoF IOL, but better than diffractive EDoF IOL. We mainly implant this EDoF IOL in the Duesseldorf Formula model as blended vision. Thus, the patients can see far, PC and iPad distance and read usual book- and newspaper print without glasses and without suffering from photopic phenomena. However, small print reading is not possible as with diffractive trifocal MIOL.



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PP162

Functional results of a new monofocal+ -EDoF- IOL based on different zones of 4th and 6th order spherical aberration: First interim results.

Presenting author: Mustafa Kamal Hallak, Germany

Purpose:

To evaluate a new generation of IOLs from Bausch+Lomb, its functional performance and visual outcomes at different distances with a dysphotopsia profile similar to a monofocal lens.

Setting:

International Vision Correction Research Centre (IVCRC), Department of Ophthalmology, University Hospital Heidelberg, Germany.

Methods:

In this ongoing prospective study, patients who received binocular implantation of a monofocal+ -EDoF- IOL with improved depth of focus based on 2 zones of 4th- and 6th-order spherical aberrations with different signs (LuxSmart IOL Bausch+Lomb Germany, USA) were examined. Functional outcomes, subjective refraction, corrected and uncorrected, monocular and binocular [logMar] visual acuity for distance, intermediate, and near, and binocular best-corrected defocus curve analysis were examined.

Results:

To date 9 eyes of 5 patients have completed the one month follow-up visit. The mean visual acuities were as follows: UDVA was 0.3logMAR monocular and 0.16logMAR binocular. CDVA was 0.15logMAR monocular and 0.06logMAR binocular. UIVA was 0.14logMAR monocular and 0.1logMAR binocular. DCIVA was 0.10logMAR monocular and 0.00logMAR binocular. The A-constant, which was not optimized at the time of initial implantation, resulted in small refractive error, which was then corrected during the course. The mean UNVA was 0.2logMAR monocular and 0.16logMAR binocular. The binocular best corrected defocus curve showed a visual acuity of 0.3logMAR or better from +0.5dpt. to -2.0dpt.

Conclusions:

The initial evaluations show that the LuxSmart Bausch+Lomb model can provide good functional results and good depth of field.



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PP163

First Evaluation of a New Refractive Low Add EDoF Toric IOL with Blue Light Filter

Presenting author: Verena Zeitz, Germany

Purpose:

The aim of this analysis was the evaluation of postoperative subjective refraction and rotational stability with a segmental, refractive extended depth of focus (EDoF) toric IOL with blue light filter.

Setting:

All surgeries were performed by a single surgeon at the Breyer-Kaymak-Klabe Eye Surgery and Premium Eyes in Duesseldorf, Germany, member of the International Vision Correction Research Center (IVCRC.net).

Methods:

Patients (n=10) underwent bilateral implantation of refractive low add EDoF toric IOL with blue light filter (+1.5D addition, Acunex Vario Toric, AN6VT; Teleon Surgical B.V., Netherlands). We assessed the subjective refraction and rotational stability after 3 months, postoperatively.

Results:

The subjective refraction and rotational stability was comparable to other toric IOL available.

Conclusions:

Acunex Vario Toric is the only low add toric EDoF IOL with glistering free blue light filter available right now. Therefore, we do have a further possibility to provide our patients with astigmatism and presbyopia with an option for an advanced independency of glasses in refractive lens exchange and cataract surgery.

Cataract**PP164****Visual performance of a non-diffractive extended vision intraocular lens: optical bench measurements and clinical outcomes.**

Presenting author: Luis Fernández-Vega Cueto-Felgueroso, Spain

Purpose:

To evaluate optical bench measurements and clinical outcomes of a non-diffractive extended vision intraocular lens (IOL) AcrySof Vivity (Alcon).

Setting:

Fernández-Vega Ophthalmological Institute, Oviedo, Spain.

Methods:

The optical quality was evaluated with the PMTF optical bench (Lambda-X). The through-focus modulation transfer function (MTF) curves and the MTF were recorded. The clinical study included 60 patients (120 eyes) who underwent bilateral cataract surgery with AcrySof Vivity IOL implantation. The more relevant inclusion criteria were age between 60 and 90 years old and axial length between 22.0mm and 25.0mm. Best-corrected distance visual acuity (CDVA), defocus curve, and distance contrast sensitivity were evaluated at 4-months.

Results:

The through-focus MTF curve showed an extended depth of focus from an object vergence of 0.0D to a 2.0D and considering a pupil transition from 4.5mm to 3.0mm. Regarding clinical outcomes, the mean age of the sample was 75.1 ± 7.0 years, with a mean pupil diameter of 4.74 ± 0.93 and 3.02 ± 0.64 mm under mesopic and photopic conditions, respectively. The mean CDVA (Snellen scale) was 0.93 ± 0.11 . The mean binocular CDVA at 66-, 50-, and 40-cm were 0.7, 0.6, and 0.5, respectively. Defocus curve showed an excellent tolerance defocus for ± 0.50 D. Binocular distance contrast sensitivity was within normal limits.

Conclusions:

The optical bench measurements were well correlated with the clinical outcomes. The clinical defocus curve and contrast sensitivity showed that AcrySof Vivity IOL provides satisfactory visual results for patients who meet the inclusion criteria of the study.

Cataract**PP165****Real-World Outcomes of a Novel Presbyopia-Correcting Toric IOL– Multi-country Registry (EVOLVE Study)****Presenting author:** Nic Reus, Netherlands**Purpose:**

To report the first real world results on visual acuity, refractive, and safety outcomes of the AcrySof IQ Vivity Toric Extended Vision IOL models DFT315, DFT415, and DFT515.

Setting:

Sub-analysis of an international, ambispective registry study conducted in Europe, the UK and Australia evaluating the performance of bilaterally implanted AcrySof Vivity and AcrySof Vivity Toric IOL in a real world setting through routine clinical practice.

Methods:

This is a sub-analysis of subjects enrolled to date and implanted with the toric version of the Vivity IOL. After a minimum of 3 months post-op and up to 6 months follow up per local clinical practice standards, subjects implanted with the AcrySof Vivity Toric IOL underwent visual performance assessments of visual acuity at distance, intermediate (66 cm) and near (40 cm) distances. Subject satisfaction, and spectacle independence recorded via validated questionnaires are reported. We present an interim analysis of outcomes observed at the enrollment visit.

Results:

To date, 129 subjects are enrolled, of which 21 subjects have been implanted with the Vivity Toric IOL. Binocular mean (SD) (logMAR) UDVA was 0.02 (0.08), UIVA 0.08 (0.11) and UNVA 0.24 (0.15). All eyes had ≤ 0.50 D of manifest refractive cylinder after surgery. 95.3% of subjects reported rarely or never wearing glasses at arm's length and 93.2% are satisfied with their sight. No halos, glare and starbursts were reported by 76.2%, 76.2% and 95.2%, respectively. There are no unanticipated AEs to date.

Conclusions:

Initial real world assessment of patients implanted with the toric version of the Vivity IOL suggests very good visual and refractive outcomes, high levels of patient satisfaction and a low need to wearing spectacles for distance and intermediate activities. Additional results on refractive outcomes and spectacle independence rates will be included in the paper.



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PP166

A Cost-effectiveness Analysis of AcrySof IQ Vivity IOL from Private Health Fund Perspective in Australia

Presenting author: Dr. Chandra Bala, Australia

Purpose:

AcrySof IQ Vivity is the first and only Extended Depth of Focus IOL (EDoF) with the Wavefront-Shaping X-WAVE technology and a clinically proven monofocal visual disturbance profile. The objective of this study was to conduct a cost-effectiveness analysis of AcrySof IQ Vivity IOL vs. standard aspheric monofocal IOL, from a private health fund perspective in Australia.

Setting:

Australia Private Health Fund Perspective

Methods:

A Markov model was developed using the following health states: well, need for spectacles(near/distance/progressive), severe visual disturbances (glare/haloes/starbursts) – with/without spectacles, and death. Model inputs (transition probabilities, discount rates, utilities, and event rates) were sourced from a randomized clinical study (NCT03010254), published literature, and expert opinion. IOL costs (Vivity-AU\$615, and AcrySof SN60WF- AU\$290) were derived from the published prostheses list. A lifetime time horizon (30 years) was considered, and cost and health outcomes were discounted at 5% per annum. Model outcomes included incremental cost-effectiveness ratio (ICER) per quality adjusted life year (QALY) gain. Sensitivity and scenario analyses were also conducted.

Results:

Bilateral implantation of AcrySof IQ Vivity IOL provided greater vision related quality of life (QALY gain of 0.16) at an incremental lifetime cost of AU\$312 vs. monofocal IOL. Vivity incremental cost effectiveness ratio (ICER) vs. monofocal IOL was AU\$1,935/QALY, which is well below the medical technology cost-effectiveness thresholds (range: AU\$45,000-AU\$75,000) recommended by the Australian authorities. Results were most sensitive to the cost of IOL prosthesis, post-operative spectacle dependence, and disutility due to wearing glasses. The robustness of results was further confirmed by one-way sensitivity analysis, probabilistic sensitivity analysis, and scenario analyses.

Conclusions:

AcrySof IQ Vivity is a presbyopia correcting IOL that is highly cost-effective treatment strategy and provides improved vision-related quality of life outcomes for patients.

Cataract**PP167****Clinical outcome and optical quality after bilateral implantation of the TECNIS Eyhance® intraocular lens****Presenting author:** Lucas Nicola Steinmüller, Germany**Purpose:**

Evaluation of visual performance and optical quality of the TECNIS Eyhance® intraocular lens compared to a monofocal aspheric IOL.

Setting:

Department of Ophthalmology, Charité-Medical University Berlin, Germany

Methods:

After phacoemulsification, a total of 40 patients (80 eyes) are bilaterally implanted with either TECNIS Eyhance® (monofocal IOL) or TECNIS® ZCB00 (monofocal IOL). Assessments including subjective refraction, distance, intermediate and near visual acuity, defocus curves, contrast sensitivity under photopic, mesopic and mesopic conditions with glare, higher-order aberrations (HOA) and patient satisfaction were performed one and three months after surgery.

Results:

The study groups currently consist of 28 eyes in the Eyhance® group and 12 eyes in the ZCB00 group. At 1-month follow-up, the Eyhance® showed better results in binocular distance-corrected intermediate visual acuity (0.00 ± 0.06 vs. 0.20 ± 0.06 logMAR) and in distance-corrected near visual acuity (0.20 ± 0.11 vs. 0.38 ± 0.04 logMAR), while no difference was found between groups in binocular corrected distance visual acuity (-0.13 ± 0.09 vs. -0.15 ± 0.09 logMAR). Measurements of internal HOA revealed greater negative primary spherical aberration (SA) in the Eyhance® group at a pupil size of 5 mm.

Conclusions:

The TECNIS Eyhance® provided superior outcomes at intermediate and near distances and comparable outcomes at far distance. The contrast sensitivities under photopic, mesopic and mesopic glare conditions are not inferior to the TECNIS® ZCB00. According to the current intermediate state, the TECNIS Eyhance® IOL can be considered as an interesting alternative to EDOF-IOLs.

Cataract**PP168****Post-market clinical follow up study to determine safety and efficacy of a hydrophobic trifocal intraocular lens POD L GF in comparison to a multifocal EdoF intraocular lens**

Presenting author: Florian Kretz, Germany

Purpose:

To compare clinical results for functional vision in different distances comparing a trifocal intermediate dominant IOL to a diffractive EdOF IOL.

Setting:

Precise Vision Augenärzte, Augentagesklinik Rheine, Germany

Methods:

Evaluation of the visual results, 1 day, 1 week, 1 month and 6 months postoperatively. Visual acuity was measured via ETDRS charts, Contrast sensitivity mesopic/photopic was evaluated with and without glare. Near and intermediate visual acuity was assessed 6 months after binocular surgery.

Results:

1 month: spherical equivalent [D] for Symphony was $-0,07[+/-0,2]$ for Pod L GF $-0,38[+/-0,37]$; CDVA [logMAR] for Symphony was $0,05[+/-0,13]$ (4 m); $0,27[+/-0,14]$ (40 cm); $0,05[+/-0,08]$ (66 cm); $0,04[+/-0,07]$ (80 cm). CDVA for Pod L GF was $-0,04[+/-0,05]$ (4m); $0,24[+/-0,07]$ (40 cm); $0,12[+/-0,04]$ (66 cm); $0,1[+/-0,05]$ (80 cm) 3-6 months: spherical equivalent [D] for Symphony was $-0,31[+/-0,34]$, Pod L GF $0,02[+/-0,15]$; binocular CDVA [logMAR] for Symphony was $-0,08[+/-0,05]$ (4 m); $0,2[+/-0,07]$ (40cm); $0,02[+/-0,11]$ (66 cm); $0,05[+/-0,11]$ (80cm). Defocuscurve: Symphony CDVA better than 0,20 logMAR from +1,50D to -2,0D. Pod L GF CDVA > 0,20 logMAR from +1.50 D to -3.0 D.

Conclusions:

Both IOLs show very good visual results for far and intermediate distances. The Pod L GF (PhysIOL) presents better results for near vision with. Both IOLs the Trifocal as well as the EdoF IOL show a stable defocuscurve with a high plateau. The Tecnis Symphony, as well as the Pod L GF are highly recommendable for patients who wish for spectacle independence for far distance, while Pod L GF even allows a good near vision.

Cataract**PP169****Real World Vision Performance of a Novel Presbyopia-Correcting IOL in Subjects with Altered Cornea – A Multi-country Registry (EVOLVE Study)****Presenting author:** Lea Kleineberg, Germany**Purpose:**

To report real world binocular distance, intermediate and near photopic visual acuities and visual disturbances of Acrysof Vivity and Acrysof Vivity Toric IOLs implanted in a subgroup of subjects with altered corneas

Setting:

Multicenter, ambispective registry study conducted in Europe, the UK and Australia evaluating the performance of bilaterally implanted Acrysof Vivity and/or Acrysof Vivity Toric IOL in a real world setting through routine clinical practice

Methods:

This is a sub-analysis of subjects with altered corneas enrolled to date. After a minimum of 3 months post-op follow up per local clinical practice standards, subjects implanted with the Acrysof Vivity and/or Acrysof Vivity Toric IOL underwent visual acuity assessments at distance, 66 cm and 40 cm (logMAR) and non-prompted visual disturbances (halos, starbursts and glare) were documented. We present the first interim analysis of outcomes observed at the enrollment visit to date.

Results:

Currently, 17 subjects with ocular comorbidities have been enrolled. Altered corneas to date include post-LASIK, corneal dystrophy or dry eye. Binocular mean logMAR BCDVA was 0.018 (0.062); DCIVA 0.143 (0.123) and DCNVA 0.202 (0.194). Binocular mean logMAR UCDVA was 0.060 (0.082); UCIVA 0.134 (0.113) and UCNVA 0.228 (0.205). No halos, glare and starbursts were reported by 88.9%, 83.3% and 88.9% of subjects. There are no unanticipated AEs to date.

Conclusions:

In this real world assessment of patients presenting altered corneas and bilaterally implanted with the Acrysof Vivity or Acrysof Vivity Toric IOL have shown very good distance, intermediate and near visual outcomes and very low levels of visual disturbances. The study enrollment continues and additional data may be presented during the meeting.

Cataract**PP170****Predicted optical quality and halos with the Vivity EDF IOL in post-LASIK patients****Presenting author:** Susana Marcos, Spain**Purpose:**

Patients that have undergone LASIK refractive surgery (particularly those who had the procedure decades ago) show excessively high amounts of corneal spherical aberration (SA, positive post myopic LASIK and negative post hyperopic LASIK, linearly correlated with pre-op spherical errors, SE). We investigated the impact of post-LASIK treatment on the optical performance of the new AcrySof™ IQ Vivity™ Extended Vision Intraocular Lens (IOL) in comparison with the AcrySof™ IQ monofocal IOL and predicted the effect of corneal aberrations on the optical depth of focus (DOF) and halos with this extended depth of focus IOL.

Setting:

Visual Optics and Biophotonics Lab, Institute of Optics, Consejo Superior de Investigaciones Científicas, Madrid, Spain; Fundación Jiménez-Díaz, Madrid;

Methods:

Computer model eyes were built with simulated post-LASIK corneas (Marcos et al 2001 Llorente et al 2004) and the Vivity/Acrysof IOLs (proprietary designs by Alcon). LASIK surgeries had been performed >20yrs ago using Technolas 217-C excimer laser, Bausch&Lomb. Five corneas (pre-LASIK SE: -7.5—+4.5D, with post-LASIK SA -1.15—+0.78 μ m) and a virgin cornea (0.28 μ m SA). Optical aberrations were obtained by ray tracing on the model eyes. DOF was estimated as the dioptric range above which optical quality (Visual-Strehl, VS) was above 0.12 ($\pm$ 0.2logMAR). Halos were estimated as the diameter of the image of a point source that encircles 50% of the total energy.

Results:

VS@far was >0.8 in virgin corneas both for Vivity EDOF (V) and Acrysof Monofocal (M) and ranged similarly from 0.23-0.54 from post-7.5—-2.5D and +4.5D LASIK for both IOLs (5-mm pupils). VS@near was 0.25-0.27 with Vivity and 0.17-0.11 with Monofocal (3-mm). DOF_V was 1.29 higher than DOF_M in virgin corneas and 1.19 in post-LASIK corneas (3-mm). The variation of DOF across post-LASIK eyes was 0.06 with Vivity and 0.26 with Monofocal. In virgin corneas and -2.5 post-LASIK, the halo metric was <2.2 arcmin for Vivity and Monofocal. Larger halos (by 2.5-1.8 arcmin) occurred with monofocal than with Vivity in -7.5 and -4.5D post-LASIK.

Conclusions:

The Acrysof Vivity IOL increases Depth-of-focus in comparison with the Acrysof Monofocal IOL. Vision improvement with the Vivity at intermediate and near distances in comparison with the monofocal occurs both in normal and post-myopic and post-hyperopic LASIK corneas. Depth-of-focus with Vivity was almost completely independent of the sign and amount spherical aberration. Also, Vivity reduced the apparent halo size in patients after moderate myopic LASIK in comparison with the Monofocal IOL. Computer eye modeling suggests that the Vivity IOL is well indicated in post-LASIK patients.

Cataract**PP171****Visual acuity and quality of vision after cataract surgery and diffractive-refractive extended depth of focus (EDOF) intraocular lens (IOL) implantation****Presenting author:** Anna Rodella, Italy**Purpose:**

To evaluate acuity and quality of vision after cataract surgery with diffractive and refractive extended depth of focus (EDOF) intraocular lens (IOL) implant for correction of pseudophakic presbyopia.

Setting:

Ophthalmology Unit, Department of Neurosciences, Biomedicine and Movement, University of Verona, Verona, Italy.

Methods:

In this prospective observational study 20 patients (40 eyes) underwent bilateral phacoemulsification and diffractive-refractive EDOF IOL implantation. After 3 months best distance corrected and uncorrected visual acuities at 4 meters, 80, 60, and 40 (near) centimeters (BCDVA, UCDVA, BC80VA, UC80VA, BC60VA, UC60VA, BCNVA, UCNVA), defocus curve, reading speed, contrast sensitivity, optical aberrations, objective Halometry, and NEI-42 questionnaire were evaluated. .

Results:

We obtained mean values of 0.04, 0.08, 0.18, 0.15, 0.20, 0.17, 0.17, 0.16 logMar for BCDVA, UCDVA, BC80VA, UC80VA, BC67VA, UC67VA, BCNVA, UCNVA, respectively. The average reading speed was 113 words/sec, the defocus visual acuity was higher than 0.4 logMar for values up to -3.50. The mean scotopic contrast sensitivity was 1.48, 1.57, 1.12, and 0.70 logCS at 3, 6, 12, and 18 c/deg. The mean total high order aberrations root mean square was 0,28 μ m. The mean Strehl ratio and MTF cut-off values were 0.11 and 20.3 c/deg respectively. The questionnaire indices indicated an excellent quality of life perception.

Conclusions:

The diffractive-refractive EDOF IOL implant allows satisfactory visual acuity at all tested distances and good reading performance. The contrast sensitivity is within the normal range and the perception of the quality of life is very high.



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Cataract

PP172

Real World Vision Outcomes of a Novel Presbyopia-Correcting IOL in Subjects with Ocular Comorbidities – A Multi-country Registry (EVOLVE Study)

Presenting author: FERNANDO Llovet-Osuna, Spain

Purpose:

To report Real World binocular distance, intermediate and near photopic visual acuities and visual disturbances the ACRYSO[®] IQ Vivity and ACRYSO[®] IQ Vivity Toric Extended Vision IOL models DFT015, DFT315, DFT415, and DFT515 implanted in a cohort of subjects with Ocular Comorbidities.

Setting:

Multicenter, ambispective registry study conducted in Europe, the UK and Australia evaluating the performance of bilaterally implanted ACRYSO[®] Vivity and ACRYSO[®] Vivity Toric IOL in a real world setting through routine clinical practice.

Methods:

This is a sub-analysis of subjects with ocular comorbidities enrolled to date. After a minimum of 3 months post-op follow up per local clinical practice standards, subjects implanted with the AcrySof IQ Vivity and/or Vivity Toric IOL underwent visual acuity assessments at distance, 66cm and 40 cm (logMAR) and non-prompted visual disturbances (halos, starbursts and glare) were collected. We present the first interim analysis of outcomes observed at the enrollment visit to date.

Results:

Currently 39 subjects with ocular comorbidities have been enrolled. Ocular comorbidities to date include Glaucoma, ARMD, Dry Eye, PCO, eye-lid related conditions, Vitreous Detachment, Pseudoexfoliation. Binocular mean (SD) (logMAR) UCDVA was 0.046 (0.081); UCIVA 0.123 (0.119) and UCNVA 0.272 (0.170). Binocular mean (SD) (logMAR) BCDVA was 0.005 (0.072); DCIVA 0.108 (0.117) and DCNVA 0.254 (0.159). No halos, glare and starburst were reported by 89.7%, 87.2% and 89.7% of subjects. There are no unanticipated AEs to date.

Conclusions:

In this Real World assessment of patients presenting ocular comorbidities and bilaterally implanted with the ACRYSO[®] IQ Vivity and/or ACRYSO[®] IQ Vivity Toric Extended Vision IOL we have observed very good distance, intermediate and near visual outcomes and high percentages of subjects without visual disturbances. The study enrollment continues and additional data may be presented during the meeting.



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PP173

Pinhole Intraocular Lens to Correct Presbyopia and Astigmatism in Eye with Regular and Irregular Cornea

Presenting author: Barbara Kusa, Italy

Purpose:

To demonstrate visual performance of the IC-8 small aperture IOL (AcuFocus, Irvine, CA) implanted in patients in whom a cataractous lens has been removed. Pinhole IOLs technology demonstrated to be the best available technology to be implanted in patients that have experienced previous RK or with irregular corneal astigmatism

Setting:

Piovella Global Center for Ophthalmology - Monza -Italy

Methods:

29 eyes with cataract, corneal astigmatism 1.50 ± 2.57 , had IC-8 IOL implantation. 21 patients experienced IC-8 IOL in the non-dominant eye and a monofocal IOL in the dominant eye. 4 Patients had bilateral IC 8 IOL implantation. One patient 20 years after RK

Results:

Results: The IC8 musk decreases halos and glare in aberrate cornea Up to 5 years in the IC-8 eye, UDVA is 20/20,56 UIVA is 20/20 at 80cm and 67 cm and UNVA is 20/20.5. In the monofocal eye, UDVA is 20/18, UIVA is 20/23 at 80cm 20/25.7 at 67cm and UNVA is 20/50. Binocular UDVA is 20/18, UIVA is 20/18.3 (80 cm and 67cm) and UNVA is 20/20.55

Conclusions:

Pinhole effect normally corrects up to two diopters of corneal astigmatism and overcome toric IOL management within this range. IC 8 is the most effective solution to correct presbyopia and astigmatism in eyes with irregular cornea

Cataract**PP174****Clinical outcomes of a novel Hybrid preloaded Toric IOL for presbyopia correction****Presenting author:** Bogdan Galan, Romania**Purpose:**

To evaluate the clinical outcomes of the novel Hybrid preloaded Toric IOL which combines EDOF and Diffractive Multifocal technologies.

Setting:

The study was performed in a single-center, Sanoptic in Iasi, Romania, by a single surgeon, Dr. Bogdan Galan

Methods:

A single-center, prospective, interventional clinical study. 32 eyes of 16 patients (age 56.7 ± 10.3) were included. After cataract surgery, all patients were implanted with the new Hybrid Tecnis Synergy IOL. Preoperative evaluation included a standardized questionnaire designed to evaluate the visual habits and demands of the patients. Postoperative evaluation at 3 months post-op included patient-reported outcomes. We utilized a standardized patient satisfaction questionnaire designed to critically assess functional vision and subjective quality of vision. In addition, at 3 months postoperative examinations included assessing monocular and binocular visual acuity, subjective refraction (UDVA, CDVA), defocus curve, contrast sensitivity, and rotational stability.

Results:

All 32 eyes completed the full set of pre-and 3 months postoperative assessments. At 3 months postoperatively mean binocular UDVA was $-0.06 \log\text{MAR}$ (± 0.05) and mean binocular CDVA was $-0.08 \log\text{MAR}$ (± 0.05). Mean binocular defocus curve showed mean VA better than $0.00 \log\text{MAR}$ between $+0.5\text{D}$ and -3.00D of defocus. The new Toric II platform proved to be rotationally stable with 1.04 degrees (± 0.7) at 1-month post-op. At 3 months mean binocular contrast sensitivity was 2.0, 1.9, 1.4 and 1.0 logCS for 3, 6, 12 and 18 cycles per degree respectively.

Conclusions:

Clinical measurements showed excellent visual quantity as measured by uncorrected and corrected DVA but also by the depth of focus as provided by this novel technology. Contrast sensitivity and patient-reported data on dysphotopsia confirmed that the new Tecnis Synergy IOL (DFW) provides a very good quality of vision. These clinical results have been reconfirmed by the patient-reported outcomes. All patient-reported very high satisfaction and full spectacle independence. No patient reported to be meaningfully bothered by dysphotopsia or be lacking quality of vision.

Cataract**PP175****Comparison of visual outcomes and contrast sensitivity of extended depth of focus lens and monofocal lens.**

Presenting author: Andrea Janekova, Czech Republic

Purpose:

To evaluate visual outcomes and contrast sensitivity of extended depth of focus lens Eyhance in comparison to monofocal lens.

Setting:

Faculty Hospital Kralovske Vinohrady, Prague, Czech Republic Eye Centre Prague, Prague, Czech Republic

Methods:

A prospective study based on evaluation of 40 eyes of 20 patients. Patients underwent cataract surgery with implantation of EDOF lens EYHANCE in one eye and monofocal lens in second eye. Inclusion criteria were no cornea, retina or optic nerve pathology and no previous refractive surgery. Corneal astigmatism up to 0.75 cylind. Patients were evaluated preoperatively for uncorrected and best corrected distance visual acuity. Postoperatively patients were evaluated in 3 and 6 months after the surgery for distance, intermediate and near visual acuity. Defocus curve was done at 6 month follow up. Contrast sensitivity was measured in mesopic condition.

Results:

At six-month follow-up the UCDVA in eyes with EDOF IOL was 1,16 (decimal) and 1,18 in eyes with monocular IOL, the UCIVA was 0.55 in eyes implanted with EDOF IOL and 0.38 in eyes implanted with monocular IOL. The UCNVA was almost similar in both groups (0,25 in EDOF IOL group and 0,23 in monocular IOL group) The defocus curve six months postoperatively shows a continuous range of vision (visual acuity above 0.2 logMAR) from 0 D to – 1,25D of defocus. Contrast sensitivity testing shows same average outcomes on all 4 tested spatial frequencies for both lenses.

Conclusions:

Eyes of patients receiving EDOF lens in current study attained as excellent visual outcomes for distances as eyes with monofocal lens and better visual outcome for intermediate than monofocal lens. Contrast sensitivity of eyes implanted with Eyhance IOL was same as in monofocal IOL group.

Cataract**PP176****Visual performance after implantation of a monofocal intraocular lens with enhanced intermediate function in cataract patients targeted for different levels of micro-monovision****Presenting author:** Andreas Scheider, Germany**Purpose:**

To evaluate binocular visual acuity, spectacle independence, prevalence of optical phenomena and patient satisfaction after bilateral implantation of a monofocal intraocular lens with enhanced intermediate function targeted for different levels of micro-monovision.

Setting:

Department of Ophthalmology, Kliniken Essen-Mitte, 45239 Essen, Germany.

Methods:

Prospective cases series. 76 eyes of 38 patients (72,4±8 years) with an astigmatism $\leq 0,75$ dioptres. Follow up 15±8,7 weeks. Incision in steep axis. Bilateral implantation of a Tecnis Eyhance ICB00 IOL. The dominant eye was aimed at emmetropia, the nondominant eye was aimed at - 0,25 - - 1,0 dpt. Postoperative visual acuity, contrast sensitivity, dysphotopsia, spectacle independence and patient satisfaction were assessed.

Results:

Mean binocular postoperative corrected distance, uncorrected distance, uncorrected intermediate, and uncorrected near visual acuities (decimal) were $0,03\pm0,08$, $0,07\pm0,14$, $0,13\pm0,15$ and $0,3\pm0,13$ respectively. Only two patients (5,3%) noticed mild dysphotopsia. The depth of focus for UDVA of 0,15 was $2,0\pm0,3$ dpt. Overall satisfaction was high. Spectacle freedom was 94,8% for distant and intermediate vision if the target refraction for the dominant eye was reached. 69,4% used reading glasses for smaller text. Spectacle freedom correlated with increasing levels of micro-monovision. In case of a postoperative myopic shift of the averaged refraction, near visual acuity improved with little deterioration of distance visual acuity.

Conclusions:

Bilateral implantation of the Tecnis Eyhance IOL with micro-monovision provides a visual rehabilitation with a large degree of independence from glasses for distance and intermediate vision and high patient satisfaction. Spectacle independence increased with increasing level of micro-monovision.

Cataract**PP177****Visual outcomes following implantation of an extended depth focus intraocular lens****Presenting author:** Joana Fernandes, Portugal**Purpose:**

To analyse the clinical outcomes after implantation of an extended range of vision intraocular lens (IOL), the TECNIS® Symphony, in a routine clinical setting.

Setting:

The study took place in ophthalmology department of Centro Hospitalar Vila Nova de Gaia / Espinho.

Methods:

A retrospective chart review was conducted for all consecutive patients of a single surgeon that underwent an uneventful phacoemulsification and TECNIS® Symphony intraocular lens (standard or toric version) implantation from October 2017 to January 2020. Monocular near and far visual acuity and the postoperative manifest refraction spherical equivalent (SE) were measured. Complications like the incidence of posterior capsular opacification requiring YAG laser capsulotomy, the need of laser enhancement to correct residual refractive errors, intraocular lens decentration and explantation requirement were reported. Patients were asked about their spectacle dependency and their level of satisfaction.

Results:

Eighty-two eyes of 42 patients were included in this study. At the end of the follow-up, the mean uncorrected distance and near visual acuity was $0.16 \pm 0.15 \log \text{MAR}$ and $0.20 \pm 0.11 \log \text{MAR}$, respectively. The mean SE after surgery was $-0.41 \pm 0.44 \text{D}$. Spectacle independence was high, with 66.7% never requiring reading spectacles. Most of patients reported mild or absent halos, glare or other photic phenomena. Patient satisfaction score for near, intermediate and far vision was 9.8 on a scale of 0 to 10. More than 97% of patients said they would choose the same IOL again and recommend the same procedure to their friends and family.

Conclusions:

The TECNIS® Symphony IOL achieved an excellent level of spectacle independence for distance, intermediate and near vision. The incidence of photic phenomena was minimal with a high level of patient satisfaction. This confirms the ability of the TECNIS® Symphony extended range of vision IOL to successfully restore visual function after phacoemulsification with a good safety profile.



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PP178

Alcon Acrysof® Vivity® - A new EDOF lens – Clinical and optical performance over 18 months

Presenting author: Kjell Gunnar Gundersen, Norway

Purpose:

To evaluate the clinical and optical performance of the new AcrySof® Vivity® EDOF IOL.

Setting:

Single surgeon eye clinic, Haugesund, Norway

Methods:

This study was a non-interventional single arm study of visual outcomes after successful bilateral cataract surgery or refractive lens exchange surgery with uncomplicated bilateral implantation of Alcon Acrysof® Vivity® IOL. All subjects were assessed during a single visit approximately 3 to 6 months after their surgery. Clinical evaluations included measurement of visual acuity at distance, intermediate and near, manifest refraction, defocus curve and subjective measures of visual quality.

Results:

60 study subjects (120 eyes) were enrolled. Our refractive target was either binocular emmetropia or up to -0.5D of myopia (mini-monovision) in the non-dominant eye. Planned Mean Refraction Spherical Equivalent (MRSE) was -0,25 D and we ended up with -0,27D. Uncorrected binocular defocus curve showed a peak of -0.04 (logMar) at -0,5 D of defocus, but with a broad performance profile. UCVA $\geq$ 0,2 (logMar) was observed between -2,5 and +1.25D of defocus indicating broad optical performance. Patient satisfaction was excellent with contrast sensitivity and dysphotopsia profiles comparable to monofocal IOL's.

Conclusions:

AcrySof® Vivity® EDOF IOL is based on a novel design using wavefront shaping technology. Theoretically, this lens is designed to provide a broad range of optical performance without sacrificing optical quality. Compared to previous reports of dysphotopsia after diffractive trifocal IOL implantation, this lens provides significantly less optical side-effects. Avoiding bilateral postoperative myopia presented the only significant clinical challenge using this lens.

Cataract**PP179****Postoperative visual performance with a X-Wave technology EDOF and trifocal diffractive intraocular lens****Presenting author:** Ertan Sunay, Turkey**Purpose:**

To evaluate and compare the clinical outcomes with a X-Wave technology EDOF and trifocal intraocular lens (IOL) during a 3-month follow-up.

Setting:

Veni-Vidi Eye Center and Uskudar University Department of Ophthalmology, Istanbul, Turkey

Methods:

Prospective comparative study including 40 eyes of 20 patients (42-80y) undergoing uneventful cataract surgery. Each patient was randomly assigned to one type of IOL, X-Wave EDOF (20 eyes) or trifocal (20 eyes). Visual, refractive changes and a questionnaire about patients' satisfaction and visual symptoms were evaluated in a 3-month follow-up. The binocular defocus curve was also measured at 3 months postoperatively.

Results:

No statistically significant differences between groups were found in postoperative uncorrected and corrected distance visual acuities ($P=0.413$). Postoperative 3 month uncorrected near, intermediate and distant visual acuities were 0,03, 0,14, 0,09 logMAR in X-Wave EDOF and 0,09, 0,12, 0,05 in trifocal groups respectively ($p_1=0.342$, $p_2=0.241$ $p_3=0.091$). Similar uncorrected near and intermediate and visual acuity were found during all follow-ups. Spectacle independence was achieved in most of the patients in both groups. Very few patients had complaints of halo and glare in trifocal group whereas no photopic symptoms were seen in X-Wave EDOF group.

Conclusions:

Both of the IOLs are able to provide an effective visual restoration which is maintained during a 3-month follow-up, with a clear benefit of the X-Wave EDOF IOL for the photopic symptoms.



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PP180

Aberrometric EDOF toric IOL: objective and subjective outcome in astigmatic patients

Presenting author: Guido Barosco, Italy

Purpose:

To evaluate acuity and quality of vision after cataract surgery with EDOF Mini Well toric (SIFI Medtech, Italy): IOL implant for correction of pseudophakic presbyopia and astigmatism

Setting:

University of Verona

Methods:

In this prospective observational study 20 astigmatic patients (> 1.5 D) underwent bilateral phacoemulsification and EDOF IOL implantation. After 3 months we evaluated: best distance corrected and uncorrected visual acuities at 4 meters, 80, 67, and 40 centimeters, defocus curve, contrast sensitivity, reading speed, and NEI-42 questionnaire

Results:

We obtained the following mean results: 0.02, 0.06, 0.06, 0.10, 0.12, 0.13, 0.13, 0.16 logMar for BCDVA, UCDVA, BC80VA, UC80VA, BC67VA, UC67VA, BCNVA, UCNVA, respectively. Postoperative SE was within ± 1 D in 91 % of patients and mean postoperative cylinder was 0.23 D. The defocus visual acuity was higher than 0.3 logMar for values up to -3.50 . The mean scotopic contrast sensitivity was 1.05, 1.09, 0.78, and 0.47 logCS at 3, 6, 9 and 12 c/deg. The average reading speed was 118 words/sec. The values of the questionnaire indicate good satisfaction of expectations, low activity limitations and glare perception

Conclusions:

The EDOF toric IOL implant allows satisfactory correction of astigmatism, good visual acuity at all tested distances as well as reading performance. The contrast sensitivity is included in the normal range and we registered high quality of life indices

Cataract**PP181****AcrySof® IQ Vivity® IOL - performance in clinical practice.****Presenting author:** Nikos Merkoudis, Sweden**Purpose:**

To evaluate the visual performance and patient satisfaction with the new non-diffractive extended depth of vision IOL AcrySof® IQ Vivity® IOL (model DFT015, DFT315, DFT415 and DFT515) after successful bilateral cataract surgery with uncomplicated IOL implantation.

Setting:

Optalmica Eyeclinics, Sweden. Private clinics. Single surgeon.

Methods:

Non-interventional single-arm analysis. 52 patients (age 63 ± 12 years) with bilateral implantation of DFT015-DFT515 were included. Healthy eyes and eyes with very small pigmentary changes in macula were included. Patient selection for IOLs pre-op was made based on patient need and clinical findings. The visual target was emmetropia in both eyes. Examinations were performed preoperatively, 1 week and 1 month after cataract surgery. The 1-week and 1-month visit included UCDVA and UCIVA measurements, the 1-month visit additionally included measure of BCVA and manifest refraction. Spectacle usage and patient satisfaction was assessed by patient questionnaires.

Results:

Uncorrected monocular distance visual acuity (UCDVA) of 20/20 Snellen chart or better was found in 88,2% of eyes at 1-month visit. No eye had UCDVA worse than 20/25. The uncorrected binocular intermediate visual acuity (UCIVA at reading distance of 60 cm) of 0.10 LogMAR or better was found in 96,4% of eyes. 67% and 33% of patients experienced none and minor visual disturbances respectively at 1-month visit. 38% and 8% of patients needed reading and computer glasses respectively. The overall patient satisfaction was 100%.

Conclusions:

The Vivity IOL provided good continuous visual acuity from intermediate to distance and the level of predictability in terms of refractive correction was high with both the toric and non-toric models. As an Extended depth of focus (EDoF) IOL, Vivity achieved a high percentage of spectacle independence, and little or no impact of visual disturbances on the patients' daily living. Patient selection and patient information is important in order to ensure the most suitable IOL for each patients needs.

Cataract**PP182****First clinical results of new Extended Depth of Focus (EDOF) IOL combining 4th and 6th order aberrations****Presenting author:** Pavel Stodulka, Czech Republic**Purpose:**

Prospective clinical study of bilateral implantation of LuxSmart (Bausch & Lomb, France) extended depth of focus (EDOF) intraocular lens (IOL). The IOL has a 2 mm EDOF centre created by a combination of 4th and 6th order spherical aberrations of opposite signs to improve intermediate vision while maintaining distance vision quality.

Setting:

Gemini Eye Clinic, Zlin, Czech Republic

Methods:

60 eyes of 30 patients were implanted with LuxSmart (Bausch & Lomb) lenses as part of routine cataract surgery. Follow-up examinations at 1 week and 1, 3, 6 months included Uncorrected Visual Acuity (UDVA), Corrected Distance Visual Acuity (CDVA), Uncorrected (UIVA) and Distance Corrected Intermediate Visual Acuity (DCIVA) at 80 & 66 cm, Uncorrected (UNVA) and Distance Corrected Near Visual Acuity (DCNVA) at 40 cm. Distance-corrected defocus curves are recorded between -2.5 D and +1.5 D in 0.5 D steps. CatQuest-9SF, spectacle independence questionnaire, contrast sensitivity (CS) and halo/glare are evaluated at 6 months.

Results:

6 months results show mean refractive outcomes (MRSE) 0.31 ± 0.43 D. Mean monocular CDVA is -0.03 ± 0.07 logMAR, DCIVA (80cm) is 0.09 ± 0.13 logMAR, DCIVA (66cm) is 0.17 ± 0.14 logMAR and DCNVA (40cm) is 0.38 ± 0.16 logMAR at 6 months. Defocus curve shows ≤ 0.2 logMAR range between -1.75 D to +0.75 D. Photopic CS is within normal range. Mesopic CS just slightly below with normal range with no impact of glare. So far 5 patients reported they need glasses for distance or intermediate, while 16 for near. 11 patients reported minor to moderate halo and 6 patients glare with no or very little bother.

Conclusions:

The first clinical outcomes with LuxSmart EDOF IOL provide high quality far and intermediate visual functions in terms of visual acuity, defocus curve, contrast sensitivity and spectacle independence questionnaire. Although distance corrected near visual acuity seems good, majority of the patients still needs spectacles. Some patients observe halo and glare which for the majority is not bothersome and corresponds to reported literature of other EDOF IOLs. The lens should thus provide expected quality of vision for active lifestyle reducing the spectacle dependency over monofocal IOLs.

Cataract**PP183****Visual quality and ocular aberrations after implanting a new aspheric monofocal IOL; a comparative study****Presenting author:** Ahmed Assaf, Egypt**Purpose:**

To evaluate the effect of increased central curvature of Tecnis-ICB00 intraocular lens optic on postoperative ocular higher-order aberrations (HOAs) and the patients' objective and subjective visual quality.

Setting:

A prospective randomized comparative study at Watany Eye Hospital

Methods:

Included in this study eyes with a senile cataract of N1-3 (LOCS III) scheduled for phacoemulsification. Eyes with other ocular comorbidities and or with intraocular complications were excluded. The total number was divided randomly into two groups; group A (Tecnis-ICB00) and group B (Tecnis-ZCB00, control). Preoperatively, biometry was done using a swept-source OCT biometer and targeting emmetropia for all eyes. Postoperative ocular HOAs were evaluated through mesopic and photopic pupils using OPD III (Nidek, Japan). Subjective mesopic contrast sensitivity with and without glare was measured. All Postoperative measurements were taken at least 2 months after the surgery.

Results:

The total number of eyes included in each group was 50. The mean postoperative spherical equivalent, UDVA, and CDVA showed no statistical significance difference between both groups. Binocular UIVA was significantly better with Tecnis ICB00. Mean ocular spherical aberration through mesopic pupil was significantly higher in group A than in group B ($P < 0.05$). No significant difference could be elicited when comparing total coma and trefoil in both groups. MTF was comparable between both groups. Mesopic CS with and without glare was lower in group A but did not reach a statistically significant level.

Conclusions:

New aspheric monofocal IOL results in increased postoperative ocular spherical aberration with no significant compromise on objective and subjective visual quality. Increased central curvature of the IOL optic didn't result in a higher incidence of postoperative coma aberration.

Cataract**PP184****Optical bench evaluation of different new generation monofocal IOL technologies****Presenting author:** Milind Pande, United Kingdom**Purpose:**

To evaluate in an optical bench the through focus performance and distance image quality of different new generation monofocal intraocular lens (IOL) technologies, designed to improve intermediate vision, and compare their performance to that of standard monofocal lenses.

Setting:

Johnson and Johnson Surgical Vision, AMO Groningen B.V., The Netherlands

Methods:

Optical bench testing in white light was performed using an eye model with the average chromatic and spherical aberration of the cornea for different pupil sizes. Distance image quality was evaluated using the Modulation Transfer Function (MTF). Through-focus simulated visual acuity (sVA) was calculated from the optical bench measurements using the optical transfer function as described in a previous publication from the same coauthors. Two enhanced monofocal IOLs (TECNIS Eyhance, model ICB00, and IsoPure, model IsoPure 123) and two standard monofocal IOLs: one aspheric (TECNIS monofocal, model ZCB00) and one spherical (SENSAR monofocal, model AAB00) were included.

Results:

The MTF results show that all IOLs provide similar distance image quality for 3mm pupil. For larger pupils, ICB00 and ZCB00 provide the highest MTF values, while for IsoPure and AAB00 the MTF reduces in 40%, or more, with respect to the MTF at 3mm. Distance sVA is similar for all IOLs at 3mm and reduces for IsoPure and AAB00 for larger pupils. At intermediate, ICB00 provides the highest sVA, 0.1 logMAR better than the aspheric monofocal IOL for all pupil sizes, while for IsoPure and AAB00 the improvement depends on the pupil size.

Conclusions:

The optical quality and simulated visual performance provided by two new generation monofocal IOLs, IsoPure and TECNIS Eyhance, was compared to that of two standard monofocal lenses. Preclinical data showed that IsoPure provides similar performance to a standard spherical monofocal IOL, with a strong pupil dependency at distance and intermediate vision, while TECNIS Eyhance, provides a sustained improvement in intermediate sVA and maintained distance image quality comparable to that of an aspheric IOL, independent of the pupil size.



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Cataract

PP185

Clinical Evaluation of a New Hydrophobic Acrylic Preloaded Intraocular Lens with a Novel Delivery System

Presenting author: Fook-Meng Cheong, Malaysia

Purpose:

To evaluate the clinical outcomes of patients implanted with a single piece hydrophobic intraocular lens (IOL) made from a new biomaterial (Clareon monofocal IOL) that is packaged as a preloaded IOL in a handheld automated disposable delivery device (AutonoMe).

Setting:

Multicentre private institutions

Methods:

This is a multi-centre retrospective review of patients who underwent uneventful phacoemulsification cataract surgery and implantation with this IOL. The primary outcome measures were the best corrected (BCDA) and uncorrected (UCDA) distance visual acuities at 1 month. Secondary outcome measures include refractive stability and predictability, contrast sensitivity as well as wound stretch and surgically induced astigmatism (SIA). 108 eyes were recruited into the study.

Results:

Mean logMAR BCDA and UCDA at 1 month were 0.06 ± 0.08 and 0.18 ± 0.17 respectively. 93.8% of eyes had BCDA of 6/9 or better. All eyes had BCDA of 6/12 or better. 80.9% of eyes had UCDA of 6/9 or better. 97.8% of eyes had UCDA of 6/12 or better. 90.9% of eyes were within 0.5D of refractive target and 68.7% were within 0.25D. Mean contrast values (logMAR) were 1.73 ± 0.18 at 3cpd, 1.91 ± 0.24 at 6cpd, 1.62 ± 0.25 at 12cpd and 1.09 ± 0.28 at 18cpd. Minimal wound stretch was noted with 2.2mm incisions and none with 2.4mm. Centroid SIAs were 0.10D and 0.23D respectively.

Conclusions:

The Clareon IOL provided excellent visual outcomes and had good refractive predictability. Contrast sensitivity was better than aged matched controls. The novel automated AutonoMe delivery system did not cause significant corneal wound stretch or induced post-op astigmatism.

Cataract**PP186****Changes in Straylight in the Immediate Postoperative Period after Cataract Surgery****Presenting author:** Nic Reus, Netherlands**Purpose:**

Straylight is an optical phenomenon where light is scattered in the eye thereby reducing the contrast of the retinal image. With cataract surgery, the opacified lens is replaced for a clear artificial intraocular lens (IOL). This leads to a decrease in straylight and subsequent improvement of visual disturbances. However, it is not known how the level of straylight changes in the immediate postoperative period and when it can be deemed stable. The purpose of the present study is to study the amount of straylight in eyes of patients in the immediate postoperative period.

Setting:

A prospective, single-center, single-surgeon pilot study with the objective to study the amount of straylight in eyes of 25 patients in the immediate postoperative period, study and compare the clarity characteristics of the Clareon and the Vivinex XY1 monofocal IOLs, and investigate which parameters may affect straylight after cataract surgery.

Methods:

Interim and sub-analysis of subjects enrolled to date. Patients underwent uncomplicated cataract surgery by means of phacoemulsification in both eyes, 2 weeks apart. One eye was randomly selected to be implanted with a Clareon CNA0T0 IOL (www.alcon.com); the fellow eye received a Vivinex XY1 IOL (www.hoyasurgicaloptics.com). Cataract surgery was performed in the visually worst eye first. Straylight was measured with the C-Quant straylight meter (www.oculus.de) preoperatively, and 1 day, 1 week, 1 month, and 3 months after surgery.

Results:

To date, 9 subjects have been enrolled; data up to 3 months have been obtained in 4. Preoperative straylight (mean [SD]) was 1.45 (0.19) log(s). Straylight 1d, 1w, 1m, and 3m after surgery was 1.24 (0.18), 1.10 (0.19), 1.14 (0.22), and 1.14 (0.24) log(s) for the Clareon IOL. For the Vivinex IOL, it was 1.40 (0.17), 1.14 (0.21), 1.11 (0.15), and 1.25 (0.18) log(s). Straylight values at 1w were statistically significantly lower than 1 day after surgery for both IOLs ($p < 0.05$). Straylight at 1 week was comparable to the pseudophakic norm ($p = 0.14$ and $p = 0.42$).

Conclusions:

Initial results show that straylight values already appear to be stable 1 week after uncomplicated cataract surgery. In addition, straylight values with Clareon and Vivinex XY1 IOLs are very comparable to the pseudophakic norm. As this study is ongoing, additional results will be presented in the paper.

Cataract**PP187****Refractive outcomes and safety of a new meniscus IOL designed to improve peripheral vision****Presenting author:** Eloy Villegas, Spain**Purpose:**

A new type of inverted meniscus IOL with convex surface facing the retina and aspheric surfaces (Art25, Voptica SL, Murcia, Spain) has been designed to improve peripheral optics providing better contrast sensitivity. We performed a study to evaluate the refractive outcomes, visual acuity and adverse events after Art25 implantation.

Setting:

Oftalvist Clinics (Murcia and Alicante, Spain), Optics Laboratory (University of Murcia, Spain)

Methods:

A group of 250 eyes of 171 patients with preoperative corneal astigmatism equal or below 1.5 D were implanted with Art25 IOL. From optical biometric measurements with IOL Master (Carl Zeiss), IOL power was estimated using the SKT formula, with A-constant of 120, targeting a postoperative refraction of emmetropia. For every patient, detailed measurements were performed at one month after cataract surgery: objective and subjective refraction, best corrected visual acuity (VA), slit-lamp biomicroscopy, intraocular pressure, corneal topography and retinography.

Results:

Average refractive outcomes were -0.10 ± 0.40 D, range $[-0.75, +0.50]$, for spherical equivalent and 0.68 ± 0.40 D, range $[0.00, 1.50]$, for astigmatism. Best corrected VA was equal or better than 0.0 LogMAR in 95% of the eyes, all better than 0.2 LogMAR. No surgery complications were noted during the Art25 implantation and no adverse events were reported at one-month follow-up except one posterior capsular opacification.

Conclusions:

The implantation of Art25 IOL provided null or small refractive errors and excellent visual acuity with a level of safety like any standard IOL.

Cataract**PP188****Decentering sensitivity of modern monofocal IOLs****Presenting author:** Stefan Pieh, Austria**Purpose:**

Modern monofocal intraocular lenses are optimized with regard to their sensitivity for decentration. Usually this results in a different extent of the spherical aberration corrections from the center to periphery of the IOL. The aim of this study on the optical bench is to compare the decentering sensitivity of selected monofocal implants.

Setting:

Department of Ophthalmology and Optometry, Medical University of Vienna

Methods:

On an optical bench with three different corneas that exhibits a spherical aberration of 0.1 μm , 0.2 μm and 0.27 μm , the Alcon (Clarion), Kowa (Avensee), Nidek (SZ1), Johnson & Johnson (ZCB00), Hoya (XY1), OphthamoPRO (Primus HD) and Zeiss (409MP) were examined with 20 D each. For each examination, the Strehl Ratio is determined with the best centration and decentration up to 0.5 mm in 0.1 mm steps. All measurements were done with green light.

Results:

Depending on the cornea used, the Strehl progression of each examination with increasing decentration are shown in a comparison diagrams. The ZCB00 as well as the Primus HD, that exhibit a high aberration correction, shows with the 0.2 μm cornea in case of good centration significantly better results, but this advantage is reduced with ongoing decentration.

Conclusions:

The spherical aberration of the individual cornea, as well as the aberration correction of the respective implant, as well as the expected decentering of the IOL, should be taken into account when selecting the IOLs for cataract surgery.

Cataract**PP189****Comparison of reading performance following implantation of an extended depth of focus, a bifocal, and a trifocal mfiol in different light and contrast conditions.****Presenting author:** MAMTA LAKHANA, India**Purpose:**

To evaluate and compare the binocular reading performance following implantation of a bifocal, a trifocal and an EDOF Multifocal Intra Ocular Lens (MFIOL) in different light and contrast conditions using a standardised reading desk.

Setting:

Nethradhama Super Speciality Eye Hospital, Bangalore

Methods:

Patients who underwent cataract surgery (30 in each group) with bilateral implantation of either of the following MFIOLs i.e. bifocal (tecnis MF +3.25 add), trifocal (ATLisa Tri) or extended depth of focus (symphony ERV), and well versed with English language were evaluated for reading performance using SRD at 6 weeks post-op. Assessments were done at patient preferred near distance and at different luminance and contrast conditions (30%, 75% and 100%). These results were compared with a control group which consisted of monofocal intra-ocular lens with near addition.

Results:

The groups were matched for age and reading distance. Mean patient preferred near reading distance was 39.1 ± 4.3 cm for bifocal group, 38.4 ± 5.7 cm for trifocal group and 40.2 ± 3.8 cm for EDOF group ($p=0.43$). At 100% contrast and luminance; bifocal, trifocal and EDOF group had reading speed of 128.88 ± 26.66 , 129.66 ± 48.49 and 130.41 ± 22.76 wpm respectively; while monofocal group had reading speed of 131.08 ± 33.62 . ($p=0.68$). At 75% contrast and luminance; monofocal (128.44 ± 33.62 wpm) and EDOF (127.41 ± 42.35 wpm) group had better reading speeds than other groups. At 30% contrast and luminance; Monofocal group performed best when compared to other groups with reading speed of 103.7 ± 22.4 wpm ($p=0.00$)

Conclusions:

All IOL groups performed well at photopic light (100%) conditions and the reading speeds were comparable. At mesopic light (75%) conditions, EDOF and monofocal group were better than other two groups. At scotopic light (30%) conditions, all groups had lesser reading speeds when compared to photopic reading speed. In scotopic conditions, Monofocal group performed the best. Financial disclosure of all authors: Dr. Sri Ganesh and Dr. Sheetal Brar are consultants for Carl Zeiss Meditec

Cataract**PP190****Visual outcomes and patient satisfaction after implantation of a presbyopia-correcting intraocular lens that combines EDOF and Multifocal profiles****Presenting author:** Tiago Ferreira, Portugal**Purpose:**

To evaluate clinical outcomes delivered by a new hybrid presbyopia-correcting intraocular lens: Tecnis Synergy ZFR00V IOL model (Johnson & Johnson Vision)

Setting:

Hospital da Luz Lisboa, Lisbon, Portugal

Methods:

A total of 27 patients undergoing bilateral IOL implantation were included. Visual acuity (VA) was measured for far distance, intermediate (66 cm) and near (40 cm) vision under both photopic and mesopic conditions. In addition, at the 3-month follow-up visit, the defocus curve was obtained for binocular vision and questionnaires were administered to measure spectacle-independence and level of satisfaction (QoV and Catquest-SF9) with the surgical outcomes.

Results:

At 3-month follow-up photopic VA values were: CDVA = -0.02 ± 0.07 , DCIVA = 0.03 ± 0.11 , DCNVA = 0.00 ± 0.08 , while mesopic VA values were: CDVA = -0.01 ± 0.05 , DCNVA = 0.07 ± 0.09 . The binocular defocus curve revealed that mean visual acuity was better than 0.30 LogMAR within the +1.00 D to -4.00 D, and better than 0.10 LogMAR between +0.50 D and -3.00 D. 3.7% of patients said they used spectacles in certain intermediate- or near-vision situations. As much as 88% of the patients reported being fairly satisfied or very satisfied.

Conclusions:

The Tecnis Synergy ZFR00V intraocular lens model used for cataract surgery is capable of restoring visual function while providing very good intermediate and near vision, under both photopic and mesopic conditions, resulting in a high level of patient satisfaction.



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PP191

Low Light Visual Outcomes and Satisfaction in Patients Implanted with a New Diffractive Presbyopia-Correcting Intraocular Lens

Presenting author: Robert Ang, Germany

Purpose:

The new presbyopia-correcting IOL (PCIOL), TECNIS Synergy IOL Model ZFR00V, combines the of both multifocal and extended depth-of-focus technologies. Postoperative visual acuity and patient satisfaction with vision under low-light and low-contrast conditions with this new PCIOL were compared to that of the PanOptix trifocal IOL, Model TFNT00, at 3-months postoperative.

Setting:

Multi-center clinical trial in private clinics

Methods:

This was a prospective, bilateral, multi-center, clinical trial with planned follow-up through 12 months. 183 adults requiring cataract surgery or refractive lensectomy with < 1.0 D of predicted post-operative corneal astigmatism in both eyes were randomized (2:1 ratio) and implanted with the Model ZFR00V (test) or the Model TFNT00 (control) and targeted for emmetropia. Binocular low contrast (25%) and mesopic (3 cd/m²) visual acuity data, as well as subject responses to a validated spectacle independence questionnaire (PRSIQ) were evaluated at 3 months (ZFR00V n = 111, PanOptix n = 58).

Results:

Mean photopic binocular low contrast BCDVA was 0.127 logMAR for ZFR00V subjects vs 0.174 logMAR for trifocal subjects. Additionally, a greater proportion of ZFR00V subjects achieved a mesopic BCDVA of ≤ 0.0 logMAR (48.6% vs 29.3%). These data also supported overall subjective questionnaire responses, where more test subjects reported being “completely”, “mostly”, or “moderately” satisfied with the ability to read menus in a dimly lit restaurant, see objects/read street signs in the evening/night, and see steps/curbs in the evening/night (93.6% vs 89.7%, 87.4% vs 82.8%, 96.4% vs 89.7%, respectively).

Conclusions:

The results of this study demonstrated that the PCIOL Model ZFR00V provided both a clinical and subjective benefit over the Model TFNT00 trifocal IOL in low-light and low-contrast conditions. Model ZFR00V offers additional vision quality benefit over the trifocal IOL for patients with nighttime visual concerns.

Cataract**PP192****Investigation of clinical outcomes after bilateral implantation of a hydrophobic trifocal intraocular lens FINEVISION TRIUMF (POD L GF)****Presenting author:** Francisco Poyales-Galán, Spain**Purpose:**

The purpose of this ongoing Multicenter prospective Post Market Clinical Follow-Up (PMCF) study is to evaluate outcomes after bilateral implantation of a hydrophobic trifocal non-toric intraocular lens (IOL), the new FinevisionTRIUMF (POD L GF), PhysiOL/BVI Medical. Only clinical results from Miranza IOA, Madrid, Spain will be given.

Setting:

Miranza IOA Madrid, Spain

Methods:

This ongoing prospective multicenter clinical study is planned for a maximum follow-up time of 12 months postoperative. The visual acuity and contrast sensitivity examinations were performed using Clinical Trial Suite (M&S Technologies, Niles, IL, USA). The first preliminary outcomes comprise manifest refraction, monocular visual acuity UDVA, CDVA (both at 4m), UNVA (40cm), DCNVA (40cm), UIVA (66cm), DCIVA (66cm), UIVA (80cm), DCIVA (80cm), at 6 and 12 months. Defocus curves and contrast sensitivity with follow-up of 6 months.

Results:

Preliminary results of 24 eyes at 4-6 months and 18 eyes at 11-13 months show mean Uncorrected Distance monocular VA (UDVA) 0.05 ± 0.14 and 0.03 ± 0.13 logMAR at 4-6 months and 11-13 months respectively. Mean Corrected Distance monocular VA (CDVA) -0.02 ± 0.12 and -0.02 ± 0.11 logMAR respectively. Photopic Mean UIVA (80cm) 0.13 ± 0.13 and 0.11 ± 0.12 , UIVA (66cm) 0.17 ± 0.15 and 0.13 ± 0.13 , UNVA 0.27 ± 0.15 and 0.19 ± 0.14 respectively. DCIVA at 80cm, 66cm, DCNVA 0.12 ± 0.15 and 0.09 ± 0.12 logMAR, 0.14 ± 0.14 and 0.11 ± 0.15 , 0.22 ± 0.12 and 0.16 ± 0.16 at 4-6 months and 11-13 months respectively. Defocus curves (4-6months) confirms broad range with VA ≤ 0.2 logMAR: Binocular: -3.0D to +1.2D (30cm to ∞).

Conclusions:

Implantation of the hydrophobic trifocal intraocular lenses FinevisionTRIUMF (POD L GF) allows for a safe and efficient restoration of near, intermediate, and far visual acuity on cataract patients undergoing lens exchange. Defocus curve confirms a broad visual acuity range. Finevision TRIUMF is a perfect trifocal lens for patients who desire intermediate over near vision without sacrificing reading ability. Superior intermediate visual acuity with TRIUMF can be further observed with a larger patient cohort in the final presentation.

Cataract**PP193****Clinical outcomes and patient satisfaction with a new set of complementary multifocal intraocular lenses.****Presenting author:** Juan F. Zapata-Díaz, Spain**Purpose:**

To evaluate the clinical outcomes and the complementarity of a set of multifocal intraocular lenses (IOLs) after the combined implantation of these 2 IOLs.

Setting:

VISTA Ircovisión Oftalmólogos, Murcia, Spain.

Methods:

Artis Symbiose Mid and Plus IOLs (Cristalens, France) were implanted in 30 patients, one in each eye. Exclusion criteria were any comorbidity affecting visual acuity including eye dryness (DEWS > 2), pupil outside the range 2-4 mm in photopic conditions and contraindication of a multifocal implant. Monocular and binocular defocus curves (DC), distance (4 m), intermediate (90 and 70 cm) and near (40 cm) visual acuities (VAs) were measured with ETDRS charts. Contrast sensitivity, patient satisfaction and light distortion were evaluated with the CSV-1000 (VectorVision, USA), the VF-14 questionnaire, and the Light Distortion Analyzer (BinaryTarget, Portugal), respectively.

Results:

Differences between monocular DCs of Artis Symbiose Mid and Plus IOLs demonstrated their complementarity, and the binocular DC showed a plateau curve from 0 to -3 D over 0.1 logMAR. Contrast sensitivity was within the normal values for the patients age range. Binocular uncorrected distance, intermediate (90 and 70 cm) and near VAs were -0.04 ± 0.08; 0.03 ± 0.13; 0.03 ± 0.11; 0.07 ± 0.11 (mean ± SD, logMAR). VF-14 score was 93.5 ± 7.1, and the binocular light distortion index was 9.88 ± 5.14 %.

Conclusions:

The Artis Symbiose Mid and Plus IOLs are complementary and able to provide patients with a binocular full range of vision in photopic conditions, with normal contrast sensitivity and low photic phenomena. Patient satisfaction was very high.



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PP194

Lid Scrub and Thermal Pulsation Treatment to Improve Tears Film Quality and Biometry Accuracy to Broaden the Use of Multifocal IOLs Safely

Presenting author: Barbara Kusa, Italy

Purpose:

To evaluate two systems Blephex (Scope Ophthalmics – Franklin – TN) and LipiView and LipiFlow (J&J /TearScience, Morrisville, NC) for the thermal pulsation treatment of Meibomian Gland Dysfunction(MGD) to improve quality of the tear film

Setting:

Piovella Global Center for Ophthalmology - Monza - Italy

Methods:

Since 2017, 411 patients (mean age 66.86 ± 11.76 years) were diagnosed with partial or total Meibomian glands occlusion by the LipiView lids transillumination. Patients received a LipiFlow treatment to remove obstructions and restore meibomian gland function. 101 of these patients received Blephex treatment immediately before since September 2019

Results:

We provide drops therapy for 2 months post treatment. Patients reported no discomfort or pain during or after treatment. Postop quality of vision improved due a better corneal tears film and provide more regular cornea to get more precise and comparable biometry results. We achieved 88% of patients with both eyes within 0.50 diopter as postoperative refractive result. 96% with one eye same refractive result.

Conclusions:

These systems provide an effective way to detect MG occlusion in MGD. It should be considered in order to optimize the tear film and visual outcomes. These treatments helps to adopt presbyopic implants up to 100% of cataract patients due to the biometry precise results.

Cataract**PP195****First clinical experience with a new pentafoveal IOL with double light-saving optics****Presenting author:** Roberto Bellucci, Italy**Purpose:**

A new hydrophilic acrylic pentafoveal IOL, the Intensity IOL, has been designed to exploit twice the light-saving optics already implemented in trifocal IOLs. The refractive focus is the intermediate one, and the distant (-0.75 D and -1.50 D) and the near foci (+0.75 D and +1.50 D) are obtained by diffraction. We report the first clinical experience with this IOL.

Setting:

Vista Vision Surgical Clinic, Verona, Italy

Methods:

Twelve patients were implanted bilaterally at cataract surgery. One month postoperative we investigated the uncorrected and corrected visual acuity (UDVA and CDVA), the automated and clinical refraction, and the defocus curve. The visual disturbances reported by the patients were collected through a questionnaire.

Results:

Mean age was 71 ± 10 years, mean IOL power was 20.4 ± 1.5 D. One month after surgery the automated refraction was -1.49 ± 0.66 D, and the clinical refraction was -0.30 ± 0.76 D. Monocular UDVA was 0.04 ± 0.07 LogMAR, and monocular CDVA was 0.01 ± 0.03 LogMAR. CDVA was better than 0.05 LogMAR from 0 D to -2.5 D defocus, and was better than 0.12 LogMAR from +0.5 D to -3.0 D defocus. Patients reported low halo and starburst in night vision.

Conclusions:

The new pentafoveal IOL provided excellent results in this study, with a very flat defocus curve and very low optical disturbances in night vision. Automated refraction appeared to pick-up the intermediate refractive focus, indicating myopia of about 1.25 D that was not found in clinical refraction.

Cataract**PP196****Trifocal IOL implantation after hyperopic corneal laser refractive surgery****Presenting author:** ROSARIO COBO-SORIANO, Spain**Purpose:**

Lens surgery with multifocal intraocular lens (IOL) implantation in postkeratorefractive eyes is a controversial subject with limited published experience. **PURPOSE:** To describe the visual and refractive outcomes of trifocal IOL implantation in eyes with previous hyperopic corneal laser refractive surgery and to ascertain the influence of the magnitude of laser refraction on post-lensectomy outcomes.

Setting:

Clinica Baviera-AIER-Eye group, Spain.

Methods:

DESIGN: Retrospective case series **METHODS:** We investigated the visual and refractive results of (1) the whole cohort composed of 549 consecutive eyes that met inclusion criteria; (2) the sample stratified into one-diopter steps subgroups of corneal laser-treatment; and (3) bivariate comparisons between low and high hyperopic ($\leq +3.0$ D vs $+3.0$ D) laser-treatment subgroups. Measures at the last visit were the following: Mean corrected and uncorrected distance and near visual acuity (CDVA, UDVA, UNVA), safety and efficacy, and refractive parameters (mean MRSE, and predictability results), and post-lensectomy enhancement and Nd:YAG-capsulotomy rates.

Results:

In the last visit postoperatively, visual and refractive outcomes of the whole cohort were the following: mean CDVA (0.06 ± 0.05), UDVA (0.09 ± 0.06), UNVA (0.17 ± 0.15) and MRSE (-0.07 ± 0.24 D) with 78% and 95% of eyes within ± 0.5 D and ± 1.0 D respectively. Percentage of enhancement and YAG-Capsulotomy were 13% and 21% respectively. Stratification of the sample by magnitude of laser treatment refraction showed a statistically significant decrease in post-lensectomy CDVA values and safety parameters with increasing magnitude of laser hyperopia correction, but good post-operative precision outcomes even in the high range of laser correction.

Conclusions:

Trifocal-IOL implantation in eyes previously treated with a prior hyperopic corneal ablation achieved excellent visual and precision outcomes in the low range ($< +3.0$ D) of laser correction, but worse visual and safety outcomes in the high-hyperopic ablation subgroup.



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PP197

Visual Outcomes in Patients Implanted with a New Diffractive Presbyopia-Correcting Intraocular Lens

Presenting author: Burkhard Dick, Germany

Purpose:

The new presbyopia-correcting IOL (PCIOL), TECNIS Synergy IOL Model ZFR00V, combines the benefits of both multifocal and extended depth-of-focus technologies. Postoperative visual acuity with this new PCIOL was compared to that of the PanOptix trifocal IOL, Model TFNT00, at 3-months postoperative.

Setting:

Multi-center clinical trial in private and university eye clinics

Methods:

This was a prospective, bilateral, multi-center, clinical trial with planned follow-up through 12 months. Adults requiring cataract surgery or refractive lensectomy with < 1.0 D of predicted post-operative corneal astigmatism in both eyes were randomized (2:1 ratio) to Model ZFR00V or the Model TFNT00 and targeted for emmetropia. Binocular visual acuity and defocus data were evaluated at 3 months (ZFR00V $n = 111$, TFNT00 $n = 58$).

Results:

Mean binocular photopic distance-corrected VA (DCVA) at far and near (40 and 33 cm) was ≥ 0.05 logMAR better for ZFR00V vs TFNT00 subjects (-0.06 vs -0.01 , 0.03 vs 0.08 , 0.08 vs 0.15 logMAR, respectively). At 66 cm, results were comparable (0.01 vs 0.03 logMAR, respectively). A greater proportion of ZFR00V subjects achieved ≤ 0.1 logMAR at all distances tested (far, 66cm, 40cm, and 33cm), where rates were 75.7% vs 50.0%. These results corroborate defocus data, where mean binocular DCVA of ≤ 0.1 logMAR was maintained from 0.0 D through 3.0 D defocus for ZFR00V and 2.5 D defocus for TFNT00.

Conclusions:

The results of this study demonstrated that the visual performance of Model ZFR00V exceeded that of Model TFNT00 at far and near distances.

Cataract**PP198****Outcomes of toric intraocular lens implantation during cataract surgery in patients with previous keratoplasty.****Presenting author:** Luca Furiosi, Italy**Purpose:**

To verify the effectiveness and safety of toric intraocular lens (IOL) in cataract surgery after deep anterior lamellar keratoplasty (DALK) and mushroom penetrating keratoplasty (MK).

Setting:

Villa Igea Hospital, Forlì, Italy

Methods:

This prospective study included consecutive cases of phacoemulsification with toric IOL implantation in eyes that had previously undergone either DALK or two piece MK. The control visits were scheduled at 1 day, 1 week, 1, 3, 6 months and 1 year. Each examination included: uncorrected and corrected distance visual acuity (VA), manifest refraction, corneal topography and anterior segment optical coherence tomography (OCT). Postoperative alignment of IOL was evaluated by AS-OCT.

Results:

42 eyes were included, 76.2% had previously undergone DALK and 23.8% MK. The mean follow-up was 8.02 ± 4.01 months. There was an improvement in the BCVA (from 0.65 ± 0.27 logMAR to 0.09 ± 0.11 logMAR) from preoperatively to the last follow-up ($P < 0.001$). Refractive spherical equivalent and astigmatism decreased (respectively, from -3.90 ± 3.45 D to -0.45 ± 1.71 , from 5.00 ± 1.66 D to -0.65 ± 1.17 D; both $P < 0.001$). The prediction error was $0.11 \pm 0.98 \pm 1.59$ D. The mean IOL rotation from the intended axis was $2.88^\circ \pm 2.90^\circ$.

Conclusions:

Cataract surgery with toric IOL implantation was safe and effective in reducing corneal astigmatism and improving visual acuity in a large cohort of post-keratoplasty eyes.



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PP199

One Year Clinical Outcomes of a Hydrophilic Trifocal Toric IOL For the Treatment of Astigmatism During Cataract Surgery

Presenting author: Robert Ang, Philippines

Purpose:

FINEVISION Trifocal Toric IOLs (POD FT, PhysIOL, Liège, Belgium/BVI Medical) are designed for the reduction of corneal astigmatism and are intended to reduce spectacle independence, providing near, intermediate and distance vision after cataract surgery. This ongoing prospective single centre, post-market clinical study investigates the visual outcomes and patient satisfaction after bilateral (or monocular) implantation of the POD FT trifocal toric IOL.

Setting:

Asian Eye Institute, Makati City, Philippines

Methods:

In this ongoing prospective study, 119 cataractous eyes (64 patients) with corneal astigmatism greater than 0.75 D underwent IOL implantation with FINEVISION Trifocal Toric (POD FT) IOL. Non-astigmatic, contralateral eyes were implanted with spherical POD F. Follow-up examinations included monocular uncorrected (UDVA), corrected distance VA (CDVA), uncorrected (UIVA) and distance-corrected intermediate VA (DCIVA), uncorrected (UNVA) and distance-corrected near VA (DCNVA). Distance-corrected defocus curves were recorded between -4.5D and +1.0D in 0.5 D steps. Contrast sensitivity was performed under mesopic and photopic conditions. Additionally, post-operative patient satisfaction and spectacle independence was evaluated using two questionnaires (QoV, NAVQ).

Results:

Interim results of 49 eyes at 11-13 months postoperative show mean refractive outcomes (MRSE) of 0.21 ± 0.41 D. Mean monocular CDVA, DCIVA, DCNVA in logMAR were 0.02 ± 0.07 , 0.06 ± 0.09 , 0.09 ± 0.10 , respectively. Mean monocular uncorrected values for UDVA, UIVA, UNVA in logMAR were 0.06 ± 0.09 , 0.07 ± 0.12 , 0.11 ± 0.11 . Defocus at 4-6M shows a broad range with VA ≤ 0.2 logMAR. Contrast sensitivity under mesopic and photopic conditions are within the normal band for this age group. NAVQ and QOV questionnaire outcomes indicate high patient satisfaction and rate of spectacle independence. The presentation will contain examination results of a larger patient cohort at 1 year follow up.

Conclusions:

Preliminary results after implantation of FINEVISION Trifocal Toric (POD FT) shows a reduction in astigmatism and very good restoration of visual function for near, intermediate and far distances after cataract surgery. All patients displayed a high rate of spectacle independence and the long-term outcomes at one year confirm these assumptions.



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Cataract

PP201

Long-term rotational stability results and long-term functional outcomes of two commonly implanted toric multifocal lenses

Presenting author: Maximilian Koppe, Germany

Purpose:

To evaluate the long-term stability results and long-term functional performance of two toric multifocal intra-ocular lenses (tMIOL).

Setting:

International Vision Correction Research Centre (IVCRC), University Hospital Heidelberg, Germany

Methods:

This ongoing prospective study includes 46 eyes of 25 patients who had phacoemulsification with uni- or bilateral implantation of the AT Lisa Tri Toric 939MP IOL (Carl Zeiss Meditech, Germany) or the Acrysof IQ ReSTOR Multifocal Toric SND1T2-5 IOL (Alcon, USA) between 3 to 10 years post-surgery. Main outcome measures were axial position, subjective refraction, corrected and uncorrected visual acuity, monocular and binocular [logMar] for distance, intermediate and near. A binocular and monocular best-corrected defocus curve analysis was performed. 27 eyes of 15 patients have completed the visit.

Results:

Mean rotational stability after a mean of 5 years was less than 5° for both IOL-models. For the Zeiss group, mean binocular visual results demonstrated UDVA, UIVA and UNVA values of $0,02 \pm 0,09$, $0,06 \pm 0,11$ and $0,16 \pm 0,1 \log \text{MAR}$, respectively. For the Alcon group, mean binocular visual results demonstrated UDVA, UIVA and UNVA values of $0,07 \pm 0,11$, $0,03 \pm 0,09$, $0,06 \pm 0,03 \log \text{MAR}$, respectively. The binocular best-corrected defocus curve of the Zeiss group showed a visual acuity of 0,18logMAR or better from +0.50dpt. to -3.0dpt. The Alcon group showed a visual acuity of 0.24logMAR or better from +0.50dpt to -3.0dpt.

Conclusions:

The AT Lisa Tri Toric 939MP as well as the Acrysof IQ ReSTOR Multifocal Toric SND1T2-5 demonstrate good long-term results in terms of rotational stability and functional results.

Cataract**PP202****Visual results of a new toric enhanced depth of focus intraocular lens****Presenting author:** Pascal Rozot, France**Purpose:**

To analyse visual results, residual astigmatism and satisfaction of the Eyhance TORIC™ intraocular lens, a new toric enhanced depth of focus (EDOF) intraocular lens (IOL).

Setting:

Clinique Juge, 13008, Marseille

Methods:

Retrospective study of 50 eyes of 42 patients with corneal significant astigmatism (72,2 year-old +/- 15, 36 to 87) who underwent uncomplicated phacoemulsification with . Micromonovision or minimonovision (-0,5D to -1,00D on the non dominant eye) was planned in 36% of patients. Analysis of postoperative uncorrected and best-corrected visual acuity at different distances, monocular and binocular focus curves and questionnaire for satisfaction and photic effects.

Results:

IOL toric EDOF IOL power varied from +15,5d to +28,0D with a cylinder between 1,00D to 4,50D. Mean distance binocular uncorrected visual acuity (VA) was 0,11 LogMAR +/-0,06 and mean binocular near uncorrected VA was J2 in 91% . Monocular defocus curve showed a mean depth of focus of 0,5D. Patient satisfaction was good or very good in 86%. 77% patients experimented diurnal light sensitivity in the first 2 months, non-disturbing haloes were present in 8%.

Conclusions:

The studied IOL toric EDOF IOL provided satisfying visual results; micromonovision or minimonovision brought less spectacle dependence and represents a valuable alternative of multifocal toric IOLs in cases of contra indications to multifocality, such as elderly patients with macular senescence or glaucoma.



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PP203

Phakic intraocular lens implantation for correction of keratoconus

Presenting author: Alexey Titov, Russian Federation

Purpose:

In this case series study, the aim was to evaluate the possibilities of posterior chamber implantation of phakic intraocular lenses (pIOL) to correct refractive errors associated with keratoconus.

Setting:

S. Fyodorov Eye Microsurgery Federal State Institution, Saint Petersburg branch

Methods:

Uncorrected distance visual acuity (UDVA), best spectacle-corrected distance visual acuity (BSCDVA), refraction and adverse effects were evaluated in 15 keratoconic eyes of 8 patients after 6 months with IPCL V2.0 model lenses (Care Group, India).

Results:

The mean pre-operative spherical equivalent and cylinder changed from -5.45 ± 2.72 D and -3.24 ± 1.48 D to -0.77 ± 1.32 D and -1.57 ± 1.51 D, respectively, 6 months post-operatively. Before the surgery the mean BSCDVA was 0.60 ± 0.25 . The mean UDVA and BSCDVA changed to 0.72 ± 0.25 and 0.89 ± 0.15 , respectively. No eye lost a line of visual acuity and 12 eyes gained one or more lines. No significant changes were seen in intraocular pressure, steep, flat and mean keratometry and endothelial cell. The crystalline lens was clear.

Conclusions:

The clinical outcomes of the current study demonstrate the safety, efficacy and predictability of the IPCL (toric and non-toric) in the correction of refractive errors associated with keratoconus. The patients' refractions achieved early stability and remained stable during the course of the study.



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Cataract

PP204

Toric Intraocular Lens Results considering Posterior Corneal Astigmatism with Online Calculators: Phacoemulsification vs Femtosecond

Presenting author: Joaquin Fernandez, Spain

Purpose:

To evaluate the prediction error obtained in Phacoemulsification (Phaco) or Femtosecond (Femto) surgeries without considering posterior corneal astigmatism correction (non-PCA) versus the correction based on Abulafia-Koch + Medcontur (AK) and Barrett calculators in toric intraocular lens (IOL) power calculation.

Setting:

Qvision, Ophthalmology Department, Vithas Virgen del Mar Hospital, Almería, Spain

Methods:

58 right eyes operated on with a monofocal toric IOL were retrospectively retrieved from our database. 28 and 30 eyes were allocated in two groups depending on surgery type, Phaco or Femto, respectively. Astigmatism prediction errors (PE) were evaluated considering the approach used for calculation of the implanted IOL power (AK) versus the estimation of PEs in non-PCA and Barrett formula. A doubly-multivariate analysis was conducted to assess differences between-surgery types, within-methods of calculation and interaction.

Results:

Mean centroid PE was significantly different between non-PCA, AK and Barrett approaches ($p < .0005$) and neither differences ($p < .239$) nor interaction ($p = .672$) between Phaco or Femto were found. Post-hoc univariate analysis showed a higher PE for the x-component of the non-PCA method versus AK (0.15 D, $p < .0005$) and non-PCA versus Barrett (0.18 D, $p < .0005$) but no differences were found between AK and Barrett (0.03 D, $p = 0.93$).

Conclusions:

Against-the-rule under-correction and with-the-rule overcorrection was found, either Phaco or Femto groups if PCA was not considered. Both, AK + Medcontur and Barrett calculators, correct mean centroid providing comparable clinical results.

Cataract**PP205****Prediction of residual astigmatism using intraoperative wavefront aberrometry versus multiple toric IOL calculators.****Presenting author:** Jorge Simão, Portugal**Purpose:**

The Barrett Toric IOL calculator offers excellent performance by including estimation of posterior corneal astigmatism and effective lens position. The option of including measured posterior corneal astigmatism is also available. Recently, the Kane Toric formula was introduced. Intraoperative Wavefront Aberrometry (IWA) is an alternative method for intraoperative IOL cylindrical power selection and axis refinement. In this study we compared the prediction of residual astigmatism by each of these methods.

Setting:

Centro Hospitalar e Universitário de Coimbra (CHUC), Coimbra, Portugal Clinical Academic Center of Coimbra (CACC), Coimbra, Portugal Faculty of Medicine, University of Coimbra (FMUC), Coimbra, Portugal Private practice - Unidade de Oftalmologia de Coimbra (UOC), Coimbra, Portugal.

Methods:

Prospective study with 60 eyes (60 subjects) implanted with a toric IOL (SN6ATx, Alcon) using IWA (ORA, Alcon) for intraoperative toric power selection and residual astigmatism prediction. Residual astigmatism for the same toric IOL power was back-simulated using the Barrett Toric calculator (with estimated (ePCA) and measured (mPCA) posterior corneal astigmatism), and the Kane Toric formula, using Oculus Pentacam keratometry data. Each suggested toric power by the calculator was noted. Subjective refraction was obtained 3 months postoperatively. The postoperative refractive astigmatism prediction error in the spectacle plane was evaluated by the centroid and the mean absolute error for each method.

Results:

The centroid prediction error was 0.15D@175±0.52 for Barrett ePCA, 0.15D@174±0.54 for Barrett mPCA, 0.22D@164±0.62 for IWA and 0.24D@179±0.54 for Kane. The Barrett ePCA showed the highest proportion of eyes with a prediction error within 0.50D, 0.75D and 1D with 62%, 90% and 93% (no improvement with mPCA), followed by IWA (50%, 75%, 92%) and Kane (50%, 80%, 92%). The chosen IOL cylindrical power (T) using IWA differed from the suggested IOL cylindrical power using the Barrett ePCA in 35/60 eyes (58%) and from the Kane in 44/60 eyes (57%), with tendency lower T values using IWA compared to the Barrett.

Conclusions:

The Barret Toric calculator had the lowest centroid and mean absolute prediction error. Measured posterior corneal astigmatism did not further enhance these predictions. The IWA device performed slightly better than the Kane Toric formula.

Cataract**PP206****Change of power and axis orientation of corneal astigmatism according to its size before and after cataract surgery****Presenting author:** Tsutomu Ohashi, Japan**Purpose:**

To evaluate the change of power and axis orientation of corneal astigmatism according to its size after cataract surgery

Setting:

Ohashi Eye Center, Sapporo, Hokkaido, Japan.

Methods:

94 patients (117 eyes) implanted with toric IOL were enrolled in this experiment (22 eyes with T3 Alcon TORIC IOL, 42 eyes with T4, 29 eyes with T5). We evaluated the change of power and orientation of steep meridian of corneal astigmatism before surgery and 1 month after cataract surgery by anterior Segment optical coherence tomography (CASIA2, Tomey, Japan). 2.4mm single plane temporal corneal incisions were used for phacoemulsification.

Results:

T3 group showed astigmatism change from $1.21 \pm 0.38D$ to $1.04D \pm 0.46D$ after surgery with orientation change 11.0 ± 10.41 degree. T4 group showed astigmatism change from $1.54 \pm 0.34D$ to $1.36 \pm 0.55D$ with 7.26 ± 6.57 degree. T5 group from 2.65 ± 0.78 to $2.41 \pm 0.83D$ with 5.62 ± 5.74 degree. Power change of each group showed $0.17D(T3)$, $0.18D(T4)$ and $0.24D(T5)$ respectively and with no significant difference. But change of axis orientation(T3) is significantly larger than those of T5 ($P < 0.05$).

Conclusions:

Patients with small amount of astigmatism (T3 group) showed a larger change of axis orientation of astigmatism compared to T5 group.

Cataract**PP207****Rotational stability and visual outcomes of two toric intraocular lenses for correcting astigmatism: plate versus loop haptics****Presenting author:** Andrea Lo Cascio, Spain**Purpose:**

Compare the rotational stability and refractive results of two toric IOLs with different designs: plate versus C-Loop. Visual expectations after cataract surgery are high. Among the factors that favor a good refractive result is the correction of astigmatism. One of the most used techniques for its correction is the implantation of toric intraocular lenses. It is known that the haptic design of the IOL is crucial to maintaining axial and rotational stability. The AcrySof toric IOL (Alcon) is a biconvex aspherical lens with open loop haptics enhanced with StableForce®. The AT-TORBI IOL (Zeiss) is a bitoric design with a 4-point platform

Setting:

The study time period was between 2017 to 2019 performed at the cornea department in Madrid, Spain

Methods:

A retrospective study including 69 eyes of 53 patients in two groups (Group 1: 30 AcrySof SNA6T. Group 2: 39 AT TORBI 709MP) who underwent phacoemulsification and toric intraocular lens implantation. Those patients with cataracts and astigmatism greater than 1.5 D in the corneal topography were included. Clinical criteria such as pre and postoperative visual acuity, type of astigmatism, as well as biometric parameters were evaluated through the IOLMaster 700 in addition to comparing refraction, residual astigmatism and lens rotation at 3 months postoperatively. All surgeries were carried out by the same surgeon

Results:

The mean age of the patients was 70.33 ± 11.16 years, similar for both groups. Preoperative corneal astigmatism in Group 1 was -3.85 ± 0.94 D and in Group 2 it was -3.13 ± 1.24 D. At 3 months postoperatively, visual acuity was 0.75 ± 0.23 (decimal) for both groups ($p = 0.8$), the mean residual refractive cylinder was -0.95 ± 0.58 D and -0.98 ± 0.79 D ($p = 0.9$) in Group 1 and 2, respectively. The mean rotation of the C-Loop design lens was $1.96 \pm 2.63^\circ$ and for the plate design it was $2.58 \pm 3.24^\circ$ ($p = 0.4$)

Conclusions:

Both types of toric intraocular lenses were equally effective in achieving good visual acuity and correcting pre-existing astigmatism, as well as being rotationally stable at 3 months of follow-up

Cataract**PP208****Improving corneal astigmatism measures for keratoconic eyes****Presenting author:** Noel Alpíns, Australia**Purpose:**

To evaluate multiple potential measures of corneal astigmatism and assess how well they correspond to manifest refractive cylinder for keratoconic eyes of varying severity. The intent is to find out whether it is possible to customize corneal astigmatism measurement for keratoconic eyes to better match the perceived visual image.

Setting:

Retrospective case series, NewVision Clinics, Cheltenham, Australia.

Methods:

Potential measures of corneal astigmatism are derived from raw total corneal power data derived from a corneal tomographer. The measures are derived from varying regions on the cornea, both in extent and center position. The measures of corneal astigmatism are evaluated according to their vectorial difference from the manifest refractive cylinder at the corneal plane, which is the ocular residual astigmatism (ORA). The lower the standard deviation of the ORA (ORAsd), the higher the correlation between the corneal astigmatism measure and the manifest refractive cylinder. The lower the mean of the ORA (ORAm_{ean}), the more accurate is the corneal measure.

Results:

ORAsds and ORAm_{eans} are calculated for all possible corneal astigmatism measures, which are derived from varying inner and outer annular extents, and centered on corneal vertex, thinnest point, front apex, and back apex, as well as pupil center. For each different annulus center, the annular extent that minimizes the ORAsd is reported. Results are stratified by keratoconus severity.

Conclusions:

Corneal astigmatism measures centered on thinnest point tend to correspond more closely with manifest refractive cylinder than other measures centered on corneal vertex, corneal apex (front or back), or pupil center. All custom measures outperform simulated keratometry. Optimization indicates that keratoconic corneal astigmatism measures need to be based at least in part on peripheral corneal power data. As keratoconus severity increases, so do both ORAsd and ORAm_{ean}. None of the corneal astigmatism measures correspond closely with manifest refractive cylinder for severe keratoconus.

Cataract**PP209****Modified Four-Flanged Intrasccleral technique of IOL fixation: 18 month clinical outcomes****Presenting author:** HEMANTH REDDY VANGA, India**Purpose:**

To report our 1 year clinical experience with the Modified Four-Flanged Intrasccleral IOL technique

Setting:

Nethradhama Super Speciality Eye Hospital, Bengaluru, India

Methods:

In this technique, the double needles are pre-prepared by feeding 6-0 prolene suture into the lumen of 27G needle, introduced into sclera 1.75 mm from limbus, the suture advanced within shaft of the needle. Once, suture is visible in the anterior chamber, it is grasped with a microforceps and exteriorized. Same is repeated on the other side, 180 degrees apart. Suture ends are passed through eyelets of a PMMA IOL, and cauterized to create flanges, following which IOL is positioned behind the pupil, outer sutures pulled anteriorly and cauterized to create two external flanges, which are then buried under conjunctiva

Results:

52 eyes of 52 patients (mean age 65 years) underwent the modified 4- flanged technique for management of aphakia. Intra-operatively, one eye each had haptic breakage, haptic slippage and IOL tilt. Post-operatively, 2 eyes had hypotony, 2 had IOL tilt, and one had flange exposure. The IOL position as seen on clinical photography and UBM remained stable and well centered throughout a mean follow up of 18 months

Conclusions:

The Modified Four-Flanged Intrasccleral IOL technique was safe and effective and provided stable results, without additional complications in the long term



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PP210

Intraoperative complications of modern phacoemulsification

Presenting author: Vadim Stebnev, Russian Federation

Purpose:

To analyze the nature, frequency and effectiveness of correction of intraoperative complications while performing high-tech phacoemulsification with IOL implantation.

Setting:

Ophthalmic clinic Eye Surgery, Department of eye diseases, Samara state medical University of Russia, Samara

Methods:

A prospective non-randomized study is devoted to the analysis of intraoperative complications in patients who underwent outpatient phacoemulsification surgery with IOL implantation. 1750 patients were operated. The IOL calculation was performed on the VERION Image Guided System; diagnostic system using the formulas Holladay II; and «Barrett Universal II»; with the formation of a personalized operation plan. All operations were performed in 3D-visualization using the digital system NGENUITY® 3D Visualization System; with the platform Digitally Assisted Cataract Surgery; (Alcon). Alcon implanted IOLs were monofocal, multifocal, toric, multifocal toric.

Results:

Of the 1750 operated patients, 19 (1.1%) experienced intraoperative complications during the surgery. The main surgical complication was the rupture of the posterior lens capsule in 15 (0.86%) patients, mainly without vitreous loss – 13 (0.74%).

Conclusions:

1. The number of intraoperative surgical complications when performing high-tech phacoemulsification with IOL implantation amounted to 1.1%. 2. Chief among them was rupture of the posterior lens capsule is 0.86%, mostly without loss of the vitreous body – 0,74%. 3. High-tech surgical management and correction of intraoperative complications occurred allowed in all cases to successfully resolve intraoperative complications, implant a posterior chamber IOL, smooth and without features of conduct of postoperative period and to obtain good anatomical and functional results.

Cataract**PP211****Choroidal and macular thickness changes following cataract surgery using spectral domain optical coherence: comparison between diabetic and non-diabetic patients****Presenting author:** Beatriz Lopes, Portugal**Purpose:**

According to the literature, cataract surgery, even under prophylactic anti-inflammatory treatment, can cause a subclinical increase in retinal and choroidal thickness, probably in response to the inflammatory reaction triggered by it. Although the effect on choroidal thickness is not yet completely understood, a recent meta-analysis suggested that diabetic patients were less likely to have an increase in choroidal thickness. The authors purpose is to evaluate and compare subclinical changes in retinal and choroidal thickness using spectral domain optical coherence tomography (SD-OCT) with Enhanced Depth Imaging (EDI) after uncomplicated cataract surgery in two groups of patients: diabetic and non-diabetic patients.

Setting:

This is a prospective, interventional, controlled study that took place at Ophthalmology Department in Beatriz Ângelo Hospital.

Methods:

Forty-nine patients, 23 diabetic and 26 non-diabetic patients, who were undergoing cataract surgery were recruited. One eye per patient was included. Both groups didn't have ophthalmological pathology other than cataracts and have been submitted to the same prophylactic regimen of topical non-steroidal anti-inflammatory therapy (ketorolac 3id). SD-OCT horizontal scans were performed preoperatively, 1 week, 1 month and 3 months postoperatively to measure subfoveal choroidal thickness (SFCT) and central macular thickness (CMT). The reliability of the sample size was tested at 0,05 significance level using statistical software Stata/MP version 14.1. The continues variables were evaluated with t-Student test.

Results:

Although there was a gradual and sustained increase in retinal and choroidal thickness after cataract surgery, over the three months in both groups, only the increase in mean CMT at one month in non-diabetic patients was statistically significant. The mean increase was $+13,73 \pm 5,62 \mu\text{m}$ ($P < 0.005$), which was not accompanied by a significant increase in choroidal thickness neither in non-diabetic ($+6,23 \pm 5,55 \mu\text{m}$ $p = 0,13$) or diabetic patients ($+3,69 \pm 5,44 \mu\text{m}$ $p = 0,25$).

Conclusions:

Nowadays, inflammatory insult caused by phacoemulsification is strongly counteracted by postoperative topical anti-inflammatory treatment. However, even with this approach, surgery can still induce changes in retinal thickness, which seems to be independent of choroidal thickness and less pronounced between diabetic patients.

Cataract**PP212****An investigation of the effects of temporary cessation of surgical activity on cataract surgery complications due to Covid-19 pandemic lockdown****Presenting author:** Korina Theodoraki, United Kingdom**Purpose:**

The covid-19 pandemic has had an unprecedented impact on medicine. In the first pandemic lockdown in the UK, elective surgery in ophthalmology ceased for 2 months. This generated a possible backlog of patients with more mature cataracts, while at the same time ophthalmic surgeons were unable to practice and maintain their microsurgical skills. The aim of this study is to explore the impact of such factors on the rate of complications associated with cataract surgery.

Setting:

Public Sector (National Health Service) University Hospital.

Methods:

A retrospective case review was undertaken of the electronic records for all patients who underwent cataract surgery by a consultant surgeon when elective activity was resumed after the 1st lockdown period in the UK (April 2020 to November 2020). A comparison was made with the cataract surgeries performed by the same consultant surgeons during the same time frame a year previously (April 2019 to November 2019). Fisher's exact tests were used to compare complication rates between the two time periods.

Results:

A total of 829 cataract surgeries were performed in 2019 and 375 in 2020. There were no differences in overall surgical complication rates, with 39 (4.7%) episodes in 2019 and 24 (6.4%) in 2020 ($p=0.27$). There were also no differences in posterior capsular rupture (PCR) rates between groups with 3 episodes in (0.36%) in 2019 and 3 (0.8%) in 2020 ($p=0.38$). In 2019 25.5% of cases had more than one risk factor for PCR while in 2020 25.6% of cases were deemed similarly high risk ($p=1.0$).

Conclusions:

For the same time period elective cataract surgical activity after lockdown was reduced by over 50% in 2020, probably due to restrictions imposed by the COVID pandemic such as social distancing within the hospital environment. However, there was no increase in the complications, suggesting that experienced ophthalmic surgeons are still able to operate safely despite a cessation/reduction of surgical activity for several weeks. In addition, the complexity of cases did not appear to be increased. It appears that the first COVID 19 lockdown in the UK had no implications on the rates of cataract surgery complications.

Cataract**PP213****Anterior chamber depth evaluation and intraoperative complications during cataract surgery in a population with and without pseudoexfoliative syndrome****Presenting author:** Joana Fernandes, Portugal**Purpose:**

To evaluate the depth of the anterior chamber in a population with cataracts with and without pseudoexfoliation (PEX) and its correlation with the occurrence of intraoperative complications.

Setting:

The study took place in ophthalmology department of Centro Hospitalar Vila Nova de Gaia / Espinho.

Methods:

The clinical files of all patients that underwent to cataract surgery over a period of one year were retrospectively analysed. All patients had a preoperative full ophthalmological evaluation. The anterior chamber depth (ACD), measured from the endothelium, was assessed with the IOL master. Patients with very advanced cataracts in which it was impossible to perform the biometry by IOL master were excluded. Clinical data such as the presence of PEX, pupillary dilation and intraoperative complications were also analysed.

Results:

A total of 1178 eyes undergone cataract surgery were included in this study. 7.3% were classified as pseudoexfoliative. There were not statistically significant differences regarding the ACD between the eyes with or without PEX (3.05mm and 3.11mm, respectively; $p=0.157$). We report a total frequency of surgical complications of 3.8%. The presence of PEX was associated with more intraoperative complications (16.3% vs 2.84%, $p<0.001$). In the eyes where complications occurred, a slightly lower ACD was found (3.06mm vs 3.11mm, $p=0.534$), nevertheless the difference between the ACD in the group with and without PEX was not statistically significant ($p=0.387$ and $p=0.928$, respectively).

Conclusions:

As expected, the risk of intraoperative complications during cataract surgery was higher in eyes with pseudoexfoliative syndrome. A lower ACD was evident in these patients, although in this study they do not differ in a statistically significant way. Therefore, a lower anterior chamber, mainly in patients with PEX, as well as an incomplete pupillary dilation, should alert the surgeon for the possibility of further complications during cataract surgery.



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PP214

Optical coherent tomography of the anterior lens capsule after cataract surgery in pseudoexfoliation syndrome

Presenting author: Elena Egorova, Russian Federation

Purpose:

To study the condition of the anterior capsule (AC) in patients with pseudoexfoliation syndrome (PEX) after implantation of IOLs of different designs.

Setting:

S. Fyodorov Eye Microsurgery Federal State Institution, Novosibirsk Branch, Russia

Methods:

OCT-study of the anterior segment was conducted in 63 patients with PEX after phacoemulsification with implantation of various acrylic IOLs: planar (48 cases) and step-vaulted (15 cases).

Results:

In the long-term period there were revealed differences in the relationship of AC and IOL. In most cases of implantation of planar IOLs, the AC after polishing adjoined the IOL surface without changing its morphology. The proliferation of myofibroblasts was noted after implantation of planar IOLs without peeling of AC. The free edge of the AC with unchanged epithelium was observed in all cases of implantation of step-vaulted IOLs.

Conclusions:

Polishing the anterior capsule after implantation of planar IOLs allows avoiding significant manifestations of contraction capsular syndrome. Implantation of step-vaulted IOLs excludes contact of the anterior capsule with the IOL surface; no manifestations of epithelial metaplasia were noted.



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PP215

The role of ascorbic acid in reducing corneal endothelial cell loss secondary during phacoemulsification surgery

Presenting author: Valvita Reçi, Macedonia, the former Yugoslav Republic of

Purpose:

The aim of this review was to analyze and summarize the role of ascorbic acid in reducing corneal endothelial cell loss secondary to high-energy ultrasound energy during phacoemulsification surgery. Phacoemulsification has become the most popular cataract surgery, while corneal endothelial damage still remains a serious complication, as excessive damage can lead to irreversible bullous keratopathy. Free radical formation due to high-intensity ultrasound and oxidative stress have been mentioned as cause of corneal endothelium damage, especially in patients with low endothelial cells below 1500 cell/mm², who have higher risk of developing corneal decompensation or even pseudophakic bullous keratopathy.

Setting:

University Clinic for Eye Diseases

Methods:

For this literature review we searched about published studies in the PubMed, Lancet, Elsevier, SciELO databases using keywords as ascorbic acid reduce corneal endothelial cell loss during phacoemulsification. During our search we found some studies, clinical trials and experimental studies in animals.

Results:

Perioperative topical use and intracameral irrigation of ascorbic acid during phacoemulsification offer hope for prevention of corneal endothelial cell dysfunction during phacoemulsification. Damage to the cornea is due to the free radicals generated by high intensity ultrasound energy in patients undergoing phacoemulsification. Adding ascorbic acid to the irrigation solution in animal experiments reduced the endothelial corneal cell loss and it may be considered as an alternative therapy. Further large studies are required to determine the optimal concentration of ascorbic acid and combination of free radical scavengers and antioxidants to be used in irrigation solutions during phacoemulsification.

Conclusions:

Perioperative topical use and intracameral irrigation of ascorbic acid during phacoemulsification offer hope for prevention of corneal endothelial cell dysfunction during phacoemulsification. Damage to the cornea is due to the free radicals generated by high intensity ultrasound energy in patients undergoing phacoemulsification. Adding ascorbic acid to the irrigation solution in animal experiments reduced the endothelial corneal cell loss and it may be considered as an alternative therapy. Further large studies are required to determine the optimal concentration of ascorbic acid and combination of free radical scavengers and antioxidants to be used in irrigation solutions during phacoemulsification.



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PP216

Association between intracameral mydriasis and posterior capsule rupture in routine cataract surgery

Presenting author: Shafiq Rehman, United Kingdom

Purpose:

To investigate the relationship between the use of Mydrane as intracameral mydriatic agent and the rate of posterior capsule rupture (PCR) during phacoemulsification surgery.

Setting:

Optegra Eye Hospitals, UK

Methods:

A retrospective audit of clinical outcomes recorded in an electronic medical record of consecutive patients following phacoemulsification surgery by a single surgeon between December 2019 and December 2020 was conducted. Chi Square statistical test was used to compare proportions between the incidence of PCR in intraocular lens (IOL) procedures where intracameral Mydrane was used versus IOL procedures where intracameral Mydrane was not used as a mydriatic agent.

Results:

Results from 766 eyes that underwent intraocular lens surgery were obtained. 46% of the surgeries were performed using intracameral Mydrane. The total PCR rate was 0.4%. None of the eyes operated without intracameral Mydrane had a PCR and 1% of the eyes operated with intracameral Mydrane had a PCR. This difference was not found to be statistically significant ($p = 0.06$).

Conclusions:

Intracameral mydriasis was not statistically significant associated to the incidence of PCR during cataract surgery.



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PP217

Swept source anterior segment OCT findings in Descemet's membrane detachment following uneventful phacoemulsification surgery: a report of 2 cases

Presenting author: DORRA KARRAY, Tunisia

Purpose:

To describe swept source anterior segment OCT findings in Descemet membrane detachment (DMD) following uneventful phacoemulsification surgery.

Setting:

Department of Ophthalmology, Fattouma Bourguiba University Hospital, Monastir, Tunisia.

Methods:

Two patients were referred for persistent massive corneal edema for more than 2 weeks after uneventful phacoemulsification surgery with no response to medical therapy. Swept source anterior segment OCT showed DMD in both cases. Intracameral injection of 20% SF6 was performed.

Results:

Swept source anterior segment OCT showed an undulating DMD, which on OCT was made of a single layer of sharply delineated hyperreflective parallel lines separated by a nonreflective narrow hyporeflective space. The mean pretreatment central corneal thickness was 758 μ m for the first case and 881 μ m for the second case. In both cases, Descemet membrane reattached successfully after intracameral 20% SF6. Corneal edema cleared completely within 1 week and the mean corneal thickness decreased for the 2 cases to 513 μ m and 697 μ m, respectively in 2 weeks.

Conclusions:

Swept source anterior segment OCT is a useful imaging modality for the diagnosis and monitoring of Descemet's membrane detachment after cataract surgery.



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PP218

Ectopia lentos in children ; clinical therapeutic and prognosis about 62 cases

Presenting author: Hamidallah Doha, Morocco

Purpose:

The aim of our work is to describe the main clinical and epidemiological characteristics of ectopia lentis and to analyze the anatomical and functional results of our treatment

Setting:

Ectopia lentis is a congenital displacement of the lens due to an abnormality of the zonule. It is a progressive and serious disease that can affect the visual prognosis. The vital prognosis can also be affected when lens ectopia is part of a general pathology.

Methods:

This is a retrospective study including 62 children treated for ectopia lentis at the pediatric ophthalmology department of Casablanca Morocco . Collected in between January 2003 to October 2020. Were studied: the epidemiological elements, circumstances of discovery, results of the initial clinical examination, medical and surgical therapeutic modalities, the results of the etiological investigation and the evolution.

Results:

Decreased visual acuity or poor visual behavior were the most common reasons for consultation. The age at diagnosis went from 2 to 17 years old. Bilaterality was in all of our patients. The lens dislocation was posterior in one case and anterior in 13 cases with secondary hypertonia 7 patients presented with retinal detachment. 13 eyes presented with peripheral degenerative lesions treated with Argon laser. Phacophagia and anterior vitrectomy were performed in all of our patients with prevention of thromboembolic complications in homocystinuria. Lens ectopia was isolated in 28 cases, associated with Marfan in 34 cases, homocystinuria in 13 cases.

Conclusions:

Ectopia lentis is a rare condition, but progressive and a source of serious complications. It presents a diagnostic and therapeutic emergency. One of the management priorities is to find and treat a general disease associated with family screening



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Cataract

PP219

Congenital Cataract in the Era of Covid-19: Results from a Single Tertiary Center

Presenting author: Fahri Onur AYDIN, Turkey

Purpose:

Investigation of the demographics, prevalence, surgery age, and characteristics of patients with congenital cataract (CC) during the COVID-19 pandemic was aimed.

Setting:

A single tertiary referral center, Basaksehir Cam and Sakura City Hospital

Methods:

The medical records of the patients with CC were reviewed retrospectively between March 2020 and March 2021. The demographics, surgery age, surgical delay of the patients were determined. The surgical delay was determined as the number of days between the first examination at our hospital and the day of surgery.

Results:

Among 1703 patients younger than 1-year-old, 13 eyes of 10 patients with CC (0.59%) were included in the study. Cataract surgery was performed for the 8 eyes (61.5%) of 6 patients (5 males, 1 female). The mean age of the patients with CC who underwent surgery was 3.6 ± 4.2 months (1.2-12.0), while it was 9.8 ± 7.1 months (0.6-17.8) for the ones without surgery. Two patients (33.3%) had bilateral cataracts. The mean surgical delay was 13.7 ± 11.1 days (4-35). All patients started using pediatric aphakic contact lenses 1 month after the operation. None of the patients showed a test positivity for COVID-19.

Conclusions:

Despite the pandemic, none of the patients underwent a clinically significant delay in the surgery apart from a patient who presented at the 12th month due to pandemic. Further multicenter studies may increase our understanding of the effect of the COVID-19 pandemic on the surgical or diagnostic delay of patients with CC.

Cataract**PP220****Visual outcome of pediatric cataract surgery – emphasis on the importance of posterior capsulotomy****Presenting author:** Calin Petru Tataru, Romania**Purpose:**

To report the outcome of cataract surgery on pediatric patients with congenital cataract. The patients were operated using a variety of surgical techniques and IOL implants.

Setting:

Cataract Department, Clinical Hospital for Ophthalmological Emergencies Bucharest, Romania

Methods:

The following paper presents a retrospective study that analyses 82 patients diagnosed with congenital cataract, who underwent cataract surgery with different IOL implantation including BIL-IOL between 2016 and 2020. In order to report the outcome, the following parameters were taken into consideration: 1) Type of cataract and age of diagnosis, 2) Systemic diseases associated with congenital cataract, 3) Impact of intraocular lens implant and intraoperative complications, 4) Correlations between the type of congenital cataract and histopathological changes of the capsular bag, 5) Postoperative outcomes and long-term complications.

Results:

Our study consists of 82 children, 46 males and 36 females, with congenital cataract operated in the same ophthalmological center in Bucharest, Romania. Of the 82 patients, 49 were diagnosed with bilateral cataract and 33 had unilateral opacities. Clinically, the most frequent type was total opacification of the lens, followed by lamellar, nuclear and cerulean cataract. We performed nine surgical approaches in our patients, depending on the type of intraocular lens (IOL). Morphological changes were observed both on the anterior and posterior lens capsules, including an increased thickness and uneven nuclei distribution.

Conclusions:

We present an interventional study regarding the surgical approach of congenital cataract consisting of IOL implantation and histopathological examination of the lens capsules. Beside evaluation of the surgical outcome, we also examine various pathological changes in all types of congenital cataract. This finding supports the modern surgical approach which includes per primam posterior capsulotomy in the treatment of congenital cataract. All our patients have good visual outcomes, emphasizing the importance of early recognition, surgical treatment and appropriate follow-up after surgery.



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Cataract

PP221

Visual outcomes of the RayOne EMV extended depth of focus intraocular lens implant

Presenting author: Clare O'Donnell, United Kingdom

Purpose:

To report complications, post-operative visual acuity and refractive outcome data after cataract surgery in a high-volume private hospital group in the UK.

Setting:

Optegra Eye Hospitals, UK

Methods:

A retrospective audit of clinical outcomes recorded in an electronic medical record of consecutive patients following phacoemulsification surgery with implantation of a monofocal IOL between October 2019 and September 2020 was conducted. 7470 procedures were performed during this period. All procedures were recorded in an electronic medical record system. Near monovision eyes with a predicted postoperative refraction (PPOR) $\leq -0.75D$ were excluded from the analysis. Best measured distance visual acuity (CDVA) in patients with and without other co-pathologies was assessed along with refractive outcomes (deviation from PPOR) for all groups.

Results:

The rate of uncomplicated procedures was 99.2%. Monocular CDVA of 20/40 or better and 20/20 or better was achieved by 96% and 61% of eyes, respectively. When the eyes with other co-pathologies were excluded, monocular CDVA of 20/40 or better and 20/20 or better was achieved by 97% and 65% of eyes, respectively. Refraction was within $\pm 1.0 D$ in 94% of eyes and within $\pm 0.5 D$ in 73%.

Conclusions:

Cataract surgery remains one of the most frequently performed surgeries and systematic auditing of outcomes data is warranted to quality assure surgical performance. The outcomes data presented in this study indicate low complication rates and visual and refractive outcomes, comparable to benchmark data.



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Cataract

PP222

Cataract and Urrets-Zavalía syndrome after XEN gel stent implantation

Presenting author: Monika Sarnat-Kucharczyk, Poland

Purpose:

The aim of this report is to present 63-years-old female with cataract and Urrets-Zavalía syndrome after XEN gel stent implantation.

Setting:

Department of Ophthalmology, Faculty of Medical Sciences in Katowice, Medical University of Silesia, Poland, Department of Ophthalmology, Professor K. Gibinski University Clinical Center of the Medical University of Silesia, Katowice, Poland

Methods:

XEN gel stent was implanted in patient with shallower anterior chamber without intraoperative complications. Best corrected visual acuity, kinetic and static visual field, optical coherence tomography of the anterior and posterior segment, corneal topography map were all performed.

Results:

Few hours after uneventful XEN gel stent implantation patient complained about severe headache due to high intraocular pressure (IOP). Slit lamp examination revealed corneal edema and glaucomflecken. Spontaneous IOP decrease was noted with formation of large filtering bleb. Fundus examination revealed increased vessels tortuosity. Then fixed and dilated pupil, little hemorrhages on the iris surface and iris-lens adhesions were observed. Cataract surgery was performed with synechiolysis and intraocular lens implantation. After surgery pupil remained wide and rigid and diagnosis of Urrets-Zavalía syndrome was made.

Conclusions:

Increased IOP may be a complication of any intraocular procedure including anti-glaucoma surgery. In the presented case IOP rise was caused by remained dispersive ocular viscoelastic device. Urrets-Zavalía syndrome was induced by multiple factors, mainly by increase in IOP, mydriasis, atherosclerosis of iris vessels predisposing to iris ischemia and atrophy.



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Cataract

PP223

Visual outcome and complications of cataract extraction in vitrectomised eyes :A Five-Year Single Institute Experience.

Presenting author: Demetrios Pirounides MD, PhD, Greece

Purpose:

To present the outcome, including the intraoperative and postoperative complications, of phacoemulsification with intraocular lens implantation (IOL) between eyes with and without previous pars plana vitrectomy (PPV), undergoing cataract surgery in a tertiary referral hospital in Thessaloniki, Greece, and compare the results to Greek and European standards using the EUREQUO database.

Setting:

Aristotle University of Thessaloniki A' Ophthalmology Department.

Methods:

Retrospective, chart review study of phacoemulsification with intraocular lens implantation in patients with previous pars plana vitrectomy, performed between 8/2015 and 8/2020. Parameters including patient characteristics, type of surgery and perioperative manoeuvres employed, difficulties and complications, preoperative visual acuity and final visual outcomes, were analysed.

Results:

In total, 32 (1.98%) vitrectomised out of 1580 non-vitrectomised eyes were included. Mean age of vitrectomised group was 67 (50% female, 52% male). Postoperative visual acuity was equal or superior to 6/12 in 72.41 % of patients. 90.63 % were subjected to phacoemulsification with posterior chamber IOL implantation while an iris claw IOL was fixed in a retropupillary position in 3.13% and an anterior chamber IOL in 6.25% was implanted. In 3.13 % of cases a mechanical dilation of the iris was required. Complications included dropped nucleus, corneal opacification and vitreous loss in one case.

Conclusions:

Cataract surgery in vitrectomized eyes appears not to be uncommon amongst patients with co-morbidities and is associated with well-established difficulties and complications. Our five-year data is comparable to that of both Greece and Europe.

Cataract**PP224****How to achieve surgical success in extremely narrow chamber cataract surgery.**

Presenting author: Natalia Monja Alarcón, Spain

Purpose:

We present a dense cataract surgery with extremely narrow chamber. We propose a series of surgical guidelines to achieve maximum endothelial respect and avoid surgical complications. We show the preoperative photos, the video of the surgery and the images of patient's evolution.

Setting:

Cornea and Anterior Segment Unit; Ophthalmology Department, Fuenlabrada University Hospital, Madrid (Spain).

Methods:

A 80-year-old woman was referred for cataract surgery with dense cataract in left eye (OS) and extremely narrow anterior chamber. Her ocular background included amblyopia and exotropia in OS and pseudophakia in OD. BCVA was 20/25 in OD and hand motion in OS. Slit-lamp examination of the OS revealed a NO5 (LOCS III) cataract, open iridotomy and an extremely narrow anterior chamber. Tonometry measured 12 mmHg in both eyes (OU). Gonioscopy shows a 360° iridocorneal contact. Pupillary dilation was not performed in OS due to the imminent risk of primary angle-closure glaucoma (PACG). The B-scan ultrasound ruled out any mass or retinal detachment.

Results:

It was decided to perform cataract surgery in order to prevent PACG (even knowing the uncertain visual prognosis secondary to her amblyopia). Due to the high density cataract, neither optical nor ultrasonic biometrics could take measurements. For this reason, we took as a reference the power of the OD lens (operated ten years before in another hospital). Finally, cataract surgery was successfully performed administering 350 ml of intravenous mannitol 30 minutes before, using a cohesive viscoelastic and performing the pre-chop technique within the capsular bag. One day after surgery, the patient did not present corneal edema and BVCA was 20/200.

Conclusions:

According to our experience, intraoperative use of cohesive viscoelastic and intravenous mannitol one hour before surgery is usually sufficient to reduce the volume of the vitreous and increase the anterior chamber (not being necessary habitually more complex techniques). In order to protect the endothelium, it is helpful to use dispersive viscoelastic and we consider essential work within the capsular bag performing the pre-chop technique. These surgical guidelines are helpful to achieve surgical success in both nanophthalmic and extremely narrow anterior chamber eyes.

Cataract**PP225****Combined cataract surgery with anti-glaucoma stent implantation complicated by persistent choroidal detachment - a case report****Presenting author:** Katarzyna Gontarz, Poland**Purpose:**

Ocular hypotony is a potential complication of intraocular surgery, including cataract removal and anti-glaucoma surgery (less often non-penetrating ones). It can be associated with flattening anterior chamber (FAC) and choroidal detachment (CD). If the complication lasts for more than 1 week, it could be a risk factor for severe visual loss. Therefore it is important to be aware of it, prevent it and know the treatment. The aim of the work is to present a case of combined cataract surgery with XEN anti-glaucoma stent implantation complicated by transient ocular hypotony with FAC and persistent CD.

Setting:

Department of Ophthalmology, School of Medicine in Katowice, Medical University of Silesia in Katowice, Poland; Department of Ophthalmology, Prof. K. Gibinski University Clinical Centre, Medical University of Silesia in Katowice, Poland

Methods:

A 69-year-old woman was admitted to the Department of Ophthalmology for lower intraocular pressure (IOP) in the right eye (RE). Preoperative RE corrected distance visual acuity (CDVA) was 0.4f (Snellen) and intraocular pressure (IOP) was 36 mmHg with almost maximal topical therapy. The patient was performed combined phacoemulsification of intumescent cataract with intraocular lens implantation and with XEN stent implantation in RE. Postoperative ocular hypotony with FAC and CD developed on the first day after the procedure. Seidel test was negative. First the injection of an ophthalmic viscoelastic device into anterior chamber was performed.

Results:

Second the assumption 2 single mattress sutures, pressing the XEN implant to the sclera, in place of the filter bubble was done. The ocular hypotony and FAC resolved in 5th day after primary surgery, but CD was still observed. Topical steroid, mydriatic and cycloplegic therapy were ordered. Due to the occurrence of RE uveitis (probably associated with persistent CD) on the 15th day after primary surgery, the systemic steroid therapy was added. Three weeks after primary surgery the RE CDVA improved to 0.6 (Snellen), the IOP was 11 mmHg, no inflammation but persistent CD were observed.

Conclusions:

The patient remains in outpatient treatment and pharmacotherapy used is maintained. The presented case is one of the few literature descriptions of this complication after such surgery. We describe the successful treatment of hypotony and FAC but unfortunately with persistent CD. The possibility of the postoperatively uveal effusion syndrome is concerned in the patient. Surgery will be considered if no improvement from pharmacotherapy persists. Due to the complication after the combined operation in the RE, the anti-glaucoma procedure in the left eye was postponed and at first the successful cataract surgery in the left eye was performed.



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PP226

Intraocular pressure measured by corneal biomechanical corrected and standard Goldmann prisms in stable and progressive primary open-angle glaucoma

Presenting author: sean mccafferty, United States

Purpose:

To evaluate differences between intraocular pressure measured by a Goldmann applanation tonometry prism (IOPG) and a modified correcting applanation tonometry surface prism (IOPC) in patients with stable and progressive primary open-angle glaucoma (POAG).

Setting:

Multispecialty ophthalmology institute

Methods:

A retrospective cross-sectional study was completed on 323 eyes in 162 patients with primary open-angle glaucoma[POAG] measuring paired IOPG and IOPC, Corneal hysteresis (CH), and CCT over an inclusive 4 month data analysis period. Progressive glaucoma (n=31 eyes) was defined as a significant change in HVF or OCT prompting a more aggressive modification in medical or surgical treatment during the analysis period.

Results:

IOPC measurements were significantly greater than their paired IOPG measurements in progressive POAG (IOPC-IOPG=2.44+/-1.88mmHg) compared to stable POAG eyes (IOPC-IOPG=1.37+/-1.86mmHg)($p<0.001$). CCT demonstrated a significant decrease and CH approached a significant decrease from stable to progressive POAG patients ($p=0.016$, $p=0.074$)

Conclusions:

A modified Goldmann biomechanical correcting prism measured a significantly greater IOP than the standard Goldmann prism among progressive glaucoma patients.



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PP228

Strabismus revealing axenfeld's anomaly

Presenting author: Yassine Moursli, Morocco

Purpose:

We report a case of axenfeld's anomaly revealed by strabismus.

Setting:

Adults ophthalmology department, Hospital 20 Aout, Casablanca

Methods:

An 8-year-old girl was evaluated for strabismus described by parents as having progressed for several months

Results:

Slit-lamp examination revealed a posterior embryotoxon and a mild corectopia with a wide anterior iridocorneal synechiae in temporal area in the right eye. Gonioscopy showed the presence of several peripheral anterior synechiae. The intraocular pressure (IOP) was 18 mmHg in right eye and 19 mmHg in left eye. Examination of optic disc was normal and visual field did not allow conclusion. OCT scan showed a medium decrease in ganglion cell complex thickness. Cardiac and abdominal ultrasound showed no abnormalities. Treatment was initiated with preservative-free latanoprost. IOP was controlled after 2 months' follow-up (right eye: 11mmHg, left eye: 12 mmHg)

Conclusions:

Axenfeld's anomaly is a rare condition that can be associated with extraocular malformations. It is important to reach an early and accurate diagnosis because the key implication of the syndrome is a 50% risk of glaucoma



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PP229

Knowledge and Awareness of Glaucoma in Mexican patients with and without glaucoma diagnosis in an Ophthalmology Referral Center

Presenting author: Cristina Aurora Tlapanco Beltrán, Mexico

Purpose:

To assess and compare knowledge and awareness regarding glaucoma in patients with and without glaucoma and their accompanying relatives attending an Ophthalmology Referral Center.

Setting:

The aim of this study is to validate and apply a questionnaire about glaucoma knowledge in the population that attend our ophthalmology center in Mexico City, measure their knowledge on the subject, and help them improve their adherence to treatment and clinical follow up.

Methods:

This cross-sectional study was conducted at Asociación Para Evitar la Ceguera (APEC) in Mexico City. A questionnaire containing a set of brief and orderly questions to gather information regarding the participants' knowledge and awareness of glaucoma was designed by a group of experts following the Delphi panel rules, then it was pre-tested in a pilot study. The questionnaire was applied to ophthalmology patients and their accompanying relatives over 18 years of age. Statistical analysis was carried out to determine the general knowledge and compared between the groups (glaucoma patients, patients without glaucoma, relatives of glaucoma and non-glaucoma patients).

Results:

Seventy-six (38%) were patients with glaucoma diagnosis, fifty-four (27%) were patients without glaucoma and the remaining sixty-nine (35%) participants were relatives of the patients with glaucoma diagnosis. We found that there was no difference between the three groups in those who scored good knowledge, but in those who scored insufficient knowledge, the relatives of the patients with glaucoma diagnosis presented the highest scores. We didn't find any association between the score or level of knowledge with age, schooling, occupation or socioeconomic income, but we found a positive correlation between the level of knowledge and having a frequent ophthalmological examination.

Conclusions:

This study provides data regarding awareness and knowledge of glaucoma in patients with and without glaucoma diagnosis and in their accompanying relatives in an Ophthalmology Referral Center. The level of awareness is high but the level of glaucoma knowledge is low, yet no association was found between knowledge and socio-demographic data. This questionnaire allows us to detect the educational deficit areas and reinforce our patients' learning and knowledge about glaucoma in order to increase timely check-ups in the general population but also helps to boost the treatment adherence and clinical follow up in those who already have a glaucoma diagnosis.



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PP230

Selective laser trabeculoplasty in exfoliative glaucoma

Presenting author: Salma hassina, Morocco

Purpose:

Selective laser trabeculoplasty (SLT) has become a widely used treatment option worldwide for lowering intraocular pressure (IOP) in patients with primary or pseudo-exfoliative open-angle glaucoma. The objective of this work is to study its effectiveness in reducing intraocular pressure and to determine possible factors predicting the therapeutic response.

Setting:

the ophthalmology department B of the Ibn Sina University Hospital, Rabat, Morocco

Methods:

A prospective study on 28 eyes of 15 patients was carried out from August 2020 to January 2021 to assess the effect on the intraocular pressure of patients who received treatment with Nd: YAG laser. Q-switched doubled frequency (532 nm). Intraocular pressure (IOP) was measured before treatment and 1, 3 and 6 months after. A reduction in IOP greater than 20% of the IOP before treatment has been defined as successful. Correlation between successful SLT and baseline IOP, age, gender, race, cataract surgery, general history, degree of trabecular pigmentation, area treated, laser energy applied, antiglaucoma therapy locale have been determined.

Results:

The results observed on the pressure drop were as follows: at one week, the reduction in IOP obtained was 3.04 mm Hg (11.87%), at one month, it was 5.71 mm Hg (22.58 %), at three months it was 7.71 mm Hg (30.33%), at six months it was 6.67 mm Hg (27.92%). The success of trabeculoplasty was found in 60.71% of the 28 eyes treated with SLT, after 1 month; after 3 months, a success rate of 78.57% was found; for the 6-month control, a success rate of 58.33% was obtained.

Conclusions:

SLT trabeculoplasty is an effective technique for managing ocular hypertension in exfoliative glaucoma. Its effectiveness in the short and medium term has been demonstrated as well as its use to retreat a patient. This laser appears to be a reliable, reproducible technique, well tolerated by the patient and involving few induced complications. However, this laser has probably not yet delivered the full extent of its potential and several still unclear areas remain to be explored.



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PP231

Investigation of long-term stability for new acrylic intraocular lens materials

Presenting author: Kenji Kawai, Japan

Purpose:

For long-term IOL implantation, manufacturers are constantly urged to improve the material to maintain transparency. In this study, we examined the long-term stability of recently marketed acrylic IOL materials by accelerated severe aging tests.

Setting:

Tokai University school of Medicine

Methods:

LENTIS Comfort (LS-313MF15) and Clareon (SY60WF) were selected as the study materials, and Nex-Acri AA 1P (NS-60YS) was used as a reference material. Severe accelerated aging testing was performed by immersing the IOLs in screw cap vials filled with ultrapure water at 100°C for 115 days. After the predetermined periods, the appearance, dimensions, weight, and transmittance of each IOL were examined. Also, the absorbance of the storage solution was measured, and the presence or absence of eluted ingredients was examined. In addition, changes in the chemical structure were checked by FT-IR.

Results:

No change was observed in the appearance, dimensions, weight, or transmittance of LS-313MF15 or NS-60YS after accelerated testing simulating 115 days. SY60WF showed white turbidity and color change, decreases in dimensions and weight, and reduced transmittance near 400-850 nm. These changes intensified with time. The absorbance of the storage solution of only SY60WF increased with time. On FT-IR, only SY60WF showed a shift of the peak derived from the carbonyl group near 1700 cm⁻¹, indicating structural change.

Conclusions:

Although no change was observed in LS-313MF15 or NS-60YS after accelerated testing simulating 115 days, SY60WF showed structural change, possibly due to hydrolysis.



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PP232

A new strategy in presbyopia correction: the optical system MINI WELL® + MINI WELL PROXA®

Presenting author: Simon Federico Spanò, Italy

Purpose:

The aim of the study is to evaluate the new unique EDOF Optical System (Well Fusion™) thought to deliver high quality of vision without spectacle. Mini WELL® and Mini WELL PROXA® share the same patented non-diffractive platform based on distribution of spherical aberrations in the central part of the optics and aspherical monofocal design in the periphery. Mini WELL PROXA® is designed to be implanted alongside Mini WELL® to secure full presbyopia correction together with greater extended depth of focus thanks to complementary optics designed to jointly work.

Setting:

Business and Portfolio Development Department SIFI S.P.A, Catania, Italy.

Methods:

The new EDOF IOL Mini WELL PROXA® has a number of zones higher than Mini WELL®, the active zone is extended up to 4.5 mm and spherical aberrations distribution is optimized to extend vision up to 3D. In the experimental testing, we have explored the characteristic of Mini WELL PROXA® compared to its complementary optic Mini WELL®. IOLs optical performance, related to the EDOF aspheric design, was tested at the optical bench and specific analyzer of image quality to investigate depth of focus, visual acuity, straylight analysis and sensitivity to tilt, decentration and angle Kappa.

Results:

The modulation transfer function through focus curves as the retinal acuity charts showed a complementary performance of the IOLs from far to near while preserving a continuous contrast for all vision conditions. MTF for a 3-mm pupil was 0.25 and 0.30 @0D, 0.15 and 0.05 @3D for Mini WELL PROXA® and Mini WELL® respectively. These values were not influenced by tilt ($\pm 2.5^\circ$), by decentration (± 0.5 mm), or by medium human angle Kappa. Visual acuity simulations indicated good visual acuity up to 3.00D of pseudoaccommodation. Straylight analysis confirmed the absence of dysphotopsia phenomena and the superior benefit of the Well Fusion™ system.

Conclusions:

Well Fusion™ technology, the proposed unique optical system, was evaluated based on numerical simulations and experimentally characterized on an optical bench. The Mini WELL PROXA® and Mini WELL® provide, through high complementarity optics at intermediate vision and very high complementarity at near vision, a continuous focus from far to near closing the gap in near vision (30-35 cm) typically associated to EDOF technology. Well Fusion™ represents an innovative solution for presbyopia treatment with uninterrupted high-quality vision at all distances and in all light conditions.

Cataract**PP233****Prospective study to evaluate visual acuity, contrast sensitivity and patient satisfaction after bilateral implantation of a glistening-free hydrophobic EdoF intraocular lens****Presenting author:** Florian Kretz, Germany**Purpose:**

Evaluation of the functional results after bilateral implantation of a glistening-free hydrophobic EdoF-IOL (Acunex Vario, Teleon, Germany). 30 patients (60 eyes) were evaluated 1, 3, 6 and 12 months postoperatively.

Setting:

Precise Vision Augenärzte, Augentagesklinik Rheine

Methods:

In a prospective clinical study, the postoperative results after bilateral implantation of the glistening-free hydrophobic EdoF-IOL „Acunex Vario“, produced by Teleon Surgical (Germany) were evaluated. Data for contrast sensitivity photopic/mesopic, with and without glare; visual acuity (UDVA/DCVA at 4m; UIVA/DCIVA at 80 cm; UNVA/DCNVA at 40 m), Defocuscurve monocular and binocular (-4.0 to +2.0 D) and the subjective patient satisfaction (Patient questionnaire) was collected. The subjective refraction was performed via ETDRS charts.

Results:

1 month: spherical equivalent -0.14 D[+/-0.61]. Average visual acuity was 0.03 [+/-0.10] (4m DCVA); 0.22 [+/-0.15] (80cm DCIVA); 0.47 [+/-0.17] (40cm DCNVA) 3 months: spherical equivalent was 0.26 D [+/-0.4]. Average visual acuity was 0.00 [+/-0.12] (4m DCVA); 0.20 [+/-0.14] (80cm DCIVA); 0.42 [+/-0.18] (40cm DCNVA). Binocular defocus curve shows visual acuity <0,10 logMAR from +1.0 D to -1.5 D. 6 months: spherical equivalent was 0.01 D [+/-0.47] . Average visual acuity was -0.01 [+/-0.09] (4m DCVA); 0.16 [+/-0.13] (80cm DCIVA); 0.4 [+/-0.16] (40cm DCNVA). Binocular defocus curve shows visual acuity <0,2 logMAR from +1,00 D to -1.5 D.

Conclusions:

This intraocular lens shows satisfying visual acuity values for far distance including a good intermediate vision up to 60 cm. Also the patients subjectively report a high satisfaction rate with independence from eyeglass correction for far and intermediate distances. Halo & Glare are less affecting than in cataract patients and comparable monofocal IOLs. The contrast sensitivity results are also comparable to monofocal, aberration neutral and aberration correcting IOLs. All in all a good option for patients who want to go spectacle independent with acceptance for reading glasses.

Cataract**PP234****Chromatic aberration and pupil dependence of two extended depth of focus IOLs****Presenting author:** Daniel Chang, United States**Purpose:**

To evaluate the induced chromatic aberration and pupil dependence of two extended depth of focus IOLs and to gain insight into their utilization of refractive and/or diffractive optics.

Setting:

Laboratory study

Methods:

Preclinical testing was performed under clinically relevant conditions for two EDOF IOL designs: TECNIS Eyhance (lens A) and Acrysof IQ Vivity (lens B). Chromatic aberration was obtained from through focus modulation transfer function (MTF) at 50 c/mm for five different wavelengths from 450nm to 650nm, and at pupil diameters from 1mm to 5mm. Chromatic aberration was expressed as the difference in power between 450nm and 650nm at the spectacle plane.

Results:

For the far focus, the chromatic aberration was 1.3 Diopters for lens A, and 1.8 Diopters for lens B, independent of pupil size. The values were characteristic of the lens material of lenses A and B, Sensor and Acrysof, respectively. For the intermediate focus of lens A, the chromatic aberration was 1.3 Diopters and independent of pupil size. For the intermediate focus of lens B, the chromatic aberration was highly depending on pupil size, ranging from 1.8 Diopters for large pupils, to 2.2 Diopters for a 2mm pupil and reducing to 0.9 Diopters for a 1 mm pupil.

Conclusions:

The induced chromatic aberration for the far focus was independent of pupil size for both lenses, and lower for lens A. For the intermediate focus, lens A showed the same amount of induced chromatic behavior as for the far focus and the amount was independent of pupil size, suggesting refractive behavior of the lens optics. For lens B, the induced chromatic aberration of the intermediate focus was highly dependent on pupil size. The variation of induced chromatic aberration of lens B for small pupil size suggests diffractive behavior of the lens optics.



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PP235

Visual outcomes of the RayOne EMV extended depth of focus intraocular lens implant

Presenting author: Masara Laginaf, United Kingdom

Purpose:

The extended depth of focus (EDOF) non-diffractive RayOne EMV IOL is designed to induce positive spherical aberration across a controlled aspheric surface and provide superior intermediate vision when compared with standard monofocals. This retrospective case series was performed to assess the real-world visual outcomes of the RayOne EMV IOL for both emmetropic and mini-monovision target refractions.

Setting:

Single centre, multiple surgeon, private practice, London, UK

Methods:

Eyes implanted with the RayOne EMV IOL during cataract surgery or refractive lens exchange were identified between 16/07/2020 and 11/02/2021. After exclusion of eyes with visually significant ocular co-morbidities, three groups were analysed: 1) all individual eyes with emmetropic target (n=50); 2) bilateral eyes with emmetropic target (n=32); and 3) bilateral eyes with mini-monovision target (n=12). Post-operative visual acuity, refraction and quality of vision were assessed at 2 weeks.

Results:

50 eyes implanted with EMV lens targeting emmetropia achieved mean uncorrected distance visual acuity (UDVA) of 0.06 ± 0.14 LogMAR, uncorrected intermediate visual acuity (UIVA) of 0.43 ± 0.13 LogMAR, and uncorrected near visual acuity (UNVA) of 0.43 ± 0.14 LogMAR. 32 eyes implanted with bilateral EMV lens targeting emmetropia achieved mean binocular UDVA of -0.01 ± 0.09 , UIVA of 0.33 ± 0.08 and UNVA of 0.31 ± 0.12 LogMAR. 12 eyes implanted with bilateral EMV lens with mini-monovision target (range -1 to -1.5 Diopters in non-dominant eye) achieved mean binocular UDVA of 0.03 ± 0.15 , UIVA of 0.23 ± 0.12 of and UNVA of 0.23 ± 0.12 LogMAR.

Conclusions:

Implantation of the EDOF RayOne EMV IOL achieves excellent outcomes for both uncorrected distance and intermediate vision. In the setting of mini-monovision, superior near vision was achieved with 100% patients reading N6 or better. Only 1 patient reported photopic phenomenon (starbursts), highlighting the advantage of this non-diffractive EDOF optic design for achieving optimal spectacle independence with low risk of dysphotopsia.

Cataract**PP236****Rayner RayOne EMV intraocular lens: our experience****Presenting author:** Francesco Blasetti, Italy**Purpose:**

The aim of this study was to assess patient satisfaction after RayOne EMV lens implant during cataract surgery. This lens was developed to enhance patient outcomes achieved with monovision

Setting:

All patients underwent uncomplicated cataract surgery performed by the same surgeon at the operative unit of ophthalmology, hospital of Chiari, Italy, from September to October, 2020

Methods:

Thirty eyes of 15 patients were divided into three groups: group A included 5 patients where a plano RayOne EMV lens was implanted in both (dominant and non-dominant) eyes; group B included 5 patients where a plano RayOne EMV lens was implanted in the dominant eye and a target sf -0,75D EMV lens in the non-dominant eye; group C included 5 patients where a plano RayOne EMV lens was implanted in the dominant eye and a target sf -1,25D EMV lens in the non-dominant eye. All patients were well-matched. Patients with more than 1.0D of corneal astigmatism were excluded

Results:

These are the results one month after phacoemulsification. In group A binocular uncorrected distance visual acuity (UDVA) was 1.0, binocular uncorrected intermediate visual acuity (UIVA) was J4 at 80 cm, binocular uncorrected near visual acuity (UNVA) was 0.5; in group B binocular UDVA was 1.0, binocular UIVA was J3, binocular UNVA was 0.6; in group C binocular UDVA was 1.0, binocular UIVA was J2, binocular UNVA was 0.6. 90% of patients reported being dysphotopsia free; 90% of patients reported no incidence of halo, starburst or haze

Conclusions:

RayOne EMV intraocular lens seems to give an extended depth of vision with reduced dysphotopsia, providing a valid alternative in patients that desire spectacle independence but are not suitable candidates for diffractive trifocal IOLs. In all groups examined it gives an excellent binocular UDVA with acceptable binocular UIVA and UNVA

Cataract**PP237****Outcome analysis of Lentis Comfort IOL implantation****Presenting author:** Yuliya Nenasheva, Russian Federation**Purpose:**

To analyze visometry indices at different distances, contrast sensitivity and glare sensitivity in patients implanted Lentis Comfort IOL with a low addition bifocal (+1.5 D) and asymmetric optics.

Setting:

The S. Fyodorov Eye Microsurgery Federal State Institution, Tambov branch

Methods:

Cataract phacoemulsification with Lentis Comfort IOL implantation was performed in 80 patients (96 eyes). On the 2nd postoperative day, in a month and six months postoperatively, distance, intermediate (70 cm) and near visual acuity were tested. Contrast sensitivity testing, examination of twilight vision and bright light sensitivity was carried out using a Binoptometer 4P (OCULUS GmbH, Germany) visual function analyzer one month after surgery.

Results:

6 months postoperatively, distance UCVA was 0.81 ± 0.10 , 7 patient required glasses correction; for average distance – 0.71 ± 0.09 , 8 patients required glasses; near NCVA – 0.48 ± 0.09 , 35 patients required glasses. According to the results of assessing twilight vision without flare with a contrast 1:23, the threshold value (≥ 3 optotypes out of 5) was achieved in 97% of patients, with a contrast 1:5 - 87%; with flare and contrast 1:23 - 90%; with flare and contrast 1:5 - 84%. The patients experienced no difficulties working and driving during the daytime. At night, 15 patients (19%) noted the unwanted light phenomena.

Conclusions:

Lentis Comfort IOL provides high distance and intermediate visual acuity with some decrease for near distance; provides high quality vision under medium and low contrast conditions with a slight decrease under flare conditions.



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Cataract

PP238

Functional visual acuity of eyes with diffractive extended depth-of-focus intraocular lenses

Presenting author: Keiichiro Minami, Japan

Purpose:

Prospective comparative case series aimed to evaluate functional visual acuity (FVA) of eyes with diffractive extended depth-of-focus (EDOF) intraocular lenses (IOLs).

Setting:

Miyata Eye Hospital, Miyazaki, Japan.

Methods:

Diffractive EDOF and monofocal IOLs (ZXR00V and ZCB00V, respectively, Johnson & Johnson Surgical Vision) were implanted in 27 eyes of 27 patients each. At 3 months postoperatively, distance-corrected visual acuities at distances from 0.3 m to 5 m, photopic contrast sensitivity, and FVA were examined. In the FVA testing using AS-28 (Kowa), FVA value that was averaged visual acuity during 60 sec, visual maintenance ratio (VMR), mean response time, and number of blinks were evaluated and the parameters were compared between the two IOLs.

Results:

The mean distance-corrected visual acuities were better at distances of 0.7 m or nearer in eyes with EDOF IOLs. There was no difference in the contrast sensitivities. In the FVA results, no difference was found in FVA value, VMR and number of blinks, while the mean response time was shorter in eyes with EDOF IOLs.

Conclusions:

The evaluation results demonstrated that the visual function of eyes with EDOF IOLs under photopic and distance-corrected conditions was comparable to that of eyes with monofocal IOLs.

Cataract**PP239****Postoperative visual performance with a X-Wave technology EDOF and standard EDOF intraocular lens****Presenting author:** Firat Helvacioğlu, Turkey**Purpose:**

To evaluate and compare the clinical outcomes with a X-Wave technology EDOF and standard intraocular lens (IOL) during a 3-month follow-up.

Setting:

Veni-Vidi Eye Center and Uskudar University Department of Ophthalmology, Istanbul, Turkey

Methods:

Prospective comparative study including 40 eyes of 20 patients (42-80y) undergoing uneventful cataract surgery. Each patient was randomly assigned to one type of IOL, X-Wave EDOF (20 eyes) or EDOF (20 eyes). Visual, refractive changes and a questionnaire about patients' satisfaction and visual symptoms were evaluated in a 3-month follow-up. The binocular defocus curve was also measured at 3 months postoperatively.

Results:

No statistically significant differences between groups were found in postoperative uncorrected and corrected distance visual acuities ($P=0.317$). Postoperative 3 month uncorrected near, intermediate and distant visual acuities were 0,03, 0,14, 0,09 logMAR in X-Wave EDOF and 0,09, 0,12, 0,28 in EDOF groups respectively ($p_1=0.342$, $p_2=0.241$ $p_3<0.001$). Significantly better uncorrected near visual acuity were found during all follow-up in the X-Wave EDOF group, which was consistent with differences among groups in binocular defocus curve. Spectacle independence was achieved in most of the patients in X-Wave EDOF group. No patients had complaints of halo and glare in both groups.

Conclusions:

Both of the IOLs are able to provide an effective visual restoration which is maintained during a 3-month follow-up, with a clear benefit of the X-Wave EDOF IOL for the near vision.

Cataract

PP240

Small Aperture IOL in Irregular Corneas

Presenting author: Gabriel Quesada, El Salvador

Purpose:

Changes in corneal shape after RK, PKP and keratoconus make it more challenging to pick the right IOL power in cataract surgery. The small-aperture IOL presents as an opportunity in these special situations.

Setting:

Conducted in Clinica Quesada, El Salvador

Methods:

Case Reports Case 1: Cataract surgery after RK (16 cuts) OU Case 2: Cataract surgery after PKP OS Case 3: Cataract surgery in Keratoconus eye OS

Results:

Case 1; previous RK + cataract Female, 68 Y.O.; cataracts OU; previous RK (16 cuts) Preop OD BCVA 20/150; K1 26.99; K2 30.76 Preop OS BCVA 20/100; K1 32.52; K2 34.94 Small-aperture IOL OU (+18.0) 6 months post op Post op UCVA : 20/30- Distance 20/30- Intermediate 20/40+ Near Case 2; PKP + cataract: Female 52 Y.O Preop OS BCVA 20/200 K1 35.85; K2 44.79 Post op UCVA : 20/50 distance 20/50 intermediate 20/50 near Case 3; keratoconus + cataract: Female, 57 Y.O. Preop BCVA 20/100 K1 43.32; K2 48.89 Post op UCVA : 20/50 distance 20/50 intermediate 20/50 near

Conclusions:

For post RK patients this lens can extend the depth of focus and provide excellent vision at distance, intermediate and near. The small-aperture IOL in the presence of irregular corneas (PKP or keratoconus) cuts off the disturbing portion of the light that is aberrated by the irregularity. The point spread function of the retina image is sharp, and the brain accepts the elongated focus.

Cataract**PP241****Preliminary results of enhanced monovision concept in cataract surgery****Presenting author:** Martin Hlozaneck, Czech Republic**Purpose:**

Monovision (MV) is a commonly used technique for patients requiring an element of spectacle independence after cataract surgery. In ESCRS Survey 2016, 6% of cataract procedures involved a presbyopia-correcting IOL, while 43% were targeted for MV or mini-MV (0.75-1.25 was the most common offset). Our aim was to evaluate real world usage of a new aspheric monofocal IOL specifically optimised for MV (Rayner RayOne EMV). It is designed to provide up to 2.25D enhanced depth of vision with a 1.0 D offset by utilising positive spherical aberration in a patented smooth optical profile, with no loss of contrast sensitivity.

Setting:

Department of Ophthalmology for Children and Adults, 2nd Faculty of Medicine, Charles University and Motol University Hospital, Prague, Czech Republic.

Methods:

Patients indicated for cataract surgery were informed about the possibility of choosing the new enhanced monovision concept. Patients with any other eye diseases were primary excluded. The IOL power was targeted to provide postoperative refraction of closest negative to zero in dominant eye with approximately 0.75 - 1.0 D of offset in the non-dominant eye. Standard examination was performed in postoperative week 1, month 1 and month 3.

Results:

Five patients were enrolled to the study. Median follow-up period was 3.0 months. On last visit, average refractive offset between eyes was -0.6 D (SD 0.34) and average difference between targeted and final refraction was -0.03 (SD 0.31). Binocular uncorrected distance visual acuity (UCDVA) was 1.0 in all patients. Median of UCDVA on non-dominant eye was 0.63 (range 0.5-1.0). Median of binocular uncorrected near visual acuity (UCNVA) was 0.63 (range 0.5 – 1.0). Median of UCNVA on dominant eye was 0.4 (range 0.32-1.0). None of the patients had any complaints regarding to disturbing light phenomena or intolerance of MV.

Conclusions:

The new concept of enhanced monovision using new IOL with positive spherical aberration could be promising in terms of low risk of intolerance, regarding to low interocular refractive offset and low risk of disturbing light phenomena. In our group of patients, it offered very good distance binocular vision with sufficient spectacle independence in everyday life. Further evaluations on large groups of patients are needed.

Cataract**PP242****Evaluation of hydrophilic EDOF IOL with a new optic concept based on a combination of high order aberrations****Presenting author:** Dalibor Cholevik, Czech Republic**Purpose:**

This prospective study investigates clinical outcomes after implantation of Synthesis Plus (Cutting Edge, France) extended depth of focus (EDOF) intraocular lens (IOL). The IOL mechanism of action is by 4th and 6th spherical aberrations of opposite signs permitting an increase in depth of field increase. This ongoing study aims to evaluate visual acuity potentials in far, intermediate, near distances, contrast sensitivity, as well as dysphotopsia effects.

Setting:

Gemini Eye Clinic, Ostrava, Czech Republic

Methods:

In this ongoing surgeon-initiated clinical study, 18 patients (35 eyes) were implanted with Synthesis Plus lenses as part of standard cataract surgery. Follow-up examinations at 1 week and 1 month included Uncorrected Distance Visual Acuity (UDVA), Corrected Distance Visual Acuity (CDVA) and Uncorrected (UIVA) and Distance Corrected Intermediate Visual Acuity (DCIVA) at 66 cm and 80 cm. Further assessment at 3 months and 6 months include Uncorrected (UNVA) and Distance Corrected Near Visual Acuity (DCNVA) at 40 cm, distance-corrected defocus curves, contrast sensitivity (CS), halo/glare assessment and spectacle independence.

Results:

The interim results on 28 eyes at 1 week and 12 eyes at 1 month show mean refractive outcomes (MRSE) 0.15 ± 0.33 and 0.16 ± 0.20 D. Mean monocular distance uncorrected (UDVA) and corrected (CDVA) visual acuity in logMAR are 0.09 ± 0.12 and 0.02 ± 0.08 at 1 week and -0.02 ± 0.12 and -0.06 ± 0.10 at 1 month. Mean monocular uncorrected (UIVA) and distance corrected (DCIVA) intermediate visual acuities in logMAR are 0.10 ± 0.12 and 0.12 ± 0.13 at 1 week and 0.11 ± 0.11 and 0.13 ± 0.10 at 1 month at 66 cm and 0.06 ± 0.11 and 0.07 ± 0.11 at 1 week and 0.07 ± 0.11 and 0.08 ± 0.10 logMAR at 1 month at 80 cm.

Conclusions:

Although these are very early data, the visual potential in terms of distance and intermediate distances seem positively similar to already evaluated EDOF IOLs presented in the literature or our group. Full outcomes will be presented at the time of the presentation.

Cataract**PP243****Clinical safety and efficacy of a preloaded monofocal hydrophobic acrylic intraocular lens in a real-world population****Presenting author:** Samuel Latham, United Kingdom**Purpose:**

This study was designed to evaluate visual, refractive and safety outcomes in eyes after they underwent phacoemulsification and implantation of a preloaded monofocal hydrophobic acrylic intraocular lens. There are no similar studies that evaluate this lens amongst published literature.

Setting:

This was a single center prospective study conducted at Ashford and St Peter's Hospitals NHS Foundation Trust, United Kingdom.

Methods:

Patients were included if they had cataract extraction with in-the-bag implantation of the EyeCee[®] One preloaded intraocular lens from August to October 2019. Pre-operative, surgery-related and 2 weeks and 3 months post-operative data was collected. Surgeons at this trust were then asked to complete a feedback form to evaluate their experience of implanting the EyeCee[®] One.

Results:

152 eyes were studied. 94 (62%) of these eyes had cataract but no concomitant ocular pathology. Three months post-operatively, 98.7% of all eyes had monocular CDVA ≤ 0.3 logMAR. 100% of the eyes without concomitant ocular pathology achieved this target. The mean CDVA of all eyes in this study improved from 0.43 ± 0.43 logMAR pre-operatively, to 0.05 ± 0.11 logMAR post-operatively ($p < 0.05$). There were no intraoperative complications and 1.3% of patients reported complications 2 weeks post-operatively. All of the participating surgeons said they would use the EyeCee[®] One again with 64% providing an overall rating of 'excellent'.

Conclusions:

Preloaded monofocal hydrophobic acrylic intraocular lenses provide an opportunity to make cataract surgery quicker, easier, safer, and therefore more economical. Our study reports pragmatic data that reveals good to excellent post-operative visual acuity and refractive outcomes in eyes 3 months after EyeCee[®] One implantation. This is accompanied with very little risk of intraoperative and 2 weeks post-operative complications. The results of this study contribute to the growing evidence of positive outcomes when phacoemulsification is combined with monofocal hydrophobic acrylic IOL implantation via preloaded injector in eyes.

Cataract**PP244****Alternative method of IOL calculation using modern formula in eyes with mature cataract****Presenting author:** DMITRII BELOV, Russian Federation**Purpose:**

To demonstrate effectiveness of IOL calculation alternative method using Barrett Universal II formula in eyes with mature cataract.

Setting:

Russian Federation, Saint-Petersburg, Multifield Hospital № 2.

Methods:

In total 149 patients (141 eyes, 59 males, 90 females) underwent phacoemulsification (PE) were enrolled in this study. Ultrasound biometry (Tomey Biometer A1-100) and keratometry (Topcon-8800) were used to IOL power calculation by SRK/T formula. For “ultrasound” axial length retinal thickness (0.2 mm) was added to calculate IOL power by Barrett Universal II formula (BUII). To assess accuracy of these formulas, mean IOL calculation error (ME) and mean absolute error (MAE) were compared. Exclusion criteria: possibility of performing optical biometry.

Results:

ME was $-0.35 \pm 0.61D$ and $-0.17 \pm 0.56D$ ($p < 0.001$) for SRK/T and BUII respectively. BUII shows lower MAE ($0.48 \pm 0.33D$) than SRK/T ($0.56 \pm 0.42D$) ($p = 0.001$). Achievement of target refraction within $\pm 0.5D$ observed in 78 (52%) and 93 (62%) cases, within $\pm 1.0D$ in 122 (82%) and 136 (91%) cases for SRK/T and BUII formulas respectively.

Conclusions:

Proposed method of IOL calculation in eyes with mature cataract using Barrett Universal II formula shows higher accuracy compared with SRK/T and can be used in everyday practice.

Cataract**PP245****Evaluation of the visual quality and independence of optical correction, of the RayOne EMV® Rayner intraocular lens, after 12 months of follow-up. First results.**

Presenting author: Mariano Royo Sans, Spain

Purpose:

Visual analysis, generated by the implantation of the RayOne EMV® intra-ocular lenses (IOL) with positive spherical aberration, based on the data of visual acuity and contrast sensitivity.

Setting:

The study population is composed of 40 eyes operated with RayOne EMV® in a period of 12 months. Visual acuity and blur curve are monitored with the EDTRS optotype at 4 meters and illumination of 85cd/m². Contrast sensitivity using table CSV-1000HGT. At a distance of 2.5 meters with different spatial frequencies.

Methods:

In this study, 20 patients that had surgery in both eyes with RayOne EMV® Rayner IOLs were examined, in which visual acuity and contrast sensitivity were measured, 5 weeks after surgery.

Results:

At 5 weeks: .- Monocular UDVA: 0.05 logMAR .- Monocular UIVA: 0.15 logMAR .- Monocular UNVA: 0.4 logMAR .- Binocular defocus curve (HOTSPOTS): - Optical infinity or far vision: 0.05 logMAR - Intermediate vision 67 cm. (-1.5D): 0.15 logMAR - Near vision 33 cm. (-3.0D): 0.4 logMAR .- Contrast sensitivity test: - 3 cycles / degree: 5.93 - 6 cycles / degree: 4.60 - 12 cycles / degree: 3.81 - 18 cycles / degree: 3.12

Conclusions:

OPTICAL: 1. Fully refractive monofocal technology. 2. Non-pupilodependent distant and intermediate functional vision. Unique IOL with central positive spherical aberration and peripheral asphericity. CLINICS: 1. 100% of patients present spectacle independence in far and intermediate vision 2. 100% of patients can read at 40 cm. with an addition of + 1.50D. 3. 1 in 3 patients has functional vision in near vision.



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PP246

Clinical Outcomes of a New Monofocal Intraocular Lens with Enhanced Intermediate Function : in Comparison with Extended Depth of Focus Intraocular Lens

Presenting author: Sanghyu Nam, Korea, Republic of

Purpose:

To compare clinical outcomes of a new monofocal intraocular lens (IOL) with enhanced intermediate function and extended-depth-of-focus (EDOF) IOL

Setting:

Setting: Asan Medical Center, Seoul, Republic of Korea Design: Nonrandomized prospective comparative case series

Methods:

Patients who are presenting for cataract surgery and met all inclusion and exclusion criteria were implanted the new monofocal IOL with enhanced intermediate function (Tecnis Eyhance ICB00) or the EDOF IOL (Tecnis Symphony ZXR00) bilaterally. IOL powers were targeted to emmetropia. Uncorrected distance visual acuity (UDVA), uncorrected intermediate visual acuity (UIVA), uncorrected near visual acuity (UNVA), corrected distance visual acuity (CDVA), defocus curve, contrast sensitivity and questionnaire regarding visual symptoms, spectacle independence, overall satisfaction and recommendation were evaluated at 3 months postoperatively.

Results:

Twenty four patients (48 eyes) were enrolled in the Eyhance group, and 20 patients (40 eyes) were included in the Symphony group. Monocular and binocular UDVA, UIVA and CDVA were similar between the groups. Monocular UNVA was significantly better in the Symphony group along with better spectacle independence for near distance, but binocular UNVA was not statistically significantly different. There were no significant differences between the groups in contrast sensitivity, glare and halo, satisfaction and recommendation rates, although unlike the Eyhance group some dissatisfaction and severe glare and halo cases were reported in the Symphony group.

Conclusions:

Bilateral implantations of the new Eyhance ICB00 IOL provided comparable clinical performances with the Symphony ZXR00 IOL, with less near spectacle independence but also less numbers of dissatisfaction and severe glare and halo cases.

Cataract**PP247****Refractive surgery in a pseudophakic patient with an epiretinal membrane using a secondary Sulcoflex® trifocal Rayner lens implant****Presenting author:** Mariano Royo Sans, Spain**Purpose:**

The epiretinal membrane (ERM) is a retinal pathology that involves the growth of a tissue on the surface of the macular area, which can evolve causing decreased vision and distortion of images. The secondary sulcus implant of a Sulcoflex® Trifocal intraocular lens (IOL) provides a reversible form of multifocality. Optical management using contact lenses, which simulate multifocal vision, is decisive for the indication of refractive surgery using a secondary implant.

Setting:

A single patient with cataract and epiretinal membrane was studied and intervened. Biometric measurements were taken using optical interferometry (I.O.L. Master500). Analysis of the anterior and posterior segment is performed using Optical Coherence Tomography (OCT), Zeiss Cirrus.

Methods:

72-year-old woman, multifocal contact lens wearer who wants independence from optical correction. Follow-up in the ophthalmology service of Hospital San Rafael because of progressive decrease in VA due to progressive cataract and ERM. Phacorefractive surgery is planned in 3 steps: - First step: phacoemulsification of the cataract and implantation of a monofocal IOL in the capsular bag. - Second step: visual quality test using multifocal contact lenses. - Third step: diffractive trifocal lens sulcus implantation. Optical calculation of the lens in sulcus using the Gills method.

Results:

Two months after the second surgery, the patient is in good ocular condition and with an uncorrected visual acuity (UNCVA) of 0.0 (LogMAR) in far and near vision, and intermediate vision of 0.1 (logMAR). The Sulcoflex® Rayner lens position features a 0.604mm Vault. The intraocular pressure is 16 mm Hg.

Conclusions:

The Piggy-Back technique with intraocular lenses is a reproducible surgical procedure with contact lenses, which is not only useful for the correction of large optic ametropia or refractive surprises in cataract surgery but can also be applied more frequently in those pseudophakic patients who want correction of presbyopia and have complex retinas or doubt about their visual quality with a multifocal intraocular lens in a first and only implant.

Cataract**PP248****A prospective, comparative study of the whole range of vision outcomes between a trifocal IOL and an extended depth of focus IOL (PanOptix IOL and Tecnis Symphony IOL) in a Chinese population**

Presenting author: Guangbin Zhang, China

Purpose:

To compare whole range of visual outcomes, spectacle independence, and visual disturbances of PanOptix IOLs (TIOL group) versus Symphony IOLs (EDOF group) in a Chinese population.

Setting:

A prospective, single site, non-randomized, comparative study/Xiamen Eye Centre affiliated with Xiamen University, Fujian, China.

Methods:

37 subjects who underwent binocular cataract surgery were assigned to TIOL group (18 with 36 eyes) and EDOF group (19 with 38 eyes). Binocular uncorrected (UDVA) and best-corrected (BCDVA) distance visual acuities (5m), uncorrected intermediate (UIVA, 60cm) and near (UNVA, 40cm) visual acuities, distance-corrected intermediate (DCIVA, 60cm) and near (DCNVA, 40cm) visual acuities, modulation transfer function (MTF), spectacle independence and Chinese version validated Questionnaire for Visual Disturbance (QUVID) were evaluated 3 months postoperatively. Standardized logarithm of the minimum angle of resolution (logMAR) charts were used for VA measurement.

Results:

Post-operative 3 months UDVA, BCDVA, UIVA-60cm, DCIVA-60cm, and MTF were not significantly different between groups (both $P > 0.05$). The TIOL group achieved significantly better UNVA-40cm (0.11 ± 0.13 Vs 0.22 ± 0.08), DCNVA-40cm (0.08 ± 0.08 Vs 0.22 ± 0.08) (both $P < 0.05$) and higher proportion of patients reporting never using spectacles for near vision than the EDOF group (83.33% Vs 47.37%, $P < 0.05$). QUVID questionnaire showed incidence of severe starbursts, halos, and glare were comparable in 2 groups 3 months after surgery ($P > 0.05$).

Conclusions:

Compared to EDOF IOL, PanOptix IOL achieve better near-vision and higher spectacle independence, which resulted in superior whole range of visual outcomes with comparable visual quality in a Chinese population.

Cataract**PP249****Clinical outcome of the new 5-foci multifocal intraocular lens****Presenting author:** Santaro Noguchi, Japan**Purpose:**

To evaluate the visual function of the new 5-foci multifocal intraocular lens(M-IOL).

Setting:

Tsukazaki Hospital

Methods:

The subjects were patients who underwent cataract surgery and were implanted with the 5-foci M-IOL, Intensity SL® (Hanita, INT) and the 3-foci M-IOL, PanOptix® (Alcon, TFN). At three months after the operation, full-distance visual acuity (LogMAR, 5m, 1m, 70cm, 50cm, 40cm, 30cm), contrast sensitivity (CGT1000 TAKAGI, CS), Glare & Halo simulator, and near activity score questionnaire were conducted. For statistical analysis, $p < 0.05$. was significant in the Mann Whitney U test.

Results:

Uncorrected visual acuity (5m ~ 30cm) were -0.13, 0.02, 0.03, 0.07, 0.11, 0.25 with INT and -0.10, 0.11, 0.13, 0.09, 0.11, 0.23 with TFN ($P = 0.908, 0.015, 0.012, 0.560, 0.013, 0.141$). CS (non-glare, glare) were 2.72, 2.89 with INT and 2.72, 2.87 ($P = 0.620, 0.480$) with TFN. The simulator results (Halo size, intensity, Glare size, intensity) were 65, 63, 0, 0 with IS and 46, 48, 19, 20 with TFN. In near activity questionnaire, INT was 0.00 and TFN was 18.2 ($P = 0.016$).

Conclusions:

Both groups had similar VA for far vision. INT had the better intermediate and near vision, and made easier for near activity than TFN. TFN had slightly smaller and weaker nighttime halo, however both lenses showed similar CS with and without glare. Performance of both IOLs was comparable and INT can be a useful option for presbyopia correction.

Cataract

PP250

Our experience in corneal astigmatism correction during cataract surgery

Presenting author: Natalia Bachuk, Ukraine

Purpose:

The aim of our study was to compare the postoperative refractive results of the implantation of toric intraocular lens (IOLs) calculated using standard formulas (Holladay calculator) and Barrett's formula (Barrett Toric Formula).

Setting:

The prevalence of astigmatism among patients undergoing cataract surgery is about 64%. High requirements for the quality of vision after phacoemulsification with intraocular lens (IOL) implantation significantly increase the relevance of calculation accuracy of the diopters and axis of the toric IOL positioning.

Methods:

In our clinic 184 patients with immature senile cataracts and initial corneal astigmatism were operated. All patients were divided into two groups, depending on the formula that was used in the calculation of toric IOL. The first group included 91 patients, IOL was calculated using the Holladay calculator. In the second group, there were 93 patients, IOL was calculated using the Barrett Toric Formula. We compared the absolute error of the prediction of postoperative refraction (the difference between postoperative refraction and prediction error of refraction), the percentage of postoperative emmetropic refraction and the degree of residual astigmatism.

Results:

The absolute error in predicting postoperative refraction was 0.11 ± 0.04 D in patients of the 1st group and 0.07 ± 0.02 D in patients of the 2nd group. Postoperative emmetropia was 10.4% in the 1st group and 27.5% in the 2nd group. The degree of residual astigmatism in patients of the first group was 0.78 ± 0.21 D with the initial with-the-rule astigmatism and 0.57 ± 0.11 D with the initial against-the-rule, whereas in the second group the corresponding indicators were significantly lower - 0.16 ± 0.05 D for direct astigmatism and 0.14 ± 0.09 D for the opposite.

Conclusions:

The use of the Barrett formula in the calculation of toric IOLs leads to a significant decrease in the absolute error in predicting postoperative refraction and the degree of residual astigmatism, which determines the increase in the frequency of postoperative emmetropic refraction among patients with initial corneal astigmatism who underwent the phacoemulsification.

Cataract**PP251****Rotational Stability and Visual Performance of New Toric Intraocular Lens with Modified Haptic Design – A Comparative Study****Presenting author:** Shinichiro Nakano, Japan**Purpose:**

To evaluate the rotational stability, astigmatism correction effect, and visual performance of a new toric intraocular lens (T-IOL) with modified haptic design, TECNIS Toric II Optiblu.

Setting:

Ryugasaki Saiseikai hospital, Ibaraki, Japan

Methods:

This was a prospective, observational comparative study of two T-IOLs, TECNIS Toric II Optiblu (Johnson & Johnson Vision, USA). and Acrysof IQ Toric (Alcon, USA). Consecutive 45 eyes of 35 patients (21 eyes for TECNIS Toric II (TECNIS group) and 24 eyes for Acrysof IQ toric (Acrysof group)), who had corneal astigmatism >0.75 diopters (D) with expected postoperative uncorrected visual acuity of 0.1 logMAR or better, were enrolled. Patients with preoperative ocular imperfections which would affect postoperative outcomes were excluded. T-IOL alignment, visual acuity, and residual astigmatism were examined at 1-day, 1-week, 1-month, and 3-months respectively.

Results:

At 1-day postoperative period, UDVA was -0.039 ± 0.08 (mean $\pm$ SD) in TECNIS group and 0.059 ± 0.16 in Acrysof group, which TECNIS group was significantly better ($p=0.015$, Mann-Whitney U test). At 3 months postoperative period, T-IOL alignment error was $1.29 \pm 1.68^\circ$ and $2.25 \pm 2.66^\circ$ respectively. UDVA was -0.040 ± 0.075 logMAR and 0.017 ± 0.131 , respectively. Residual subjective astigmatism was 0.13 ± 0.25 and 0.17 ± 0.27 D, respectively. Postoperative astigmatism prediction error was $0.10D @ 135^\circ \pm 0.32D$ and $0.06D @ 129^\circ \pm 0.31D$ (centroid) respectively. At 3 months post-op, there were no significant differences in IOL misalignments, UDVA, and residual subjective astigmatism between the two groups.

Conclusions:

Postoperative results of TECNIS Toric II Optiblu were equivalent to those of Acrysof IQ toric. Adding to this, TECNIS Toric II Optiblu had faster stabilization of postoperative UDVA, compared to Acrysof IQ toric.



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Cataract

PP252

Post-op visual acuity prediction with Diopsys® electroretinography in patients with dense cataract

Presenting author: Hamilton Moreira, Brazil

Purpose:

To evaluate the visual acuity potential in patients with dense cataract through total field electroretinography - Diopsys®.

Setting:

FEMPAR Mackenzie - Médicos de Olhos SA - University based and private hospital setting.

Methods:

Four groups of patients were studied in a cohort study: (A) patients with dense cataracts; (B) patients with cataracts and possible observation of the eye fundus (C) patients without cataracts; (D) patients with maculopathy and without cataracts. ffERG and VA measurements were compared.

Results:

13 eyes of 10 patients were studied. Comparing pre-surgical group A (n = 5) with probable good macular function versus group C (n = 3), there was a difference with little significance in magnitude ($p = 0.04$) and in phase ($p = 0.04$). Pre-surgical group A with a probable poor macular function versus group D (n = 2), we found a slight similarity in magnitude ($p = 0.07$), with difference in phase ($p = 0.007$). In addition, comparing group B (n = 3) to group C, we found similar values for magnitude ($p = 0.07$) and phase ($p = 0.08$).

Conclusions:

Our findings indicate dense cataract interfere in ffERG - Diopsys®, with low confidence as a visual acuity predictive factor. The more dense the cataract, the more interference was found.

Cataract**PP253****Intra-individual comparative study of Nd:YAG-laser incidence with two hydrophilic MICS IOLs, one with sharp posterior edge.****Presenting author:** Andreas Rygaard, Sweden**Purpose:**

To investigate Nd:YAG-laser incidence due to visually disturbing posterior capsular opacification (PCO) occurring within 5 years after phacoemulsification in patients implanted with a hydrophilic acrylic Micro-Incision Cataract Surgery (MICS) IOL (MI60, Bausch & Lomb, Rochester, NY USA) in one eye, and a hydrophilic acrylic MICS IOL with sharp posterior edge and modified water content in the contralateral eye (MJ14, Bausch & Lomb, Rochester, NY USA).

Setting:

Academic hospital, 250000 citizens in uptake area. 2400 cataract operations annually. Only unit offering YAG-laser treatment within uptake area.

Methods:

We searched electronic medical records for cataract operations performed September 9th 2011 to February 6th 2014 to identify patients with both eyes operated during that period, with one eye receiving MI60 IOL and the other eye MJ14 IOL. Cases with peroperative damage to capsule or zonulae were excluded. Dates of Nd:YAG-laser treatment or death within a follow-up period of 5 years (1825 days) were recorded. To test statistical significance we used Chi-square test for cross-sectional observation of outcome at 5 years after surgery and Cox regression model to assess effects of age at surgery and death during follow-up period.

Results:

Eighteen patients were enrolled. In eyes with MI60, 9 (50%) underwent Nd:YAG-laser capsulotomy within 5 years after surgery, whereas none of the 18 eyes with MJ14 did. Two patients died before reaching a 5-year follow-up period for both implanted IOLs, and 2 patients died after 5-year follow-up of the eye with MI60 IOL but did not reach 5-year follow-up for the eye with MJ14 IOL. The difference in Nd:YAG-laser incidence was statistically significant both with Chi-square test as well as with Cox regression, taking into account patient age at surgery as well as date of death.

Conclusions:

In this retrospective intra-individual comparative study, eyes with MICS IOL MJ14 showed absence of visually disturbing PCO demanding Nd:YAG-laser treatment for a period of 5 years after surgery. In contrast, 50% of the eyes with MICS IOL MI60 needed Nd:YAG-laser treatment for visually disturbing PCO within 5 years after surgery. We conclude that the design of the MJ14 MICS IOL, with a modified water content compared with other hydrophilic acrylic IOLs and a sharp posterior optic edge, with clinical as well as statistical significance delays PCO development after phacoemulsification for cataract.



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Cataract

PP254

Cataract surgery complication rates in residency programs: a targeted literature review

Presenting author: Jessica Pan, United States

Purpose:

Residency programs serve as a gateway to train the next generation of surgeons. While residents proceed through the learning curve, a higher rate of complications may occur. Certain technologies could allow for the learning process needed while lowering the impact it can have on patients. A targeted literature search was conducted to contrast the overall complication rates and complication rates in complex patient cases for residents-in-training and experienced surgeons. Both conventional and femto-second laser-assisted cataract surgeries (FLACS) were reviewed.

Setting:

Not applicable.

Methods:

The PubMed database was searched in August 2020, utilizing the following terms: cataract surgery OR phacoemulsification AND residency. The search was limited to the last 10 years (2010-2020). Conference abstracts published by the European Society of Cataract & Refractive Surgeons, American Academy Ophthalmology, and the American Society of Cataract and Refractive Surgery over the last three years were screened. Outcomes were overall complication rates and complication rates for complex cases when using conventional cataract surgery or FLACS.

Results:

20 studies were identified (single-arm = 14; comparative = 6). For conventional cataract surgery, overall complication rates for residents ranged from 1.3%-15.1% (n=7) and 0.8%-5.8% (n=4) for attendings. In complex cases, residents ranged from 6.5%-63.1% (n=5) and 3.5%-53.0% (n=3) for attendings. Common intraoperative complications by residents were posterior capsule rupture and vitreous loss (n=6, 0.9%-7.0% and 0.2%-6.7%). Among residents, a similar rate of intraoperative complications was observed between FLACS and conventional cataract surgery (manual small-incision cataract surgery or phacoemulsification) in comparative studies (n=5). However, complex case complication rates may be lower for residents using FLACS compared to conventional surgery (n=2).

Conclusions:

Complications were more likely to occur during surgery performed by a resident than surgery performed by an experienced surgeon, overall and in complex cases. Technologies such as FLACS may be helpful in lowering complication rates in complex cases for trainees in residency programs. Advanced technologies should be considered to address common intraoperative complications by residents. Remediating complications such as posterior capsule rupture that occur during phacoemulsification can improve patient outcomes and reduce impact on patients.



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Cataract

PP255

New Lens Extraction Device for Low Energy Cataract Fragmentation

Presenting author: Gabriele Scaltrini, Italy

Purpose:

The miLOOP (Carl Zeiss Meditec) is a micro interventional device designed to delivery low energy endocapsular lens fragmentation manly in dense cataract and complicated cases Single use device, finger controlled, no phaco energy no cavitation reduced I/A. Every cataract extraction is based on the needs to divide the nucleus. This provides safer cataract surgery especially with hard and voluminous nucleus

Setting:

Piovella Global Center for Ophthalmology - Monza - Italy

Methods:

miLOOP was adopted 148 Eyes with medium/hard cataract in patients over 57 yo to split the nucleus in two part or more. The metal loop was inserted in the capsular bag and open through the edge of hydrodelinetion rime. Once the loop is in the proper vertical position the loop is retracted to split the nucleus

Results:

The nucleus was split in two or more pieces in all patients. It is necessary a long learning curve adopting the device in simple cases to be confident in the proper use to avoid device related complications In one case the loop did not match the capsular bag and caused mild zonula damage with no significant weak event. In one eye we experienced opening of the posterior capsule due to a lack of experience in adopting the device that was opened and retracted more then one single time

Conclusions:

miLOOP adoption in medium dense cataract and in complicated cases reduces phaco energy by 50%, reduces I/A fluid use by 30 % and makes hard nucleus cataract removal more controlled and efficient. A proper learning curve needed.



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Cataract

PP256

Experience of performing limbal relaxing incisions during femtolaser-assisted phacoemulsification in the surgical treatment of cataracts associated with corneal astigmatism

Presenting author: Benta Dzhashe, Russian Federation

Purpose:

Analysis of the results of performing limbal relaxing incision during femtolaser-assisted phacoemulsification.

Setting:

Single center

Methods:

Examined the results of 36 cases of phacoemulsification of the cataract with laser assistance and the performing limbal relaxing incision with astigmatism in the range of 3.0 D and UCDVA 0,09 ($\pm 0,11$).

Results:

UCDVA for 3 days after surgery in eyes with astigmatism up to 2.5 D was $0.6 \pm 0,21$, in eyes with astigmatism more than 2.5 D $0.3 \pm 0,1$. Astigmatism values according to the keratometry were respectively 0.25-0.5 and 0.75 D to 1.75 D. Independence from spectacle correction in cases of astigmatism up to 2.5 D noted in 28 cases (93%), with astigmatism of 2.5-3D in 3 cases (50%).

Conclusions:

According to the study the correction of astigmatism in the cases of femtolaserassisted phacoemulsification by the method of limbal relaxing incisions is more effective in the eyes with astigmatism not higher than 2.5 D.

Cataract**PP257****IOLs Design and Material influence in ND: Yag laser rates for a large series of MICS IOL implantations.****Presenting author:** Gilles Lesieur, France**Purpose:**

To study the cumulative neodymium: YAG (Nd:Yag) laser rate (capsulotomy for posterior capsular opacification) after 8535 implantations during cataract surgery of 9 different hydrophilic acrylic MICS lenses and 2 hydrophobic and evaluate influence of material and design.

Setting:

Centre Ophtalmologique IRIDIS, Albi, France.

Methods:

This retrospective study comprises all patients who were implanted between 2004 and the end of 2020 with one of the after 11 micro-incision IOLs: Akreos MICS and INCISE (Bausch and Lomb), CT Asphina 509 M/MP and AT TORBI 709 M/MP (Carl Zeiss Meditec), Synthesis and Synthesis Toric (Cutting Edge) MicroSlim, Micro AY, MicroPure Ankoris and PodEye (BVI-PhysIOL). The postoperative follow-up ranges from 1 to 189 months. The cumulative Nd: Yag laser frequency rates in all groups were calculated, and the cumulative incidence rates were defined by propensity score, Weighted Cox regression, Tuckey test, Kaplan-Meier survival analysis and Mann-Withney test.

Results:

The 2 years survival percentage was 100% for the INCISE, PODEye, Synthesis and Synthesis Toric (95% CI: 100-100); 71,73% for the Akreos MICS (CI: 67-76); 92,70% for the CT Asphina (CI: 91-94); 99,31% for the AT TORBI (CI: 99-100); 88,81% for the MicroSlim (CI: 86-91); 88,81% for the Micro AY (CI: 87-90); 92,10% for the MicroPure (CI: 88-95); and 49,87% for the Ankoris (CI: 19-75). The 9 years survival percentage was 13,62% for the Akreos MICS (95% CI: 9-19); 31,73% for the CT Asphina (CI: 27-37); 64,19% for the MicroSlim (CI: 58-69); 50,48% for the Micro AY (CI: 47-54).

Conclusions:

The hydrophilic Akreos had the lowest survival rate, although it had square edges. MicroPure, which is hydrophobic, showed a lower survival rate than Ankoris (hydrophilic 26%) after 5 years. The Incise as well as the AT TORBI seem to be effective lenses to avoid PCO, with respectively a hydrophilic material at 22% and 25%. Moreover, the PODEye (hydrophobic) showed better results compared at the Ankoris. Finally, MicroSlim showed a very good survival rate after 9 years. All the data will be discussed according to design and material.



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PP258

Refractive results of the hydrophobic Clareon® Intraocular Lens: about 254 cases

Presenting author: Corinne Dot, France

Purpose:

To analyze the refractive results and the long-term outcome of the hydrophobic Clareon® IOL (Alcon).

Setting:

A retrospective and prospective monocentric study on IOLs implanted consecutively between July 2017 and December 2019, and conducted in real life

Methods:

The power was evaluated by using the IOL Master 700® (Zeiss) for emmetropia with the SRK/T formula except for hyperopic patients where the multifunction formula was preferred. The preoperative A constant used was 119.1, as previously recommended by Alcon. The first postoperative refraction selected for the study was performed 1 month after surgery. A part of these patients have been prospectively evaluated 3 years after the surgery. In this last subgroup, visual acuity and safety (transparency and % of Nd:YAG capsulotomy) were assessed

Results:

254 eyes were enrolled. The mean age of the patients was 75,1 years $\pm$ 0,7. The mean follow-up was 33 months $\pm$ 10. One month after surgery, the mean UCVA was 8,8 $\pm$ 0,05; more than half of the patients (52%) had an UCVA superior or equal to 1 (10/10) and 80% superior to 0,8. We have assessed 50 patients three years after surgery: the mean UCVA was 0,76 $\pm$ 0,14. The analysis of the transparency of Clareon® did not reveal any glistening (grade 0) for 93,2% of patients. Only 3/50 patients (6%) required a capsulotomy, performed at 36 months.

Conclusions:

The refractive results are excellent. The tolerance within the first 3 years confirms, for the first 50 patients, the high quality of this recent hydrophobic material. This study is still ongoing to evaluate a larger cohort for the long-term outcome.

Cataract**PP259****Effect of Refractive Astigmatism on All-Distance Visual Acuity in Eyes with a Trifocal Intraocular Lens****Presenting author:** Ken Hayashi, Japan**Purpose:**

To investigate the effect of refractive astigmatism on all-distance visual acuity (VA) in eyes implanted with a diffractive trifocal or bifocal intraocular lens (IOL).

Setting:

Hayashi Eye Hospital

Methods:

Fifty eyes with trifocal IOLs (Alcon PanOptix; TFNT00), and 50 eyes with bifocal IOLs (ReSTOR +3D; SN6AD1) were enrolled. After simulating astigmatism by adding cylindrical lenses of 0, 0.5, 0.75, 1.0, and 1.5 diopters (D), the corrected logarithm of minimal angle of resolution (logMAR) VA was measured using an all-distance vision tester.

Results:

Mean VAs at most distances significantly worsened in proportion to the astigmatism ($P \leq 0.0111$) with no significant difference in near VA in the trifocal group or in intermediate VA at 0.7 m in the bifocal group. Mean intermediate VA at 0.5 m was significantly better in the trifocal group than in the bifocal group when the astigmatism was ≤ 0.75 D ($P \leq 0.0472$), but distance VA was significantly worse in the trifocal group when the astigmatism was ≥ 0.5 D ($P \leq 0.0457$). Useful mean VA was achieved when the astigmatism was ≤ 0.75 D in the trifocal group and ≤ 1.0 D in the bifocal group.

Conclusions:

All-distance VA, particularly distance VA, worsened more in proportion to astigmatism with a trifocal IOL than with a bifocal IOL. Useful VA was achieved when the astigmatism was 0.75 D or less with a trifocal IOL, suggesting that astigmatism correction is necessary when astigmatism is more than 0.75 D.

Cataract

PP260

RayOne diffractive trifocal IOL: refractive and visual outcomes

Presenting author: Andrea Llovet-Rausell, Spain

Purpose:

To evaluate refractive and visual parameters related to distance, intermediate and near vision after cataract surgery or refractive lensectomy of a diffractive trifocal intraocular lens (IOL).

Setting:

Clinica Baviera - AIER Eye Group. Spain

Methods:

Retrospective study performed in 1048 patients who underwent phacoemulsification (cataract or refractive lensectomy) and bilateral implantation of a non toric diffractive trifocal intraocular lens (RayOne trifocal, Rayner Surgical, England). A complete ophthalmologic examination was performed before and after the operation. The minimum follow-up was 3 month. The main outcome measures were uncorrected distance (UDVA), corrected distance (CDVA), intermediate visual (UIVA), near (UNVA) acuities and manifest refraction.

Results:

The study included 1048 patients (2096 eyes), mean SE (spherical equivalent) 1.76 ± 0.71 diopters (D), binocular (logMAR) UDVA 0.38 ± 0.21 , CDVA 0 ± 0.01 , UIVA 0.72 ± 0.19 and UNVA 0.78 ± 0.02 . There was a significant improvement in UDVA (0 ± 0.01), UIVA (0.21 ± 0.06) and UNVA (0.09 ± 0.07) ($p < 0.001$). Postoperative refractive state was within the range of ± 1.00 D (93.5%). Safety index of 1.01 ± 0.05 and efficacy index of 0.96 ± 0.08 .

Conclusions:

RayOne trifocal diffractive IOL improved distance, intermediate and near vision in presbyopic eyes, with good refractive results, efficacy and safety.

Cataract**PP261****Patient-Reported Quality of Life and Satisfaction after Refractive Lens Extraction using a diffractive trifocal IOL– a Multicenter Retrospective Cohort Study**

Presenting author: Walter Sekundo, Germany

Purpose:

To assess the patient satisfaction and quality of life after refractive lens exchange (RLE) with one single brand of trifocal IOL.

Setting:

SMILEEYES clinics Leipzig, Marburg, Munich, Trier

Methods:

Consecutive patients who underwent RLE with “ATLISA tri” or “AT LISA tri toric” (Carl Zeiss Meditec AG, Germany) at one of five surgical centers were surveyed for their quality of life and satisfaction after surgery using a standardized questionnaire. Patient responses were compared to patient characteristics such as age, gender, axial lengths and pre-surgery refraction.

Results:

102 patients with 204 treated eyes were included into the analysis. The mean age was 54.6 ± 5.2 years. 172 eyes were hypermetropic, 3 emmetropic, and 25 myopic, with a mean pre-surgical refractive error of 0.93 ± 2.17 D. Reported post-surgical satisfaction was as follows: 81.2% stated that their visual needs were completely, and 17.8% partially met. Self-reported refractive error quality of life improved significantly in all queried areas of life. Most reported post-surgical limitations were found for “driving at night” and “driving in bad weather conditions”. Halos were reported by 91 (90.1%) patients

Conclusions:

Patient satisfaction and self-reported quality of life after RLE with trifocal IOL was high. Glare and halos remain the only significant drawback of the procedure leading to 40% of patients experiencing difficulties at night driving.



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PP262

Our experience after two years implantation: visual and clinical outcomes after the implantation of 25 trifocal supplementary intraocular lenses in eyes with monofocal primary IOLs.

Presenting author: Carlos Palomino Bautista, Spain

Purpose:

Assessing the efficacy of the AddOn lens in patients with monofocal intraocular lenses implanted in a capsular bag.

Setting:

Hospital Universitario Quironsalud Madrid

Methods:

The patients had no ocular pathology, no amblyopia, and all were pseudo-phakic with monofocal implants with no tilts or decentration. They were multifocused with AddOn Medicontur (trifocal) on 25 eyes, 10 bilateral and 5 monolateral implants were implanted. Age: 70.2 ± 7.08 (65, 81). They were followed up at 6 months: far, intermediate and near VA, specular endothelial micrography, angle control, defocus curve and defocus tolerance (DOF 90%). Monolateral patients had monofocals implanted and we multifocalised with AddOn. They had a diffractive lens implanted (trifocal) in their contralateral eye.

Results:

At 6 months the refractive results were $EE = -0.02 \pm 0.08$ D, UCDVA: 0.01 ± 0.08 LogMAR, UCIVA: 0.20 ± 0.12 LogMAR and UCNVA: 0.12 ± 0.06 LogMAR. The subjective DOF (90%): 0.49 ± 0.09 (0.30, 0.57) D and the DOF (90%) with itrace 0.300 ± 0.07 (0.21, 0.45). 100% of the patients showed satisfaction according to their own questionnaire. There are no statistically significant differences with respect to the previous study.

Conclusions:

Independence from glasses was achieved at all distances after the AddOn implantation. All multifocused patients were satisfied with the AddOn implant. Taking into account the limitation of the sample ($n = 25$), we conclude that AddOn progressive is a good and safe option for multifocalising pseudo-phakic patients with monofocal lenses.

Cataract**PP263****Comparative Study of the Visual Performance of 7 Types of Premium IOLs****Presenting author:** Carlos Palomino Bautista, Spain**Purpose:**

The main objective of this study is analyze the visual quality of the different designs of existing intraocular lenses, to predict their optical and visual behavior within the human eye and thus be able to choose the best lens design for each type of patient based on this visual needs.

Setting:

Hospital Universitario Quironsalud Madrid

Methods:

The study design was retrospective randomized. Each type of lens was implanted in 50 eyes. Pre and post-surgical visual acuity with and without correction was analyzed, as well as refraction before and after procedure. Defocus curves was performed. Objective (Ray tracing) and subjective defocus tolerance were performed. Patient satisfaction was performed using questionnaires. The intraocular lenses studied were Synergy (J&J Vision, EEUU), Panoptix (Alcon, Fort Worth, EEUU), Miniwell (Sifi Medtech, Italia), Finevision (Physiol, Lieja, Bélgica), Symphony (J&J Vision, EEUU), AT LISA 839 (Carl Zeiss, Jena, Germany) and Asquelio TFLIO130C (Ast Products, Inc, Billerica, MA, USA).

Results:

The best postoperative visual acuity (decimal) in 3 distances studied was Synergy: 1.10 ± 0.12 (far), 1.00 ± 0.29 (intermediate 67 cm) and 0.92 ± 0.11 (near 33 cm). Synergy is the lens that exhibited the best defocus curve from 1.00 m to 22 cm. Statistically significant differences were founded between Synergy and Symphony vs Finevision and AT Lisa tri 839mp ($p < 0.05$). Synergy provided the best results in the analysis of the satisfaction questionnaires in all tasks.

Conclusions:

Synergy showed better visual acuities at all distances studied. The best defocus curve from 1.00 m to 22 cm was obtained with Synergy. Synergy and Symphony are the lenses that have the best defocus tolerance, Synergy showed the highest satisfaction in patient questionnaires.

Cataract**PP264****Standardized and automated measurement of visual acuity and contrast sensitivity defocus curves after the implantation of a presbyopia-correcting diffractive-refractive trifocal intraocular lens****Presenting author:** Guadalupe Cervantes-Coste, Mexico**Purpose:**

To assess the visual acuity and contrast sensitivity using a novel, standardized and automated application (Multifocal Lens Analyzer 3.0; MLA by Qvision, Madrid, Spain) after the binocular implantation of the Medicontur Liberty 677MY trifocal intraocular lens (IOL) in presbyopic cataract patients who wish to be spectacle independent.

Setting:

Association to Avoid Blindness in Mexico (Asociación Para Evitar la Ceguera en México - APEC) Hospital, Mexico

Methods:

During our prospective non-comparative study we tested the Multifocal Lens Analyzer 3.0 application with the Liberty presbyopia-correcting IOL. Fifty-three eyes of 28 patients were assessed using the device one and three months following the mono- or bilateral implantation of the diffractive-refractive trifocal IOL. Only subjects with a preoperative cylindric refraction of not more than 1.00 D were evaluated. Monocular uncorrected and corrected visual acuity defocus curves from +1.0 to -4.0 dioptres (D) addition (0.5 D increments), and monofocal uncorrected and corrected contrast sensitivity defocus curves from +1.5 to -4.5 D addition (0.5 D increments) were plotted in each case.

Results:

Area under the curve (AUC) calculations for both visual acuity (VA) and contrast sensitivity (CS) have proven good clinical performance of the investigated IOL. Both VA and CS curves improved significantly during the first three postoperative months in each of the three regions (far, intermediate, near). Total VA-AUC improved from 1.866 ± 0.1667 to 2.104 ± 0.1572 (Baseline: 0.5 logMAR); while Total CS-AUC improved from 2.226 ± 0.3094 to 2.681 ± 0.3123 . All patients reported good visual functions while performing general daily activities, regardless of both distance from the eye and light conditions.

Conclusions:

The MLA application is a fast, accurate and comfortable solution which could be easily inserted into our daily clinical practice. Based on our experiences, the Liberty 677MY presbyopia-correcting IOL is a good choice to restore vision after cataract surgery. The lens provides sharp vision for far, intermediate and near distances, with good contrast sensitivity. Visual outcomes seem to further improve during the first three postoperative months. All our patients are highly satisfied and completely spectacle independent. The MLA application is a useful tool to standardize measurements and compare the results with those obtained by other surgeons, or with other IOLs.



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PP265

Diffraction Blended Vision with a diffractive EDoF and a trifocal IOL – Trifocal+ Vision

Presenting author: David Lucht, Germany

Purpose:

To compare diffractive blended vision effect after cataract surgery by implantation of a diffractive EDOF intraocular lens (IOL) and a trifocal multifocal IOL (MIOL).

Setting:

All surgeries were performed by one surgeon at the Breyer-Kaymak-Klabe Eye Surgery and Premium Eyes in Duesseldorf, Germany, member of the International Vision Correction Research Center (IVCRC.net).

Methods:

We retrospectively analyzed diffractive blended vision effect with a diffractive EDOF IOL and trifocal MIOL (LARA / LISatri, (CZM)) compared to classical bilateral trifocal MIOL (Panoptix (Alcon), LISatri (CZM)). One month or more after second eye surgery, the objective is to compare binocular contrast sensitivity, binocular defocus curves and monocular and binocular halo and glare between the groups.

Results:

The LARA/LISA trifocal+ Vision strengthens LISatri especially in the laptop distance compared to classical bilateral trifocal MIOL Implantation. This combination of EDOF and trifocal MIOL also added the distance strength, reduced halo and glare, increased contrast sensitivity in the dominant eye, but not with binocular vision.

Conclusions:

The combination of the LARA/LISatri further improves the visual quality. Therefore, this combination is a good option to improve e.g., the intermediate vision even more. We coined it Trifocal+ Vision. We apply the same strategy at IPCL surgery in presbyopia correction.

Cataract**PP266****Comparison of two trifocal intraocular lenses implanted monocularly and binocularly in emmetropic patients.**

Presenting author: Javier Lorenzo Fernandez Garcia, Spain

Purpose:

To compare visual and refractive outcomes of two different trifocal intraocular lenses (TIOL) implanted monocularly and binocularly in emmetropic patients.

Setting:

Clinica Baviera/AIER Eye Hospital Group, Spain.

Methods:

This multicenter, multisurgeon, retrospective, comparative case series study includes consecutive emmetropic presbyopic eyes with bilateral implantation of a TIOL. The procedures were performed at the Baviera Clinics in Spain from 2015 to 2021. Two models of TIOL were evaluated: PhysiOL FineVision (FV) and Zeiss AT Lisa Tri (AT). The study includes 611 eyes of 428 patients. The sample was divided in 4 groups: group FV1 (195 patients operated monocularly with FV); group AT1 (50 patients operated monocularly with AT), group FV2 (133 patients operated binocularly with FV); and group AT2 (50 patients operated binocularly with AT).

Results:

Mean preoperative results were comparable in both groups. Postoperative monocular uncorrected distance visual acuity (UDVA) was similar for both IOLs in those implanted monocularly (FV1 0.01 vs AT1 0.01, $p=0.239$), but significantly better in those implanted binocularly with AT (FV2 0.02 vs AT2 0, $p=0.041$). Corrected distance visual acuity (CDVA), binocular uncorrected near visual acuity (UNVA) and uncorrected intermediate visual acuity (UIVA) were comparable between both groups. There is a significant difference in binocular UNVA (FV1 0.1 vs FV2 0, <0.001) and UIVA (FV1 0.3 vs FV2 0.18, $p=0.002$) between monocular and binocular implantation with FV, but no with AT.

Conclusions:

Monocular and binocular trifocal IOL implantation after phacoemulsification in emmetropic eyes is a safe, effective and predictable procedure. UDVA with AT implanted monocularly was significantly better than FV. Bilateral implantation of FV offers better visual outcomes in near and intermediate vision than monocularly.



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PP267

Short-term efficacy report of a new model of multifocal pseudophakic intraocular lens

Presenting author: German Bianchi, Argentina

Purpose:

To evaluate visual outcomes after cataract surgery with a new model of multifocal intraocular lens (IOL).

Setting:

Clínica de Ojos Dr Nano, Buenos Aires. Argentina.

Methods:

A non-randomized prospective case-series study was designed to evaluate the refractive efficacy of the Hanita Intensity pseudophakic multifocal IOL in patients with programmed femtosecond laser-assisted cataract surgery, performed between October 2020 and November 2020, with 3 months of follow-up. Manifest refraction spherical equivalent (SE), and a binocular defocus curve were evaluated.

Results:

A total of 48 eyes (24 patients) were included. The mean $\pm$ standard deviation (SD) of preoperative SE was 1.78 ± 2.23 D (range; -4.50 to 4.75) which decreased to -0.10 ± 0.33 D (range; -0.75 to 0.63) 3 months after surgery. Regarding SE refractive accuracy 87.5 % of eyes obtained SE values between -0.5 and 0.5 D. There was no loss of lines of vision. Regarding the defocus curve, 0.010 logMAR for -3.0 D, 0.006 logMAR for -1.5 D and -0.070 logMAR for 0 D was achieved.

Conclusions:

Good levels of uncorrected visual acuities were obtained in all of the cases, for distance, intermediate, and near vision. Patients achieved spectacle independence, however, a larger series with a longer follow-up will be necessary to confirm the presented results.



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PP268

First European Comparatives Clinical Results for a Violet Light Filtering Trifocal IOL

Presenting author: Detlev Breyer, Germany

Purpose:

The goal was to compare a new trifocal MIOL with violet light filter with well-established trifocal MIOL (LISA, CZM und Panoptix, Alcon).

Setting:

All surgeries were performed by one surgeon at the Breyer-Kaymak-Klabe Eye Surgery and Premium Eyes in Duesseldorf, Germany, member of the International Vision Correction Research Center (IVCRC.net).

Methods:

20 eyes of 10 patients with cataract and expected postoperative corneal astigmatism of under - 0.75D were included. In all eyes, a new hydrophobic diffractive refractive aspheric trifocal MIOL with violet light filter (Optiflex Trio; Biotech, India) was implanted. We assessed subjective refraction, monocular uncorrected and best distance corrected visual acuity for far, intermediate and near distances, and monocular defocus capacity after 3 months postoperatively. Halo and Glare phenomena were documented in a patient questionnaire.

Results:

The defocus curve showed comparable far, intermediate and near vision to both well-established trifocal MIOL. Evaluation of the patient questionnaire also indicated similar halo & glare phenomena like in patients with both comparative trifocal MIOL.

Conclusions:

The visual outcome of Optiflex Trio was comparable to both well-established trifocal MIOL. The defocus capacity of this violet light filtering trifocal MIOL is more like that of Panoptix. Optiflex Trio is an interesting alternative to LISA and Panoptix.



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Cataract

PP269

Higher order aberrations and Modulation transfer function in eyes with Trifocal IOLs

Presenting author: Smitesh Shah, India

Purpose:

To compare higher order aberrations (HOA) and modulation transfer function (MTF) in eyes implanted with Trifocal IOLs.

Setting:

Isha Netralaya, Kalyan, India

Methods:

A prospective study where subjects implanted with Trifocal IOLs (Acrysof IQ PanOptix, Alcon; Triphobic, Care Group), and monofocal IOL (Tecnis, Johnson & Johnson) as control group aged between 40 -75 years, post-operative best corrected visual acuity 0.2logMAR or better, pre operative corneal astigmatism <1.50D and cataract grade NS I-III were included. Subjects with any ocular pathologies, irregular astigmatism, previous refractive surgery, and intra-operative complications were excluded. At 1 month follow up, internal HOA (3rd, 4th and 5th order) and MTF at 5,10,15,20,25,30 cycle per degrees were obtained using HOYA i-Trace aberrometer for 4mm fixed pupil and compared among different groups.

Results:

Eighty seven, 84 and 26 eyes were implanted with PanOptix, Triphobic and Tecnis IOL respectively. The Mean $\pm$ SD age of the subjects implanted with PanOptix, Triphobic and Tecnis IOL were 59.92 $\pm$ 7.10, 58.79 $\pm$ 8.38 and 56.65 $\pm$ 6.25 years respectively. Higher order aberrations were similar in all the IOLs (One Way ANOVA, $p > 0.05$). MTF was found to be significantly better with PanOptix IOL at all spatial frequencies (One Way ANOVA, $p < 0.05$) however Tukey Post Hoc analysis showed MTF of both the trifocal were similar to Monofocal IOL at all spatial frequencies.

Conclusions:

We noted similar internal HOA in eyes implanted with both trifocal IOLs. The MTF of both trifocals were comparable to monofocal IOL however PanOptix IOL resulted in higher MTF. This could be attributed to Enlighten Optical technology used by the IOL which redirects the majority of light from intermediate to far distance.

Cataract**PP270****Defocus Curve Assessment in eyes implanted with Trifocal IOLs****Presenting author:** Smitesh Shah, India**Purpose:**

To evaluate defocus curve in eyes implanted with trifocal IOLs.

Setting:

Isha Netralaya, Kalyan, India

Methods:

A prospective study where subjects implanted with Trifocal IOLs (Acrysof IQ PanOptix, Alcon; Triphobic, Care Group) and Control monofocal IOL (Acriol, Care Group), aged between 40 -75 years, BCVA 0.2logMAR or better was included. Subjects with ocular pathologies, any Intra-operative complications were excluded. At 1month follow up, Monocular distance corrected defocus curve measured in each subject using logMAR chart. The visual acuity with each defocus lens ranging from +2.00 to -3.0D (0.5D steps) was measured in randomized order.

Results:

Ninety Two, 84 and 25 eyes were implanted with PanOptix, Triphobic and Acriol IOL respectively. The Mean $\pm$ SD age of the subjects implanted with PanOptix and Triphobic, IOL were 59.92 $\pm$ 7.10, 58.79 $\pm$ 8.38, 61.79 $\pm$ 6.38 years respectively. All three IOLS performed similar for defocus levels from +2.00D to -1.0D however statistical significant difference was noted for defocus level of -1.5D, -2.0D, -2.5D and -3.0 D (One way ANOVA, P <0.001). Tukey Post-Hoc analysis revealed PanOptix IOL performed better at -1.5 and -2.0D whereas Triphobic IOL performed better at -2.5 and -3.0D

Conclusions:

Defocus curve for trifocal IOLs helps understand IOLs performance at range of distances. PanOptix IOL performed better at intermediate distance as compared to triphobic whereas Triphobic IOL performed better at near distance compared to PanOptix IOL. This information could be helpful in better patient selection based on patients need.

Cataract**PP271****Early functional results of a binocular diffractive trifocal intraocular lens system with continuous phase design to improve near and intermediate visual performance.**

Presenting author: Maximilian Koppe, Germany

Purpose:

To evaluate the clinical outcomes of a trifocal (MIOL), diffractive binocular intraocular lens system (Artis Symbiose, Cristalens Industrie, France), where one lens exhibits an extended depth of focus profile for intermediate vision (Artis Mid) and the other lens for near vision (Artis Plus).

Setting:

International Vision Correction Research Centre (IVCRC), Department of Ophthalmology, University Hospital Heidelberg, Germany

Methods:

The first results of this ongoing clinical study include 4 patients who underwent phacoemulsification due to cataract with implantation of the MIOL (Artis Symbiose, Cristalens Industrie, France). Subjective refraction, corrected and uncorrected visual acuity, monocular and binocular [logMar] for distance, intermediate and near vision, as well as a binocular and monocular best-corrected defocus curve analysis were evaluated 3 months after surgery.

Results:

Median binocular visual results demonstrated UDVA, UIVA and UNVA values of 0,10 (0,00-0,24), 0,00 (-0,06-0,02) and 0,12 (0,00-0,40)logMAR, respectively. Median binocular distance corrected visual results demonstrated DCVA, DCIVA, DCNVA values of 0,00 (0,00-0,08), 0,00 (-0,02-0,10) and 0,12 (0,00-0,30)logMAR. The binocular best-corrected defocus curve showed a continuous visual acuity of 0,20logMAR or better over 3dpt.

Conclusions:

The initial results are promising. The binocular application of the Artis Symbiose IOL System exhibits particularly good results in near and intermediate ranges at an early stage.



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Cataract

PP272

Evaluation of short-term visual outcome of a diffractive trifocal intraocular lens (IOL) in Chinese myopic cataract patients

Presenting author: Xu Chen, China

Purpose:

To evaluate short-term visual performance after implantation of a diffractive trifocal IOL (AcrySof IQ PanOptix) in Chinese myopic cataract patients.

Setting:

Aier school of ophthalmology, Central south university, Changsha; Department of Ophthalmology, Shanghai Aier Eye Hospital; Department of Ophthalmology, Shanghai Aier Qingliang Eye Hospital

Methods:

23 Patients (39 eyes) who underwent cataract surgery combined with PanOptix IOL implantation with an axial length (AL) greater than 24.5mm were enrolled and divided into two subgroups: high myopic group (subgroup1: $26 \leq AL \leq 30.5$ mm) and low-mediate myopic group(subgroup 2).

Results:

There are 15 patients (25 eyes, 27.45 ± 1.32 mm) in subgroup 1 and 8 patients (14 eyes, 25.10 ± 0.37 mm) in subgroup 2. UDVA, UIVA and UNVA in subgroup 1 were 0.06 ± 0.09 , 0.01 ± 0.08 , and 0.02 ± 0.08 , while 0.07 ± 0.10 , 0.02 ± 0.08 and 0.06 ± 0.08 in subgroup 2, respectively. Each subgroup showed the similar defocus curve that reached at a vergence of 0.00 D (far focus) at peak, then dropped slightly at -1.00 D, ascended from -1.50D (intermediate focus) and peaked again at -2.50 D (near focus) similarly. CS under photopic and mesopic conditions were similar in both subgroups.

Conclusions:

PanOptix diffractive trifocal IOL provides satisfied visual outcome, including good uncorrected distance, intermediate, and near acuity with non-compromised visual quality in Chinese myopic cataract patients 1 month postoperatively.

Cataract**PP273****Evaluation of vision-related quality of life after unilateral implantation of a new trifocal intraocular lens**

Presenting author: Cem Ozturkmen, Turkey

Purpose:

To evaluate visual performance and subjective quality of life after unilateral implantation of a new trifocal intraocular lens (IOL) in young and middle-aged patients.

Setting:

A prospective study held in a tertiary eye clinic.

Methods:

Patients that underwent surgery for unilateral cataract in one eye with an emmetropic fellow eye were included. PanOptix multifocal IOL implanted in all subjects. Vision related daily activity performance was evaluated 6 months following surgery. Patients were divided in two groups according to their uncorrected near visual acuity (UNVA): Group I if fellow eye UNVA was worse the operated eye; Group II if fellow eye UNVA was equal or better than the operated eye. The VF-14 questionnaire was used between the highest score of 4 indicating no difficulty and the lowest score of 0 if unable to perform.

Results:

18 patients were enrolled in this study. Patients had good visual performance showing VF-14 scores above 3 in all categories. Reading small print (3.78 ± 0.43) and driving at night (3.78 ± 0.43) were found to be the most difficult tasks to perform. No significant difference was found between two groups in any category that was investigated by the VF-14 questionnaire.

Conclusions:

Unilateral implantation of PanOptix multifocal IOL is well tolerated with good patient satisfaction assessed by VF-14 questionnaire in subjects that have cataract in one eye, which encourages single-eye surgical procedure in this particular group of patients.

Cataract**PP274****Comparison of axis determination with different toric intraocular lenses power calculation methods****Presenting author:** Veronika Röggl, Austria**Purpose:**

To compare the axis position of the measured total corneal astigmatism (TCA) with the axis of the anterior keratometry and the calculated axis position of different toric intraocular lens (tIOL) calculators.

Setting:

Department of Ophthalmology, Medical University of Vienna

Methods:

A total of 163 astigmatic eyes of 163 patients were retrospectively analysed. The axis of the actual TCA, measured with anterior segment OCT, was compared to the anterior K value (I) and three different methods of TCA calculation for tIOL power determination: Abulafia Koch regression formula (II), Barrett Toric calculator V2.0 (III), Barrett Toric calculator V2.0 including measured posterior K (IV). Eyes were assigned to three subgroups: with-the-rule (WTR), against-the-rule (ATR) and oblique astigmatism.

Results:

The mean deviation of calculated from measured TCA was $+0.56^\circ$ (I), -0.32° (II), -0.37° (III) and -1.0° (IV). With WTR and oblique astigmatism the TCA-axis agrees most with the anterior K (6.5% and 31.6% outliers $>5^\circ$ deviation, respectively). With ATR astigmatism the Barrett toric calculator with measured posterior K and the Abulafia-Koch formula are closest to the measured TCA axis (1.5% and 3% outliers with $>5^\circ$ deviation).

Conclusions:

The means of the calculated axis are similar to the measured TCA, but the proportion of outliers with an axis deviation of $>5^\circ$ show remarkable differences. Isolated anterior K-measurements show the fewest outliers in with-the-rule and oblique astigmatism. In against-the-rule astigmatism, Abulafia Koch calculation shall be used for axis determination.



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PP275

Estimation of Total Corneal Astigmatism from anterior keratometry

Presenting author: Carlos Palomino Bautista, Spain

Purpose:

To provide predictive models of total corneal astigmatism (TCA) using anterior keratometric measurements based on the real corneal refraction index.

Setting:

Hospital Universitario Quironsalud Madrid

Methods:

Anterior and posterior corneal curvature measurements were obtained in 723 normal eyes using Pentacam HR rotating scheimpflug camera. Predictive regression models were then constructed to determine TCA from the anterior radii of curvature in eyes with the rule (WTR), against the rule (ATR) and oblique (OBL) astigmatism. The models were validated on a sample of Pentacam HR keratometry data obtained in 100 eyes randomly selected according to the same inclusion criteria.

Results:

Simulated keratometry (simK)-derived TCA (using the keratometric index 1.3375) was 1.26 ± 0.90 D, while model-derived TCA was 1.09 ± 0.89 D. Simk overestimated predicted TCA by 0.21 ± 0.18 D in eyes WTR astigmatism, but underestimated this TCA by 0.16 ± 0.11 D in ATR eyes and 0.14 ± 0.14 D in OBL eyes

Conclusions:

Three TCA prediction models were obtained based only on Pentacam anterior corneal surface radius of curvature measurements.

Cataract**PP276****Functional outcomes of the PRECIZON Toric Intraocular Lens**

Presenting author: Detlef Holland, Germany

Purpose:

To evaluate the performance of the PRECIZON Toric Intraocular Lens (IOL; Ophtec, Groningen, The Netherlands).

Setting:

nordblick Augenklinik Bellevue, Augenzentrum.One

Methods:

Prospective, open label, non-randomized, single-centre study. Outcome parameters were the mean change in cylindrical power of the eye, uncorrected and corrected distant visual acuity scores (UDVA and CDVA), the amount of surgically induced astigmatism (SIA), the degree of IOL axis misalignment, manifest refraction spherical equivalent (MRSE), safety, patient satisfaction. The axis marking was performed by the RoboMarker. (Surgilum, USA). UCDVA, CDVA, spherical equivalent and rotation stability was recorded. Intraoperative and postoperative adverse events were documented

Results:

Bilateral implantation of the toric IOL was performed in 18 patients. At 3 months, the mean reduction in cylinder was $1.59 \text{ D} \pm 0.74$. The mean UDVA and CDVA was 0.03 ± 0.10 and -0.04 ± 0.06 , respectively. The mean degree of IOL axis misalignment was 3.74 ± 3.96 . The spherical equivalent was 0.13 ± 0.46 . After 3 months, only 6% of cases used spectacles for distance vision and 78% was satisfied or very satisfied. Misalignment did not seem to have a significant impact on the uncorrected distance visual acuity which proves the positive effect of the new optic design.

Conclusions:

Bilateral Precizon Toric IOL implantation is a safe and effective procedure, providing excellent predictability of astigmatic correction, good visual outcomes and a high level of satisfaction. The results confirm that with the new transitional toric optic design even in eyes with significant misalignment good uncorrected DVA can be achieved.



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PP277

Clinical Burden Associated with Uncontrolled Intraocular Pressure in Cataract Surgery

Presenting author: Carine Hsiao, United States

Purpose:

During cataract surgery, deviation of intraocular pressure (IOP) from physiological ranges is often transient, but can lead to poor patient outcomes in some cases. The purpose of this literature review was to investigate the complications associated with uncontrolled intraoperative IOP.

Setting:

Not applicable.

Methods:

A targeted literature search was conducted in PubMed. The search was designed to target English language studies that analyzed complications associated with uncontrolled IOP during cataract surgery. The search was not restricted by date of publication or study design.

Results:

Seven articles were identified. Deviation from physiological IOP can cause complications in cataract surgery. Large fluctuations may induce corneal endothelium damage. The sudden IOP drop during occlusion break surge decreases anterior chamber depth, which may result in posterior capsule rupture (PCR). Elevated IOP impairs ocular blood flow and may increase PCR risk by breaking down the posterior capsule-anterior hyaloid membrane barrier. High IOP system settings (maximum 85 mm Hg) significantly increase day-1 postoperative corneal edema (12% vs. 4%, $P=0.04$) and anterior segment inflammation (Cells: 30% vs. 6%; Flare: 30% vs. 7%; $P=0.01$) versus low IOP settings (maximum 69 mm Hg).

Conclusions:

Uncontrolled IOP during cataract surgery is associated with an increased risk of PCR and postoperative complications. This review highlights the importance of monitoring and controlling intraoperative IOP to minimize fluctuations and prolonged exposure to high IOPs.



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PP278

Modelling the impact of fluidics, phaco power and position on floppy iris behaviour during phaco-emulsification: A mathematical and computer simulation study with clinical applications

Presenting author: David Lockington, United Kingdom

Purpose:

Efficient phaco-emulsification relies on optimised fluidics and energy transfer to enable mobilisation, followability and removal of lens fragments. These interactions can be compromised in the setting of intra-operative floppy iris (IFIS), leading to potential complications. We wanted to expand our previous IFIS modelling work to further consider the relationship between the phaco probe, the fluidic followability currents and the relevance to potential floppy iris deformation mechanisms.

Setting:

Fluid-structure interaction in IFIS was studied using a mathematical model with simulation through a collaboration of Tennent Institute of Ophthalmology, Glasgow, UK; Hong Kong Polytechnic University, Hong Kong; University of Glasgow, UK; and Shandong University, Shandong, PR China.

Methods:

A simplified two-dimensional phaco-emulsification model was developed (iris as two elastic beams with geometrical non-linearity, sinusoidal, transverse velocity applied to mimic the torsional vibration of phaco probe). Dynamics of fluid flows was numerically simulated using the lattice Boltzmann method. Dynamics of the flexible structure was solved using the finite-element method. Coupling of the fluid flow and iris structure was handled using the immersed boundary method. This model was used to study the impact of probe position, iris stiffness, and phaco power and frequency on iris behaviour.

Results:

3 distinct modes of iris movement (repulsion, attraction, adhesion) were identified related to probe position. The iris final deformation mode was independent of the initial phase angle of the probe oscillation velocity. Stiffening the iris made the adhesion mode zone shrink and the attraction mode zone expand relative to the phaco probe position. Reducing the phaco power also reduced the intraoperative risk of iris tissue damage by shrinking the adhesion mode zone and reducing the iris vibration amplitude in the attraction mode zone.

Conclusions:

This mathematical model of IFIS in phaco-emulsification demonstrates that a larger safe surgical zone could be achieved by increasing the iris stiffness, decreasing probe power and maintaining the probe in an optimal frequency range and position. Ensuring surgeons are aware of these factors should reduce propensity for IFIS behaviour and minimise the risk of iris damage during phaco-emulsification.

Cataract**PP279****Intravitreal steroid treatment for pseudophakic macular edema in non-diabetic patients****Presenting author:** Aliko Liaska, Greece**Purpose:**

Pseudophakic macular edema, also referred to as Irvine-Gass syndrome, is a complication of cataract removal or other intraocular procedures. It is characterized by the release of pro-inflammatory mediators triggered by the surgical “trauma”, that induces blood-ocular barrier breakdown. Inflammation is amongst associated factors suspected to predispose for postoperative macular edema. The purpose of the study is to evaluate the results of intravitreal steroid treatment of postoperative macular edema.

Setting:

Department of Ophthalmology, General Hospital of Lamia, Lamia, Greece

Methods:

Case-series retrospective chart review of operated patients evaluated in General Hospital of Lamia (GHL) during 2020. Five non-diabetic patients (one woman, four men, 78-83 years-old) presented with macular edema after operation. They had undergone (i) IOL dislocation surgery (three patients), (ii) uneventful phaco and intraocular lens-IOL implantation (one patient) and (iii) manual extracapsular cataract extraction with IOL implantation (one patient). Mean visual acuity (VA) was 0.74 logMAR (0.3-1) and mean Central Retinal Thickness (CRT) was 485.2 μ m (391-713). All patients had one-month treatment with topical steroids and non-steroid anti-inflammatory agents (NSAIDs) without response. All patients had intravitreal steroid treatment (triamcinolone acetonide-one patient and dexamethasone implant-four patients). Follow up lasted 2-10 months. Pre- and after-treatment VA and CRT were recorded and tested with Wilcoxon signed rank sum test.

Results:

VA improved to 0.4 logMAR (range 0.15-0.7) ($p=0.0422$) and CRT was reduced to 279.6 (range 257-321). Two patients needed a second treatment 6 months later. No patient lost vision.

Conclusions:

Postoperative macular edema in non-diabetic patients may respond well to intravitreal steroid treatment, given all other topical therapeutic measures are exhausted.



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PP280

Pitfalls of a Continuous Curvilinear capsulorhexis.

Presenting author: Mohit Garg, India

Purpose:

To describe the long term sequelae of a continuous curvilinear capsulorhexis and its impact on the capsular bag-intraocular lens complex.

Setting:

Tertiary eye care hospital in North East India.

Methods:

Observational study where patients who underwent Phacoemulsification with continuous curvilinear capsulorhexis and in the bag IOL placement were evaluated over time. Clinical evaluation, photographic documentation, AS-OCT and UBM was done where necessary. For patients where explantation was done, for various reasons, histopathological, biochemical, immuno-histochemical, and electron microscopic studies were done in order to monitor the cases. Various parameters such as capsulorhexis size, orientation, inflammatory status of eye etc. were studied along with their relation to long duration post operative status of IOL-capsular bag complex.

Results:

The cases which presented for long duration follow up were observed and capsular bag IOL lens complex was evaluated. Certain changes were observed which have not been reported in the can-opener technique. Changes observed were found to have various clinical forms including Anterior capsular opacification, capsular phimosis, Ring of soemmering formation, liquified after cataract, late spontaneous dislocation of capsular bag-iol complex etc. The observations and assumptions made were supported by various imaging, histochemical, biochemical and microscopic evidences. The size and the orientation of the capsulorhexis with respect to IOL was also found to be associated with different fates.

Conclusions:

Continuous curvilinear capsulorhexis has proven to be a boon for cataract extraction and IOL implantation but is not free from flaws. Further innovation is needed in order to maintain an ideal IOL status for a long duration post-operatively.

Cataract**PP281****Incidence and clinical aspects of dry eye syndrome after phacoemulsification****Presenting author:** omar nabih, Morocco**Purpose:**

According to the Ocular Surface and Tear Film Society, dry eye is a multifactorial disease of the ocular surface defined by the loss of tear film homeostasis associated with ocular symptoms or tear film instability, Hyperosmolarity, inflammation and damage of the ocular surface as well as neurosensory abnormalities do play an important role in it Cataract surgery is one of the factors inducing an alteration in tear film homeostasis

Setting:

The aim of our work is to study the incidence, as well as the severity of dry eye syndrome after phacoemulsification in a university ophthalmic department in Casablanca, Morocco

Methods:

This is a prospective observational study, conducted in our department from January 1 to March 1, 2019. were included patients who were candidates for cataract surgery over the age of 55. Forty eight patients were included in the study. The statistical study was performed using SPSS 20 software. The severity of ocular surface symptoms was investigated by the OSDI score. The ocular surface was reassessed at one week, one month and 3 months postoperatively.

Results:

We noted a significant improvement of the visual acuity by logMAR of 1.23 ± 0.61 preoperatively vs. 0.28 ± 0.20 at the end of the third month ($p < 0.05$). Mild to moderate dry eye syndrome was noted in eight patients (16.5%) preoperatively. Worsening of the OSDI score was noted in 52% and 31% of patients at one week and one month respectively with moderate to severe symptoms. Only 10.5% of patients maintained a moderate OSDI score at the end of the third month on topical treatment.

Conclusions:

Dry eye syndrome is common after phacoemulsification. Despite the improvement in visual acuity, the quality of life of patients is often impaired due to an unrecognized dry eye syndrome or induced by surgery, therefore it is important to manage the ocular surface both pre and postop in order to limit visual discomfort postoperatively.

Cataract**PP282****Complications of empiric treatment of cataract by couching****Presenting author:** Annick Rolande Kougou Ntoutoume, Morocco**Purpose:**

Traditional lens lowering is still practiced in some developing countries. The complications of this empirical technique are serious and represented by glaucoma, retinal detachment and endophthalmitis. We report the case of a 70-year-old woman with phacoantigenic uveitis and hypertonia following lowering of the lens.

Setting:

Mohammed V University in Rabat, Medical School Ophthalmology Unit A, Speciality Hospital

Methods:

A 70-year-old patient consulted for a red and painful right eye that had progressed for 7 days. She is type 2 diabetic, illiterate and comes from a modest social background. She reported on a traditional lens-lowering notion of the eye 3 weeks ago. We performed a complete ophthalmologic examination and an ocular ultrasound.

Results:

The ophthalmologic examination of the right eye found visual acuity to count the fingers closely, significant inflammation in the anterior chamber, grade 1 hyphema, a wick of vitreous in the anterior chamber, hypertonia at 45 mmHg and a luxated cataract lens. in the vitreous, mobile according to eye movements and confirmed on ocular ultrasound. Examination of the left eye mainly notes visual acuity including the fingers and a cataract lens. The patient underwent emergency hypotonizing treatment, corticosteroid therapy and an anterior and posterior vitrectomy with phacofragmentation, without implantation in the right eye.

Conclusions:

Patients who are victims of this archaic practice are exposed to numerous complications which are often of poor prognosis. Hence the interest of informing and sensitizing populations in precarious socio-economic and intellectual situations.



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PP283

Changes in corneal astigmatism after clear corneal tunnel phacoemulsification guided by corneal topography

Presenting author: Salvo Giugno, Italy

Purpose:

Surgically induced astigmatism (SIA) caused by the incision after cataract surgery may be calculated to improve IOL toric power calculation and achieve better visual outcome. SIA could be determined as the difference between preoperative and postoperative keratometry.

Setting:

Studio Oculistico Dr. Salvatore Giugno Viale Mario Gori 63, Niscemi (CL) Italia

Methods:

Preoperative and 6 months postoperative data of 52 cataractous eyes (43 patients) undergoing uncomplicated cataract surgery were assessed. All incisions were performed at 110°. No sutures were used in any patient. Corneal topography was done in all eyes on the day prior to surgery and 6 months post-operatively. Changes in anterior corneal astigmatism of the refractive analysis at 3 mm and anterior Keratometry at 3 mm were evaluated.

Results:

Patients with preexisting anterior corneal astigmatism >1.00 diopters (D) had an increased or invariated cylinder postoperatively (0,19 +/- 0,13 Diopters). Patients with preexisting anterior corneal astigmatism >0,45 and <1.00 diopters (D) showed a significant difference in surgically induced astigmatism: a decrease of postoperative cyl at 3 mm of 0,22 +/-0,11 (D).

Conclusions:

In cases of preoperative astigmatism >0,45 and <1 D, the SIA of the phacoemulsification significantly decrease it in the post-operative.



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PP284

Use of hyperfocal applied to cataract surgery

Presenting author: Salvo Giugno, Italy

Purpose:

To set a hyperfocal point, evaluate patient-reported satisfaction and spectacle dependence for key activities of daily living after cataract surgery with pseudophakic mini-monovision.

Setting:

Studio Oculistico Dr. Salvatore Giugno Viale Mario Gori 63, Niscemi (CL) Italia

Methods:

The hyperfocal distance is the distance beyond which all objects have an acceptable sharpness, setting the focus to infinity. In cataract surgery it's possible to use the hyperfocal distance, setting the focus to infinity, choosing a preoperative optimization of hyperfocal for far or near. In the biometric calculation, setting a hyperfocal instead of emmetropia, for far or near we will obtain an acceptable vision, even if not perfect, in a wider range of focus, with a prevalence of sharpness for far, near or intermediate, depending on the type of optimization of the hyperfocal we selected.

Results:

We performed a prospective randomized study in two groups of patients with bilateral cataracts. The first group of patients was operated by aiming for a distance emmetropia target. The second group was operated on with the goal of achieving mild myopia (-0.50D) in the dominant eye and -1D in the non dominant eye. One month after surgery all patients were subjected to a questionnaire designed to assess the independence from the use of glasses in daily life: it was assessed a greater independence from the use of glasses in myopic patients.

Conclusions:

This type of vision, in which the contrast is slightly reduced but the depth of field is greater, is perceived with greater liking because a greater number of points are seen more clearly. In conclusion, myopic patients have achieved greater independence from the use of glasses in most activities carried out in the intermediate and near.



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PP285

Refractive outcomes in patients undergoing cataract surgery post refractive surgery

Presenting author: Omer Jamall, United Kingdom

Purpose:

There is an increasing prevalence of patients with cataracts who have previously had laser refractive surgery (LRS). This poses challenges when calculating the correct replacement IOL power. Different formulas have been designed to try to account for the alterations in corneal shape. This audit is designed to assess the refractive outcomes in patients who have had previous laser surgery in order to assess the accuracy of the current practice at our Trust of using the American Society of Cataract & Refractive Surgery (ASCRS) online calculator.

Setting:

Patients who had cataract surgery performed within the Barking, Havering & Redbridge University Hospitals NHS Trust.

Methods:

Data was gathered from patients with a history of LRS over a five-year period and included the pre-operative & post-operative refraction and visual acuity (VA). Their outcomes were compared against the Royal College of Ophthalmology guidelines which state that 85% of patients undergoing routine cataract surgery should have a postoperative spherical equivalent within 1 dioptre (1D) of the predicted refractive outcome.

Results:

In 90% of eyes, the ASCRS calculator was used in combination with the Haigis-L formula and/or the Holladay formula. The spherical equivalent was within 1D of the predicted refractive outcome in 24/30 eyes.

Conclusions:

Previous refractive surgery is a well-known risk factor for refractive surprise post cataract surgery. Our results showed that 80% of patients had post-operative refraction within 1D of target refraction. Of the five patients who did not meet this requirement, four of these had a significant pre-existing cylinder which was not corrected at the time of surgery and three of these patients were left with a postoperative VA between 0.02-0.2 LogMAR and were therefore pleased with their outcomes. We conclude that our current practice is meeting quality standards.



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PP286

Red flag Alert! Spherophakia rescued by using all the right rules

Presenting author: Ashraf Armia Balamoun, Egypt

Purpose:

Male patient presented to me with refractive corneal surgery in both eyes with residual high degree errors still present. By examination he did the right eye with by another surgeon with residual cataract, displaced IOL, contracted bag and with residual refraction of mixed high astigmatism. The left eye was cataracts with N+++ and normal posterior segment. UBM showed a typical picture of spherophakia which was not previously detected by the refractive surgeon and not put in mind with the surgeon who did the cataract in the right eye.

Setting:

Al Watany Eye Hospital WEH, Watany Research and Development Centre WRDC, Cairo, Egypt

Methods:

We used all the best and rescue tools for the left eye to get the best results. We used FLACS to get the perfect size of the capsulorhexis, using the CTR to stretch the bag against the elastic zones then we succeeded to implant single piece inside the bag.

Results:

We followed up the patient for centration and stable refraction with slit lamp photos showing this. Refraction was maintained by +0.25 Smh and - 0.75 astigmatism with UCVA of 20/20 in the left eye.

Conclusions:

Proper diagnosis of a cataract shperophakia case and using FLACS with all the rescue tools can save the eye reaching the best results comparing to what happened in the right eye.



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Cataract

PP287

Patient adherence to glaucoma treatment during the COVID-19 pandemic

Presenting author: Ioanna Mylona, Greece

Purpose:

The purpose of this study was to determine the factors which are associated with adherence to glaucoma treatment during the COVID-19 pandemic

Setting:

Department of Ophthalmology, General Hospital of Serres

Methods:

A cross-sectional cohort study of 100 consecutive glaucoma outpatients who were interviewed with a Greek-translated modified version (ARMS2-COVID) of the original ARMS2 scale who examined adherence to medication. Length of treatment and disease onset along with basic demographics (gender, age, socioeconomic status and educational level) were also recorded.

Results:

The COVID-19 pandemic disproportionately impacted patients of older age and lower educational level with regards to their ability to follow their treatment plan regardless of the length of previous treatment. A multiple regression analysis concluded that a higher level of education and a younger age are significant predictors of higher adherence to treatment.

Conclusions:

More planning will be required to reach the higher age group of limited education with appropriate educational interventions and proactive patient follow-up.



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Cataract

PP288

VERION assisted Carlevale lens implantation

Presenting author: Georgios Batsos, Greece

Purpose:

To describe a novel approach, using ALCON®'s VERION® image guiding system, for optimal positioning of a Carlevale® scleral fixated intraocular lens (IOL).

Setting:

2nd Department of Ophthalmology, Ophthalmiatreio Athinon, Athens, Greece

Methods:

VERION® measuring module was used and the reference photo of the eye was taken. The desired axis for the scleral incisions was determined with Vision Planner. Two opposite scleral pockets were made using the microscope's digital marker as guidance for the axis. After a 25G pars plana vitrectomy, the dislocated IOL was removed from a 2.6 mm corneal incision. At the scleral pockets, 1.5mm posterior to the limbus, 23G scleral incisions were made. The Carlevale® IOL was inserted through the corneal incision. With hand shake technique, the IOL plugs were externalized from the scleral incisions and inserted into the pockets.

Results:

Four months postoperatively, the Carlevale® IOL is aligned in the optimal position, centered and not tilted. The patient is satisfied with the visual outcome.

Conclusions:

VERION® digital marker provides real-time visualization of the desired axis, enabling axis precision and optimal alignment of the scleral incisions. It can help minimize potential sources of errors, leading to better visual outcomes.

Cataract**PP289****What if it wasn't a secondary cataract?****Presenting author:** BAJJOUK Salma, Morocco**Purpose:**

The appearance of the opacification of the intraocular implant must be known, even if it is rarely found, so as not to be confused with a secondary cataract. The purpose of this work is the description of this opacification and the adequate management in face of this incident.

Setting:

We report the case of a 65 years old patient with type 1 diabetes, who complains of a progressive loss of visual acuity. The patient was operated on for cataract in the right eye 2 years ago: phacoemulsification and implantation in the capsular bag of hydrophilic acrylic lens.

Methods:

The ophthalmological examination of the operated eye found visual acuity of 1/10. Examination of the anterior segment found a clear cornea, a calm anterior chamber, and visibly anterior opacification of the intraocular implant. Examination of the posterior segment was normal. Faced with the decline in visual acuity and functional discomfort, lens was explanted and was examined by gross and light microscopy. The patient was reimplanted with an implant clipped to the posterior surface of the iris.

Results:

Microscopic analysis confirmed the opacification of the implant and presence of homogeneous deposits on the anterior surface only, without exceeding the limit of the anterior rhexis. The posterior surface of the hydrophilic acrylic implant was clean. The analysis of these deposits reveals a phospho-calcium crystalloid composition. Postoperative visual acuity was 6/10.

Conclusions:

The secondary opacification of a hydrophilic implant is rarely reported in the literature recently. The pathophysiology is not yet clear. Its management unfortunately requires an explantation of the opacified implant and a reimplantation.



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PP290

Posterior capsule opacification (PCO) during the implantation of open bag IOL. Results of 10 years' experience with plate torsion-haptic intraocular lenses (PHTIOL) "Torsion"

Presenting author: Sergey Kuznetsov, Russian Federation

Purpose:

Analysis of frequency of ND: YAG-laser capsulotomy of posterior capsule opacification (PCO) in patients with intraocular correction of aphakia by PHTIOL.

Setting:

1Penza Institute for Further Training of Physicians - Branch Campus of the Federal State Budgetary Educational Institution of Further Professional Education «Russian Medical Academy of Continuous Professional Education» of the Ministry of Healthcare of the Russian Federation. 2The Penza Region Hospital, Penza, Russia.

Methods:

PHTIOL "Torsion" (RF Patent 2208418), manufactured by "Reper-NN Ltd." 5,5× 15,4× 0.2 mm by size, were used in clinic at 752 eyes of 615 patients with age related cataract during a routine PHACO through 2.2 mm incision. Standard research methods were used in all patients includes refractometry and monitoring of PHTIOL position by UBM-biometry before and after surgery. ND: YAG-laser capsulotomy was performed in a circle or a cross forming 4-mm hole in borders of PHTIOL optical part. Follow-up was from one to 10 years (at mean 7.73 ± 3.21 years).

Results:

ND: YAG-laser capsulotomy was performed on 32 eyes (4.25%) of 23 patients in follow-up of 5.5 to 10 years. During the period 5,5-7 years capsulotomy was performed on 15 eyes (46,87%), from 7 till 8,5 years were done on 14 eyes (43,75%), from 8,5 till 10 years was performed on 3 eyes (9,37%). Correct and stable PHTIOL position was proved by UBM method. In all patients, the parameters of CB with implanted lens did not significantly differing from those after of the ND: YAG-laser capsulotomy. Furthermore, there was no long-term complications of the CB.

Conclusions:

The 10-years results of open bag PHTIOL implantation allows to conclude, that the IOL "Torsion" really can significantly reduce the risk of PCO. In addition, PHTIOL significantly delays the time of occurrence PCO to an average of 6.99 ± 0.9 years. Therefore, the statistic of PCO after cataract surgery with implantation of IOL should be taken into account as a minimum after 5,5 years.



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PP291

Visual Outcomes and higher order aberrations in eyes with Hybrid EDOF IOL

Presenting author: Vaishal Kenia, India

Purpose:

To report visual outcomes and higher order aberrations in eyes implanted with Hybrid EDOF IOL

Setting:

Kenia Eye Hospital, Mumbai, India

Methods:

This is retrospective case series where records of subjects implanted with Hybrid EDOF IOL (LUCIDIS, SAV-IOL), aged between 40-65 years were analyzed. Subjects with Pre surgery corneal astigmatism >0.75 D, corneal Guttae, IOP less than 22mmHg, any ocular Co morbidities, Intra or post operative complication, Cases where IOL master 700 not possible and missing data were excluded. At 1 month follow up uncorrected visual acuities at distance (UCDVA), intermediate (UCIVA) at 80 cms and near (UCNVA) 40 cms were recorded. Internal Higher order aberrations (HOA) for a fixed pupil size of 4mm and 6mm were calculated using NIDEK OPD Scan.

Results:

32 eyes of 22 patients had a Mean $\pm$ SD age and IOP of 62.29 $\pm$ 4.83 years and 16.56 $\pm$ 2.70 mmHg respectively. 87.76% and 12.24% had UCDVA of 20/20 and 20/30 respectively. 57% had UCIVA better than N10 and 30% had N12. 87.86% and 8.16% had UCNVA of N6 and N8 respectively. HOA were significantly lesser at 4mm pupil as compared to 6mm (Paired T test, P<0.05).

Conclusions:

Hybrid EDOF IOL such as LUCIDIS provides excellent vision at all distances. This could be attributed to IOL design which is spherical aberrations neutral lens and works on the principle of axicons.

Cataract**PP292****Results Of EDOF IOL's Implantation In Post Laser Vision Correction Eyes**

Presenting author: Liat Mendel, Israel

Purpose:

To describe patient's results and satisfaction from EDOF IOL's implantation, in post laser vision correction eyes.

Setting:

Ein Tal surgical center, Tel Aviv, Israel

Methods:

A retrospective surgical case series of 10 post myopic laser vision correction eyes of 7 patients who underwent uneventful cataract surgery with EDOF IOL's implantation in Ein Tal medical center, during the years 2017-2020, by one surgeon. Patients were evaluated for visual acuity, refraction and satisfaction questionnaire, one-month post-operative.

Results:

Seven patients (ten eyes) with a mean age of 55.6 ± 9 years were included. Mean axial length was 25.3 ± 1.1 mm. Mean post-operative spherical equivalent (SE) was -0.31 ± 0.24 D. Mean uncorrected visual acuities for distance, intermediate and near were: 6/6, 6/7.5 and J3.7, accordingly. 100% of patients (n=5) reported their vision for far and intermediate as "excellent" or "good". Sixty percent of patients reported they "never" or "rarely" use spectacles for any distance. All the patients reported they would choose to implant this IOL again.

Conclusions:

EDOF implantation can be a suitable option for post myopic laser vision correction patients, with good refractive results and spectacles independence. A larger group is necessary to further assess their results.



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PP293

Assessment of intermediate distance tasks and their impact on functional vision after the bilateral implantation of two monofocal IOLs: a comparative study

Presenting author: Daniele Tognetto, Italy

Purpose:

To evaluate the patient-reported outcome measures (PROMs) of cataract patients after the bilateral implantation of two different types of monofocal IOLs

Setting:

University Eye Clinic of Trieste, Trieste, Italy

Methods:

Cataract patients scheduled for the bilateral implantation of a monofocal IOL were randomly assigned to the implantation of a new monofocal IOL (ICB00) or the standard monofocal IOL ZCB00 of the same brand respectively. All patients underwent a complete ophthalmological examination during the pre-operative visit and 1 month after the second eye surgery. IOL calculations were performed using a swept-source optical biometry. The Catquest-9SF questionnaire was administered at each visit and the average pre-operative and post-operative scores were calculated and compared between the two groups.

Results:

A total of 36 patients were enrolled in the study. The ICB00 group showed an increase of average scores of intermediate distance vision related items and of the global score as well.

Conclusions:

The quality of life related questionnaire showed better results in the group implanted with the new monofocal IOL.



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PP294

A Cost-benefit Analysis of AcrySof IQ PanOptix Trifocal Intraocular Lens (IOL) from Patient Perspective in the USA

Presenting author: Dr. Chandra Bala, Australia

Purpose:

AcrySof IQ PanOptix is the first trifocal IOL approved by Food and Drug Administration (FDA) in the USA. It provides excellent visual acuity at distance, intermediate and near, very high spectacle independence, and very good patient satisfaction. The objective of this study was to conduct a cost-benefit analysis of AcrySof IQ PanOptix IOL vs. standard monofocal IOL, from patient perspective in the USA. Additionally, the incremental vision related quality of life gain and net monetary benefits of AcrySof IQ PanOptix technology for patients were assessed.

Setting:

US patient perspective.

Methods:

A de novo Markov model was developed with following health states: need for spectacles, patient reported bothersome visual disturbances (glare/haloes/starbursts), and death. Model inputs (transition probabilities, costs, discount rates, utilities, and event rates) were derived from the AcrySof IQ PanOptix FDA clinical trial, published literature, expert opinion, and other country specific sources. Model outcomes included total costs, quality adjusted life years (QALYs) and net monetary benefit. The model time horizon was lifetime (30 years) and cost and health outcomes were discounted at 3% per annum. In addition, sensitivity analysis and scenario analysis were conducted.

Results:

Bilateral implantation of AcrySof IQ PanOptix provided greater vision related quality of life (QALY gain of 0.67) at an incremental cost of \$2,783 compared to monofocal IOL. The incremental cost per QALY gain was \$4,126/QALY. At commonly used willingness-to-pay (WTP) threshold of \$50,000 per QALY gain, net monetary benefit per patient with bilateral AcrySof IQ PanOptix IOL procedure was \$30,941. Results were most sensitive to the PanOptix PCIOL procedure cost, disutility due to wearing spectacles, cost of bi-focal/progressive spectacles, and spectacle dependence rates. The robustness of results were further confirmed by one-way sensitivity analysis, probabilistic sensitivity analysis, and scenario analyses.

Conclusions:

AcrySof IQ PanOptix IOL improves overall vision related quality of life and provides net monetary benefits for presbyopic cataract patients at commonly used WTP threshold of \$50,000 per QALY vs. monofocal IOLs. Presbyopic patients undergoing cataract surgery should be provided information on the clinical and cost benefits of AcrySof IQ PanOptix IOL for making informed treatment choices.



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PP295

Angel of kappa for successful multifocal IOL outcomes

Presenting author: Mahmoud Kesba, Egypt

Purpose:

The aim of this review to show the importance for IOL to be centered in relation to the patient's true visual axis rather than the geometric center of the pupil.

Setting:

Mataria teaching hospital

Methods:

For this literature review we searched about published studies in the PubMed, Google scholar databases using the following terms: kappa angel, multifocal IOL, presbyopic IOL

Results:

Angle κ affected the objective visual quality multifocal after IOL implantation. As most studies showed that temporal decentration of the IOL is associated with the greatest risk in multifocal IOL implantation, particularly in cases with a higher angle kappa and Ignoring angle kappa may sometimes result in decentered treatment and aggravation of visual symptoms. Some studies showed angle κ with greater than 0.4 mm, the incidence of glare and halo increased and when it was greater than 0.5 mm, patients' visual quality decreased.

Conclusions:

An evaluation of angle kappa should be a part of preoperative examination before MIOL implantation and decision to implant a multifocal IOL should be carefully considered for patients with a large angle κ . Patients with a high angle kappa should be excluded because of a higher risk of postoperative photic phenomena

Cataract**PP296****A multi-site study of visual and refractive outcomes following toric intraocular lens (TIOL) implantation during cataract surgery.****Presenting author:** Byron Lu Morrell, United Kingdom**Purpose:**

Modern advances in ophthalmic surgical techniques and intraocular lens technology now allow patients with corneal astigmatism to undergo cataract surgery with implantation of toric IOLs. Existing data suggests that toric IOLs (TIOs) represent an excellent, cost-effective option for improving vision for astigmatic cataract patients. Currently, TIOs are not routinely funded across the NHS and criteria for funding is decided locally. At our hospitals, cataract patients with greater than 2D of astigmatism are considered for TIOL implantation. Therefore, our aim was to assess postoperative visual and refractive outcomes of these patients.

Setting:

A retrospective cohort study conducted at Whipps Cross, Mile End and Royal London Hospitals, Barts Health NHS Trust of patients who had undergone cataract surgery with implantation of TIOL MX60T (Bausch & Lomb) between February 2019 and December 2020.

Methods:

Data were collected from our electronic patient record (EPR) software “Medisoft” on patient demographics, visual acuity, autorefraction, keratometry, operation data, and lens data. Analysis of data was performed using Microsoft Excel.

Results:

47 eyes of 36 patients were included. Preoperative mean corneal astigmatism was $3.18 \pm 1.42D$ and postoperative refractive cylinder was $1.2 \pm 0.87D$, representing a cylindrical reduction of $1.94D$ ($p < 0.001$). Preoperative mean best corrected visual acuity was 0.53 ± 0.50 logMAR and postoperative unaided visual acuity was 0.18 ± 0.20 logMAR, representing an improvement of 0.30 logMAR ($p < 0.001$).

Conclusions:

Our study demonstrates improvement in visual acuity and astigmatic error in the majority of patients with corneal astigmatism implanted with TIOs during cataract surgery, comparable to other studies conducted in a similar setting. Our results indicate efficacy of TIOL implantation in cataract patients with high corneal astigmatism, supporting its role in the NHS service.

Cataract**PP679****Effect of rebamipide on the difference in power and axis of corneal astigmatism between two intra-patient keratometric measurements in dry eyes****Presenting author:** Takeshi Teshigawara, Japan**Purpose:**

This study investigated the effect of rebamipide on discrepancies in power and axis of astigmatism between two intra-patient keratometric measurements in patients with dry eyes.

Setting:

Yokohama Tsurumi Chuoh Eye Clinic and Yokosuka Chuoh Eye Clinic, Kanagawa, Japan

Methods:

Fifty-eight dry eyes (with a short tear break-up time [TBUT] of <5 s) and 30 non-dry eyes (control group) were analyzed. Dry eye patients were treated with 2% rebamipide ophthalmic suspension (Reba group) or artificial tears (AT group) for 4 weeks. TBUT and corneal high-order aberrations (HOAs) were evaluated at baseline and 4 weeks after treatment. Astigmatism power and axis were measured twice at both evaluations, at 5-minute intervals. Baseline and post-treatment measurements were compared. Changes in TBUT and HOAs, and intra-patient discrepancies in astigmatism power and axis measurements were evaluated.

Results:

At baseline HOAs, astigmatism power, and axis discrepancies were significantly larger in the dry eye than non-dry eye. HOAs showed significant positive correlations with intra-patient differences in astigmatism power and axis. 4-weeks following treatment, HOAs and astigmatism power and axis discrepancies decreased in a significant number of Reba patients. In AT group, only differences in astigmatism power decreased in a significant number of cases. The degree of change in astigmatism power after treatment was significantly greater in Reba than AT group. In Reba group, baseline HOAs showed significant positive correlation with changes in HOAs and intra-patient difference in astigmatism power.

Conclusions:

In dry eyes with short TBUTs, rebamipide significantly improved the corneal surface condition and significantly reduced intra-patient discrepancies in astigmatism power and axis measurements. Rebamipide may improve the accuracy of intraocular lens (IOL) power calculations in dry eyes, particularly when toric IOLs are implanted.



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PP683

Conjunctival extranodal marginal zone lymphoma (ENMZL) treated with surgical resection and immunotherapy - a different approach.

Presenting author: Leticia Bochese, Brazil

Purpose:

To describe a patient with a conjunctival lymphoma treated with surgical resection and immunotherapy which is uncommonly performed.

Setting:

It is known that the main treatment for the conjunctival lymphomas is radiotherapy of the orbit. But not always should be the first indication regarding its sides-effects. The case has been reported in a private clinic in Caxias do Sul, Brazil.

Methods:

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Results:

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Conclusions:

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Cataract

PP684

Tissue Plasminogen Activator for Fibrinoid Reaction Post Complex DMEK

Presenting author: Michael Mimouni, Canada

Purpose:

To describe successful treatment of a fibrinoid reaction post complex Descemet Membrane Endothelial Keratoplasty (DMEK) using tissue plasminogen activator (tPA).

Setting:

Tertiary Care Center

Methods:

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Results:

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Conclusions:

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PP685

Traumatic cyclodialysis - from cyclopexy ab interno to DMEK

Presenting author: Cristina Martin, Germany

Purpose:

One cause of persisting hypotension after bulbar trauma is cyclodialysis. This case report describes the performing of cyclopexy ab interno in traumatic cyclodialysis and the management of possible postoperative complications.

Setting:

This case was observed at the Department of Ophthalmology, Saarland University Medical Center (UKS), Homburg/Saar, Germany

Methods:

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Results:

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Conclusions:

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PP686

Ocular inflammatory reaction after COVID-19 vaccine administration

Presenting author: Shafiq Rehman, United Kingdom

Purpose:

To report on a case of recurrent bilateral cystoid macular oedema (CMO) and brisk unilateral anterior uveitis arising within 1 week of administration of the mRNA Pfizer-BioNTech COVID-19 (BNT162b2) vaccine (Pfizer, Inc; Philadelphia, Pennsylvania) in a pseudophakic patient.

Setting:

Optegra Eye Hospitals, UK

Methods:

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Results:

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Conclusions:

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Cataract

PP687

Interacting with a deaf, mute and blind patient during corneal transplantation surgery under local anesthesia

Presenting author: Gal Antman, Israel

Purpose:

To report a unique and simple sign language that was used to communicate with a deaf, mute and uni-ocular blind patient during corneal transplantation surgery, under local anesthesia.

Setting:

Operating room, tertiary medical center in Israel

Methods:

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Results:

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Conclusions:

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PP688

Bitot's spot, dense cataract and corneal perforation after bariatric surgery

Presenting author: Marina Rodriguez-Calvo-de-Mora, Spain

Purpose:

We present a case of sterile corneal perforation, Bitot's spot and dense cataract secondary to hypovitaminosis A in a patient operated on bariatric surgery

Setting:

Tertiary reference center

Methods:

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Results:

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Conclusions:

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PP689

Challenging surgical cases in pediatric patients

Presenting author: Paul Filip Curcă, Romania

Purpose:

Lens shape and transparency anomalies represent an important cause of reduced visual acuity and amblyopia in pediatric patients. Their treatment has continuously evolved throughout the years with innovative surgical techniques and improvements of intraocular lens implants. We present the adaptation of commonly used surgical techniques in accordance with two challenging cases. Both patients were given a full ophthalmological examination including medical history, visual acuity tests, slit lamp biomicroscopy and fundus examination.

Setting:

Clinical Hospital for Ophthalmological Emergencies Bucharest Department I, Cataract Surgery
Bucharest, Romania

Methods:

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Results:

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Conclusions:

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PP690

Uveitis-glaucoma-hyphema syndrome, an acute complication after traumatic cataract surgery

Presenting author: Isabel Sendino-Tenorio, Spain

Purpose:

We present a case of a patient from our center who developed a uveitis-glaucoma-hyphema (UGH) syndrome after an ocular trauma. Although it is a rare complication of traumatic cataract surgery with lens implantation in the posterior chamber, it should not be disregarded. We explain the way we manage this specific situation.

Setting:

Complejo Asistencial Universitario de León

Methods:

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Results:

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Conclusions:

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Cataract

PP691

Bilateral malignant glaucoma and anterior lens luxation following YAG peripheral iridectomy assessed with anterior segment OCT

Presenting author: KHALED EL MATRI, Tunisia

Purpose:

To report a case of bilateral malignant glaucoma and anterior lens luxation following YAG peripheral iridectomy (PI) in a young high-myopic patient and to report anterior segment optical coherence tomography (AS-OCT) findings initially and after surgery.

Setting:

Observational case report

Methods:

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Results:

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Conclusions:

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PP692

Late Onset Descemet Membrane Detachment and Corneal Edema after Cataract Surgery

Presenting author: George Kontadakis, United Kingdom

Purpose:

To report an unusual case of a patient with mild Fuch's dystrophy who developed clinically significant corneal edema due to type 2 Descemet membrane (DM) detachment 6 months after uneventful phacoemulsification.

Setting:

Whipps Cross University Hospital, London

Methods:

-

Results:

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Conclusions:

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PP693

Endophthalmitis Associated with Polypropylene Flange Exposure after a Four-flanged Canabrava Intrasccleral Intraocular Lens Fixation Technique

Presenting author: Eduardo Roditi, Israel

Purpose:

To present the first reported case of endophthalmitis associated with exposure of a polypropylene flange that extruded through the conjunctiva 6 months after surgery, with devastating clinical outcome.

Setting:

A retrospective review of the patient chart, slit-lamp images, and other imaging modalities was performed at the Shaare Zedek Medical Center Ophthalmology Clinic, Jerusalem, Israel.

Methods:

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Results:

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Conclusions:

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PP694

Lens Subluxation in a Marfan Syndrome,? Our Surgical Experience in a Bilateral Case

Presenting author: Simone Alex Bagaglia, Italy

Purpose:

Ectopia lentis refers to a hereditary or acquired displacement of the lens from its normal position. The lens may be completely dislocated, rendering the eye functionally aphakic (luxated), or partially displaced, remaining partly within the pupillary area (subluxated). Aphakia IOLs may be a good option In Lens Surgery Marfan's syndrome Patients.

Setting:

Ophthalmology Unit, Villa Donatello Private Hospital, Via Attilio Ragionieri, Sesto Fiorentino, Florence, ITALY

Methods:

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Results:

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Conclusions:

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Cataract

PP695

Non-Diffractive Extended Vision Presbyopia and Astigmatism Correcting Intraocular Lens in a Patient with Cataract and Keratoconus

Presenting author: ALTAN A. OZCAN, Turkey

Purpose:

To describe the results of phacoemulsification and implantation of a non-diffractive extended vision presbyopia and astigmatism correcting intraocular lens (Acrysof IQ Vivity Toric) in a patient with cataract and keratoconus.

Setting:

Cukurova University School of Medicine Department of Ophthalmology, Adana-Turkey

Methods:

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Results:

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Conclusions:

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PP696

Allergic Reaction to Chloramphenicol Eyedrops Post Phacoemulsification and Intraocular Lens Placement

Presenting author: James Morris, Ireland

Purpose:

To describe a case of severe allergic reaction to chloramphenicol (CPL) eye drops after phacoemulsification surgery

Setting:

Royal Victoria Eye and Ear Hospital, Adelaide Road, Dublin 2

Methods:

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Results:

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Conclusions:

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PP697

Lens nucleus dislocation following intra-vitreous gas injection during pars-plana vitrectomy presenting with lens-induced uveitis

Presenting author: Sourour Zina, Tunisia

Purpose:

To describe an unusual case of posterior lens nucleus dislocation manifesting with lens-material antigenic uveitis following pars-plana vitrectomy with intra-vitreous gas injection for rhegmatogenous retinal detachment

Setting:

Department of Ophthalmology, Fattouma Bouguiba University Hospital, Monastir, Tunisia.

Methods:

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Results:

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Conclusions:

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PP698

Refractive surprise in a patient with previously unknown keratoconus corrected with a toric sulcus add-on intraocular lens

Presenting author: Tomislav Sarenac, Slovenia

Purpose:

To present a case of a patient, where add-on sulcus intraocular lens (IOL) was implanted to correct the refractive surprise after primary phacoemulsification.

Setting:

The patient was referred to us with significant visual disturbance, blurry vision and glare, after uneventful primary phacoemulsification with IOL in the capsular bag.

Methods:

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Results:

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Conclusions:

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PP699

UBM Image Before and After YAG Laser in Capsular Block Syndrome

Presenting author: Esin Kırıkkaya, Turkey

Purpose:

To show the place and importance of UBM (ultrasonic biomicroscopy) imaging before and after Nd: YAG laser in capsular block syndrome in a male patient who underwent cataract operation 5 years ago.

Setting:

Health Sciences University, İzmir Tepecik Training and Research Hospital, Ophthalmology Outpatient Clinic.

Methods:

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Results:

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Conclusions:

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PP700

Development of Posterior Lenticonus Following the Diagnosis of Isolated Anterior Lenticonus in Alport Syndrome

Presenting author: Turki Bin Dakhil, Saudi Arabia

Purpose:

This case report describes a case in which the patient diagnosed with a progressive lenticonus, having been diagnosed eight years earlier with isolated anterior lenticonus which was followed by development of posterior lenticonus.

Setting:

Case report

Methods:

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Results:

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Conclusions:

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PP701

Immune checkpoint inhibitor Pembrolizumab causing ocular cicatricial pemphigoid

Presenting author: Triona Butler, Ireland

Purpose:

To present the diagnosis, and clinical course of an unusual cause of ocular cicatricial pemphigoid associated with Pembrolizumab, a humanised monoclonal antibody targeting PD-1.

Setting:

Royal Victoria Eye and Ear Hospital, Dublin, Ireland

Methods:

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Results:

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Conclusions:

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PP702

Cases of Intraocular Lens Opacification In Pseudophakic Eyes: Analysis of the Results of Microstructural Studies

Presenting author: Rafik Boutaba, Russian Federation

Purpose:

To find out what structural changes in the IOL led to the need to remove them from pseudophakic eyes due to a decrease in visual acuity.

Setting:

1-Ophthalmology Department. Academician I.P. Pavlov First Saint Petersburg State Medical University of the Ministry of Healthcare of Russia 2-Institute of Macromolecular Compounds Russian Academy of Sciences, Saint Petersburg, Russia

Methods:

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Results:

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Conclusions:

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PP703

Forgiven: Fixation of Misaligned Toric Trifocal

Presenting author: Lional Raj Daniel Ponniah, India

Purpose:

To demonstrate the bioptic strategies which help fixate misaligned Toric Trifocal IOL due to a biometric toric calculation error through a case report

Setting:

A case report from the department of cataract and refractive surgery in a tertiary eye care hospital in South India

Methods:

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Results:

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Conclusions:

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Cataract

PP704

Cataract surgery with premium IOL in a patient with previous corneal refractive surgery

Presenting author: Lucio Buratto, Italy

Purpose:

The aim of this case report is to show how to improve visual quality and also reduce spectacle dependence in a patient who underwent miopic LASIK many years before

Setting:

Centro Ambrosiano Oftalmico - CAMO, Milan, Italy

Methods:

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Results:

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Conclusions:

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Cataract

PP706

IOL power calculation in patient with kerato-ectasia following radial keratotomy enhanced with LASIK

Presenting author: Dr Ananth Doddaramgowda, India

Purpose:

Corneal ectasia in post-RK and LASIK with early cataract is a surgical challenge. This case highlights the importance of IOL power calculation and surgical technique to achieve optimum visual outcomes in such challenging cases.

Setting:

Surgical evaluation and procedure were performed in a tertiary level eye care hospital in Southern India by an experienced keratorefractive surgeon.

Methods:

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Results:

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Conclusions:

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Cataract

PP707

Dropped lens, raised pressure: a case report

Presenting author: Shiama Balendra, United Kingdom

Purpose:

There is a paucity of studies investigating the association between lens dislocation and ocular hypertension. Since it is relatively uncommon to observe raised intraocular pressure (IOP) associated with a dropped intraocular lens implant (IOL), we report here a case of a patient presenting with dislocated MA60 lens and raised IOP. The situation was alleviated by performing two procedures to control her pressure: trans-scleral cyclodiode and micropulse diode laser trabeculoplasty.

Setting:

A 70-year-old Afro-Caribbean female healthcare assistant presented to the Eye Casualty at Western Eye Hospital with a dislocated MA60 lens and raised IOP.

Methods:

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Results:

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Conclusions:

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PP708

Secondary Pigment Dispersion after Cataract Surgery

Presenting author: Yordanka Kirilova, Bulgaria

Purpose:

Pigment dispersion and elevation of IOP has been associated with 1-piece foldable IOL with ciliary sulcus fixation. We demonstrate a case with pigment dispersion after phaco in-the-bag IOL implantation.

Setting:

Specialized ophthalmological hospital "Acad. Pashev" - Medical University Sofia, Bulgaria

Methods:

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Results:

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Conclusions:

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Cataract

PP709

Spheroidal degeneration associated with exfoliation assessed with anterior segment OCT

Presenting author: Dhouha Gouider, Tunisia

Purpose:

To describe the clinical and imaging features of spheroidal degeneration through a case report

Setting:

Ophthalmology department B, Hedi Raies institute

Methods:

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Results:

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Conclusions:

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PP710

Time course of acute reversible clouding of the hydrophilic IOL

Presenting author: Yeon Jeong Lee, Korea, Republic of

Purpose:

To report a time course of acute reversible clouding of the hydrophilic IOL

Setting:

Kangwon National University, Chuncheon, Republic of Korea

Methods:

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Results:

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Conclusions:

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PP711

Transient opacification of a Carlavale intraocular lens

Presenting author: Agnieszka Dyrda, Spain

Purpose:

To report a case of a transient intraoperative opacification of a Carlevale intraocular lens (IOL).

Setting:

Institut Català de Retina, Barcelona, Spain

Methods:

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Results:

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Conclusions:

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PP712

Custom Match Intraocular Lens Implantation

Presenting author: Johann Kruger, South Africa

Purpose:

Combining extended focus lens called Eyehance Intraocular lens (manufactured by Johnson & Johnson) with Medicontur Liberty Multifocal Intraocular lens, to establish increase depth of focus. To detect a decrease in halo's and establish better intermediate near vision.

Setting:

Tygervalley eye and laser center, Cape Town by DR. J.A. KRÜGER (MMed FCS FRCS Ophthalmology).

Methods:

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Results:

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Conclusions:

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PP713

How to manage anterior polar pyramidal congenital cataract?

Presenting author: Hazem Elnashar, Egypt

Purpose:

To show how to deal with this type of congenital cataract especially how to do rhexis in the presence of this opacity which extend into anterior chamber

Setting:

Memorial institute for ophthalmic research (MIOR)

Methods:

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Results:

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Conclusions:

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PP714

Keratoprosthesis as the only option to restore useful visual acuity.

Presenting author: Anna Mikolajczyk, Poland

Purpose:

The aim is to report an attempt to restore functional vision in a monocular patient using a keratoprosthesis.

Setting:

1 Department of Ophthalmology, Katowice Division, Medical University of Silesia, Poland 2
Department of Ophthalmology, Professor K. Gibinski University Clinical Center of the Medical
University of Silesia, Katowice, Poland.

Methods:

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Results:

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Conclusions:

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