Purpose: Full shape crystalline lens quantification is critical to improve state-of-the-art intraocular lens (IOL) selection in cataract surgery. We estimated lens volume (VOL), surface area (SA), diameter (DIA) and equatorial plane position (EPP) in patients before cataract surgery, and we evaluated the EPP as an estimator of post-operative IOL position (ELP).

Methods: The anterior segment of 7 eyes (76±8 y.o, range, 66-87 y.o) from 6 patients before cataract surgery and 1 eye (80 y.o) post-operatively (Aspheric monofocal Asphina IOL, Zeiss) were imaged and quantified using a custom-developed 3-D Optical Coherence Tomography (OCT) system provided with distortion correction algorithms. Whole crystalline lens 3-D models were constructed from the information visible through the pupil (Martinez-Enriquez et al. IOVS 2016), and VOL, SA, DIA, lens thickness (LT) and EPP (distance from the anterior lens apex to the equatorial plane) were estimated pre-operatively. EPP was used as estimator of ELP. The estimation error was compared with state-of-the-art methods, namely: ELP=LT/2; Rosen et al. (2006) constant: ELP=0.41LT; and the intersection approach, where the ELP is estimated as the plane of intersection between anterior and posterior lens best fitting conicoid surfaces.

Results: Mean VOL, SA, DIA, LT and EPP across subjects (±SD) was 208±27 mm³, 186±14 mm², 9.27±0.32 mm, 4.76±0.42 mm & 2.16±0.22 mm, respectively. The ratio EPP/LT was patient-dependent (0.44-0.47) indicating the importance of individual anatomical measurements for ELP proper estimation. The ELP estimation error was 62 µm (equivalent to -0.07 D) using the newly proposed metric EPP, whereas using other metrics was: +202 µm (-0.27 D) using LT/2, -204 µm (+0.29 D) using Rosen constant, and -168 µm (+0.24D) using the intersection approach.

Conclusions: 3-D OCT measurements with dedicated algorithms allow full quantification of the crystalline lens in-vivo. The estimated parameters (EPP in particular) provide valuable information for improving the estimation of the post-operative IOL position and thus the IOL selection. Improvements by 0.25 D in IOL power calculations resulting from accurate ELP accumulate to those arising from patient-specific measurements of posterior corneal surface, 3-D biometry and 3-D ray tracing analysis.

Program Number: 1803 Poster Board Number: B0136
Presentation Time: 11:00 AM–12:45 PM
Full shape crystalline lens quantification from 3-D OCT images and its application to predict the post-operative IOL position

Eduardo Martinez-Enriquez1, Pablo Perez-Merino1, Mengchan Sun1, Sonia Durán-Poveda2, Ignacio Jiménez-Alfaro2, Susana Marcos1.
1Instituto de Óptica (CSIC), Madrid, Spain; 2Fundación Jiménez Diaz, Madrid, Spain.

Purpose: To determine and compare the incidence of macular oedema in uncomplicated cataract surgery, and we evaluated the EPP as an estimator of post-operative IOL position (ELP).

Methods: A prospective study of 15 patients who had uncomplicated cataract surgery at Lincoln County Hospital, United Kingdom, a National Health Service (NHS) district general hospital (DGH) in a rural area. All patients had macular OCT before cataract surgery, and at one month and three months post-operatively to assess CMT and presence of macular oedema. Data analysed and compared between the healthy subjects and diabetes group using Student t-Test.

Results: Out of the total 15 patients, 11 were healthy patients and 4 were diabetics. The average age of patients is 71 year-old, 74 among healthy group and 64 in the diabetic groups. Average CMT pre-operatively was 266.55um and 274.5um, at one month 271.64um and 281.25um, and at three months follow up was 280.27um and 287.25um for healthy and diabetics respectively.

Change in CMT in healthy group is 2.03% (t-Test 0.0749, p=0.471) at one month and 4.48% (t-Test 0.0330, p=0.487) at three months after cataract surgery; whereas in patients with diabetes CMT change is 2.52% (t-Test 0.0575, p=0.479) and 4.96% (t-Test 0.0531, p=0.480) at one and three month post-operatively.

Support: ERC Grant Agreement [ERC-2011-AdC-294099] and FIS2014-56643-R
Macular oedema was present in one patient in healthy group at three month follow up and no patient developed macular oedema in the diabetic group. **Conclusions:** We carried out a prospective study of incidence of pseudophakic macular oedema and CMT change in healthy and diabetic patients at a DGH in the Midlands, UK. Diabetic patients experienced higher increase in CMT after cataract operation in comparison with healthy individuals, but we did not find a higher rate of macular oedema among diabetics. Further study is required with a bigger sample size to investigate the correlation between diabetes and development of pseudophakic macular oedema.

**Commercial Relationships:** Lin Lu, None; Matthew Wakefield, None; Soon W. Ch'ng, None; Christopher Knapp, None

**Program Number:** 1806 **Poster Board Number:** B0139

**Presentation Time:** 11:00 AM–12:45 PM

**Changes in Corneal Thickness Following Two Different Techniques of Nucleofractis in Resident Cataract Surgery**


**Purpose:** To evaluate the change in central corneal thickness (CCT) at one week following uncomplicated phacoemulsification performed by resident surgeons using either pop-and-chop (P&C) or divide-and-conquer (D&C) nucleofractis.

**Methods:** This was a prospective, randomized study of patients undergoing non-complex cataract surgery by resident surgeons at the Hampton Veterans Affairs Medical Center between July 2015 and December 2016. Cases complicated by trauma, pseudoexfoliation, or prior ocular surgery were excluded. Additionally, cases with intra-operative complications were excluded. Patient’s demographics, pre-operative CCT (central corneal thickness), case time, CDE, ultrasound time, aspiration volume (asp-V), and post-operative CCT at POD7 (post-operative day 7) were recorded for the two methods. Changes in CCT were compared using the Student’s t-test. Relationships between CCT at POD7 and the studied variables were tested using a Pearson’s correlation.

**Results:** 115 eyes met inclusion criteria. There was no difference in demographic data or pre-operative CCT (p=0.17) between the two groups. Of the 115 eyes, 59.6% (n=69) underwent D&C and 40.4% (n=46) underwent P&C. P&C was significantly faster (22.8 vs 27.2 min, p=0.03) and used significantly less ultrasound (8.5 vs 15.27 CDE, p=0.001) than D&C. There was a statistically significant increase between average pre-operative and POD7 CCT in both P&C (53.0 vs 49.2, p=0.001) and D&C (30.8 vs 38.5, p<0.001). The change in CCT at POD7 was not statistically significant between the two techniques (p=0.08). There was a significant correlation between CDE (r=0.58, p<0.0003), case time (r=0.16, p=0.0006), ultrasound time (r=0.19, p=0.0002), and asp-V (r=0.15, p=0.001) when compared with change in CCT at POD7 in the D&C group. No significant correlation was seen in the P&C group: CDE (r=0.0004, p=0.89), case time (r=0.09, p=0.53), ultrasound time (r=0.02, p=0.77), and asp-V (r=0.01, p=0.82).

**Conclusions:** P&C phacoemulsification is a faster and more energy efficient technique for cataract extraction than D&C when performed by resident surgeons. This study found no significant difference in the change in CCT on POD7 between the two techniques. Increased case time, CDE, ultrasound time, and aspiration volume and time are correlated to increased corneal swelling in D&C but not P&C. The reason for this difference is unclear and needs further study.


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In a CATALYS® system, a mask was placed over the B0141 Determination of the effects of the Ziemer LDV Z8 liquid Filbert Nguyen 11:00 AM–12:45 PM Biomechanics Laboratory, Singapore General Hospital, Singapore, , Abbott Medical Optics (E); Corneal and External Eye Disease , None; 1808 1807 Cadaveric porcine eyes harvested at <6 and 24> post hours The precision of femtosecond lasers for cataract surgery to compare the results to two commercial available diagnostic systems. Methods: In a CATALYS® system, a mask was placed over the internal illumination source to produce two concentric circles of illuminated dots. Prior to a normal laser cataract procedure, images of the dot rings reflected from the patient’s cornea were captured by the onboard video. The ellipticity of the dot rings was analyzed to determine the orientation of the steep meridian. For reference, the corneal astigmatism was also measured by two commercially available devices: Pentacam corneal topographer and Lenstar optical biometer. Measurements from all three devices were compared for angle and vector difference in measured astigmatism.

Results: The total number of eyes in the study was 39. Of these, 33 were measured with all three devices, and 6 measured with only the CATALYS® system, and Lenstar system. Differences in steep meridian measurement decreased with increasing astigmatism, whether compared between the two commercial devices or either commercial device vs. CATALYS® system. Vector astigmatism differences, which consider both magnitude and angle, were not significantly different between the three devices. Mean difference in steep meridian angle: Astigmatism Lenstar-Pentacam Devices Lenstar-Catalys Systems 0.5D to 1.0D 15° 20° 17° 1.0D to 1.5D 14° 17° 14° Over 1.5D 4° 8° 10° Mean difference in vector astigmatism: Astigmatism Lenstar-Pentacam Devices Lenstar-Catalys Systems 0.5D to 1.0D 0.36D 0.40D 0.44D 1.0D to 1.5D 0.66D 0.57D 0.65D Over 1.5D 0.48D 0.47D 0.68D Conclusions: The CATALYS® system was successfully adapted to measure corneal steep meridian with a precision comparable to commercially available keratometers.

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Commercial Relationships: David Dewey, Abbott Medical Optics (E); Sherene Elezaby, Abbott Medical Optics (E); Sanjeev Kasthurirangan, Abbott Medical Optics (E); Theresa Miller, Abbott Medical Optics (E); Noah Bareket, Abbott Medical Optics (E)

Program Number: 1807 Poster Board Number: B0140 Presentation Time: 11:00 AM–12:45 PM Using a femtosecond laser to overcome corneal edema during lens capsulotomy Geraint P. Willaims, Ben L. George, Yoke Wong, Gary Hin-Fai Yam, Marcus Ang, Shian Chao Tay, Jodhbir Mehta. 1Tissue Engineering and Stem Cell Group, Singapore Eye Research Institute, Singapore, Singapore; 2Corneal and External Eye Disease Service, Singapore National Eye Centre, Singapore, Singapore; 3Biomechanics Laboratory, Singapore General Hospital, Singapore, Singapore; 4Department of Hand Surgery, Singapore General Hospital, Singapore, Singapore.

Purpose: The precision of femtosecond lasers for cataract surgery to place corneal relaxing incisions for the correction of astigmatism is impacted by the manual ink tattoos used to mark the steep meridian. Automatic measurement of steep meridian within a laser cataract system will help to place precise incisions. This study evaluates a CATALYS® system adapted to measure corneal steep meridian and compares the results to two commercial available diagnostic systems.

Methods: In a CATALYS® system, a mask was placed over the internal illumination source to produce two concentric circles of illuminated dots. Prior to a normal laser cataract procedure, images of the dot rings reflected from the patient’s cornea were captured by the onboard video. The ellipticity of the dot ring images was analyzed to determine the orientation of the steep meridian. For reference, the corneal astigmatism was also measured by two commercially available devices: Pentacam corneal topographer and Lenstar optical biometer. Measurements from all three devices were compared for angle and vector difference in measured astigmatism.

Results: The total number of eyes in the study was 39. Of these, 33 were measured with all three devices, and 6 measured with only the CATALYS® system, and Lenstar system. Differences in steep meridian measurement decreased with increasing astigmatism, whether compared between the two commercial devices or either commercial device vs. CATALYS® system. Vector astigmatism differences, which consider both magnitude and angle, were not significantly different between the three devices. Mean difference in steep meridian angle: Astigmatism Lenstar-Pentacam Devices Lenstar-Catalys Systems 0.5D to 1.0D 15° 20° 17° 1.0D to 1.5D 14° 17° 14° Over 1.5D 4° 8° 10° Mean difference in vector astigmatism: Astigmatism Lenstar-Pentacam Devices Lenstar-Catalys Systems 0.5D to 1.0D 0.36D 0.40D 0.44D 1.0D to 1.5D 0.66D 0.57D 0.65D Over 1.5D 0.48D 0.47D 0.68D Conclusions: The CATALYS® system was successfully adapted to measure corneal steep meridian with a precision comparable to commercially available keratometers.

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Commercial Relationships: David Dewey, Abbott Medical Optics (E); Sherene Elezaby, Abbott Medical Optics (E); Sanjeev Kasthurirangan, Abbott Medical Optics (E); Theresa Miller, Abbott Medical Optics (E); Noah Bareket, Abbott Medical Optics (E)
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Patients who undergo cataract surgery often describe stark increases and decreases in light intensity. This study uses video analysis to obtain quantifiable estimates of changes in patients’ light exposure during cataract surgery. In particular, the patient’s light exposure was analyzed during four steps of cataract surgery: IOL implantation, phacoemulsification, the introduction of Trypan blue, and removal of Trypan blue.

**Results:** No difference in the edge morphology or in rupture strength (120, 113, and 118 mN at increasing energy, p=NS) was observed in clear corneas. Only 50% of capsulotomies succeeded at 90% energy in an oedematous cornea. This was abrogated at increased energy (75% completion at 130%, 100% at 150%). Rupture strength in oedematous corneas was not significantly different at 112, 133 and 114 mN for 90, 130 and 150% respectively, p=NS. In human samples, increased TUNEL positive cells were seen at 130% energy, but not at 150% (0.0 manual vs. 0.2 [90%] vs. 2.1 [130%] vs. 0.6% [150%], p<0.05).

**Conclusions:** Capsulotomy could be achieved in the presence of corneal edema with a femtosecond laser. Low energy delivered by the Ziemer Z8 platform had minimal effect on lens capsule morphology and strength and negligible influence on cell death, even with incremental increases in energy. Furthermore, increasing energy appears to enhance consistency in the ability to complete a capsulotomy in an oedematous cornea.

**Commercial Relationships:** Geraint P. Williams, Ziemer (R); Ben L. George, None; Yoke Wong, None; Gary Hin-Fai Yam, None; Marcus Ang, Ziemer (R); Shian Chao Tay, None; Jodhbir Mehta, Ziemer (R)

**Support:** TCR Eyesite Supported by National Research Foundation of Singapore-Funded Translational and Clinical Research Programme Grant NMRC/TCR/01020-15/2013. Geraint P Williams’ SERI/SNEC fellowship is supported by a Dowager Eleanor Peel Trust Travelling Grant and a Royal College of Ophthalmology/Pfizer Ophthalmic Fellowship.

**Program Number:** 1809 Poster Board Number: B0142

**Presentation Time:** 11:00 AM–12:45 PM

**Evaluation of anterior chamber depth and removal properties of different sodium hyaluronate based solutions for OVD applications; emphasis on effect of cohesiveness**

*Marcus Jansson, Anna Norlin Weissenrieder, Maria Lundqvist. R&D, Abbott Medical Optics AB, Uppsala, Sweden.*

**Purpose:** The purpose was to objectively study how OVD intramolecular cohesion contributes to restoring anterior depth volume and the OVD removal properties after IOL implantation. In addition, the study compares how intramolecular cohesion predicts the OVD functional performance compared to the conventionally used viscosity parameters, such as zero shear.

**Methods:** Sodium hyaluronate (HA) dissolutions of different molecular weights and concentrations were evaluated. A Bohlin Rheometer was used to evaluate rheology, including rotational and oscillatory measurements. Tackiness testing and a specially designed test cell were used for cohesiveness classification. The anterior chamber depth maintenance and removal properties were quantitatively evaluated during simulated surgery in cadaver pig eyes by Scheimpflug technique, and related back to the molecular cohesion of the OVD.

**Results:** The cohesiveness of the OVD is related to the molecular weight and concentration of the sodium hyaluronate. Scheimpflug studies show that a higher cohesiveness relates positively to anterior chamber depth maintenance and removal properties. At a certain concentration of HA (18-20 mg/ml for high molecular weight HA) the OVD characteristic becomes viscoadaptive, which requires a changed irrigation/aspiration technique for optimal removal. In this study, the intramolecular cohesion measurements better predicts OVD functional performance for anterior chamber depth maintenance and removal properties compared to conventional viscosity parameters.

**Conclusions:** Cohesiveness classification, together with rotational and oscillatory data can predict the OVD performance related to anterior chamber depth maintenance and removal properties and should be utilized together with zero shear data when comparing functional performance of OVDs.

**Commercial Relationships:** Marcus Jansson, Abbott Medical Optics (E); Anna Norlin Weissenrieder, Abbott Medical Optics (E); Maria Lundqvist, Abbott Medical Optics (E)

**Program Number:** 1810 Poster Board Number: B0143

**Presentation Time:** 11:00 AM–12:45 PM

**Video Recording and Light Intensity Analysis during Cataract Surgery Simulated from the Patient’s Perspective**

*Spencer Fuller, Hideki Fukuoka, Natalie A. Afshari. Shiley Eye Institute - University of California San Diego, La Jolla, CA.*

**Purpose:** Patients who undergo cataract surgery often describe visual phenomena during the procedure. The best understanding of intra-operative visual experiences derives from patients’ descriptions and artists’ renditions. We set out to visualize and capture intra-operative visual phenomena during cataract surgery. In addition, we hypothesized that photographs from the footage could permit quantified estimates of changes in patients’ light exposure during surgery.

**Methods:** Post-mortem porcine eyes were fixed on a surgical tray, and video recording of cataract surgeries was accomplished using a plastic-covered, front-facing iPad Air (MD785LL/B) camera via the ManualShot iPad Application (REU Limited Version 1.0.1). Video footage of cataract surgeries was obtained from six eyes filmed through a maculostomy—a small hole made at the site of the macula through the posterior aspect of the globe. Photographs at predetermined points during surgery were extracted from the footage. The Mean Gray Value (MGV), a summary statistic of the image’s light intensity, was obtained using the open-source, validated FIJI image processing package distributed by ImageJ (v. 1.51h, National Institutes of Health).

**Results:** We obtained video footage and 24 images for light intensity analysis. When compared to baseline light intensity prior to surgery, the percentage increase or decrease in light intensity was -10% when AC = 0, +42% when AC = full, -94% after application of Trypan blue, -9% after Trypan blue removal, -47% after phacoemulsification, and -2.5% after IOL placement (Alcon MTA4UO 23.0 D). The step of cataract surgery associated with the highest increase in light intensity compared to the previous step was when Trypan blue was removed after Trypan blue application (+1.432%), and the second highest increase in light intensity was after IOL placement following phacoemulsification (+86%).

**Conclusions:** Our data demonstrates that average light intensity after cataract surgery is similar to intensity prior to surgery, and reveals that light intensity exposure varies greatly during surgery. Our video footage, photographs, and data on changes in light exposure during cataract surgery may serve as informational and educational tools for physicians, residents-in-training, and patients alike.

**Commercial Relationships:** Spencer Fuller; Hideki Fukuoka; None; Natalie A. Afshari, None

**Support:** Research to Prevent Blindness

**Program Number:** 1811 Poster Board Number: B0144

**Presentation Time:** 11:00 AM–12:45 PM

**Comparison of intraoperative time using Femtosecond Laser Assisted Cataract Surgery (FLACS) versus conventional phacoemulsification**

*Syeed A. Karim1, Sharon Ong1, Osamah Saed2, Arturo Betancourt2, Luke Chang2, Brad Spagnolo2, Andrew Hammer3. Ophthalmology, University of Maryland, Baltimore, MD; 2BW Eye, Glen Burnie, MD.*

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Purpose: The use of Femtosecond laser assisted cataract surgery (FLACS) has become more widespread in recent years. The purpose of this study was to compare operative time required for FLACS versus conventional phacoemulsification.

Methods: We conducted a retrospective study in a large ophthalmology private practice on all uncomplicated cataract surgeries performed from November 2013 to December 2015. Demographic and intraoperative variables collected prospectively at the time of surgery include surgeon, phaco energy as measured by cumulative dissipated energy (CDE), total intraoperative time (OR time), patient age, operative eye, procedure performed, intraocular lens (IOL) power and type, patient allergies, past medical history, and ASA rating. Total intraoperative time included only time spent in the operating room. Bivariate analysis was performed with OR time as a dependent variable. Surgeon, type of surgery, CDE, right or left eye, and age were independent variables. Multivariable analysis was performed on age and all variables that were significant using bivariate analysis.

Results: 1885 surgeries were reviewed. 629 (33.4%) were FLACS cases, and 1252 (66.6%) were conventional phacoemulsification cases. The average age of patients was 71.18 +/- 19.89. The average intraoperative time overall was 13.51 +/- 14.88. Cases using FLACS had a mean operative time of 13.13 +/- 5.13 minutes as compared to conventional phacoemulsification which was 13.67 +/- 17.87 (P = 0.46). When stratified by surgeon, one surgeon had a small but significant increase in intraoperative time related to FLACS use vs. conventional phacoemulsification (10.19 +/- 3.57, 9.22 +/- 4.35, P = 0.01). Surgeon was associated with a significant difference in OR time (P<0.001) as was CDE. Higher CDE was also associated with longer intraoperative time (P = 0.001). There was no association between intraoperative time and age (P = 0.45) or right or left eye (P=0.23). Multivariable analysis included age, CDE, and surgeon and showed that CDE and surgeon were both significantly associated with intraoperative time.

Conclusions: FLACS use is not associated with a significant difference in operative time in this sample overall, but individually resulted in a small increase in intraoperative time for one surgeon. Higher CDE and surgeon were associated with longer intraoperative time overall.

Commercial Relationships: Syed A. Karim, None; Sharon Ong, None; Osamah Saeedi, None; Arturo Betancourt, None; Luke Chang, None; Brad Spagnolo, None; Andrew Hammer, None

Program Number: 1812 Poster Board Number: B0145
Presentation Time: 11:00 AM–12:45 PM

Comparison of femtosecond-laser assisted cataract surgery to conventional phacoemulsification cataract surgery
Fares A. Alsaleh, Yassine J. Daoud. Wilmer Eye Institute, Baltimore, MD.

Purpose: Clinical benefits from use of femtosecond-laser assisted cataract surgery (FLACS) have not been documented in controlled studies, an important step in substantiating the increase in operative time and expense associated with FLACS. We performed a randomized clinical trial comparing phacoemulsification (PE) and FLACS across relevant clinical outcomes.

Methods: Randomized clinical trial comparing FLACS to conventional PE surgery conducted by cornea faculty at a tertiary referral center. 51 Patients were randomized into one eye done with FLACS (cases) and the fellow eye with PE (controls). Criteria included bilateral visually significant cataract, absence of other ocular pathology and previous/concurrent ocular surgery. Subjects underwent ETDRS best-corrected visual acuity (BCVA), applanation tonometry, specular microscopy and ultrasound pachymetry at baseline, 1 week, 1 month and 3 months. Ultrasound, aspiration and surgery times were measured and cumulative dissipated energy (CDE)/fluid usage was recorded intra-operatively for each procedure. Mixed effects regression models were used to estimate follow up outcome scores over time by procedure arm. Two-tailed t-test was used for analysis of intraoperative records.

Results: Aspiration time was significantly reduced in PE (02:13.8 ±00:47) compared to FLACS (03:02.5 ±1:12) (p<0.0002) and overall surgery time showed a reduction in PE (07:33.8 ±05:04) compared to FLACS (09:50.2 ±05:53) (p<0.05). There was no significant difference in CDE (p=0.84) or ultrasound time (p=0.35), but there was a significant decrease in fluid usage in PE (58.50 ±14.90) compared to FLACS (72 ±19.1) (p=0.0005). BCVA and intraocular pressure (IOP) did not show significant differences between PE and FLACS at 1 week (p=0.21, p=0.99), 1 month (p=0.59, p=0.63) and 3 months (p=0.39, p=0.31) postoperatively, respectively. There was a significant reduction in mean pachymetry at 1 month in PE (574.55 ±46.78) compared to FLACS (587.20 ±42.10) (p=0.005) that disappeared at 3 months (p=0.70). Endothelial cell counts (ECC) showed no difference at 1 week (p=0.08), 1 month (p=0.26) and 3 months (p=0.22).

Conclusions: Our results show that conventional PE takes significantly less operative time and uses less intraoperative fluid. There were no differences in BCVA, IOP, pachymetry and ECC at 1 week, 1 month and 3 months postoperatively.

Commercial Relationships: Fares A. Alsaleh, None; Yassine J. Daoud, None
Support: Micheal O'Bannon Foundation

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Clinical Trial: NCT02096627

Program Number: 1815 Poster Board Number: B0148
Presentation Time: 11:00 AM–12:45 PM

Comparison of efficacy and safety of 45° versus 30° balanced phaco tip in torsional phacoemulsification
Kaori Morii1, Shinji Miura1, Kenji Sawada1, Yoshihumi Otsuka1, Hinako Kubotani1, Futoshi Taketani1, Ritsuko Fujiwara1.
1 Ophthalmology, Asagiri-Hospital, Akashi, Japan; 2 Hyogo Prefectural Amagasaki General Medical Center, Amagasaki, Japan.

Purpose: To compare intraoperative performance and postoperative outcomes after torsional phacoemulsification using a 45° or a 30° balanced phaco tip.

Methods: A single surgeon performed 80 cataract surgeries with a 45° (40 eyes, group A) or a 30° (40 eyes, group B) Intrepid® Balanced phaco tip. All surgeries were performed using the Centurion® platform with the same ultrasound (US) energy and fluidics settings via a 2.3 mm temporal corneal incision. Intraoperative measurements included total US seconds and the cumulative dissipated energy (CDE) value. The central corneal thickness (CCC) and the central corneal cell density (CD) were evaluated pre- and post-operatively.

Results: The mean total US seconds and CDE value were 24.91 ± 15.32 and 2.98 ± 1.85 in group A, and 32.88 ± 7.34 and 4.19 ± 1.78 in group B, respectively, with a statistical significance (p < 0.05). Postoperatively, there was no significant increase in CCC and no significant decrease in CD in either group.

Conclusions: Torsional phacoemulsification cataract surgery with a 45° balanced tip provided more effective lens removal than a 30° tip. Both tip designs provided safe results.

Commercial Relationships: Kaori Morii, Shinji Miura, None; Kenji Sawada, None; Yoshihumi Otsuka, None; Hinako Kubotani, None; Futoshi Taketani, None; Ritsuko Fujiwara, None

Program Number: 1816 Poster Board Number: B0149
Presentation Time: 11:00 AM–12:45 PM

Manual Small Incision Cataract Surgery (MSICS) under topical, incisional site sub-conjunctival 2% and intracameral 1% lignocaine anaesthesia - an ongoing pilot study
Sushant Wagley1, Marcelino Correia2, Andreas Kreis3, Nitin Verma4, Manoj Sharma5. 1 Hurley Medical Center, Flint, MI; 2 East Timor Eye Program, Dili, Timor-Leste; 3 Cabinet Ophtalmologique De La Planta, Sion, Switzerland; 4 Ophthalmology, University of Tasmania, Hobart, TAS, Australia.

Purpose: To evaluate the efficacy of topical incisional site sub-conjunctival 2% and intracameral 1% lignocaine anaesthesia in terms of pain, surgical complications, and visual outcome in manual small incision cataract surgery.

Methods: Data was prospectively collected for 48 cataract patients treated by a single surgeon at the National Eye Center in Dili, Timor-Leste. Patients received 0.3 ml sub-conjunctival 2% lignocaine and 0.2 ml intracameral 1% lignocaine as anaesthesia and Modified Wong-Baker Faces Pain reading scale was used to measure pain score. Patients who had undergone surgery in the fellow eye under peri/retro bulbar or sub-tenon anaesthesia were also asked about eye pain during previous procedure.

Results: Of the 48 patients analyzed, 31 (64.6%) were male and 17 (35.4%) female. The average age of patients was 60.8 years (SD 12.9). Majority of the patients had no pain with a few reporting minor pain. Surgeon’s experience was favorable in terms of patient cooperation, ocular movement, and anterior chamber stability. Over 95% of cases resulted in vision 6/18 or better.

Conclusions: Topical anesthesia with sub-conjunctival 2% and intracameral 1% lignocaine for manual small incision cataract surgery shows to be promising in this population considering patient comfort, surgeon experience, potential hazards, and visual outcome.

Commercial Relationships: Sushant Wagley, None; Marcelino Correia, None; Andreas Kreis, None; Nitin Verma, None; Manoj Sharma, None
EVALUATION OF THE MACULAR THICKNESS AFTER THE ACCOMPLISHMENT OF THE CAPSULOTOMY WITH Nd: YAG LASER STRATIFIED BY TOTAL AND PER PULSE ENERGY
Mayara Martins Abrahao, Leonardo Pinheiro Teixeira, DENISE Borges de Andrade Mendanha, Mateus Martins Cortez Vilar, Nicolau Zacharias Abrahao Filho, Joao J. Nasserallla. Oftalmologia, Instituto de olhos De Goiania, Goiania, Brazil.

Purpose: Realize a comparative analysis of the retinal thickness after performing the Nd:Yag Laser for capsulotomy stratification by energy. Associating the variance or maintenance of that with total energy or even with the energy used in every shot.

Methods: A clinical trial was performed correlating the macular thickness before and after the Nd:Yag Laser in 14 eyes of patients diagnosed with posterior capsule opacity at the Instituto de Olhos de Goiania.

Patients with vision less than 0.3 were included and there were no other ocular or systemic alterations that justified low visual acuity. Macular thickness was obtained through Optical Coherence Tomography and Nd:Yag Laser was performed following random energy patterns justified by the degree of opacity. The patients were randomly selected and submitted to the capsulotomy procedure with Nd:Yag Laser. The macular thickness was measured before and after 5 days of the procedure with subsequent correlation between the total energy used stratified by pulses.

From a total of 14 eyes among which 5 were male patients and 9 female patients, ranging in age from 50 to 79 years, it can be observed that macular thickness remained constant in the majority of patients, and a small increase were observed in patients where a greater amount of total energy independent of the energy per pulse was used.

Results: From a total of 14 eyes among which 5 were male patients and 9 female patients, ranging in age from 50 to 79 years, it can be observed that macular thickness remained constant in the majority of patients, and a small increase were observed in patients where a greater amount of total energy independent of the energy per pulse was used.

Conclusions: The macular thickness didn’t undergo significant variation stratified by the energy in this trial. Therefore, there are many studies that perform the increase of retinal thickness after yag laser for capsulotomy, showing us the necessity of analyse the risk factors constantly related.

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Program Number: 1820 Poster Board Number: B0153
Presentation Time: 11:00 AM–12:45 PM
Combined femtosecond laser assisted cataract surgery with the Catalys® system (Abbott, Abbott Park, IL) and vitrectomy
Brian Lee, Paul Drayna, Sandra R. Montezuma. UMN, Minneapolis, MN.

Purpose: Determine the benefits and challenges of combined femtosecond laser assisted cataract surgery with the Catalys® system (Abbott, Abbott Park, IL) and vitrectomy.

Methods: We retrospectively reviewed eight consecutive cases of combined femtosecond laser assisted cataract surgery with the Catalys® system and vitrectomy by a single surgeon. This study was reviewed and approved by the University of Minnesota Institutional Review Board and Ethics Committee.

Results: This study included 6 eyes of females and 2 eyes of males, with mean age of 69.1±7.2 years, mean pre-operative intraocular pressure of 14.9±3.5 mmHg, and mean logMAR best corrected visual acuity of 0.44±0.26. 25% of eyes had history of occlusive retinal vasculitis, 38% of eyes had history of proliferative diabetic retinopathy, 63% of eyes had diagnosis of epiretinal membrane. All patients completed both portions of the combined procedure. There were no complications from the femtosecond laser portion with the mean vacuum time 163s (range 125-320s). Post-operative findings included intraocular pressure rise on day one that resolved by week one in 25% of the eyes; persistent macular edema in 38% of the eyes (present prior to surgery in 2 of the 3 eyes). The mean intraocular pressure was not significantly different at month one (p=0.52), month three (p=0.55), or month six (p=0.32). There was an improvement in mean logMAR best corrected visual acuity to 0.27±0.26 (p<0.05) at month one, 0.25±0.25 (p<0.05) at month three, and 0.22±0.25 (p<0.05) at month six. Intraocular lens was centered in all cases, and manifest refraction spherical equivalent was -0.77±0.89, which was not statistically significantly different than the target spherical equivalent of -0.59±0.63 (p=0.24).

Conclusions: Combined femtosecond laser assisted cataract surgery with the Catalys® system and vitrectomy was not associated with significant complications, with an overall improvement in visual acuity.

Commercial Relationships: Brian Lee, None; Paul Drayna, None; Sandra R. Montezuma, None

Program Number: 1821 Poster Board Number: B0154
Presentation Time: 11:00 AM–12:45 PM
Outcomes in cataract surgery using ReSure® Sealant for the intraoperative management of clear corneal incisions: Results from a registry evaluation for pre-specified adverse ocular events
Deepa Mulani1, Ranjan Malhotra2, Y Ralph Chu3, Mitchell Jackson4, Kevin Jong5, Cynthia Matossian6, N Timothy Peters4, Inder Paul Singh6, Jonathan Solomon6, Navin Tekwani7, Thomas R. Walters4, Eric Ankerud8, Jamie Lynne Metzinger4, Nicole Rissman4, Jonathan H. Talamo3. Ocular Therapeutix, Bedford, MA; 1Ophthalmology Associates, St. Louis, MO; 2Chu Vision Institute, Bloomington, MN; 3Jackson Eye, Lake Villa, IL; 4Matossian Eye Associates, Doylestown, PA; 5Eyesight Ophthalmic Services, PA, Somersworth, NH; 7Tekwani Vision Center, St. Louis, MO; 3Houston Eye Associates, Houston, TX; 4The Eye Center of Racine & Kenosha, Racine, WI; 6Bowie Vision Institute, Bowie, MD; 8Keystone Research Ltd., Austin, TX.

Purpose: To collect post-approved data relative to the incidence of pre-specified Adverse Ocular Events for cataract surgery patients treated with ReSure Sealant.

Methods: This was a prospective, multicenter, single-arm observational post-approval registry study, conducted at up to 40 sites in the United States. Patients were eligible for inclusion in the study if they were greater than or equal to 22 years of age, had a cataract and were expected to undergo clear corneal cataract surgery with phacoemulsification and implantation of a posterior chamber intraocular lens. ReSure Sealant was prepared and applied in accordance with the product’s accompanying Instructions for Use. The primary endpoints were the proportion of patients experiencing persistent anterior chamber cells, hypotony, ocular discomfort, and surgical re-intervention in the postoperative follow-up period; achievement of the primary endpoint was based on statistical analysis of the true proportion of eyes exhibiting any adverse ocular event occurring less than or equal to 7.5%.

Results: A total of 12 endpoint adverse ocular events were reported for 12 subjects within the cohort of 626 subjects (1.9%). The frequency of each of the primary endpoint events was low (range 0 to 0.8%). The true proportion of each primary endpoint event is less than 0.075. None of the primary endpoint events were attributed to the application of the ReSure Sealant and no event was deemed to be serious. Seven of the 12 events observed within the course of this study were mild, and the remaining 5 events were of moderate intensity. None of the events were of severe intensity. Eleven of the 12 events were determined to be related to the cataract surgery.

Conclusions: The results of the primary analysis demonstrate that the true proportion of the frequency of primary endpoint adverse ocular events was well below the pre-specified threshold of 7.5%. Results of this registry confirm that the ReSure Sealant can be used safely by ophthalmologists.
Subconjunctival dexamethasone is used in patients at high risk of developing CMO, however its role in patients with no risk factors for CMO development has not been evaluated. We performed a prospective, randomised, controlled, investigator-masked, single centre clinical trial to test the hypothesis that injection of intraoperative subconjunctival dexamethasone prevents the development of CMO following routine uncomplicated cataract surgery.

**Methods:** Eyes of patients scheduled to undergo cataract surgery with no known risk factors for development of CMO were randomised to receive either the current standard of care (control group; n = 89) or the current standard of care plus a single subconjunctival depot injection of 1 mg dexamethasone at the conclusion of cataract surgery (dexamethasone group; n = 115). Eyes were excluded from the study if lens capsule disruption occurred at surgery. The primary outcome was the mean change in central macular thickness (CMT), evaluated using optical coherence tomography at 1 week. Secondary outcomes were the incidence of clinical CMO, best-corrected visual acuity (BCVA), intraocular inflammation, and intraocular pressure. An intention to treat analysis was performed using Student’s t-test, the Mann-Whitney U test and Fisher’s exact test.

**Results:** Mean change in CMT was similar between the two groups (1.3±19.7 µm in the control group compared to 1.5±13.6 µm in the dexamethasone group; P = 0.956). Clinical CMO was present in 2 eyes (2.2%) in the control group and 1 eye (0.9%) in the dexamethasone group (P = 0.582). BCVA at 1 week was 0.10±0.14 logMAR in the control group and 0.10±0.18 logMAR in the dexamethasone group (P = 0.967). There were no statistically significant differences between the groups in the level of postoperative intraocular inflammation (P = 0.279), change in intraocular pressure (P = 0.943) or frequency of adverse events (P = 0.687).

**Conclusions:** Subconjunctival dexamethasone was not efficacious in preventing CMO or reducing intraocular inflammation following routine cataract surgery. It was not associated with an increase in post-operative complications or adverse effects.

**Commercial Relationships:** Enis D. Kocak, None; Anthony J. Hall, None; David van der Straaten, None

**Clinical Trial:** ACTRN1261300314729
DEXTENZA was shown to be statistically superior to placebo (PV) in treating post-surgical inflammation and pain in subjects having undergone cataract extraction; superiority over PV was observed as early as Day 2 for absence of ocular pain and Day 4 for absence of AC cells. Ocular AEs observed in >5% of subjects were limited to eye inflammation and increased intraocular pressure. There were no treatment-related serious AEs. No subjects experienced a treatment-emergent AE leading to subject withdrawal.

Conclusions: DEXTENZA was shown to be statistically superior to PV in treating post-surgical inflammation and pain in subjects having undergone cataract extraction; superiority over PV was observed as early as Day 2 for absence of ocular pain and Day 4 for absence of AC cells. Treatment with DEXTENZA was safe and well-tolerated.

Summary of the Co-Primary Efficacy Endpoint Results

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Topical NSAIDS, corticosteroids, and antibiotics have been used in the treatment of post-surgical pain. A total of 924 subjects were randomized into the study (n=539, DEXTENZA; n=385, PV). A pooled analysis of the primary outcome measure (absence of pain, score of 0) at Day 8 was conducted. Subjects enrolled in the study were randomized on Day 1 to receive either DEXTENZA or placebo vehicle insert (PV); the treatment was inserted into the inferior canaliculus of the operated eye within minutes of the completion of surgery. Subjects completed follow-up visits at post-operative Days 2, 4, 8, 14, 30 and 45/60. Absence of pain (score of 0) at Day 8, as rated by the patient, was evaluated as a primary endpoint. Safety evaluations included adverse event (AE) collection and ocular examination findings, including slit lamp, dilated fundus, visual acuity, and intraocular pressure exams.

**Results:** A total of 924 subjects were randomized into the study (n=539, DEXTENZA; n=385, PV). A pooled analysis of the primary endpoint showed that 79.2% of subjects receiving DEXTENZA had an absence of pain at Day 8, compared to 56.9% of PV patients (p<0.0001).

In Phase 3a, a significantly greater proportion of patients in the DEXTENZA group had an absence of pain at Day 8, compared to patients receiving PV (80.4% [131/164] vs 43.4% [36/83], p<0.0001).

In Phase 3b, similar results were observed: 77.5% [124/161] vs. 58.8% [47/80], p=0.0025. In Phase 3c, DEXTENZA showed statistical superiority over PV; 79.6% (172/216) of subjects receiving DEXTENZA had pain at Day 8, compared to 61.3% (136/222) of subjects receiving PV (p<0.0001). Across all three studies, a greater proportion of subjects in the placebo group experienced at least one ocular AE in the study eye as compared to patients receiving DEXTENZA. The most frequent ocular AEs were anterior chamber inflammation, increased IOP, corneal edema, and eye inflammation. There were no treatment-related serious AEs.

**Conclusions:** DEXTENZA was effective in treating post-surgical pain according to the integrated efficacy data, and across all three Phase 3 clinical trials. Treatment with DEXTENZA was safe and well-tolerated.

**Summary of Adverse Events**

**Commercial Relationships:** Jonathan H. Talamo, Ocular Therapeutix (E); Sydney L. Tyson, Ocular Therapeutix (F); Shamik Bafna, Ocular Therapeutix (F); Gira P. Joseph, Ocular Therapeutix (F); Jason J. Jones, Ocular Therapeutix (F); Michael P. Jones, Ocular Therapeutix (F); Janet K. Kim, Ocular Therapeutix (F); James B. Martel, Ocular Therapeutix (F); Michael L. Nordlund, Ocular Therapeutix (F); Ian K. Piovannetti, Ocular Therapeutix (F); Inder Paul Singh, Ocular Therapeutix (F); Jamie Lynne Metzinger, Ocular Therapeutix (E); Deepa Mulani, Ocular Therapeutix (E)

**Support:** Ocular Therapeutix supported this research.

**Clinical Trial:** NCT02736175

**Program Number:** 1826 Poster Board Number: B0159

**Presentation Time:** 11:00 AM–12:45 PM

**DEXTENZA**™ (extended release dexamethasone) 0.4 mg vs. Placebo for the Treatment of Ocular Pain after Cataract Surgery: Results of Three Phase 3 Studies

**Swati Sane**, Shamik Bafna, John P. Berdahl, Michael Endl, Joseph P. Gira, Eugene Protzko, Inder Paul Singh, Sydney L. Tyson, Thomas R. Walters, Gary Wortz, Jamie Lynne Metzinger, Deepa Mulani, Jonathan H. Talamo, Ocular Therapeutix, Bedford, MA; Cleveland Eye Clinic, Elyria, OH; Vance Thompson Vision, Sioux Falls, SD; Fichte, Endl & Elmer Eyecare, Amherst, NY; Ophthalmology Consultants, St. Louis, MO; Seidenberg Protzko Eye Associates, Havre de Grace, MD; The Eye Centers of Racine & Kenosha, Racine, WI; SurgiCenter of Vineland, Vineland, NJ; Keystone Research, Ltd., Austin, TX; Kohler Vision Group, Lexington, KY.

**Purpose:** To evaluate the integrated efficacy of DEXTENZA when placed in the canaliculus of the eye for the treatment of post-surgical pain in subjects who have undergone cataract extraction with intraocular lens implantation.

**Methods:** Three prospective, multicenter, randomized, parallel-arm, double-masked, vehicle controlled Phase 3 clinical trials were conducted. Subjects enrolled in the study were randomized on Day 1 to receive either DEXTENZA or placebo vehicle insert (PV); the test article was inserted into the inferior canaliculus of the operated eye within minutes of the completion of surgery. Subjects completed follow-up visits at post-operative Days 2, 4, 8, 14, 30 and 45/60. Absence of pain (score of 0) at Day 8, as rated by the patient, was evaluated as a primary endpoint. Safety evaluations included adverse event (AE) collection and ocular examination findings, including slit lamp, dilated fundus, visual acuity, and intraocular pressure exams.

**Results:** A total of 924 subjects were randomized into the study (n=539, DEXTENZA; n=385, PV). A pooled analysis of the primary endpoint showed that 79.2% of subjects receiving DEXTENZA had an absence of pain at Day 8, compared to 56.9% of PV patients (p<0.0001).

In Phase 3a, a significantly greater proportion of patients in the DEXTENZA group had an absence of pain at Day 8, compared to patients receiving PV (80.4% [131/164] vs 43.4% [36/83], p<0.0001).

In Phase 3b, similar results were observed: 77.5% [124/161] vs. 58.8% [47/80], p=0.0025. In Phase 3c, DEXTENZA showed statistical superiority over PV; 79.6% (172/216) of subjects receiving DEXTENZA had pain at Day 8, compared to 61.3% (136/222) of subjects receiving PV (p<0.0001). Across all three studies, a greater proportion of subjects in the placebo group experienced at least one ocular AE in the study eye as compared to patients receiving DEXTENZA. The most frequent ocular AEs were anterior chamber inflammation, increased IOP, corneal edema, and eye inflammation. There were no treatment-related serious AEs.

**Conclusions:** DEXTENZA was effective in treating post-surgical pain according to the integrated efficacy data, and across all three Phase 3 clinical trials. Treatment with DEXTENZA was safe and well-tolerated.

**Summary of Pain Data**

**Commercial Relationships:** Swati Sane, Ocular Therapeutix (E); Shamik Bafna, Ocular Therapeutix (F); John P. Berdahl, Ocular Therapeutix (F); Michael Endl, Ocular Therapeutix (F); Joseph P. Gira, Ocular Therapeutix (F); Eugene Protzko, Ocular Therapeutix (F); Inder Paul Singh, Ocular Therapeutix (F); Sydney L. Tyson, Ocular Therapeutix (F); Thomas R. Walters, Ocular Therapeutix (F); Jamie Lynne Metzinger, Ocular Therapeutix (E); Deepa Mulani, Ocular Therapeutix (E)

**Support:** Ocular Therapeutix supported this research.

**Clinical Trial:** NCT02736175; NCT02034019; NCT02089113

**Program Number:** 1827 Poster Board Number: B0160

**Presentation Time:** 11:00 AM–12:45 PM

**Dropless Cataract Surgery with Pars Plana Intravitreal Trimoxi Use - An Outcomes Analysis**

Branson LeClair1, Michael E. Rauzer2, Eden Yoon2.

1School of Medicine, Loma Linda University, Loma Linda, CA; 2Loma Linda Eye Institute, Loma Linda, CA.

**Purpose:** Topical NSAIDS, corticosteroids, and antibiotics have been the mainstay for prophylaxis and treatment following cataract surgery to reduce inflammation and prevent post-op infectious endophthalmitis. Our study compares the outcomes of intraoperative pars plana intravitreal injection of Trimoxi + topical NSAID (“Dropless”) versus traditional eyedrop usage after cataract surgery. Our hypothesis was that the pars plana intravitreal injection of...
Trimoxi + topical NSAID is a non-inferior treatment method to standard eydrop therapy for cataract surgery.

**Methods:** This retrospective cohort study analyzed a total of 530 patients. 263 patients received standard therapy (4 week taper of antibiotic, NSAID and steroid eye drops) ; 267 patients received 0.2 mL of Trimoxi (Triamcinolone acetate – 15mg/mL ; Moxifloxacin – 1mg/mL) injected into the vitreous via the pars plana during cataract surgery + postop topical NSAID. Anterior chamber inflammation, corneal edema, and IOP were measured at 1 day, 1 week and 1 month postop. Other complications and modifications to the planned postop regimen were also noted.

**Results:** A binary logistic regression shows no statistically significant differences between the two treatment groups across the three time points in all measured outcomes. Regarding anterior chamber inflammation (OR=0.997), no significant differences were detected between the treatment groups (p=0.9892). In the Dropless group, 22 eyes were given additional steroid drops postoperatively. In the standard eye drop regimen
group 3 eyes required altered therapy (restart or increase the steroid/NSAID). A slight increase in the odds of corneal edema in the dropless group (OR=1.42) was found, although the p-value is not regarded as statistically significant (p=0.0815). Regarding postop IOP, there are decreased odds of elevated pressure in the dropless group (OR=0.651), but again there is no significant differences detected between treatment groups (p=0.1208).

**Conclusions:** Intravitreal Trimoxi during cataract surgery + postop NSAID use appears non-inferior to traditional postop eydrop use after cataract surgery. However, more patients in the dropless group required an alteration in the planned eye drop regimen versus the traditional group.

**Commercial Relationships:** Bronson LeClair, None; Michael E. Rauser, None; Eden Yoon, None

Program Number: 1828 Poster Board Number: B0161
Presentation Time: 11:00 AM–12:45 PM

**Unplanned Initiation of Postoperative Topical Medications after Intravitreal Antibiotic-Steroid Injection during Cataract Surgery**

Zeeshan Haq1, Kamran Riaz2, 1University of Chicago Pritzker School of Medicine, Chicago, IL; 2Department of Ophthalmology and Visual Science, The University of Chicago, Chicago, IL.

**Purpose:** The incidence of, and risk factors for, elevated intraocular pressure (IOP) and breakthrough inflammation after intravitreal antibiotic-steroid injection during cataract surgery remain understudied. We performed a regression analysis of short-term results from a retrospective clinical cohort to test the hypothesis that previously implicated systemic and ocular factors may contribute to these postoperative complications.

**Methods:** The study includes 90 eyes (median age = 73.5 years; 56.7% female) from 64 patients who underwent uncomplicated phacoemulsification with an intravitreal antibiotic-steroid injection between 05/2016 and 11/2016. A single surgeon (K.R.) performed all of the cataract surgeries using a standardized technique for intravitreal injection at the conclusion of the surgery. All patients were followed for at least one month. Univariate logistic regression was used to identify potential predictors of unplanned topical pharmacotherapy initiation, which included age, glaucoma status, diabetes mellitus (DM), a history of laser treatment for DM, age-related macular degeneration, epiretinal membrane, previous history of intraocular inflammation, and a history of pars plana vitrectomy.

**Results:** The unplanned initiation of topical hypotensive medication for elevated IOP (> 30 mm hg) occurred in 10 eyes (11.1%) and was not significantly associated with a previous diagnosis of glaucoma or glaucoma suspect status (OR = 1.57; 95% CI = 0.29 to 8.37; p-value = 0.60). The unplanned initiation of topical corticosteroid and/or non-steroidal anti-inflammatory therapy for breakthrough inflammation occurred in 13 eyes (14.4%) and was not significantly associated with any of the tested predictors. Of 70 eyes that received a final refraction, a best corrected visual acuity of 20/25 or better was achieved in 60 eyes (85.7%). At the conclusion of the follow-up period, cystoid macular edema and endophthalmitis were diagnosed in 1 (1.1%) and 0 (0.0%) eyes, respectively.

**Conclusions:** Short-term outcomes of this technique are comparable to a standard postoperative regimen of topical medications. Further study of the factors that contribute to elevated IOP and breakthrough inflammation in the early postoperative period is necessary to identify patients at risk for these complications in whom an approach combining intravitreal and topical therapy may be appropriate.

**Commercial Relationships:** Zeeshan Haq, None; Kamran Riaz, None

Program Number: 1829 Poster Board Number: B0162
Presentation Time: 11:00 AM–12:45 PM

**Omidria® versus Epinephrine: A Retrospective Review of Intraoperative Maintenance of Mydriasis**

Joshua Nunn1, Shruti Sudhakar2, Ingrid U. Scott3, Seth Pantanelli4.
1Ophthalmology, Penn State Hershey Medical Center, Hershey, PA; 2Penn State Hershey Medical Center, Hershey, PA.

**Purpose:** To compare the relative efficacy of phenylephrine 1.0%-ketorolac 0.3% (Omidria®) versus epinephrine in the maintenance of mydriasis during cataract surgery.

**Methods:** This study was approved by the local Institutional Review Board. Surgical videos of eyes that underwent cataract surgery with intraocular lens implantation at an academic medical center between 08/2015 and 06/2016 and which received intracameral Omidria® or epinephrine were reviewed retrospectively. A single examiner who was masked with respect to intracameral mydriatic agent administered reviewed each surgical video and measured the intraoperative pupil diameter at 1 minute intervals for the duration of the surgery. Preoperative white-to-white measurements were used as a reference to calculate pupil diameters.

**Results:** The study included 46 eyes (19 Omidria®, 27 Epinephrine) from 46 patients. The two patient groups were similar with respect to age, gender, race, baseline intraocular pressure, white-to-white distance, axial length, use of tamsulosin, and baseline pupil diameter. There was no statistically significant difference in the mean area under the curve change from baseline pupil diameter between the two groups (0.85 versus 0.44, respectively; p = 0.7494). No eye in either group had a pupil diameter of less than 6 mm at any time during the procedure.

**Conclusions:** No significant differences were identified between Omidria® and epinephrine with regards to maintenance of intraoperative mydriasis. This finding warrants further investigation in prospective randomized studies with larger sample sizes.

**Commercial Relationships:** Joshua Nunn, None; Shruti Sudhakar, None; Ingrid U. Scott, None; Seth Pantanelli, None

Program Number: 1830 Poster Board Number: B0163
Presentation Time: 11:00 AM–12:45 PM

**Prospective Comparison of Intracameral Phenylephrine/ Ketorolac (Omidria®) to Intracameral Epinephrine With Respect to Pupil Size During Phacoemulsification Cataract Surgery**

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**Purpose:** To compare intraoperative mydriasis during phacoemulsification cataract surgery associated with use of intracameral phenylephrine 1.0%/ketorolac 0.3% (Omidria®) versus intracameral epinephrine. There are currently two published prospective randomized controlled trials comparing Omidria® to placebo, phenylephrine alone, and ketorolac alone. Both of these studies report that Omidria® is superior to placebo for the maintenance of mydriasis during cataract surgery. However, there are no studies comparing Omidria® to epinephrine, which has been used by ophthalmologists for years to facilitate intraoperative mydriasis during cataract surgery.

**Methods:** Prospective, randomized single-masked study of patients who underwent bilateral, sequential phacoemulsification cataract surgery by a single surgeon at an academic medical center. The first eye was randomly assigned to receive Omidria® or epinephrine and the fellow eye was assigned to the other mydriatic agent. Videos of each surgery were reviewed by a single masked examiner, who measured pupil diameter from the time of incision (baseline) until wound closure at 1-minute intervals. The primary endpoint is the mean area under the curve (AUC) change from baseline in pupil diameter over time to the end of cataract surgery. Secondary endpoints include maximum intraoperative pupil constriction compared to baseline, proportion of eyes with pupil diameter less than 6.5 mm at any time during surgery, proportion of eyes with pupil diameter less than 6.0 mm during cortical clean-up, and proportion of eyes with greater than 2.5 mm of pupillary constriction at any time during surgery.

**Results:** Sixteen eyes from eight patients have been enrolled in the study to date. At the current average enrollment rate of two eyes per week, we anticipate having results from at least fifty eyes of twenty-five patients by end of April 2017. The mean AUC change from baseline was 0.45 mm in the Omidria® group and 0.36 mm in the epinephrine group.

**Conclusions:** Based on the data collected to date, there is no statistically significant difference between intracameral Omidria® and intracameral epinephrine with respect to maintenance of mydriasis during phacoemulsification cataract surgery. Additional data are being collected and will be reported.

**Commercial Relationships:** Zachary C. Landis, None; Shruti Sudhakar, None; Joshua Nunn, None; Ingrid U. Scott, None; Seth Pantanelli, None

**Clinical Trial:** NCT02895035

**Program Number:** 1831 **Poster Board Number:** B0164

**Presentation Time:** 11:00 AM–12:45 PM

**Incidence of Cystoid Macular Edema after Intraocular Vancomycin in Cataract Surgery**

Mona Adeli, Thomas Mauger. Ophthalmology, The Ohio State University, Columbus, OH.

**Purpose:** Various studies have demonstrated the efficacy of intracameral antibiotics in decreasing the incidence of endophthalmitis after cataract surgery. While many of the initial studies utilized intracameral cephalosporin agents, intracameral vancomycin has been used as an alternative in penicillin-allergic patients. The purpose of this study was to compare the incidence of pseudophakic cystoid macular edema (CME) in subjects who received intracameral cephalosporin versus intracameral vancomycin during cataract surgery.

**Methods:** A retrospective chart review was conducted on all subjects at our academic institution with the diagnosis of CME by ICD code between the time period of January 1, 2010 and June 30, 2015. Inclusion criterion was the documentation of CME within a 90-day post-operative period after cataract surgery. Exclusion criteria were prior history of macular edema, history of epiretinal membrane, concomitant vitreoretinal surgery at the time of cataract extraction, intraoperative posterior capsule tear, and history of diabetes mellitus. A Pearson’s chi-square test was used for statistical analysis.

**Results:** The final analysis included a total of 24 subjects (29 eyes) with CME. The incidence of pseudophakic CME in our population of 7,822 cataract surgeries after applying the above-stated exclusion criteria was 0.37%. The incidence of pseudophakic CME was 0.33% in subjects who received intracameral cephalosporin, and 0.78% in subjects who received intracameral vancomycin. There was no significant difference between the incidence of CME between these groups (p = 0.054).

**Conclusions:** This study demonstrated a trend toward a higher incidence of CME in subjects who received intracameral vancomycin as opposed to intracameral cephalosporin during cataract surgery. This finding was not, however, statistically significant. However, the morbidity associated with the development of CME is much lower than that associated with the development of endophthalmitis. Additional research must be conducted to determine the safest endophthalmitis prophylaxis in the population of penicillin- and cephalosporin-allergic patients.

**Commercial Relationships:** Mona Adeli, None; Thomas Mauger, None

**Program Number:** 1832 **Poster Board Number:** B0165

**Presentation Time:** 11:00 AM–12:45 PM

**The role of Intracameral Moxifloxacin for Prophylaxis of Postoperative Endophthalmitis**

Milad Modabber, Steven A. Arshinoff. Ophthalmology, McGill University, Montreal, QC, Canada; Ophthalmology, University of Toronto, Toronto, ON, Canada.

**Purpose:** Post-operative endophthalmitis (POE) is an uncommon yet potentially devastating complication of cataract surgery. The landmark study by the European Society of Cataract and Refractive Surgeons (ESCRS) clearly demonstrated the benefit of intracameral antibiotic prophylaxis in reducing the incidence of POE. However, it only tested one antibiotic at one concentration. The advent of fourth-generation fluorquinolones, including Moxifloxacin, have since shown to be the most effective broad-spectrum topical antibiotics. Here, we seek to evaluate the efficacy and liabilities of the available prophylactic intracameral antibiotics, and to devise an optimum dosing and administration protocol for intracameral moxifloxacin.

**Methods:** Retrospective review of all cataract surgical cases, performed sequentially by the senior author (S.A.A.), using clear corneal incisions, with no cases excluded. The rates of POE using Intracameral vancomycin were compared with that of intracameral moxifloxacin following practice pattern transition to Moxifloxacin. The administration dosing and regimen of the intracameral antibiotics, as well as microbiological and pharmacodynamics analysis of the medications were reviewed.

**Results:** Intracameral vancomycin was used in the first 4797 cases, with no POE cases. Following discovery of the risk of Toxic anterior segment syndrome (TASS) with Canada’s generic vancomycin, transition was made to moxifloxacin. Using intracameral moxifloxacin (100 mcg in 0.1 mL), a single case of POE in 3430 cases occurred with a moxifloxacin-resistant strain of Staphylococcus epidermidis. Increasing the dose and revising the administration technique of intracameral moxifloxacin (450 to 600 mcg) resulted in no cases of POE in 4601 subsequent cases. No adverse side effects or complications were observed.

**Conclusions:** Intracameral moxifloxacin injection into the anterior chamber as the final step in cataract surgery is safe and effective. Based on its favorable potency, penetration, and safety profiles,
moxifloxacin may provide a superior alternative for intracameral antibiotic in postoperative endophthalmitis prophylaxis.

Commercial Relationships: Milad Modabber, None; Steven A. Arshinoff, None