

71st Annual Wills Eye Hospital Conference
Free Paper Session
Thursday, March 7, 2019

The Free Paper Presentations will be held in the Sara and Noel Simmonds Auditorium of Wills Eye Hospital. The best paper presented by a resident will receive the Shipman Award. The best paper presented by a fellow will receive the McDonald Award.

1:00 PM Opening remarks
Sunir J. Garg, MD

1:08 PM Endophthalmitis Rates Following Corneal Transplantation
Durga S. Borkar, MD, (F) Turner D. Wibbelsman, BS, Jason Hsu, MD, Zeba A. Syed, MD [Retina]

Purpose: To evaluate endophthalmitis rates after penetrating and endothelial keratoplasty
Methods: The records of an academic private practice in Philadelphia, PA were electronically queried for surgical visits during which a penetrating or endothelial keratoplasty was performed between 1/1/12 and 9/1/18. Demographic information and surgical indication were recorded for each patient and office visit. Endophthalmitis diagnosis was determined by ICD and procedure codes. Charts of endophthalmitis cases were reviewed for information on clinical characteristics and outcomes.
Results: 1681 penetrating keratoplasties for 1334 patients and 2304 endothelial keratoplasties for 1734 patients were performed. The rate of endophthalmitis for penetrating keratoplasty was 0.71%, while the rate for endothelial keratoplasty was 0.17% ($p=0.01$).
Conclusion: In this cohort of patients undergoing corneal transplantation, endophthalmitis rates were significantly lower for endothelial keratoplasty compared to penetrating keratoplasty.

1:16 PM Survival Times in Patients with Vitreoretinal Lymphoma. Analysis of 95 Patients at a Single Center
Lauren A. Dalvin, MD (F), Li-Anne S. Lim, MD, Arman Mashayekhi, MD, Carol L. Shields, MD [Tumor]

Purpose: To identify factors predictive of survival time in patients manifesting VRL.
Methods: Retrospective review of patients diagnosed with VRL from 1984-2018 with Kaplan-Meier and Cox regression analysis.
Results: There were 95 patients, 52 (55%) males and 43 (45%) females, with VRL. Mean patient age was 67 years (median 66, range 28-91 years). The presence of subretinal pigment epithelial (sub-RPE) infiltration was associated with shorter mean time to death (46 vs. 76 months, $p=0.04$, hazard ratio [HR] 1.9). The mean survival did not differ by sex, age at presentation, association with CNS or systemic lymphoma, unilateral versus bilateral ocular involvement, presence of vitreous involvement, or primary method of VRL treatment ($p>0.05$).
Conclusion: Patients with VRL who present with sub-RPE infiltration have shorter mean survival time.

1:24 PM When is iCare High Care?
Jade M. Price, MD (F), Alex V. Levin, MD, MHSc, FRCSC [Pediatric Ophthalmology]

Purpose: We note a subset of children with significant difference between rebound tonometry (RBT) and applanation tonometry (AT) measurements and seek to identify characteristics contributing to artifact elevation of intraocular pressure (IOP) as measured with RBT.
Methods: Retrospective, cross-sectional study with chart review over 6 months was performed identifying various characteristics of children with IOP measured by RBT and AT.
Results: Of 234 eyes with RBT measurements, 43 eyes had elevated values. Examination under anesthesia (EUA) with AT measurement was required for 18 patients and 15 eyes had a significant difference between RBT and AT measurements.
Conclusion: Elevated RBT values were identified in 18% of eyes. Following AT measurement during EUA, RBT artifact elevation was present in 71% of these eyes. Additional investigation will be done to identify risk factors for RBT artifact elevation.

1:32 PM Disparity in Presenting Visual Acuity between Different Socio-demographic Groups with Neovascular AMD
Connie M. Wu, MD (R), Anthony Obeid, MD [Retina]

Purpose: The aim was to examine the correlation between presenting visual acuity (VA) and socio-demographic characteristics in patients with neovascular age related macular degeneration (nAMD).
Methods: Patients with nAMD who presented to Mid Atlantic Retina and the Wills Eye retina service were identified between January 2013 and June 2017. Socio-demographic characteristics included age, race, gender, and regional adjusted gross income (AGI).
Results: The analysis included 3205 patients. There was a significant increase in the prevalence of severe vision loss as regional AGI decreased, with 41% of incomes \leq \$50,000, 34 % between \$51,000 -\$75,000, 29% between \$76,000 -\$100,000, 29% $>$ \$100,000 presenting with severe vision loss ($p < 0.001$). There was no significant difference in the prevalence of severe loss between genders ($p = 0.60$) or between race ($p = 0.12$).
Conclusions: There is a significant disparity in presenting VA between different socio-demographic groups.

1:40 PM Epidemiology of Severe Chemical Ocular Burns in Brazil over Ten Years (2008-2017)
Michelle White, MD (F), Beeran Meghpara, MD, Clase Dohlman, MD, PhD [Cornea]

Purpose: Describe the rate and hospitalizations of severe ocular chemical burns in Brazil over ten years (2008–2017)
Method: Data was collected from the hospital information system of the Unified Health System (SIH/SUS). Search parameters were verified with a retrospective chart review at a single hospital, Universidade Federal de São Paulo.
Results: There were 3,468 hospitalizations for “ocular burns” over ten years. It was assumed that these hospitalizations represented patients with “severe ocular chemical burns” and this was verified by the retrospective chart review. The minimum rate of severe ocular chemical burns was 1.7 per 1,000,000 inhabitants. Mean age was 24 and males are 1.56 times more likely than females.
Conclusion: While severe ocular chemical burns are rare, they portend a poor outcome with devastating consequences given the average age of individuals affected.

1:48 PM Quality of Life Comparison of Exenterated and Non-Exenterated Patients with Sinonasal Malignancies
Michele D. Markovitz, MD (R), Chandala Chitguppi, MD, Michael P. Rabinowitz, MD, Mindy R. Rabinowitz, MD [Oculoplastics]

Purpose: To create and validate a vision-related quality of life (QOL) questionnaire comparing exenterated and non-exenterated patients with orbital malignancies.
Methods: A QOL questionnaire assessing vision following surgery was created. Fisher's exact and Student's t-tests were performed for categorical and Likert data.
Results: 18 exenterated and 16 non-exenterated patients were surveyed. Data revealed significant differences in appearance and driving; exenterated patients reported greater difficulty driving ($p = 0.009$) and worse appearance ($p = 0.005$). There was no difference in remaining endpoints.
Conclusions: Patients and surgeons often fear disfigurement and altered lifestyle after exenteration. Our study shows no significant difference in QOL endpoints between groups, except for driving and appearance. We conclude these patients have similar QOL following treatment and encourage providers to discuss these results and to choose the best treatment for their patients.

1:56 PM Stargardt Misdiagnosis: How Ocular Genetics Helps
Manuel B. Ibanez, IV, MD, DPBO (F), Thales AC de Guimaraes, MD, Alex V. Levin MD, MHSc, FRCSC, Jenina E. Capasso, MS, LCGC [Retina] [Ocular Genetics]

Purpose: Ocular Genetics at Wills Eye sees a wide range of rare disorders for accurate diagnosis. To demonstrate how focused consultation and DNA testing results in precise diagnoses, we investigated false diagnosis rates for patients referred for Stargardt disease.
Methods: Retrospective review of patients referred with Stargardt over three years. Results of diagnostic testing and DNA were compared to standard definition of Stargardt.
Results: Of 41 patients, 15 (36.6%) had been misdiagnosed. Six had non-Stargardt phenotype of which 3 had ABCA4 mutation, and 9 had another DNA confirmed diagnosis.
Conclusion: Our study highlights the essential role of the subspecialty field of ocular genetics in obtaining accurate diagnoses for the delivery of correct counseling and interventional trial eligibility assessment.

2:04 PM Choroidal Melanoma Treated with Plaque Radiotherapy & Prophylactic Anti-VEGF: Impact of Subfoveal Fluid.

Andrei P. Martin, MD (F), Lauren A. Dalvin MD, Li-Anne S. Lim, MD, BS, Carol L. Shields, MD [Tumor]

Purpose: To evaluate radiation maculopathy after plaque radiotherapy for uveal melanoma in eyes with and without subfoveal fluid (SFF) at presentation.

Methods: Retrospective, nonrandomized, interventional case series with Kaplan-Meier analysis.

Results: Of 1327 eyes, SFF was observed in 378 eyes (28.4%). SFF (versus [vs.] no SFF) was associated with younger patient age (57 vs. 60 years, $p=0.001$), and shorter distance to optic nerve (2.6 vs 5.3 mm, $p<0.001$) and foveola (1.7 vs 5.1 mm $p<0.001$). Time to radiation maculopathy was significantly shorter in patients with subfoveal SRF at presentation (26 vs. 34 months, $p<0.05$).

Conclusion: With the presence of subfoveal SRF can lead to earlier radiation maculopathy following plaque radiotherapy.

2:12 PM Clinical Features and Outcomes of Conjunctival Melanoma with NRAS, BRAF, NF1 and ATRX Mutations

Sara E. Lally, MD (S), Carol L. Shields, MD, Lauren A. Dalvin, MD, LiAnne S. Lim, MD [Cornea] [Oncology]

Purpose: To evaluate clinical features and outcomes of conjunctival melanoma (CoM) associated with NRAS, BRAF, NF1 and ATRX mutations.

Methods: Primary conjunctival melanoma was evaluated with next generation sequencing.

Results: Sufficient tumor cellularity was available in 66 of 77 samples. The most common mutations were BRAF 24%, NRAS 24%, ATRX 34% and NF1 42%. NRAS mutation was associated with metastasis in 40% versus 8% with no mutation ($p<0.01$). BRAF mutation was found more frequently with Asian race 19% vs. 0% ($p=0.01$) and caruncle tumor location 31% vs. 8% ($p=0.03$). BRAF was less frequently associated with superior quadrant tumor location 25% vs. 58% ($p=0.04$) and negatively correlated to number of recurrences ($R = -0.25$, $p=0.03$).

Conclusion: NRAS mutation imparted a higher risk of metastasis and BRAF mutation correlated with high-risk clinical features and frequent recurrence.

2:20 PM Aflibercept to Ranibizumab Switch for Macular Edema Secondary to Neovascular AMD

Anthony Obeid, MD (F), Phoebe Mellen, MD, Turner D. Wibbelsman, BS [Retina]

Purpose: This study evaluates outcomes after a switch from aflibercept to ranibizumab therapy for macular edema secondary to AMD.

Methods: At the three visits before (B3, B2, B1) and after the switch (P1, P2, P3) and the switch date itself, functional and anatomic outcomes were assessed in 148 eyes.

Results: After the therapeutic conversion, logMAR VA increased significantly from the switch visit [0.47, Snellen 20/60] to the P1 [0.51, Snellen 20/65], P2 [0.54, Snellen 20/70], and P3 [0.52, Snellen 20/66] visits [$p=0.07$, $p=0.02$, $p=0.20$]. CFT increased significantly from the switch [186 μm] to the P1 [198 μm], P2 [193 μm], and P3 [194 μm] visits [$p=0.004$, $p=0.001$, $p=0.01$].

Conclusions: There was significant worsening in functional and anatomic outcomes after switch to ranibizumab from aflibercept for neovascular AMD.

2:28 PM Outcomes of Combined Ab Interno Canaloplasty Plus IStent Versus IStent Alone Performed with Cataract Surgery

Michael D. Abendroth, MD, MBA (R), Mark F. Pyfer, MD, Qiang Zhang [Cataract] [Glaucoma]

Purpose: to compare the efficacy of combined ab interno canaloplasty using the Omni device (Sight Sciences, CA, USA) plus iStent (Glaukos, CA, USA) versus iStent alone performed with cataract surgery.

Methods: retrospective, consecutive case series by a single surgeon in a Wills Eye affiliated community practice. Up to 3 months postoperative outcome data collected includes: visual acuity, intraocular pressure, glaucoma medication use, additional glaucoma procedures required, and incidence of surgical complications.

Results: target enrollment is 30 patients that received iStent alone (complete) and 30 that also received ab interno canaloplasty (in process.) Statistical analysis includes t-test for continuous variables and chi-squared test for discrete data.

Conclusion: preliminary results show that ab interno canaloplasty plus iStent results in significantly lower intraocular pressure and decreased glaucoma medication use compared to iStent alone.

2:36 PM Etiology, Treatment and Visual Outcomes of Patients with Choroidal Neovascularization under the Age of 50

David Xu, MD (F), Anthony Obeid, MD, MPH, Turner D. Wibbelsman, BS,
Allen C. Ho, MD [Retina]

Purpose: This report characterizes patients under 50 who developed CNV and analyze the etiology, treatment and visual outcomes.

Methods: Patients under 50 diagnosed with CNV were included. Mean age, gender, etiology causing CNV, number of anti- VEGF injections and visual acuities were recorded.

Results: 168 eyes of 154 patients were included. Median age was 36 (range 6-50) years. The most prevalent etiologies were inflammatory/uveitic causes (80 eyes, 47%), idiopathic (35 eyes, 21%), and high myopia (33 eyes, 20%). 131 eyes (78%) required anti-VEGF treatment with a mean of 6.0 ± 5.6 injections. Overall, mean VA improved by 0.13 ± 0.07 logMAR ($p < 0.001$) over follow up.

Conclusions: Young patients develop CNV for a heterogeneous range of etiologies including inflammatory disorders, idiopathic, or secondary to high myopia.

2:44 PM The International Pediatric Glaucoma Registry: First 500 Cases

Shaden H. Yassin, MD (F), Alex V. Levin, MD, MHSc, FRCSC [Pediatric Ophthalmology]

Purpose: To examine the epidemiology of childhood glaucoma based on a large worldwide sample enrolled in this International Registry, hosted by Wills Eye Hospital

Methods: We review the first 500 patients enrolled in this Registry. We collected and analyzed the age, type of glaucoma based on the new CGRN classification, age of diagnosis, country of origin, severity of glaucoma and outcomes.

Results: In the USA, glaucoma associated with acquired conditions (37.5%) is most common with diagnosis age 6.80 years. In Asia, primary congenital glaucoma is most common (52.4%), with diagnosis age 2.80 years. In the Middle East, glaucoma following cataract surgery is most common (46.7%), with diagnosis age 2.60 years.

Conclusion: Our study illustrates the Registry's research utility, and provides preliminary insight on the epidemiology of pediatric glaucoma.

2:52 PM Yield of Radiologic Imaging for Ophthalmic Conditions in an Emergency Room Setting

Austin R. Meeker, MD (R), Jordan D. Deaner MD, Robert C. Sergott MD [Neuro]

Purpose: To describe the diagnostic and economic yield of radiologic imaging for ocular complaints in an emergency room setting.

Methods: All patients who underwent imaging of the eyes, brain, sinuses, and associated vasculature in the Wills ER from April 1, 2017 to November 1, 2018 were included. Visual and ocular symptoms, physical examination findings, radiologic findings, diagnoses, and treatments were recorded.

Results: 2,280 patients met the criteria for inclusion with a total of 3,375 imaging studies performed.

Results are currently being collected.

Conclusions: Analyses will include the diagnostic yield and cost-benefit analysis of radiologic imaging grouped by patient history, pertinent physical exam findings, final diagnosis, and imaging type.

3:00 PM Break

3:15 PM Refractive Outcomes after Scleral Fixation of Intraocular Lenses Using the Yamane Technique

Matthew D. Shulman, MD (F), Aditya Kanasa-thasan, MD, Brandon Ayres, MD [Cataract]

Purpose: To examine the refractive outcomes of eyes that underwent scleral-fixated IOL placement using Yamane technique.

Methods: A retrospective cohort study examining the set of patient's of Dr. Brandon D. Ayres who underwent Yamane technique from 1-11/2018. Pre- and post-operative vision was recorded in Snellen and converted to logMAR. Manifest refractions were recorded, or an accurate autorefractometer used. Other characteristics were recorded for correlation analysis including whether pars plana vitrectomy was performed.

Results: 32 patients met inclusion criteria. Preoperative VA was 1.10 logMAR, post-operative VA was 0.53 logMAR. There was an average gain of 5 lines of vision among all patients, with 56% experiencing at least a 2-line increase and 41% a 6-line increase.

Conclusions: Our series suggests visual improvement and refractive outcomes with the Yamane technique are similar to scleral-sutured IOLs.

3:23 PM Comfort and Efficacy of Povidone Iodine 5% compared to Aqueous Chlorhexidine 0.1% for Intravitreal Injection

Thomas Jenkins, MD (F), Ferhina Ali, MD, MPH, Sunir J. Garg, MD, FACS [Retina]

Purpose: Povidone iodine 5% (PI) is an antiseptic for intravitreal injections. Aqueous chlorhexidine (AC) 0.1% may be better-tolerated. We compared pain scores, ocular surface, and microbiological properties between PI and AC.

Methods: Prospective randomized study of bilateral injections with PI and AC. Pain (0-10) after instillation and one day after was obtained. Ocular staining score (OSS) was recorded. Cultures were evaluated.

Results: One hundred eyes were included. PI had greater pain scores immediately (1.44 vs 0.44, $p<0.001$) but not post-procedure day 1 (1.04 vs 0.48, $p=0.06$). PI had worse OSS (4.22 vs 3.1, $p<0.001$). There was no difference in culture positivity or in adverse events ($p=0.99$).

Conclusions: Povidone iodine 5% demonstrated greater discomfort and corneal epitheliopathy. The disinfecting agents showed similar anti-microbial efficacy. Aqueous chlorhexidine may be a better-tolerated alternative.

3:31 PM Factors Predicting Distribution and Practice Patterns of Retina Providers across the United States
Ravi R. Pandit, MD, MPH (F), Turner D. Wibbelsman, BS, Allen C. Ho, MD [Retina]

Purpose: Despite increasing national rates of retinal disease, the distribution and practice patterns of various retina providers is poorly understood.

Methods: Ophthalmologists performing anti-VEGF injections were identified in a 2016 Medicare data set, and subsequently merged with Census Bureau, IRS, CDC datasets.

Results: 3113 retina providers—2113 retina specialists (RS) and 1000 hybrid providers (HP)—were identified. 63% of counties had 0 retina providers ($n=3235$). RS were more likely to practice in affluent locations ($p<0.001$) with lower diabetic burden ($p<0.001$) compared to HP. RS performed 86% of treatments ($n=5.4$ mil). HP were more likely to use bevacizumab than RS (18.6% vs. 12.5%, $p<0.001$).

Conclusions: Retina providers and associated practice patterns are unequally distributed in the US. This knowledge is critical when considering interventions to address access to retina care.

3:39 PM Accuracy of Ophthalmic Diagnosis and Treatment by Physicians Referring Patients to the Wills Emergency Room

Daniel J. Ozzello, MD (R), Jordan D. Deaner, MD, Austin R. Meeker, MD, Julia A. Haller, MD [Trauma] [Ocular Emergencies]

Purpose: To describe the concordance of work-up, diagnosis and treatment recommendations for patients with suspected ophthalmic disorders between referring physicians and ophthalmologists in the Wills Eye Emergency Room (WER)

Methods: This study is a prospective case series. The study group includes all patients transferred to the WER or its affiliated consultation service at Thomas Jefferson University Hospital over a six-month period. After patients are treated in the WER, their charts are reviewed to analyze accuracy of referring providers' diagnosis and treatment of ophthalmic disorders compared to diagnosis and management in the WER.

Results: 1,104 transfers to the WER or its affiliated consultation service have been made to date. The six-month data collection period is ongoing.

Conclusions: Conclusions will be drawn once data collection and analysis is complete.

3:47 PM Large Uveal Melanoma: Clinical Features and Millimeter-By-Millimeter Risk for Metastasis in 1311 Cases

Carol L. Shields, MD (S), Jerry A. Shields, MD, Sara E. Lally, MD, Arman Mashayekhi, MD [Tumor]

Purpose: To analyze outcomes of large (≥ 10 mm thickness) uveal melanoma.

Methods: Retrospective case series.

Results: Of 1311 patients with large melanoma, the mean tumor base was 17 mm and mean thickness was 12

mm. Treatment included enucleation (67%), plaque radiotherapy (32%), resection (1%), or exenteration (<1%). At 3, 5, and 7-years, Kaplan-Meier estimates of metastasis were 30%, 45%, and 52%. According to tumor thickness (10-11 11.1-12, 12.1-13, 13.1-14, 14.1-15, 15.1-16, >16. mm) metastasis at 5 years was 38%, 42%, 56%, 48%, 61%, not available, and 66%. Features associated with worse outcome included lack of Bruch membrane rupture, extramacular location, and extraocular extension. There was no difference in metastasis for patients treated with plaque radiotherapy versus enucleation.
Conclusion: Large melanoma demonstrates 7-year rate of metastasis at 52%, with increasing risk per millimeter thickness increment.

3:55 PM The Utility of Cultures in Management of Endophthalmitis Following Intravitreal Injection of Anti-VEGF Agents

Samir N. Patel, MD (R), Philip P. Storey, MD, MPH, James F. Vander, MD [Retina]

Purpose: To assess the utility of culture data in the management of endophthalmitis from anti-VEGF injections.

Methods: Patients who developed endophthalmitis after anti-VEGF injections were evaluated. The outcome measures were a change in clinical management within 1 week of initial endophthalmitis culture and treatment. A change in clinical management was defined as an additional intravitreal antibiotic injection or pars plana vitrectomy.

Results: 70 cases of endophthalmitis were identified, and 17 were culture-positive. A change in clinical management occurred in 3/17 (18%) culture-positive cases compared to 3/50 (6%) culture-negative cases ($p=0.143$). Changes in clinical management were based on declining vision and/or worsening clinical exam. No additional interventions were initiated for a positive-culture result.

Conclusion: Culture data may have a limited effect on clinical management of endophthalmitis from anti-VEGF injections

4:03 PM Conjunctival Melanocytic Nevi with Granular Cell Change – A Case Series

Maya Eiger-Moscovich, MD (F), Tatyana Milman, MD, Ralph C. Eagle, Jr. MD, Carol L. Shields, MD [Pathology] [Tumor]

Purpose: Granular cell change (GCC) in melanocytic nevi is under-represented in literature. We present a case series of GCC in conjunctival nevi, delineating their clinical and histopathologic features.

Methods: Medical records of patients diagnosed with GCC nevi between 2016-2018 were reviewed. Data included demographics, clinical features, pathologic findings, and follow-up.

Results: Twelve patients (six males) with median age of 14 were identified. Most nevi were well-circumscribed bulbar conjunctival lesions. Features prompting excision included unusual pigmentation, atypical location, and growth. Microscopically, GCC manifested as round-to-polygonal cells with copious pink-to-lightly pigmented granular cytoplasm, pleomorphic central nuclei, and immunoreactivity for Melan-A, SOX10 and HMB-45, with Ki-67<2%. There were no recurrences over mean follow-up of 11.2 months.
Conclusions: GCC in nevi can simulate melanoma clinically and histopathologically. Familiarity with this entity is important for accurate diagnosis and management.

4:11 PM Submacular Hemorrhage Secondary to Age-Related Macular Degeneration in a Treat and Extend Regimen

Douglas Matsunaga, MD (R), Daniel Su, MD, Carl D. Regillo, MD [Retina]

Purpose: To characterize submacular hemorrhage (SMH) secondary to neovascular AMD requiring surgery in a treat and extend regimen.

Methods: This retrospective chart review included patients with nAMD complicated by SMH requiring subretinal tissue plasminogen activator.

Results: 46 eyes of 46 patients were included with 61% on anticoagulation. SMH occurred in 15 (32%) patients who had not received anti-VEGF therapy before. In patients treated with anti-VEGF, 20 (43%) were on a stable treatment interval, 9 (17%) had recently extended their interval, and 2 (4%) had shortened their interval. In treated patients, the average treatment interval at the time of SMH was 6.8 weeks with 11.7 mean total injections prior to SMH.

Conclusions: SMH in AMD predominantly occurred in patients who had not received or were on stable treatment intervals of anti-VEGF.

4:19 PM Surgical Outcomes of iStent Surgery Performed by Ophthalmology Residents Compared to Attending Surgeons
Cindy X. Zheng, MD (F), Saumya Copparam, BS, Sarah Amanullah, BS, Daniel Lee, MD [Glaucoma]

Purpose: To compare outcomes of iStent surgery performed by residents to attending surgeons.
Methods: Retrospective chart review of patients who had iStent surgery at Wills Eye Hospital.
Results: There were 31 iStents implanted by a resident and 93 by an attending surgeon on the same day that a resident case was performed. Mean baseline IOP and number of glaucoma medications were similar between the 2 groups ($P=0.14$ and 0.41 , respectively). At final follow-up, there was no difference between mean IOP and number of medications between the resident and attending groups ($P=0.57$ and 0.12 , respectively). There were 2 hyphemas in the attending group and 1 hyphema in the resident group. The resident group had 1 case of iridodialysis, not requiring additional surgery.
Conclusions: iStent surgery by residents has similar efficacy and safety to attendings.

4:27 PM Aflibercept to Ranibizumab Switch for Macular Edema Secondary to Retinal Vein Occlusion
Turner D. Wibbelsman, BS (F), Anthony Obeid, MD, MPH, Marc J. Spirn, MD [Retina]

Purpose: This study evaluates outcomes after a switch from aflibercept to ranibizumab therapy for macular edema secondary to RVO.
Methods: At the three visits before (B3, B2, B1) and after the switch (P1, P2, P3) and the switch date itself, functional and anatomic outcomes were assessed in 82 eyes.
Results: After the therapeutic conversion, logMAR VA increased significantly from the switch visit [$0.56 (\pm 0.57)$] to the P1 [$0.62 (\pm 0.55)$], P2 [$0.65 (\pm 0.63)$], and P3 [$0.58 (\pm 0.54)$] visits [$p=0.04$, $p=0.02$, $p=0.03$]. CFT increased significantly from the switch [$244 (\pm 138) \mu\text{m}$] to the P1 [$308 (\pm 186)$] and P2 [$287 (\pm 175)$] visits [$p<0.001$, $p=0.005$].
Conclusion: Although short term regression after the switch was observed, with additional ranibizumab treatment administered at a shorter interval between injections, CFT and VA approached levels similar to those at the switch visit.

4:35 PM Risk Factors for Radiation Maculopathy Following Plaque Radiotherapy and Bevacizumab for Uveal Melanoma
Sameeksha H. Tadeballi, MD (F), Li-Anne S. Lim, MD, Lauren A. Dalvin, MD, Carol L. Shields, MD [Tumor]

Purpose: To evaluate risk factors for development of radiation maculopathy in patients with uveal melanoma treated with plaque radiotherapy and prophylactic intravitreal bevacizumab injection.
Methods: Retrospective review of uveal melanoma treated with I-125 plaque radiotherapy and prophylactic intravitreal bevacizumab to evaluate factors associated with radiation maculopathy.
Results: Of 1327 eyes, 569 (42.8%) patients developed radiation maculopathy. Comparison of eyes with versus without radiation maculopathy revealed an association between radiation maculopathy and younger patient age (57 vs. 61 years, $p<0.001$), shorter tumor distance to foveola (3.3 vs. 4.9 mm, $p<0.001$), and higher radiation dose to foveola (60.8 vs. 54.7 Gy, $p=0.01$).
Conclusions: Younger age, shorter tumor distance to foveola, and greater radiation dose to foveola were associated with development of radiation maculopathy following plaque radiotherapy for uveal melanoma.

4:43 PM An Innovative Interprofessional Course in Ophthalmology and Low Vision For Occupational Therapy Students
Lucas Bonafede, MD (R), Alex V. Levin, MD, MHSc, FRCSC, Alison Bell, OTD, OTR/L, Arlene Lorch, OTD, OTR/L [Pediatric Ophthalmology]

Purpose: To design and evaluate a course for occupational therapy students to improve their skills and knowledge about ophthalmology and low vision.
Methods: A curriculum using didactic learning, clinical experience, and reflective writing was created to instruct OT students in ophthalmology and low vision. Design: Course development and evaluation.
Participants: Nineteen occupational therapy students from TJU. Main Outcome Measures: Each trainee evaluated their satisfaction with the course. Reflective writing from each participant was reviewed.
Results: Nineteen students participated. Reflective writings revealed three themes: the impact of eye-related medical conditions on daily life; insight into the provider/patient interaction; the potential role of the occupational therapist on the vision team.

Conclusions: This collaborative, multi-modal interdisciplinary educational model can assist in training and sensitizing occupational therapy students in the areas of ophthalmology and low vision.

4:51PM Investigating Pre-Operative Factors that Predict Trabecular Meshwork Bypass Procedure Outcomes
Jason S. Flamendorf, MD (R), Cindy X. Zheng, MD, Melih Ustaoglu, MD, Daniel Lee, MD [Glaucoma]

Purpose: The purpose of the present study is to evaluate intraocular pressure (IOP) response to pharmacologic dilation or prior selective laser trabeculoplasty (SLT) as predictors of iStent success.

Methods: A retrospective chart review study of patients who had iStent implantation in conjunction with cataract surgery was conducted. iStent success was defined as IOP reduction $\geq 20\%$ from baseline, a reduction of at least one glaucoma medication, and no need for re-operation.

Results: Eighty eyes of 56 patients were identified who met the inclusion criteria. The increase in IOP after pharmacologic dilation was lower in the iStent success group than in the failure group, which trended towards statistical significance. No other baseline characteristics, including SLT response, were statistically significant.

Conclusion: Measuring both pre- and post-dilation IOP may provide guidance about the optimal iStent candidates.

4:59 PM Choroidal Melanoma Treated with Plaque Radiotherapy, Impact of Tumor Thickness on Outcomes in 1327 Patients

Xiaolu Yang, MD, PhD (F), Lauren A. Dalvin, MD, Li-Anne S. Lim, MD, Carol L. Shields, MD [Tumor]

Purpose: To evaluate clinical outcomes following plaque radiotherapy for choroidal melanoma based on presenting tumor thickness.

Methods: Retrospective case series.

Results: Of 1327 eyes, 418 (31.5%) had small (thickness < 3 mm), 723 (54.5%) medium (3.1-8 mm), and 186 (14.0%) large melanoma (> 8 mm). Comparison (small vs. medium vs. large) showed foveolar thickness at onset of cystoid macular edema (CME) [393 vs. 423 vs. 442 μm , ($p=0.01$)], foveolar thickness at maximum CME [470.16 vs. 503.16 vs. 540.23 μm ($p=0.003$)], 10-year rate of cataract formation [16.2% vs. 30.1% vs. 57.1% ($p<0.001$)], NVI [1.2% vs. 1.9% vs. 16.4% ($p<0.001$)], scleral thinning [0.2% vs. 0.6% vs. 6.0% ($p=0.001$)], and death [2.4% vs. 8.7% vs. 10.2% ($p=0.018$)].

Conclusions: Compared with small and medium choroidal melanoma, plaque-irradiated large melanoma had worse complications and greater tumor-related death.

5:07 PM Endophthalmitis Following Cataract Surgery: Visual Outcomes and Culture Results

Hanna J. Levin, BS (F), Philip P. Storey, MD, MPH, Samir N. Patel, MD, Allen C. Ho, MD [Retina]

Purpose: To describe the visual outcomes and microbial spectrum of endophthalmitis cases following cataract surgery (CE/IOL).

Methods: Retrospective review of endophthalmitis post-CE/IOL.

Results: Eighty-seven cases were included. Initial mean VA was logMAR 2.14 (count fingers equivalent), improving to logMAR 0.87 (Snellen 20/160) at 3 months post-treatment ($p<0.001$), and to logMAR 0.93 (Snellen 20/160) at final visit ($p<0.001$). Forty-three cases were culture-positive (49.4%) and the most common isolates were Staphylococcus epidermidis ($n=21$), viridans-group Streptococci ($n=8$), and Staphylococcus aureus ($n=7$). Comparing cases by culture result, culture-positive cases had worse VA at presentation than culture-negative (logMAR 2.34 vs. 1.92; $p=0.02$) although final mean VA was not significantly different (logMAR 1.01 vs. 0.84; $p=0.46$).

Conclusions: Visual acuity in patients with endophthalmitis following cataract surgery significantly improves an average of 20/160 at 3 months post-treatment.

5:15PM Short Term Outcomes of Transconjunctival Ab Externo XEN 45 Gel Stent Implantation

Michael M. Lin, MD (F), Cindy X. Zheng, MD, Stephen J. Moster, MD, Jonathan S. Myers, MD [Glaucoma]

Purpose: The XEN 45 Gel Stent is typically implanted from an ab interno approach into the superior or superonasal subconjunctival or sub-Tenon's space to lower intraocular pressure (IOP), but previous surgical scarring or facial anatomy may prevent implantation in this area.

Methods: Retrospective chart review of patients undergoing ab externo superotemporal transconjunctival XEN implantation.

Results: Ten eyes of 8 patients underwent ab externo XEN implantation. Pre-operative IOP was 16.2 ± 5.2 mmHg on 2.2 ± 1.5 glaucoma medications. At follow-up 31.7 ± 23.8 days after surgery, IOP was 9.7 ± 4.6 mmHg on 0.3 ± 0.7 medications. One patient developed serous choroidal effusions that resolved with atropine. There were no cases of wound leak or anterior chamber shallowing.

Conclusions: Ab externo superotemporal transconjunctival XEN implantation demonstrates similar safety and efficacy in the first month to that of ab interno approaches.

5:23PM Long-term Visual Outcomes Following Fractionated Stereotactic Radiotherapy for Optic Nerve Sheath Meningioma

Sana S. Dastgheyb, PhD (F), Jurij R. Bilyk, MD, Christopher Farrell, MD [Neuro]

Purpose: To determine the efficacy and potential prognostic indicators for favorable outcomes following fractionated radiation treatment of optic nerve sheath meningiomas.

Methods: Visual and radiographic results were analyzed from 29 cases of meningioma treated at WEH/TJUH. Age, visual acuity, visual fields, color vision, and time to treatment were assessed as prognostic indicators for visual outcome using chi-squared analysis.

Results: Patients aged greater than 46, those initially presenting with large visual field defects, and those presenting with color vision defects, were significantly more likely to have worsened visual outcomes.

Conclusion: Our results show older age (>46 years), large visual field defects, and color vision defects at the time of treatment may portend worsened visual outcomes. These results serve to guide clinical decision making in the radiation of optic nerve sheath meningiomas.

5:31PM Risk factors for CME in Uveal Melanoma Treated with Plaque Radiotherapy and Prophylactic Bevacizumab

Pornpattana Vichitvejpaisal, MD, FICO (F), Li-Anne S. Lim, MD, Lauren A. Dalvin, MD, Carol L. Shields, MD [Tumor]

Purpose: To evaluate risk factors for development of cystoid macular edema (CME) following plaque radiotherapy for uveal melanoma.

Methods: Retrospective case series.

Results: Of 1327 eyes, 561 (42%) developed CME. Comparison of eyes with versus without CME showed an association between CME and younger patient age (59 vs. 60 years, $p=0.01$), shorter tumor distance to foveola (4.0 vs. 4.4 mm, $p=0.001$), and higher total radiation dose to tumor apex (71.5 vs. 70.5 Gy, $p<0.001$). Total radiation dose to foveola was less in eyes that developed CME (56.0 vs. 58.5 Gy, $p=0.41$).

Conclusions: Younger patient age, shorter tumor distance to foveola, and higher radiation dose to tumor apex are risk factors for CME following plaque radiotherapy for uveal melanoma. Radiation dose to foveola is not a risk factor for CME development.

5:39PM Prediction of Netarsudil's Effect in Eyes that have Undergone Prior Selective Laser Trabeculoplasty

Stephen J. Moster, MD (F), Michael M. Lin, MD, Cindy X. Zheng, MD, Marlene R. Moster, MD [Glaucoma]

Purpose: Both netarsudil (Rhopressa) and selective laser trabeculoplasty (SLT) target the trabecular meshwork to lower intraocular pressure (IOP), but the interaction between these treatments has not been evaluated.

Methods: Retrospective chart review of eyes with prior SLT and subsequent netarsudil treatment.

Results: In 82 eyes, IOP pre-netarsudil was 18.1 ± 4.9 mmHg on 2.9 ± 1.2 glaucoma medications, decreasing to 14.5 ± 5.1 mmHg at 40.8 ± 28.1 days after starting netarsudil. Factors independently associated with greater netarsudil IOP lowering included greater pre-netarsudil IOP (coefficient 0.29 ± 0.29 , $p=0.001$) and greater previous post-SLT IOP decrease (coefficient 0.34 ± 0.37 , $p=0.01$). Time between SLT and netarsudil initiation (range 25-5299 days) was not significant.

Conclusions: Higher pre-treatment IOP and greater previous SLT response correlate with better response to netarsudil. Whether history of SLT is recent or remote does not impact the effect of netarsudil.

5:47PM Patients Ultra-Responsive to Ranibizumab Based on Diabetic Retinopathy Severity in DRCR.net Protocol S

Allen Chiang, MD (S), Sunir J. Garg, MD, Min Tsuboi, PharmD, Ivaylo Stoilov, MD [Retina]

Purpose: We evaluated patients who achieved ≥ 4 -step DR improvement and predictive factors.
Methods: DRCR.net Protocol S study compared prompt PRP laser to RBZ 0.5 mg for the treatment of PDR with and without DME. DR ultra-responders were defined as eyes with improvement by ≥ 4 steps on the ETDRS-DRSS. The frequency of ≥ 4 -step improvement was analyzed at years 1 and 2 in RBZ treated eyes. Predictors were assessed by multivariate analysis.
Results: The proportion of DR ultra-responders at years 1 and 2 was 43/148 (29.1%) and 28/136 (27.9%), respectively. Eyes with greater odds of being ultra-responders were older, had vitreous hemorrhage, and HbA1c $< 9\%$ at baseline. No ultra-responder eyes received rescue treatment (PRP/vitreotomy).
Conclusion: In Protocol S, nearly 30% of RBZ treated eyes were ultra-responders with ≥ 4 -step DR improvement at years 1 and 2.

5:55 PM Pterygoid Corneal Dystrophy

Preema M. Buch, MD (F), Alex V. Levin, MD, MHSc, FRCSC, Ralph C. Eagle, Jr., MD, Irving M Raber, MD [Cornea]

Purpose: To describe an unusual corneal finding in a Mexican family.
Method: Retrospective review of the family history, clinical and histopathologic findings, and clinical course of one family with atypical primary and recurrent pterygia, associated with significant scarring. If able, genetic studies will be performed.
Result: Majority of the family members had bilateral prominent pterygia. In all cases excision resulted in severe recurrence and/or scarring, necessitating corneal transplantation in several subjects. Most of the transplants were complicated by recurrent scarring.
Conclusion: The phenotypic similarities, post-op robust fibrosis, and no gender discrimination show a possible autosomal dominance with varying expressivity. Histopathologically, while primary pterygia in our patients demonstrated typical actinic changes and vascularity, the post-op exuberant cellular fibrotic response was unusual. Clinically these resemble "pterygoid corneal dystrophy" described in 3 patients from a German family.

6:03 PM Misfolded Tau Protein in the Retina

Umur A. Kayabasi, MD, (A), John Rose, MD, Robert C. Sergott, MD [Neuro]

Purpose: Tau is the culprit lesion in Alzheimer's Disease (AD). Detection of the pathological protein accumulations may be possible by using spectral domain optical coherent tomography (SD-OCT) and fundus autofluorescein (FAF). Tau protein images in the brain consist of normal or reverse C-shaped paired helical filaments (PHF).
Methods: 20 patients with PET proven AD were examined by SD-OCT and FAF. Mean age was 72. Hypo or hyperfluorescent retinal lesions were scanned by SD-OCT and investigated in a masked fashion.
Results: In all the patients, PHF that exactly corresponded with the histopathologic and cryo-EM images of Tau were detected along with lesions similar to amyloid beta.
Conclusions: Retinal images of Tau were disclosed for the first time in live AD patients.

6:11PM **Opening Reception**