



Research Day - Friday, May 14, 2021 – Live Virtual Event

Co-Chairs: Shandiz Tehrani MD, PhD and Phoebe Lin, MD, PhD

8:00 am Introduction

8:05 Choroidal disease mechanisms in AMD – **Elliott Sohn, MD** (Associate Professor of Ophthalmology and Visual Sciences, University of Iowa Carver College of Medicine)
Moderator: Shandiz Tehrani

- | | |
|-------|--|
| 9:00 | A multi-center study assessing refractive outcomes following uveitic cataract surgery – Daniel Lee, MD |
| 9:12 | Characteristics of ophthalmology residency applicants who have personal recommendation correspondences sent on their behalf – Miles Greenwald, MD |
| 9:24 | Prevalence of peripheral avascular retina in spontaneously regressed retinopathy of prematurity – Adam Hanif, MD |
| 9:36 | Cigarette smoking as a risk factor for trabeculectomy failure – Ross Passo, MD |
| 9:48 | Electronic health record medication list accuracy in glaucoma patients – Joel Kaluzny, MD |
| 10:00 | Sutureless Interlamellar Keratoplasty (SILK): Introducing a novel additive corneal transplant technique for keratoconus – Priscilla Vu, MD |

Moderator: Phoebe Lin

10:12 Break

- | | |
|-------|--|
| 10:30 | Treatment outcomes in 11 patients with RPE65-retinopathy receiving voretigene neparvovec-rzyl– Cristy Ku, MD, PhD |
| 10:42 | Visual outcomes in macula-involving retinal detachments based on time to surgical repair – Claudine Yee, MD |
| 10:54 | Acute syphilitic posterior placoid chorioretinitis: A Comprehensive Review of Current Literature – Michael Gale, MD |
| 11:06 | Quantitative and qualitative retinal and choroidal vascular changes in birdshot chorioretinopathy using PR-OCTA – Ashlin Joye, DO |
| 11:18 | Analysis of bleb formation for subretinal gene therapy – Kaitlin Kogachi, MD |
| 11:30 | Administration of interferon alpha-2a for the treatment of acute retinal necrosis-associated cystoid macular edema – Claire Mueller, MD |
| 11:42 | Change in central and peripheral corneal graft thickness in UT-DSAEEK in the Descemet Endothelial Thickness Comparison Trial– Michal Gutowski, MD |
| 11:54 | Macular ganglion cell layer plexus evaluation using projection-resolved optical coherence tomographic angiography in glaucoma– Karine Duarte Bojikan, MD, PhD |

Moderator: Shandiz Tehrani

12:06 pm Lunch

1:15 Casey Eye Institute Publication Highlights – **Phoebe Lin, MD, PhD**

- | | |
|------|---|
| 1:35 | Validation of home visual acuity tests for telehealth in the COVID-19 era – Kellyn Bellsmith, MD |
| 1:47 | An update: Telemedicine for ROP diagnosis in a real-world system: technical description and evaluation – Ian Danford, MD |
| 1:59 | Prognostic factors in optic pathway gliomas – Alex Walters, MD |
| 2:11 | Long term outcomes of early aqueous suppressant use in glaucoma drainage devices – Bennett Hong, MD |
| 2:23 | 5-Year results of a home monitoring device in study participants at high risk for neovascular age-related macular degeneration – Marcus Altman, MD |
| 2:35 | Outcomes of a resident mentorship program in an ophthalmology residency program – Sarah Glass, MD |
| 2:47 | Intravitreal methotrexate for proliferative vitreoretinopathy: assessment of anatomical and functional outcomes – Rebekah Gensure, MD, PhD |
| 2:59 | Transient vision loss associated with pre-filled aflibercept – Brittini Scruggs, MD, PhD |

Moderator: Phoebe Lin

3:11 Adjourn

Title: A Multi-Center Study Assessing Refractive Outcomes Following Uveitic Cataract Surgery

Authors: Daniel J. Lee¹, Steven Seto², Mark Banghart, MS³, Kelly Boyd³, Catherine Thuruthumaly⁴, Eric B. Suhler^{1,5}, Laura J. Kopplin³

¹Casey Eye Institute, Oregon Health & Science University, Portland, OR, USA

²Advocate Aurora Health, Milwaukee, WI, USA

³Department of Ophthalmology and Visual Sciences, University of Wisconsin-Madison, Madison, WI, USA

⁴Department of Ophthalmology and Visual Sciences, Medical College of Wisconsin, Milwaukee, WI, USA

⁵Department of Ophthalmology, Veterans Affairs Portland Health Care System, Portland, OR, USA

Purpose: Prior literature has reported that approximately 93% of eyes undergoing cataract surgery achieve a postoperative spherical equivalent (SE) within 1 Diopter (D) of that predicted by preoperative biometry (Lundstrom *et al*, 2018). While prior studies have assessed vision outcomes and postoperative complications following cataract surgery in patients with uveitis, less is known about refractive outcomes in this population. Our study assessed the refractive outcomes following uveitic cataract surgery and sought to identify factors associated with deviations

Methods: A multicenter clinical database query was performed for patients with uveitis who underwent cataract surgery between June 2015 and June 2020. Two hundred eighty-three eyes from 216 subjects were examined. The difference between the intended refractive goal and postoperative refractive spherical equivalent (SE) was calculated, and postoperative refractive target deviation greater than 1 diopter (D) was tested for association with demographic and clinical characteristics using bivariate and multivariate logistic regression analysis.

Discussion/Results: 59.4% of eyes deviated from the intended refractive target by at least 0.5 D, and 13.4% of eyes deviated by at least 1 D. The mean difference from refractive goal was 0.57 ± 0.68 D (range 0 – 4.54 D). Stepwise logistic regression analysis demonstrated that age ($p=0.0164$), postoperative visual acuity ($p=0.0116$), preoperative keratic precipitates ($p=0.0122$), and postoperative inflammation one month after surgery ($p=0.0371$) were associated with postoperative refractive target deviation greater than 1 D.

Conclusion: A notable percentage of eyes undergoing uveitic cataract surgery deviated from the intended refractive target by at least 1 D. Younger age, preoperative keratic precipitates, lower postoperative visual acuity, and postoperative inflammation one month after surgery were associated with this outcome. Preoperative counseling related to refractive outcomes may be beneficial in patients with a history of uveitis prior to proceeding with cataract surgery.

Funding: sources include an unrestricted grant from Research to Prevent Blindness, Inc. as well as NIH/NEI core grant (P30EY010572).

Disclosures: No relevant financial disclosures to disclose from any of the authors.

Title: Characteristics of Ophthalmology Residency Applicants Who Have Personal Recommendation Correspondences Sent on Their Behalf

Authors: Miles F. Greenwald, John L. Clements, Thomas S. Hwang.

Purpose: Increasing attention is being given to the biases inherent in the applicant selection processes for residency training programs. Our residency program underwent a review of our applicant evaluation process in order to identify potential sources of bias. This study aims to assess the characteristics of ophthalmology resident applicants at one institution who had personal recommendations sent on their behalf outside of the SF Match.

Methods: Review of all residency program applications received at Oregon Health and Science University (OHSU) for the 2019 and 2020 application cycles.

Discussion/Results: 1097 total applications were received during the 2019 and 2020 application cycles, of which 117 were from self-reported underrepresented minority (URM) groups, including African American/Black, Hispanic, American Indian, Alaskan Native, Native Hawaiian and Pacific Islanders (10.6%). 53 total applicants (4.8%) had communication written to the application committee on their behalf by a practicing ophthalmologist that was separate from the letters of recommendation included in their application. Of these, 50 letters were sent on behalf of non-URM applicants (5.1%) while 3 letters were sent on behalf of an URM applicant (2.6%) ($P=0.23$ Chi Square).

Conclusion: Communications on behalf of applicants occurred at a lower rate for URM applicants compared with non-URM applicants. It has previously been reported that personal communications are more highly weighed by ophthalmology residency program committee members than important application aspects such as Dean's letters, personal statements and advanced degrees.¹ Attention should be paid by residency program selection committees to the potential for introduced bias against URM applicants with these types of communications.

1. Nallasamy S, Uhler T, Nallasamy N, Tapino PJ, Volpe NJ. Ophthalmology resident selection: current trends in selection criteria and improving the process. *Ophthalmology*. 2010;117(5):1041-7.

Funding: Unrestricted grant from Research to Prevent Blindness, NIH/NEI core grant P30EY010572

Disclosures: No authors have any conflicts of interests to disclosure

Title: Prevalence of persistent avascular retina in patients with a history of retinopathy of prematurity screening without treatment

Authors: Adam M. Hanif, MD¹; Rebekah H. Gensure, MD, PhD¹; Brittini A. Scruggs, MD, PhD¹; Jamie Anderson, BS¹; Michael F. Chiang, MD²; J. Peter Campbell, MD, MPH¹

1. Ophthalmology, Oregon Health & Science University, Portland, Oregon
2. National Eye Institute, National Institutes of Health, Bethesda, Maryland

Purpose: Persistent avascular retina (PAR) in patients with a history of retinopathy of prematurity (ROP) may predispose development of retinal detachment later in life. While PAR has been associated with the use of vascular endothelial growth factor antagonist therapy for treatment requiring ROP, its prevalence in prematurely born patients without prior ROP treatment is unknown. This is a potentially large population at risk, as approximately 90% of babies who develop ROP may demonstrate spontaneous disease regression without treatment. In this study, we explore the prevalence of PAR in a cohort of patients with a history of ROP screening without treatment.

Methods: Patients were recruited from an existing population-based cohort from the ongoing Imaging & Informatics in ROP (i-ROP) study (July 2011 – present). Inclusion criteria included age between 4 and 8 years, and a history of ROP screening, with or without a clinical diagnosis of ROP. Eyes previously treated for ROP were excluded from the study. Those who met inclusion criteria, were reachable and were willing to participate were scheduled to return for outpatient evaluation with multimodal imaging at OHSU between September 2019 and September 2020. Ultra-widefield fluorescein angiography (UWFFA) images from these encounters were reviewed by two masked expert graders for presence of PAR and categorization of retinal vascular abnormalities.

Discussion/Results: 15 patients (28 eyes) were recruited during the study period and met inclusion criteria. Average age at time of evaluation was 6.7 years. Fourteen of 15 (93%) patients (23/28 eyes, 82%) demonstrated regions of PAR on UWFFA. Of the 28 eyes, only 1 appeared to have normal peripheral retinal vasculature. Ten (36%) eyes demonstrated PAR in zone II, 13 (46%) eyes demonstrated PAR in zone III, and 7 (25%) demonstrated abnormal vessels without clear PAR. All eyes with a history of type 2 ROP had PAR in Zone II. Other peripheral retinal findings ranged from persistent vascular tortuosity to neovascularization and leakage.

Conclusions: These findings indicate a high prevalence of PAR in patients with a history of ROP screening without treatment. Given the risk of late onset retinal detachment in these patients and the improving neonatal survival for extremely preterm infants, clinicians should be aware of this potential clinical finding in patients with a history of extreme prematurity, with or without ROP treatment.

Funding:

- JPC: financial support from Genentech
- MFC: Previously a consultant for Novartis (Basel, Switzerland) and an equity owner in InTeleretina, LLC
- All other authors have no conflicts of interest to disclose

Disclosures: This work was supported by grants R01EY19474, R01 EY031331, R21 EY031883, and P30 EY10572 from the National Institutes of Health (Bethesda, MD), an investigator-initiated grant from Genentech, and by unrestricted departmental funding and a Career Development Award (JPC) from Research to Prevent Blindness (New York, NY).

Title: Cigarette smoking as a risk factor for trabeculectomy failure

Authors: Ross Passo, Jonathan Young, Beth Edmunds, John Morrison, Hana Takusagawa, Shandiz Tehrani

Purpose: Trabeculectomy is a widely performed glaucoma surgery to lower intraocular pressure (IOP). Unfortunately, post-surgical scarring and inflammation can limit its effectiveness. Cigarette smoke is an ocular irritant and may be a risk factor for trabeculectomy failure. This study aimed to determine the association between tobacco smoking and trabeculectomy failure.

Methods: This was a retrospective, case-control study of 77 patients with a known current smoking history who underwent primary trabeculectomy without prior intraocular surgery at the Casey Eye Institute between 2010 and 2017. These subjects were compared to two age, sex, and race matched groups: former smokers and non-smokers. Exclusion criteria included congenital glaucoma, neovascular glaucoma, uveitic glaucoma, age < 18, and follow-up time < 1 month. Smoking status, age at time of surgery, sex, race, mean IOP, number of IOP lowering medications, and need for additional glaucoma surgery post-trabeculectomy were obtained from the electronic health record.

Discussion/Results: Compared to non-smokers, survival curves fared worse in the former smoking group ($p=0.002$, hazard ratio 3.37) and trended worse in the current smoking group ($p=0.053$, hazard ratio 2.66). See figure 1 for details. There were no statistical differences in survival between the smoking and former smokers ($p=0.37$). Pooled current and former smoker survival was statistically worse than non-smokers ($p=0.004$, hazard ratio 2.69).

Conclusions: A history of smoking was significantly associated with an increase in trabeculectomy failure. Surgical glaucoma specialists should be mindful of this when performing preoperative assessments of patients.

Funding: supported by an unrestricted grant from Research to Prevent Blindness (OHSU) and the National Institutes of Health (P30EY010572)

Disclosures: none

Title: Electronic health record medication list accuracy in glaucoma patients

Authors: Joel V. Kaluzny, Wei-Chun Lin, Jimmy Chen, Michael F. Chiang, Michelle R. Hribar

Purpose: The electronic health record (EHR) is a critical part of patient care. EHR data has potential for use in large-scale research. However, the quality of this research is reliant on accuracy of the data in the EHR. Our aim is to assess the accuracy of the EHR in capturing glaucoma patients' current ophthalmologic medication by comparing their documentation in the medication list and in progress notes.

Methods: Progress notes and medication list data from the EHR were extracted by 3 independent reviewers for encounters containing ICD codes with the word "glaucoma" at the Casey Eye Institute from 1/1/2019 to 12/31/2019. All ophthalmologic medications were included and further stratified according to type: prescription eye drops/ointment, over-the-counter (OTC) eye drops/ointment, and oral medications. For each encounter analyzed, the current medication list was manually abstracted from the progress note text and compared to the EHR medication list at the time of the encounter. A subset of 20 encounters were used to generate an analysis protocol and as cross-validation amongst reviewers (96.4% agreement).

Discussion/Results: Overall, 9066 encounters met the inclusion criteria. 150 encounters were randomly selected for analysis. Prescription medications were most common (93% of encounters), followed by OTC medications (43%), and oral medications (9%). The average number of ophthalmic medications per encounter was 1.97, while the average number of discrepancies per encounter was 0.55. 57% of encounters contained some discrepancy. Prescription medications were more frequently included in the medication list but left out of the progress notes, whereas, OTC medications were more commonly mentioned in the notes, but left out of the medication lists. Overall, a large portion of encounters (26%) had 2 or more medication list discrepancies.

Conclusions: Medication discrepancies were found to be present in a large percentage of encounters. Approximately 1 in 4 medication entries had a discrepancy between the medication list and the note. These findings demonstrate significant inconsistencies in the EHR medication records, which may affect research that uses this data. There is opportunity for improving the accuracy of medication documentation in the EHR which could have benefits for both research as well as clinical care.

Funding: Supported by grants R00LM12238, R01LM013426, 1R21EY031443, and P30EY10572 from the National Institutes of Health (Bethesda, MD), by grant T15LM007088 from the National Library of Medicine, and by unrestricted departmental funding from Research to Prevent Blindness (New York, NY).

Disclosures: Chiang: Novartis (Consultant), InTelereTina LLC (Equity Owner), Genentech (Grant), NIH (Grant), National Science Foundation (Grant).

Title: Sutureless Interlamellar Keratoplasty (SILK): Introducing a novel additive corneal transplant technique for keratoconus

Authors: Vu, Priscilla Q.¹; Galloway, Joshua ²; Chamberlain, Winston ¹

1. Cornea, Oregon Health & Science University Casey Eye Institute, Portland, OR, United States.

2. Lions VisionGift, OR, United States.

Purpose: To describe preliminary results on a novel interlamellar corneal transplant surgery that aims to preserve all of the host tissue with addition of an acellular corneal graft. The technique is expected to have minimal rejection risks, to endow tensile strength to the cornea, and to maintain clarity. It is theoretically reversible and does not exclude future standard keratoplasty techniques.

Methods: Two patients with keratoconus underwent Sutureless Interlamellar Keratoplasty (SILK). In this procedure a central interlamellar pocket is manually fashioned with intraoperative OCT guidance through a 4.0 mm superior scleral tunnel at an average 75% depth. A halo[®] graft (electron beam sterilized acellular anterior corneal allograft including Bowmans membrane, Lions VisionGift, Portland, OR) is inserted into the pocket and centered over the pupil. OCT, Scheimpflug tomography, and specular cell counts were performed prior and 1-4 weeks after surgery.

Discussion/ Results: Average central graft thickness was 75.5 microns. Average early increase in central corneal thickness as measured by OCT was 269 microns. Average early decrease in KMax by Scheimpflug tomography was 2.6 D (74.3 reduced to 71.7) and average 1 week decrease in steep K was 2.0 D (63.6 reduced to 61.5). 3 month endothelial cell counts increased by 249 in the first patient (2623 increased to 2872).

Conclusion: The authors demonstrate a new additive keratoplasty technique for keratoconus that spares the cornea of sutures, thickens the cornea and results in early flattening of the steep keratometry.

Funding: This research is supported by an unrestricted grant from Research to Prevent Blindness, as well as an NIH/NEI core grant (P30EY010572).

Disclosures: None

Title: Treatment outcomes in 11 patients with *RPE65*-retinopathy receiving voretigene neparvovec-rzyl

Authors: Cristy A. Ku¹, Mariana Matioli de Palma², Austin Igelman¹, Jacque Duncan³, Andreas K. Lauer¹, Steven T. Bailey¹, Richard G. Weleber¹, Paul Yang¹, Mark E. Pennesi¹

Purpose: To report on the outcomes of patients with *RPE65*-associated retinopathy treated with FDA-approved voretigene gene replacement therapy at a single treatment site.

Methods: This is a retrospective study on patients with *RPE65*-associated retinopathy treated with voretigene neparvovec-rzyl. Records, imaging, and diagnostics were reviewed including fundus autofluorescence (FAF), optical coherence tomography (OCT), full-field stimulus threshold (FST), kinetic visual fields, dark-adapted two color visual fields (2cDAP), full-field ERG (ffERG). FST was performed and analyzed on Espion ColorDome LED full-field stimulator system and Diagnosys software, and dark-adapted two color perimetry on the Octopus 900 Haag-Streit perimeter.

Discussion/Results: A subretinal injection of voretigene was administered into 19 eyes from 11 patients (pt) with an average age of 20.82 YO (range 4-38 YO). FST was performed for 11 eyes (from 6 pts) with improvements seen in 10 eyes. There was an average change in FST of -12.6 dB (range +0.2 to -39.0, SD 10.80) with the blue stimulus, and -9.63 dB (range +0.90 to -28.9, SD 10.47) with the white stimulus, and -7.06 (range +1.7 to -20.5 dB) with the red stimulus. When 1 year or longer follow-up data was available (10 eyes from 5 pts), improvements in FST were maintained in all treated eyes. 2cDAP field was performed for 10 eyes (from 6 pts) with all eyes showing an improvement in mean sensitivity to the blue stimulus, with an average improvement of 10.56 dB (range -1.9 to +22.2 dB, SD 7.93). 9 out of 10 eyes (from 6 pts) showed an improvement to the red stimulus, with average improvement of 4.62 dB (range 0.0 to +10.0, SD 2.37 dB). Gains in 2cDAP was sustained in all patients with follow-up at 1 year. ffERG was performed in 14 eyes (from 8 pts) with a greater than 50% improvement in 5 eyes (from 3 pts).

Conclusion: A majority of patients with *RPE65*-associated retinopathy treated with voretigene showed improvements in FST and dark-adapted perimetry. Dark-adapted perimetry may be a sensitive outcome that provides topographical information in relation to the treatment area.

Funding: Unrestricted grant from Research to Prevent Blindness, NIH/NEI core grant (P30EY010572)

Commercial Relationships Disclosure (Abstract): Cristy Ku: Commercial Relationship: Code N (No Commercial Relationship) | Mariana da Palma: Commercial Relationship: Code N (No Commercial Relationship) | Austin Igelman: Commercial Relationship: Code N (No Commercial Relationship) | Andreas Lauer: Commercial Relationship: Code N (No Commercial Relationship) | Steven Bailey: Commercial Relationship: Code N (No Commercial Relationship) | Jacque Duncan: Commercial Relationship(s);Acucela:Code F (Financial Support);Allergan:Code F (Financial Support);Second Sight Medical Products:Code F (Financial Support);AGTC:Code C (Consultant);Spark Therapeutics:Code C (Consultant);SparingVision:Code C (Consultant);Neurotech USA:Code F (Financial Support);NightstaRx Limited:Code F (Financial Support);Editas Medicine:Code C (Consultant);ProQRTherapeutics:Code C (Consultant) | Paul Yang: Commercial Relationship(s);NIH:Code F (Financial Support);Adverum:Code C (Consultant);AGTC:Code C (Consultant);Nanoscope Therapeutics:Code C (Consultant) | Mark Pennesi: Commercial Relationship(s);Editas:Code F (Financial Support);Foundation Fighting Blindness:Code F (Financial Support);AGTC:Code C (Consultant);Biogen:Code C (Consultant);Adverum:Code C (Consultant);Astellas Pharmaceuticals:Code C (Consultant);Novartis:Code C (Consultant);RegenexBio:Code C (Consultant);Gensight:Code C (Consultant);Atsena:Code C (Consultant);Horama:Code C (Consultant);Nayan:Code C (Consultant);AGTC:Code F (Financial Support);Biogen:Code F (Financial Support);ProQR Therapeutics:Code F (Financial Support);Sanofi:Code F (Financial Support);ProQR Therapeutics:Code C (Consultant);Sanofi:Code C (Consultant);Blue Rock:Code C (Consultant);IVERIC:Code C (Consultant);Roche:Code C (Consultant);Viewpoint Therapeutics:Code C (Consultant);DTx:Code C (Consultant);Endogena:Code C (Consultant);Nacuity Pharmaceuticals:Code C (Consultant)

Title: Visual outcomes in macula-involving retinal detachments based on time to surgical repair

Authors: Claudine Yee, MD, David N. Xu, BS, MA, Rebecca F. Berger, BS, MPH, Kristine E. Traustason, MD, Christina J. Flaxel, MD

Purpose: To examine the relationship between duration of macular detachment and post-operative visual acuity in patients with macula-involving rhegmatogenous retinal detachments undergoing surgical repair.

Methods: Retrospective chart review was conducted for patients who underwent surgical repair of a macula-involving rhegmatogenous retinal detachment at two ophthalmology services from 2008 to 2019. Patients with visual acuity worse than 20/30 before detachment, recurrent detachments, and without adequate follow-up were excluded. Multivariate linear and logistic regression models were constructed using eyes with duration of macular detachment ≤ 7 days. Primary outcome measure was post-operative best corrected visual acuity (BCVA) as dependent on duration of macular detachment. Secondary outcome measure was proportion of eyes attaining post-operative BCVA of logMAR 0 and 0.18 based on duration of macular detachment.

Discussion/Results: Three hundred forty eyes from 340 patients met inclusion criteria; 193 eyes had a duration of macular detachment ≤ 7 days and were included in the multivariate analysis. Post-operative BCVA increased by 0.022 logMAR units with each additional day of macular detachment ($P = 0.002$). Eyes that underwent surgical repair within 3 days of macular detachment were more likely to have post-operative BCVA of logMAR 0 (Snellen 20/20) than eyes who had surgical repair between 4 and 7 days of macular detachment (OR 2.46; 95% CI, 1.03 to 5.85; $P = 0.04$). For each additional day of macular detachment, the odds of achieving logMAR 0 (Snellen 20/20) decreased by a factor of 0.75 (95% CI, 0.59 to 0.94; $P = 0.01$). Duration of macular detachment and pre-operative visual acuity were the only independent factors associated with post-operative BCVA; patient age, ethnicity, lens status, surgery type, and gas did not have a significant impact on post-operative BCVA.

Conclusion: Increased duration between macular detachment and surgical repair is associated with a progressive decline in post-operative visual acuity even in the first seven days of macular involvement. Visual outcomes may be optimized with early surgical repair of macula-involving rhegmatogenous retinal detachments.

Funding: Unrestricted grant from Research to Prevent Blindness, NIH/NEI core grant (P30EY010572)

Disclosures: The authors have no financial relationships to disclose

Title: Acute Syphilitic Posterior Placoid Chorioretinitis: A Comprehensive Review of Current Literature

Authors: Michael Gale, MD, Christa Prentiss, BS, Kavita Bhavsar, MD

Purpose: To describe and summarize the clinical and multimodal imaging features of patients with acute syphilitic posterior placoid chorioretinitis (ASPPC), collected from all relevant case reports and series published since the most recent review in 2012.

Methods: A literature review was performed using a Pubmed search and references listed in articles. Between 2012 and 2019 a total of 49 published cases were identified containing 79 eyes with abnormalities noted on exam or imaging. Data collected from these articles included, but was not limited to, patient demographics, syphilis serologic testing, biomicroscopic exam findings, autofluorescence fundus (FAF) photographs, fluorescein angiography (FA) and optical coherence tomography (OCT).

Discussion/Results: The median age at presentation was 49 years (range 27-70 years) with 73.5% male cases. All patients had positive syphilis serology; 89.8% of patients had positive VDRL and/or RPR titers and 73.5% had a positive FTA-ABS absorption. Of patients that had CSF studies, 20.4% had positive testing (VDRL, FTA-ABS, RPR or syphilis antibody testing). HIV testing was positive in 28.6% of patients, with a median CD4 T-cell count of 267.5 (range 94-830). Median vision on presentation was 20/200 in symptomatic eyes and 20/20 in asymptomatic eyes; median final vision was 20/25 and 20/20 in symptomatic and asymptomatic eyes, respectively. In symptomatic eyes, 56.9% had anterior chamber and/or vitreous inflammation and 97.2% had a yellowish, placoid, outer retinal lesion identified. In asymptomatic eyes, 25.0% had incidental abnormalities noted on exam or imaging studies. FAF imaging revealed lesions with hyperautofluorescent edges and variable central autofluorescence. FA showed early central hypofluorescence and progressive late hyperfluorescence with occasional optic disc and vascular leakage. OCT revealed subretinal fluid early in the disease course and irregularity of IS/OS junction with granular hyperreflectivity of the RPE.

Conclusions: ASPPC is a rare complication of systemic syphilis infection, but has characteristic ocular findings on clinical exam and multimodal imaging. Given the relatively good prognosis with prompt and appropriate antibiotic therapy, this is a very important disease process to keep on differential of placoid lesions. Based on these cases, it is critical to check for concomitant HIV infection and to perform a thorough examination of the asymptomatic eye.

Funding: Michael Gale: unrestricted grant from Research to Prevent Blindness, NIH/NEI core grant (P30EY010572); Christa Prentiss: none; Kavita Bhavsar: Advisory board consultant for Regeneron and Genentech

Disclosures: Michael Gale: none; Christa Prentiss: none; Kavita Bhavsar: Advisory board consultant for Regeneron and Genentech

Title: Quantitative retinal and choroidal vascular changes in Birdshot Chorioretinopathy using PR-OCTA

Authors: Ashlin Joye, Mohamed Ahmed, Acner Benech, Liang Liu, Jie Wang, Mohamed Saleh, Eric Suhler, James T Rosenbaum, David Huang, Yali Jia, Phoebe Lin

Purpose: To obtain a quantitative assessment of retinal and choroidal micro-vasculature changes in birdshot chorioretinopathy (BSCR) utilizing projection-resolved optical coherence tomography angiography (PR-OCTA).

Methods: BSCR patients and age-matched healthy controls were imaged with a commercial 70-kHz spectral domain OCT system (RTVue-XR, Optovue). Macular 3x3 mm² and peripapillary 4.5x4.5 mm² scans with acceptable quality underwent customized processing that included projection artifact removal, semi-automated segmentation of retinal layers, bulk motion subtraction, and shadow artifact removal. The density of the superficial vascular complex (SVC), intermediate capillary plexus (ICP), deep capillary plexus (DCP), inner retina (SVC+ ICP+ DCP), and choriocapillaris were compared between BSCR patients and controls using a generalized estimating equation (GEE).

Discussion/Results: Images from 17 eyes of 12 BSCR patients (all female) and 13 eyes of 13 age and gender-matched controls (mean [SD] age, 59.4 ± [12.5], 60.2 ± [12.9] years; P = 0.89) were included in this study. Vessel density was significantly lower in BSCR patients when assessing the macular SVC, ICP, and DCP, as well as the peripapillary inner retina, ICP, DCP, and choriocapillaris.

Conclusions: We demonstrated with PR-OCTA that macular and peripapillary vascular density is significantly reduced in BSCR compared to healthy controls. This study highlights the utility of PR-OCTA and provides insight into the underlying pathophysiology of BSCR.

Funding: Research to Prevent Blindness NIH/NEI core grant (P30EY010572)

Disclosures: None

Title: Analysis of bleb formation for subretinal gene therapy

Authors: Katie Kogachi, MD; Brittini Scruggs, MD, PhD; Mark Pennesi, MD, PhD; Paul Yang, MD, PhD; Steven Bailey, MD; Andreas Lauer, MD

Purpose: In gene therapy for treatment of progressive inherited retinal degenerations, the most common route of delivery is injection into the subretinal space. Prior studies have shown an association between retinal damage and increased injection pressure during subretinal gene therapy. Little quantitative information is available using the devices currently used for human gene therapy surgery. The purpose of this study is to correlate simulated intraoperative injection pressure levels with drip rate and volume.

Methods: The Constellation® Vision System (Alcon, Fort Worth, TX) was set up for foot pedal controlled trans-vitreous subretinal injection using the viscous fluid injection mode. A MicroDose™ Injection Device (MedOne Surgical, Inc., Sarasota, FL) was filled with Balanced salt solution (BSS®; Alcon, Fort Worth, TX) and was attached to a 41-gauge subretinal injection cannula (Dutch Ophthalmic, Inc., Exeter, NH, USA). Using foot-pedal control, constant pressure delivery measured in pounds per square inch (PSI) was simulated. The drip rate of ejected BSS from the cannula was measured in a 30-second timespan. The volume was measured at the end of 30 seconds. This procedure was performed in triplicate for PSI ranging from 1 to 20. Figures were generated and statistical analyses were performed using GraphPad Prism 4.0b for Macintosh (GraphPad Software, San Diego, CA).

Discussion/Results: The rate of volume delivered correlated with injection pressure ranging from PSI of 1 to 20 ($R^2 = 0.983$); the number of drops per minute also correlated with injection pressure of the same range ($R^2 = 0.984$). The flow of BSS from the cannula reached a steady stream at a PSI of 21.

Conclusion: Injection pressure measured in PSI may be a useful variable that can be adjusted to control rate and volume delivered during subretinal injections. This quantitative information may be useful to refine gene therapy delivery and minimize surgery related adverse outcomes, such as damage to retinal pigment epithelium. Future studies may focus on further characterization of the retinotomy site to improve outcomes and minimize adverse outcomes.

Funding: NIH K08EY026650 (P.Y.), Foundation Fighting Blindness Career Development Award CD-NMT-0714-0648 (P.Y.), The Heed Foundation (B.A.S.), NIH P30 EY010572 Core Grant (OHSU-Casey Eye Institute), and an unrestricted grant to the Casey Eye Institute Department of Ophthalmology from Research to Prevent Blindness, Inc. New York, NY

Disclosures: A.K.L. has received consulting fees or funds in support of clinical research from AGTC, Atsena, Biogen, California Institute of Regenerative Medicine, Cambridge Consulting, Genentech, IvericBio, Oxford BioMedica, and Regenxbio, ReNeuron, TeamedOn. M.E.P. has received consulting fees from Adverum, AGTC, Allergan, Astellas Pharmaceuticals, Biogen, BlueRock, Editas, Iveric Bio, Novartis, Ora, RegenexBio, Roche, Viewpoint Therapeutics. M.E.P. serves on the scientific advisor boards for Atsena, DTx Therapeutics, Endogena, Eyevensys, Horama, Nayan, Nacuity Pharmaceuticals, Ocugen, Sparing Vision, and Vedere. P.Y. has received consulting fees from Adverum, AGTC, Nanoscope Therapeutics. All other authors have no conflicts of interest.

Title: Administration of interferon alpha for the treatment of cystoid macular edema following acute retinal necrosis

Authors: Claire Mueller, MD, Sandip Suresh, MD, and Eric Suhler, MD MPH

Purpose: Acute retinal necrosis (ARN) is a rare and potentially devastating viral retinitis and panuveitis syndrome. Cystoid macular edema (CME) is a late, vision threatening complication following ARN. We report the efficacy of both topical and subcutaneous interferon (IFN) alpha in the treatment of refractory CME following ARN in three patients.

Methods: Case series of three patients with refractory CME following ARN who were treated with topical or subcutaneous IFN alpha. Optical coherence tomography (OCT) and visual acuity was used to monitor treatment efficacy before and after medication administration.

Discussion/Results: Three patients diagnosed with culture proven ARN developed CME following the treatment of their acute viral retinitis. CME was refractory to traditional treatments including oral steroids, topical steroids, topical non-steroidals, intravitreal anti-VEGF medications, and acetazolamide. Resolution of CME occurred with topical IFN alpha 2b in one patient. The second patient was treated successfully with subcutaneous pegylated interferon alpha 2a, but stopped treatment due to side effects. The CME did not return upon discontinuation of the medication. The third patient was unsuccessfully treated with a 4-week course of topical interferon alpha 2b, but CME resolved upon starting subcutaneous pegylated interferon alpha.

Conclusions: Topical and subcutaneous IFN alpha is a viable option for treatment of patients with refractory CME following ARN. Switching to an alternate formulation due to side effects or inadequate response is possible.

Funding: None

Disclosures: None

Michal Gutowski:

Abstract not submitted

Title: Macular Ganglion Cell Layer Plexus Evaluation Using Projection-Resolved Optical Coherence Tomographic Angiography in Glaucoma

Authors: Karine Bojikian, Ping Wei, Jie Wang, Liang Liu, Acner Camino, Aiyin Chen, Eliesa Ing, Yali Jia, David Huang

Purpose: To evaluate macular ganglion cell layer plexus (GCLP) in open-angle glaucoma eyes using projection-resolved (PR) optical coherence tomographic angiography (OCTA).

Methods: Optovue 6x6-mm OCTA macular scans were performed in one eye of each participant. Flow signal was calculated using the split-spectrum amplitude-decorrelation angiography algorithm. The ganglion cell layer plexus (GCLP) has its anterior boundary at the nerve fiber layer-GCL junction and extends posteriorly through 75% of the thickness of the combined ganglion cell and inner plexiform layer (GCIPL). The superficial vascular complex (SVC) contains both GCLP and NFL plexus. The GCLP and the SVC vessel density (VD) were measured using a custom software with automatic shadow exclusion and reflectance compensation, and a PR-OCTA algorithm was used to remove flow projection artifacts. *En face* GCLP and SVC angiograms were generated. The macular VD (defined as the percentage area occupied by flow pixels) was calculated from the entire 6x6mm *en face* image, excluding the temporal corners of a semi-circle with a diameter of 7-mm centered at the foveola.

Results: Sixty glaucoma (32 perimetric and 28 pre-perimetric) and 38 normal participants were enrolled and one eye in each participant was studied. Mean age and standard deviation in normal and glaucoma patients were 59.6±10.7 and 65.6±8.6 years, respectively. Visual field (VF) mean deviation (MD) for glaucoma eyes was -3.5±4.8 decibels. The GCLP and SVC VDs were significantly lower in glaucoma eyes than normal eyes ($p<0.001$). In the perimetric glaucoma group, diagnostic accuracy, measured by the area under the receiver operating curve (AROC), was 0.943 for GCLP VD, 0.918 for SVC VD, 0.921 for GCIPL thickness, and 0.900 for ganglion cell complex thickness (GCC) (sensitivities at 95% specificity were 78.1%, 68.8%, 84.4%, and 75.0%, respectively). Both GCLP VD and SVC VD had good repeatability, as measured by the intraclass correlation coefficient (0.968 and 0.974, respectively, $P<0.001$). The GCLP VD was significantly correlated with central VF MD, GCC and GCIPL thickness (Pearson's $r=0.513$, $r=0.844$, and $r=0.890$, respectively, $P<0.001$). The GCLP VD map shows that glaucoma damage has a characteristic arcuate shape that is most severe in the inferotemporal macula (Fig. 1).

Discussion: Macular GCLP VD correlates well with VF and is an accurate diagnostic parameter for glaucoma. The patterns of perfusion loss in GCLP and SVC are subtly different; because GCLP excludes the overlying NFLP, it may better localize focal defects in ganglion cell perfusion.

Conclusion: Macular GCLP It may be useful in evaluating the location and severity of glaucomatous damage in the macula.

Funding: The study was supported by NIH grants R01 EY023285, P30 EY010572, R01 EY010145 from the National Institutes of Health, Oregon Health & Science University (OHSU) foundation, and an unrestricted grant from Research to Prevent Blindness.

Disclosures: David Huang and Yali Jia have financial interest in Optovue, Inc., a company that may have a commercial interest in the results of this research and technology. These potential conflicts of interest have been reviewed and are managed by OHSU. The other authors do not report any potential financial conflicts of interest.

Title: Validation of home visual acuity tests for telehealth in the COVID-19 era

Authors: Kellyn N Bellsmith, Michael J Gale, Sen Yang, Isabelle B Nguyen, Christa J Prentiss, Luan T Nguyen, Allison I Summers, Merina Thomas

Purpose: One of the most important clinical data points in evaluating ophthalmology patients is visual acuity (VA). During the COVID-19 pandemic, eye health providers are utilizing telehealth to decrease patient and provider risk associated with in-person clinic visits, while still providing high-quality care. This study sought to compare at-home VA testing with in-office clinical VA measurements to determine the validity of at-home VA testing for telehealth visits.

Methods: Patients from 1 comprehensive and 3 subspecialty ophthalmology clinics had VA $\geq 20/200$ in the study eye. The patients were prospectively randomized to perform 2 of 3 at-home VA tests (printed chart – University of Arizona/Banner Eye Care Letter Distance Chart; mobile phone app – Verana™ Vision Test; website test – Farsight.care) within 3 days of their standard of care clinic visit. Patients also completed a survey to assess usability of home tests. At the clinic visit, best corrected Snellen distance acuity was measured to serve as the reference standard.

Discussion/Results: Of the 44 patients (84 eyes) enrolled, 60% were female and the mean age was 66 years (range 22 to 80). The mean difference between printed chart and Snellen, website test and Snellen, and mobile app and Snellen acuity data was 0.10 (95% CI: 0.09-0.11), 0.13 (95% CI: 0.12-0.14), and 0.12 (95% CI: 0.11-0.13) LogMAR, respectively. The highest degree of correlation was between the website and Snellen tests (0.74, 95% CI: 0.59-0.84) (Table 1).

Patients found the tests easy to perform at home and were neutral regarding confidence in their results and desire to continue with home testing. In the survey, there was no significant difference for any question about the 3 tests ($P = 0.32-0.62$), although there was a trend toward a more positive response with the printed chart (Table 2).

Conclusion: These data suggest that some at-home visual acuity tests are comparable in accuracy to in-clinic Snellen visual acuity tests (within 1 line of difference). Patient surveys indicated the tests were easy to understand and complete at home. Further development and validation of at-home vision testing modalities are needed to provide accurate and accessible tele-ophthalmology care.

Funding: This project is supported by an unrestricted grant from Research to Prevent Blindness, as well as an NIH/NEI core grant (P30EY010572).

Disclosures: The authors have no financial disclosures.

Title: Telemedicine for ROP Diagnosis in a Real-World System: Technical Description and Evaluation

Authors: Ian D. Danford, Miles F. Greenwald, Susan Ostmo, Robert Schelonka, Howard S. Cohen, J. Peter Campbell, Michael F. Chiang

Purpose: Describe and evaluate the implementation of an operational retinopathy of prematurity (ROP) tele-screening program.

Methods: We evaluated data from all infants who met ROP screening criteria in the Salem Hospital (SH) neonatal intensive care unit (NICU) between October 2015–October 2018. Retinal images were captured and transferred to OHSU for remote ROP severity grading. Images are then graded remotely by a pediatric ophthalmologist at OHSU, according to the International classification of ROP (ICROP) disease severity. Clarity and field of view (FOV) of the images are graded as “acceptable”, “possibly acceptable”, or “not acceptable.” We assessed agreement between the last imaging exam and the first follow-up ophthalmoscopic exam. We compared outcomes between our telemedical program and the inpatient ROP service.

Discussion/Results: The remote ROP grading system operates as follows. Nurse practitioners in the SH NICU take retinal images encoded with the Digital Imaging and Communications in Medicine (DICOM) format with a wide-angle camera (RetCam; Natus Medical Incorporated, Pleasanton, CA). Identifying patient information is entered into the RetCam at the time of image acquisition to ensure accurate patient-image correspondence. DICOM images are then loaded onto a secure file within the SH server which is accessed every several minutes by a secure managed file transport (MFT) system (SecureTransport; Axway, Phoenix, AZ), which is managed by the OHSU information technology (IT) department. The MFT system automatically transfers the DICOM images to a secure watch folder within the OHSU server. This watch folder is programmed to be periodically polled by the AXIS Image Management library at OHSU (AXIS Image Management; Sonomed Escalon, New Hyde Park, NY). These images can then be reviewed, and the image interpretation, clinical assessment and plan are entered within the context of a telemedicine encounter at OHSU. If the images are concerning for type 2 or worse disease, the patients were transferred to the OHSU NICU for more advanced ophthalmic evaluation and treatment. If patients were discharged home from SH, they were scheduled for outpatient dilated ophthalmoscopic exams.

87 infants (174 eyes) met criteria for ROP screening. Mean gestational age at birth was 29.2 ± 2.1 weeks with mean birth weight 1240 ± 235 grams. Telemedical exams detected 2 infants with type 2 or worse disease, who were referred for inpatient treatment. For patients discharged with documented local outpatient follow-up, mean time between last telemedical exam and first ophthalmoscopic exam was 14.77 days (range: 7 to 88 days). There was no significant difference in outpatient follow-up time between patients seen via telemedical encounters vs inpatient encounters.

There was agreement of ROP disease category in 88.4% of eyes examined at OHSU follow-up ($\kappa = 0.70$), indicating substantial agreement in grading ROP severity between raters using Retcam and outpatient ophthalmoscopy.

Conclusions: We found substantial agreement between ICROP severity by telemedical imaging and ophthalmoscopic follow-up exams amongst a group of pediatric ophthalmologists. Patients in the telemedicine program have close outpatient follow-up, comparable to our inpatient service

Funding: R01EY19474, K12EY27720, and P30EY10572 from the National Institutes of Health (Bethesda), by grant SCH-1622679 from the National Science Foundation (Arlington, VA), and by unrestricted departmental funding and a Career Development Award (JPC) from Research to Prevent Blindness (New York, NY).

Disclosures: MFC is an unpaid member of the Scientific Advisory Board for Clarity Medical Systems (Pleasanton, CA), a Consultant for Novartis (Basel, Switzerland), and an equity owner in Intelereitina (Honolulu, HI).

Title: Prognostic Factors in Optic Pathway Gliomas

Authors: Alex Walters, Brad Henriksen, C. Blake Perry, Rohan Verma, Leah Reznick, John Ng

Purpose: While most patients with optic pathway gliomas (OPGs) are children with neurofibromatosis 1 (NF1) who have benign tumors, OPGs are not limited to this population, and a subset of these tumors demonstrate progressive tumor growth or de novo tumors. The clinical presenting features and histopathologic characteristics that distinguish these more aggressive from benign OPGs are limited. We describe characteristics of patients with OPGs confirmed by biopsy by describing clinical features and comparing histologic tumor characteristics.

Methods: A retrospective chart review was completed of all patients with biopsy-confirmed OPGs at our institution in the last 20 years. Clinical, pathologic, and neuroimaging results were compiled, and additional immunologic and histologic testing was completed. Categorical data was analyzed for significance by chi square testing.

Results: 15 patients (10 children and 5 adults) underwent biopsy. 17 specimens were available for histologic review due to one patient with subsequent biopsies. The average age (years) at first biopsy was 6.14 in children and 43.78 in adults. All pediatric tumors were low-grade, while 1 adult tumor was high-grade. At the time of surgery, pediatric patients were more likely than adults to have strabismus ($p=0.002$) and proptosis ($p=0.003$). All adults had visual acuity of $\geq 20/50$ prior to surgery.

All patients with NF1 were pediatric (<18 years). Patients with NF1 were more likely to have light-perception visual acuity or worse at the time of surgery ($p=0.02$). Patients with NF1 were more likely to have multifocal lesions on MRI ($p=0.0001$) and bilateral lesions (0.0001). For all biopsies, immunostaining and genetic tests were negative for tumor markers IDH1 (100%), negative or only weakly positive for p53 (94%), Ki67 (76%), and *BRAF* (83%). Follow-up ranged from 1.44 – 20.88 years from pathologic specimen collection. Continued growth, re-growth, and/or malignant transformation occurred in 31% of patients without NF1, compared to 50% of NF1 patients. Multiple courses of chemotherapy were more common in NF1 patients compared to all patients with sporadic tumors ($p=0.002$).

Conclusions: OPGs have distinct clinical, radiographic, and possibly immunologic characteristics in children, adults, and NF1 patients. Immunologic and genetic testing may help distinguish tumor subtypes. There was no statistically significant differences among performed histologic testing.

Funding: This work was supported by the National Institutes of Health [grant P30EY010572] and by Research to Prevent Blindness [unrestricted grant]. The authors do not have any proprietary interests in the materials described in the article.

Disclosures: None

Title: Long term outcomes of early aqueous suppressant use in glaucoma drainage devices

Authors: Bennett Hong, Shandiz Tehrani

Purpose: One of the most commonly performed surgical procedures for the management of glaucoma is implantation of the Ahmed glaucoma valve. Pakravan and colleagues, in 2014, showed that early aqueous suppressant use in the postoperative period can increase the survival of the implant at postoperative year one. However, there are currently no studies that demonstrate long term efficacy of early postoperative aqueous suppressant use.

Methods: This is a retrospective chart review. It includes patients ages 18 and older at the time of their first Ahmed valve implant between the years 2015 and 2018. Only patients who had one year of follow up or more will be included in the study. Two groups of patients will be compared: patients who started an aqueous suppressant when their intraocular pressure (IOP) is over 10mmHg and those who started at an IOP greater than 15mmHg. The primary outcome measure is postoperative IOP success, which is defined as an IOP between 6mmHg and 15mmHg, and at least 30% reduction from baseline. Secondary outcome measures include hypertensive phase frequency. Failure is defined as failure to maintain that IOP target on maximum medical therapy two consecutive visits at least one month apart, and the need for repeat surgery or cyclophotocoagulation.

Discussion/Results: 453 tube shunts (as identified by the CPT code) were implanted between 2015 and 2018. Only cases of Ahmed valve implants and no prior tube implants will be included in the study. Baerveldt implants and istent implants (which are included in the 453 total) will be excluded.

Conclusion: Pakravan and colleagues found that the 1 year success rate in the early intervention group was 63.2% and 33.3% at control. The authors hypothesize that the success rates for the group will be similar at years 2, 3, 4, and 5.

Funding: An unrestricted grant from Research to Prevent Blindness to OHSU, An NIH/NEI core grant (P30EY010572) to OHSU

Disclosures: None

Title: 5-Year Results of a Home Monitoring Device in Study Participants at High Risk for Neovascular Age-related Macular Degeneration

Authors: Marcus T. Altman, MD, Merina Thomas, MD

Purpose: Age-related macular degeneration (AMD) with choroidal neovascularization (CNV) is a leading cause of blindness, necessitating early treatment before significant vision loss occurs. The ForeseeHome™ Preferential Hyperacuity Perimeter (PHP) is FDA-approved to aid in home monitoring for CNV related to AMD. A prospective cohort study evaluated how often home monitoring detects conversion to CNV in patients with intermediate AMD over a relatively long follow-up.

Methods: Patients were ≥ 55 years-old and had intermediate AMD with visual acuity $\geq 20/63$ in the study eye. A previous study determined that an in-office qualifying test could identify patients most likely to use the PHP device successfully. Patients who qualified were then required to establish a baseline score at home with the device. If successful, the patient proceeded with daily home use. Patients were monitored for 5 years and could trigger an in-office visit by either a device alert or by reporting a visual symptom. If no CNV was detected at the visit, the patient could then re-establish a baseline with the device to continue home testing.

Discussion/Results: 91 patients qualified for device use, with mean age of 73.1 years and visual acuity of 20/28. Of these, 132 study eyes established a baseline to begin home testing, with 54 eyes (41%, 95% CI 32%-50%) having at least one alert (by symptom and/or device) over 5 years of testing. Among 90 device-triggered visits, 83 (92%) were false positive, while 7 (8%, 95% CI 3%-15%) resulted in detection of CNV at mean 2.1 years following enrollment. Two eyes that developed CNV were diagnosed by symptom only without a device alert (2 of 9 total CNV cases; 22% false negatives, 95% CI 3%-60%). Mean visual acuity at time of CNV detection was $\sim 20/32$. 23 eyes that had a false-positive alert withdrew from the study due to a failure to re-establish baseline—of these, 6 (26%) developed CNV on average 2.7 years later. Mean monthly device usage was 15 times per month and was higher in the first year of an eye's enrollment versus the fifth year (18.5 vs 12.8 uses per month, difference = 5.7, 95% CI: 3.5-7.9; $P < .001$).

Conclusions: These data over 5 years suggest a large proportion of incident neovascular AMD cases were detected by home monitoring, and eyes monitored by the device had good visual acuity at time of CNV detection. In this study, the device showed a 22% false negative rate.

Funding: *Research to Prevent Blindness, NIH/NEI core grant (P30EY010572)*

Disclosures: The authors have no conflicts of interest to disclose

Title: Outcomes of a Formal Mentorship Program in an Ophthalmology Residency

Authors: Sarah Glass, MD¹; Ambar Faridi, MD^{1,2}

Institutions:

¹Ophthalmology, Oregon Health and Science University - Casey Eye Institute, Portland, OR, United States.

²Veterans Administration Portland Healthcare System, Portland, OR, United States

Purpose: Effective mentorship is well-established as vital to trainees' professional and personal development in medical training. Faculty mentors may also find the experience fulfilling, as it provides an opportunity to support and advocate for a learner. Ophthalmology literature, however, lacks robust data describing formal ophthalmology mentorship programs and their success. This descriptive study evaluates the experience of participants in a formal mentorship program in an ophthalmology residency to improve the program and provide recommendations on mentorship.

Methods: A voluntary, anonymous, web-based survey of all current and former mentees and mentors at the Casey Eye Institute at Oregon Health and Science University was conducted in March-April 2021 to assess participants' experiences with the residency's mentorship program. The study was approved by the OHSU Institutional Review Board.

Results: Of 65 eligible participants, 30 mentees (88%) and 22 mentors (71%) completed the survey. In-person meetings were preferred by 82% and were the most common mode of communication. Mentors typically initiated meetings in 62% of cases. Career guidance was reported to be a critical goal by 39% of participants, while 61% viewed research mentoring as least important. Pairs felt they were most similar in geographic background, though 32% rated personality match as the most important component to an effective mentorship. Thirty-six percent of mentees believed mentors should initiate contact to schedule meetings, and 43% of mentors felt mentees should. Only 25% of mentees compared to 43% of mentors found the relationship valuable to their experience. The majority of all participants felt they lacked skills to be an effective mentee (54%) or mentor (53%). Although neither group felt that they prioritized the relationship, mentees prioritized it significantly less (64% vs. 38%, $p < 0.05$).

Conclusions: The study provides a qualitative and critical assessment of an established ophthalmology residency mentorship program and can inform changes to support resident needs and faculty experiences. Overall, the current program does not provide effective mentorship from the mentee's perspective. Clearer delineation of mentorship roles and expectations as well as a special focus on ongoing communication between mentor and mentee for relationship building may improve the program.

Funding: This work is supported indirectly by an unrestricted grant from Research to Prevent Blindness and an NIH/NEI core grant (P30EY010572).

Disclosures: None

Title: Intravitreal methotrexate for proliferative vitreoretinopathy: assessment of anatomical and functional outcomes

Authors: Rebekah H. Gensure, Christina J. Flaxel, Phoebe Lin

Purpose: Proliferative vitreoretinopathy (PVR) is the most common cause of failure in retinal detachment (RD) surgery. Current standard of care is vitrectomy with membrane peel with a wide range of reported anatomical and functional success in cases of recurrent RD due to PVR ranging from 45-80%. No current pharmacological intervention is available for treatment or prevention of this vision threatening complication. Observational studies in patients receiving methotrexate (MTX) for intravitreal lymphoma found patients undergoing diagnostic chorioretinal biopsy did not tend to develop proliferative vitreoretinopathy or epiretinal membranes. The purpose of this study is to investigate an intravitreal MTX protocol in patients with recurrent RD due to PVR on post-operative complications, primarily recurrent RD requiring reoperation within a 2 year period, and secondarily characterizing functional success via post-operative visual acuity (VA). We hypothesize that the intravitreal MTX series may improve rates of anatomical and functional success in cases of recurrent RD due to PVR.

Methods: For this non-randomized prospective study, potential participants were identified as eligible based on a history of recurrent RD due to PVR grade C or open globe injury (OGI) and were offered enrollment if able to return for 8 weekly followed by 4 biweekly injections. The study protocol entailed a series of 13 repeated intravitreal injections over 16 weeks of intravitreal MTX 400 mcg in 0.1 mL, with the first injection taking place intraoperatively at the time of RD repair. All subjects underwent vitrectomy with silicone oil tamponade and retinectomy following initial presentation.

Discussion/Results: 20 subjects were recruited. 17 completed the full 16-week protocol of MTX injections, 1 subject redetached at week 3, 1 subject was lost to follow-up, and 1 subject was unable to complete the protocol due to neurosurgical intervention. 4 subjects had prior OGI. 13 subjects (65%) were male, 7 (35%) female. Baseline VA was HM or better, with mean logMAR VA 1.73 +/- 0.68 (Snellen equivalent 20/1060). LogMAR VA at the 6-month post-op period was 1.55 +/- 0.6 (20/710) and 1.34 (20/437). By the time of last follow-up, VA improved by an average of 0.4 LogMAR units over baseline. Only 3 subjects showed a visual acuity decline from baseline (one from CF to HM, HM to LP, and 20/40 to 20/60). 7 subjects developed recurrent detachments over the 2 year follow-up period (38% including the week 3 early redetachment). The most common findings after injection were mild conjunctival hyperemia and mild keratopathy; no significant adverse events associated with MTX were identified.

Conclusions: Patients with PVR undergoing intravitreal MTX demonstrated functional success in improved visual acuity, with anatomical success demonstrated by rates of recurrent detachment due to PVR on the lower end of previously reported values. Intravitreal MTX series may show some potential in improving functional and anatomical success rates in patients with recurrent RD due to PVR or OGI. Further investigation in a large multicenter, randomized, controlled Phase 3 clinical trial is currently underway.

Funding: Supported by an unrestricted grant from Research to Prevent Blindness and NIH/NEI core grant (P30EY010572)

Disclosures: None

Title: Transient vision loss associated with aflibercept pre-filled syringes

Authors: Brittini A. Scruggs MD, PhD¹, Daniel J. Lee, MD¹, Merina Thomas, MD¹, Ambar Faridi, MD^{1,2,*}

¹*Casey Eye Institute, Department of Ophthalmology, Oregon Health & Science University, Portland, OR, USA*

²*Veteran Affairs Portland Health Care System, Department of Ophthalmology, Portland, OR, USA*

Purpose: To describe cases of significant vision loss following intravitreal aflibercept (Eylea™; Regeneron) injections using pre-filled syringes (PFS), which were approved by the Food and Drug Administration (FDA) in 2019.

Methods: All retina specialists (N=13) at Oregon Health & Science University and the Veterans Affairs Portland Medical Center were queried in December 2020 to determine their experience with aflibercept PFS. The specialists were asked to report any episodes of post-injection severe vision loss with or without the need for an anterior chamber paracentesis after administering aflibercept PFS. Medical records of all patients who had this complication were reviewed for demographics and pertinent ocular history. Institutional review board (IRB) approval was obtained at Oregon Health & Science University (OHSU) and at Veteran Affairs (VA) Portland Health Care System.

Discussion/Results: All specialists reported using aflibercept PFS starting in February 2020 when the PFS was made available at our institutions. Three specialists had no cases of vision loss with PFS use, whereas 10 specialists (76.9%) reported a perceived increase in post-injection vision loss with aflibercept PFS. There were 16 reported events of no light perception (NLP) or light perception (LP) vision immediately after aflibercept PFS. Seven physicians reported one case each; another specialist described two cases; one reported three events; and one reported four events. Chart review was performed for 12 of these events. The indication for aflibercept was exudative age-related macular degeneration (N=8), diabetic macular edema (N=3), or central serous retinopathy (N=1). The median age of the affected patients was 71 years (range 49-94). Two patients were being treated for glaucoma (N=1) or ocular hypertension (N=1); one patient was a glaucoma suspect. Three patients required anterior chamber paracentesis, and the remaining patients had improved vision without procedural intervention.

Conclusions: Pre-filled syringes have several advantages over traditional vial packaging (e.g., reduced total injection time, decreased endophthalmitis rates). However, retina specialists in our institution have noted numerous cases of transient central retinal artery occlusions with the recent adoption of aflibercept PFS. As a result, the majority of affected patients have reported increased injection-related anxiety. Ongoing studies by our team include comparing PFS and traditional 1mL syringes as well as conducting an IRB-approved national survey for query of ophthalmologists performing aflibercept injections using pre-filled syringes.

Funding Sources: National Institutes of Health Grants P30 EY010572 and unrestricted departmental funding from Research to Prevent Blindness (New York, NY).

Disclosures: The authors report no conflicts of interest.