



Poster Presentations

119th Annual AOA Congress & 46th Annual AOSA
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June 29-July 3, 2016

Poster Presentations

Optometry's Meeting® • Boston, Massachusetts • June 29-July 3, 2016

“TOP” POSTERS

The poster session will be displayed on on Friday, July 1, 2016 and Saturday, July 2, 2016 at the Boston Convention and Exhibition Center in the Exhibit Hall. The authors/presenters will be present on Saturday from 11:00am-2:00pm only. The interactive poster session will offer CE credit at this time. Attendees wishing to spend an uninterrupted one or two hours viewing the interactive poster session will be able to receive the appropriate one- or two-hour CE credit. Please note the poster session is not COPE approved. Please check with your State Board to determine if the session can be used toward license renewal.

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POSTER 1

A Comparison of Backlit ETDRS VA Chart to M&S Technologies Automated ETDRS VA Chart

Paul Alan Harris, O.D.
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Laurel Roberts

The standard ETDRS chart is a large floor-mounted backlit device which takes up a significant amount of space, requires manual changes amongst the three provided plastic sheets for different test conditions, and may be memorized during research protocols and in some clinical settings. The M&S Technologies Automated ETDRS VA chart has the potential to make the test more portable, less easy to memorize, and easier to calibrate. It also includes automated scoring, making the researcher or clinician's job much easier.

111 second and third year SCO students had their visual acuity taken 8 separate times with each of the conditions being randomized. Visual acuity was measured four different times on each of the two different types of charts. The four conditions for each chart includes: with full correction, without correction, with +1.50 spheres over full correction and with +3.00 over full correction. All testing was done at 4 Meters.

There was a strong relationship between both methods of measuring visual acuity with the ETDRS charts in each of the four conditions. Within each condition, correlations between the two charts were high and statistically significant (all $p < .001$). There were no significant differences between the two chart types in Letter scores (total count of number of letters correct on all lines; $p = .86$) or LogMAR scores ($p = .96$).

The results show that the two charts are functionally equivalent to each other under a variety of testing conditions which mimic both the clinical and the research setting well. These findings set the stage for the adoption of the Automated ETDRS

chart by M&S Technologies in any clinical or research setting that calls for ETDRS testing.

POSTER 2

Pupil Diameter Differences at Home Plate in Night Game and Day Game Scenarios

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Baseball players are required to hit a ball in a myriad of demanding, dynamic environments. One factor impacting their visual performance is illuminance. Illuminance variations during a game, or an at-bat, result in pupil diameter changes. Diameter changes may impact visual performance by altering retinal illuminance and by varying the retinal image quality produced through physiological and optical effects. The aim of this study is to measure whether a pupil diameter produced during artificially lit nighttime scenarios mimics the diameter produced during naturally lit daytime scenarios

Daytime diameters had a mean(SD) of 2.58(0.45) mm. Nighttime diameters had a mean(SD) of 6.45(1.11)mm. The mean(SD) increase in individual diameter was 3.87(1.14)mm ($P < 0.001$; $r = 0.120$). Average day vs. night illuminance measurements were: Home plate (3907.62 fc vs. 12.11 fc), OD (4505.87 fc vs. 5.60 fc), OS (4096.77 fc vs. 5.23 fc). Daytime illuminance differences between home plate and each canthus were not found to be statistically significant (POD=0.344, POS=0.751), but were for nighttime (POD=<0.001, POS=<0.001).

Pupil diameter increased in nighttime scenarios (when average illuminance was reduced to as little as 0.12% of the daily value). The magnitude of this diameter increase is almost double the 2mm difference accepted as a clinical guideline and significantly different from daytime measurement. The variability found in pupil diameter change

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warrants a follow up study to investigate whether large pupils, or large changes in pupil diameter, has a greater impact on a player's visual function.

POSTER 3

Validation Study of Visual Objectives Biomarkers for Acute Mild Traumatic Brain Injury

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The Department of Defense reported that 339,462 cases of traumatic brain injury (TBI) were clinically confirmed from 2000 to the third quarter 2015, with mild TBI (mTBI) accounting for 82.5% of all cases. Currently there is a lack of mTBI objective biomarkers. This study aims to validate objective visual biomarkers for early identification of mTBI.

The study included 100 acute non-blast mTBI (≤ 72 hrs post-injury) and 100 age-matched controls (age 19-44 yrs). Pupillary Light Reflex (PLR) functions were measured with handheld monocular infrared pupillometer (NeuroOptics PLR-200). PLR functions measures included: 1) maximum diameter; 2) minimum diameter; 3) percent of constriction; 4) constriction latency; 5) average constriction velocity; 6) maximum constriction velocity; 7) average dilation velocity; 8) 75% re-dilation recovery time. Saccadic eye movement function was determined with the King-Devick (KD) Test. Near Point of Convergence (NPC) was measured with a near point convergence ruler. The Convergence Insufficiency Symptoms Survey (CISS) was also used to assess visual symptoms.

Out of the eight PLR functions, average dilation velocity (mTBI 0.63 ± 0.41 mm/sec; Control 0.92 ± 0.12 mm/sec; $P = 0.031$) and 75% re-dilation recovery time (mTBI 3.82 ± 1.17 sec; Control 2.61 ± 0.44 sec; $P = 0.023$), were significantly reduced in mTBI subjects. In addition, mTBI subjects had significantly higher NPC value (mTBI 14.58 ± 4.17 cm; Control 8.37 ± 2.12

cm; $P = 0.013$), KD Test score (mTBI 60.32 ± 9.60 ; Control 43.43 ± 4.83 ; $P < 0.001$) and CISS score (mTBI 24.55 ± 3.95 ; Control 8.97 ± 2.30 ; $P < 0.001$).

These results strongly suggest that PLR (i.e. average dilation velocity and 75% re-dilation recovery time) and NPC can serve as objective biomarker for mTBI. These results also suggest damage to the sympathetic system. CISS and KD Test also appear to be useful for identifying acute mTBI, although there is a subjective component to these two tests. In combination, these tests are ideal since they are hand-held, easy to use, quick, deployable, easily performed by subjects, including mTBI subjects and easily administered by auxiliary staff (non-providers).

POSTER 4

Predicting Visual Symptoms through Vision Screening Tests in Dental Students

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Professional dental curriculum presents students with increased visual demands both for prolonged near activities and the utilization of dental loupes. Pre-clinical training with loupes often begins within the first year professional year. Loupes have become commonplace in the field of dentistry due to increased near magnification, improved working posture, and enhancement of certain procedures. Dental loupes employ convergent optics to form a stereoscopic image. Prolonged converging and accommodative effort may cause eyestrain, headaches, or other visual symptoms.

Fifty-one dental students from Midwestern University participated in this study. Subjects completed a symptoms survey and visual screening prior to entering school and being fit for loupes. The subjects were surveyed for visual symptoms related

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to near work and loupe utilization. Subjects were asked to report any symptoms of headaches, eyestrain, double vision, etc. At the initial screening each subject underwent nine tests to assess visual function: autorefraction, visual acuity, stereoacuity, cover test, near point of convergence (NPC), negative relative accommodation (NRA), positive relative accommodation (PRA), accommodative facility, and vergences. Each category was divided into normal and abnormal ranges. The data was also tested for a statistically significant difference between asymptomatic and symptomatic subjects.

Dental students significantly developed symptoms throughout the first six months of professional school both when surveying symptoms related to near work ($t = -4.41$, $p < 0.01$) and loupe utilization ($t = -3.81$, $p < 0.001$). None of the screening procedures showed correlation to symptoms at the initial visit, however both reduced accommodative facility ($r = 0.681$, $p < 0.01$) and abnormal NRA ($r = -0.53$, $p < 0.05$) at the initial visit correlated with the most symptomatic students at a six month follow up.

This study demonstrates the need for dental students to have binocular visual function testing with emphasis on accommodative assessment as symptoms related to both prolonged near work and loupe utilization develop within the first six months of professional school.

POSTER 5

When Strabismus is a Sign of a Life Threatening Condition

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Strabismus is a common finding during an eye examination for which we as optometrists are well trained to diagnose and treat. However, when there is a presentation of recent onset of strabismus, especially with double vision, extra care needs to be taken to rule out any possibly life threatening

etiology.

The patient, a 15 year old African American male presented with recent onset strabismus and double vision. On examination his uncorrected vision was 20/20 in each eye. He scored 0/9 on the Titmus stereo test and could not appreciate any depth with the fly. On cover test he had 40 prism diopters of esotropia at distance and 20 prism diopters of esotropia at near. While performing ocular motilities there was a distinct increase in esotropia on left gaze but the alignment improved on right gaze. The health of the anterior and posterior segments of his eyes was normal. An emergent MRI of the brain with and without contrast was ordered. The MRI found a large pontine glioma. The patient was admitted to the Children's hospital that day. He was diagnosed with a Grade III anaplastic astrocytoma of the brainstem. Now, a year later, he is currently receiving radiation therapy and the tumor has not grown in size. The lateral rectus palsy has not improved so he has glasses with Fresnel prisms and an eye patch to help with the double vision.

Recent onset strabismus, especially when there is reported double vision, may be a sign of an underlying neurological condition. Ocular motilities should be investigated in strabismic patients to help determine the cause of the misalignment. Be suspicious of a lateral rectus palsy if esotropia is greater at distance than at near. Lateral rectus palsy requires an MRI and a referral to neurology in most cases.

POSTER 6

Neuroplasticity and Vision Therapy for Adults: A Case Series

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Optometric Vision Therapy is considered a viable

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treatment option for children with various binocular vision disorders (strabismus, amblyopia and other dysfunctions of the binocular vision system). Unfortunately, children with these disorders, if left untreated, become adults with strabismus, amblyopia, convergence insufficiency, etc. Current research suggests that the human visual system retains a good deal of neuroplasticity into adulthood and that even senior individuals can learn new ways of seeing. Unfortunately, optometrists are less likely to suggest vision therapy to their adult patients even though it has been shown to be effective for various groups within the adult population.

The diagnostic data, therapy utilized and treatment outcomes are presented for 3 adults with strabismus. LM is a 69 y/o WM who presented with severe symptoms associated with one or more vision dysfunctions (intermittent exotropia at near, convergence insufficiency, diplopia) that interfered with his ability to work. MP is a 24 y/o WF with a post-surgical (surgery at age 5 years) intermittent esotropia, convergence excess (variable), accommodative insufficiency and suppression. The final patient (SP) is a 29 y/o BF with a 90PD IAXT, diplopia, accommodative excess and oculomotor dysfunction. Depending upon the patient noted above, anywhere from 29 to 42, forty-five minute in office vision therapy sessions resulted in significant improvement in vision function and relief of symptoms for up to 2 years post therapeutic intervention.

POSTER 7

Sutureless Amniotic Membrane Transplantation for Ocular Surface Reconstruction in Keratitis-Ichthyosis-Deafness (KID) Syndrome

Breanne B. McGhee

Keratitis ichthyosis deafness (KID) syndrome is a rare inherited autosomal dominant genetic disorder

that results from mutations in the GJB2 gene coding for connexin 26. The syndrome is characterized by keratotic ectodermal thickening, sensorineural hearing loss, and vascularizing keratitis.

An 18 year old Hispanic female presented to clinic with her parent for a vision exam with concerns of ocular pain, photophobia and stable reduced vision. Medical history revealed a prior diagnosis of keratitis ichthyosis deafness (KID) syndrome that was confirmed by prior positive genetic testing for the disorder. Dermatological observation in office revealed epidermal thickening with multiple irregular erythematous rashes encasing her entire body, which are clinical findings consistent with the syndrome. Mild hearing loss with support of hearing aids was reported. Unaided acuities were worse than 20/400 OD, OS (distance) and 20/50 OU (near) at a short working distance. Slit lamp biomicroscopy revealed bilateral vascularized keratitis with moderate stromal haze impacting the visual axis. Sutureless amniotic membrane transplantation via ProKera was inserted in the office under topical anesthesia and replaced twice in both eyes over for a course of 2 weeks with concomitant use of topical antimicrobials and antibiotics. Multiple follow ups were warranted to ensure absorption of the membrane, safety and efficiency, and no occurrence of ocular pathological insults. Sodium fluorescein with cobalt blue filter during slit lamp assessment was used to evaluate the progression of epithelial healing. A high oxygen permeability therapeutic bandage contact lenses replaced the ProKera lens after the amniotic tissue dissolved to continue to promote corneal healing and ocular relief.

As a result of sutureless amniotic membrane transplantation therapy via ProKera, the corneal surface defects re-epithelized successfully and stromal inflammation reduced ultimately improving visual acuities. Corneal integrity remained stable 3 months following treatment. ProKera lenses are easy to use in office and effective in aiding good anterior ocular health in various surface disorders.

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POSTER 8

Minimizing Glare and Photophobia after Trauma by Fitting a Specialty Soft Prosthetic Lens within a Piggyback System

Kathryn Werner

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PA 39 year old female presented for a contact lens fit secondary to aphakia, partial aniridia and irregular astigmatism in the left eye caused by trauma and subsequent surgeries. In October 2014 the patient incurred another traumatic injury to her left eye while still recovering from her initial retinal surgery. The decrease in vision resulting from her irregular pupil, epiretinal membrane, and partial retinal detachment was very disabling. The glare experienced by the patient was not reduced with tinted spectacles alone worn over her gas permeable lenses.

Anterior segment photography was performed to document the pupil abnormalities. Topography of the left eye revealed superior steepening with K readings of 41.7/47.5 (5.8 D of astigmatism @ 17.5). Slit lamp revealed aphakia, endothelial pigment on the cornea, and iris atrophy. HVID was measured to be 12.5mm OD and 13.0mm OS. Pupils were measured as OD bright 0.5mm dim 1.5 and OS 8mm bright and 8.5mm dim illumination. The patient's acuity with habitual gas permeable lenses was OD 20/60+ and OS 20/40-2. Various options were discussed including: a soft prosthetic lens with computer-generated iris design to cut down glare as well as piggy-backing a corneal gas permeable lens over a prosthetic lens. A clear soft lens was ordered for fitting; even though the patient's Snellen acuity was unchanged in the soft lens, she reported that her quality of vision was substantially decreased. Therefore, a piggy-back system with an underlying Cantor Nissel prosthetic lens with an overlying corneal gas permeable lens was finalized. Optimal

vision remained 20/40 OS, the quality of vision remained stable and the patient was finally able to function without squinting and/or headaches.

Fitting a patient who has vision loss and extensive glare due to retinal pathology and an irregular pupil can be a challenge. Assessing the acuity with soft prosthetic versus a gas permeable lens is very valuable. Obtaining total resolution of glare is sometimes an unrealistic goal, so minimizing glare with a prosthetic soft lens while maintaining the best visual acuity and optics in a gas permeable lens allows you to select the most optimal fit.

POSTER 9

Analysis of Body Mechanics During Eye Examinations: Are Optometrists at Risk?
EXAMINATIONS: ARE OPTOMETRISTS AT RISK?

Kaila M. Osmotherly, O.D.

Additional Author(s): Kelly Meehan, O.D.
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Throughout a typical eye wellness exam, an optometrist will assume several different postures. There have been numerous reports of work related discomfort and injury within the profession. These include, but are not limited to, injuries to the neck, shoulder, and upper and lower back. Poor posture may result from lack of adjustable equipment, poor ergonomics, and/or fatigue, leading to possible abbreviated careers. This study focuses on the neck in particular, and the forward head posture assumed by optometrists during a typical exam. This posture leads to abnormal forces on the joints and surrounding structures, resulting in pain and discomfort.

Seven licensed optometrists demonstrated three specific postures known to cause discomfort in optometrists: refraction, slit lamp biomicroscopy, and binocular indirect ophthalmoscopy. Subjects were affixed with fluorescent markers on the external auditory meatus and the acromion process.

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These landmarks were used to identify forward head posture in the subjects. Photographs were then obtained on each subject and analyzed via the Postural Analysis System Software (PASS) developed at Hardin-Simmons University. Subjects' postures were compared to a reference head position of 0 degrees as described by Kendall. Last, descriptive analyses were performed using SPSS Version 19 software.

Mean resting posture was 15.46 ± 2.3 degrees from zero. Other results are as follow: refraction - 34.40 ± 2.5 degrees, slit-lamp - 20.92 ± 1.8 degrees, and BIO - 25.13 ± 2.4 degrees.

The results demonstrate that optometrists assume a forward head posture during a typical eye exam. This forward head posture can lead to narrowing of the intervertebral foramina, abnormal compression of the zygapophyseal joints, and can lead to cervical extensor muscles becoming ischemic, because of the constant isometric contraction of these muscles. All of these consequences can lead to work related neck pain and discomfort.

POSTER 10

Use of Digital Devices and Reports of Dry Eyes: Performance of a Novel Silicone Hydrogel Lens Among Contact Lens Wearers

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Use of digital devices for prolonged periods can contribute to blink rate and tear film integrity alterations resulting in symptoms of dryness. A population of lens wearers that use digital technology and report having dry eyes evaluated a unique silicone hydrogel lens (samfilcon A) designed to retain moisture and provide a smooth surface.

In this 2 week, single arm, bilateral, open-label study, subjects that spend at least 3 hours each workday using a computer or electronic device and experienced dry eyes were assessed. Patients were enrolled by 22 independent investigators. Following 7 days of wear, subjects completed an internet survey to capture their perspectives regarding the product. Investigators completed slit lamp examinations (SLE) and exited the subjects, after 2 weeks of product use.

A total of 226 eligible subjects that experienced dry eyes were enrolled. There was no significant difference in SLE > Grade 2 findings between Dispensing and 2-week visits. There were no adverse events. The proportion of subject agreement regarding performance attributes associated with general wear experiences and with focusing for a long time at digital devices were statistically significantly greater than 50% ($p < 0.05$). While focusing for long times at digital devices, subjects agreed the lenses were comfortable (88.9%), helped eyes stay moist (80.5%), provided clear vision (88.9%), prevented blurriness (81.0%) and prevented eye from feeling tired or fatigued (84.1%). For general wear experiences, subjects agreed the lenses provide clear vision throughout the day (90.3%), provide clear vision when driving at night (90.3%), made them less aware they are wearing lenses (77.4%). Preference over habitual lenses on these questions were also statistically significant ($p < 0.05$).

Dry eyes are commonly associated with overexposure to digital devices and can have an impact on the wearing experience of contact lenses. The performance ratings demonstrated that the novel samfilcon A (Bausch + Lomb Ultra) lenses can help practitioners improve the contact lens wearing experience for those that use digital devices and report dry eyes.

POSTER 11

Subjective Comfort and Dryness Experiences During Multi-Center Clinical Evaluation of Two Monthly

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Replacement Silicone Hydrogel Contact Lenses

Gary Orsborn, O.D.

Additional Author(s): Jose Vega, O.D.

Discontinuation of contact lens (CL) wear continues to impact the growth in numbers of individuals wearing contact lenses, with discomfort and dryness being the primary reasons for discontinuation. Monthly replacement lenses remain the largest CL category in the U.S., and continue to show robust growth. The aim of this study was to investigate differences in comfort and dryness sensations between two leading monthly replacement CLs, comfilcon A (CA) and samfilcon A (SA) silicone hydrogel CLs, over 4 weeks of daily wear, using both conventional and lifestyle-types of study questions.

Ninety adapted soft CL patients were enrolled in a single-masked, bilateral, dispensing, cross-over study comparing CA and the SA single vision sphere lenses. Each subject was randomized to wear one lens or the other for 4 weeks of daily wear before repeating the schedule for the second pair without a washout period. Subjects were asked about comfort and dryness-related questions during follow-up visits after 14 and 28 days of being issued lenses. All subjects used the same multipurpose solution for lens care and were instructed to wear lenses a minimum of 12-hours a day and 7-days a week.

A total of 82 subjects finished the CA and 80 the SA arms of the study. For conventional study questions, there were no significant differences between the lenses in overall comfort, comfort on insertion and end-of-day comfort at the 2-week and 4-week visits ($p > 0.05$). There were statistically significant differences in favor of CA for end-of-day dryness ($p = 0.029$ at 2-weeks, $p = 0.016$ at 4-weeks). When asked lifestyle-types of questions, significantly more subjects agreed that CA lenses prevented the feeling of dryness ($p = 0.012$ at 2-weeks, $p = 0.039$ at 4-weeks), and at the 4-week visit that CA lenses were as comfortable at end of day as beginning ($p = 0.036$),

and that eyes felt less dry ($p = 0.004$) and less tired ($p = 0.003$) after using digital devices.

Both lenses showed good comfort scores when measured using conventional study questions. With more lifestyle-related types of questions, subjects were able to discriminate between the lenses in favor of the comfilcon A lens for numerous comfort and dryness-related subjective experiences.

POSTER 12

Tensile Tests of SynergEyes Hybrid Duette Contact Lens to Assess Junction Strength

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SynergEyes hybrid contact lenses are comprised of a high-Dk rigid gas permeable (RGP) center surrounded with a silicone hydrogel (SH) skirt. The junction between RGP and SH skirt is treated with HyperBond®, a proprietary treatment, and designed to prevent separation resulting from the lens wearer's daily handling. The purpose of the study was to evaluate the bond strength at the junction of SynergEyes hybrid contact lens by measuring its tensile strength. Tensile strength indicates how strong the material is when pulled or stretched.

Twenty-one (21) samples of SynergEyes Duette lens were used in the experiment. The tensile strength of each lens was measured with Instron 3342 series. The samples were designed to mimic the stress distribution of a dog-bone shaped sample; allowing the thinnest region to be at the junction between RGP and SH. Samples tested were fully hydrated and at room temperature and humidity. The sample was clamped between two opposing grips. The Instron was set at crosshead speed of 10mm/minute.

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The average maximum load used to stretch the lenses was 8.5 Newtons (N); the highest maximum load was 10.2 N and the lowest maximum load was 5.8 N. The average tensile strain of the lenses at maximum load was 73.9%; the highest tensile strain at maximum load was 78.9% and the lowest tensile strain at maximum load was 53.2%. The average tensile strength of the lenses was 0.95MPa; the highest tensile strength was 1.13MPa and the lowest tensile strength was 0.64MPa.

The strength of a material is measured by the level of stress it could withstand before point of breakage. The tensile tests from the study indicated 95% of the lenses could withstand at least 7.5N before breakage. Laboratory tests have shown that 0.2N of force correlates strongly to the force applied by fingers when cleaning contact lenses. The lenses were stretched beyond point of recovery before breakage occurred. The point of breakage for 100% of tested lenses occurred through the SH, indicating no junction separation. None (0%) of the tested lens broke through the junction.

POSTER 13

A Multi-technique Investigation of the Interaction between a Natural Wetting Agent and a High Poly Vinylpyrrolidone Content Silicone Hydrogel Contact Lens

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Maintaining a wettable surface is an important factor that can influence successful contact lens wear. Interactions between lens material and lens care formulations can help maintain surface moisture and lens wettability. This study assessed

the interaction of hyaluronan (HA), a natural humectant, to a unique silicone-hydrogel lens containing high bulk content PVP, samfilcon-A, using multiple analytical techniques.

The distribution of HA sorbed from 0.1%(w/v) HA as well as a commercial solution (Biotrue MPS) onto samfilcon A was assessed by atomic force microscopy (AFM) imaging. AFM was used to quantitate surface roughness of lenses before and after incubation with HA solution. The novel techniques of confocal laser scanning (CLSM) and differential interference contrast (DIC) microscopies were used to characterize the association of HA to the surface of samfilcon A. In addition, Gel Permeation Chromatography (GPC) was used to understand the molecular weight distribution of HA attracted to the lens.

The surface roughness of samfilcon A was measured to be $2.5\text{nm} \pm 0.4\text{nm}$ before exposure to HA. After incubation with 0.1% HA solution, RMS surface roughness was significantly decreased ($p < 0.05$) for samfilcon A. CLSM and DIC imaging illustrated a confluent, stained HA network that extended across the entire surface. The morphology of the HA network was consistent between the 0.1% HA and commercial MPS solution. GPC analysis showed a distribution of HA molecular weight adsorbed to samfilcon A.

CLSM and DIC imaging offered a comprehensive view of the lens surface and demonstrated an extensive coverage of HA on samfilcon A. AFM measurements confirmed that HA adsorption reduced roughness of the surface. Together, the combination of imaging techniques provided a unique picture of the interaction of HA and PVP containing silicone-hydrogel lenses. GPC analysis provided additional insight into the molecular weight composition of the HA adsorbed to samfilcon A.

POSTER 14

Residual Peroxide Levels after Neutralization of Two

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Marketed One-Step Hydrogen Peroxide Systems

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To compare residual peroxide profiles (R-H₂O₂) of Clear Care Plus (CCP) and PeroxiClear (PC) after neutralization in laboratory-cycled cases and patient-used cases.

R-H₂O₂ of neutralized CCP and PC (N=5 CCP and PP cups/discs) was measured via UV spectroscopy in parts per million (ppm) after 1, 15, 30, 45, 60, 75, 90 and 100 cycles at manufacturer-recommended neutralization times (NT; CCP=6hrs, PC=4hrs) at ambient room temperature. Additionally, 132 subjects used CCP and PC systems in randomized order for 30 days to disinfect silicone hydrogel lenses. Lens cases were collected at Day 30 and the appropriate solution was added to each case (10mL/case) to measure R-H₂O₂ via UV spectroscopy at NT.

At NT, mean R-H₂O₂ for CCP was <10ppm after 30 cycles and 5ppm after 100 cycles; PC averaged 55ppm and 72ppm after 30 and 100 cycles. In 30-day used cases, R-H₂O₂ of CCP and PC at NT was 26.2±41.17 and 229.7±280.13 respectively, (p<0.001). There was a slightly higher incidence of related ocular adverse events (AEs) in subjects using PeroxiClear (11 related AE's in 5 subjects) than in subjects using Clear Care Plus (2 related AEs in 1 subject).

The CCP and PC hydrogen peroxide systems used by subjects resulted in slightly higher R-H₂O₂ concentrations at NT than laboratory-cycled systems; however, the manufacturer-recommended 6-hour NT of CCP allows for more-complete neutralization of H₂O₂ than the 4-hour NT recommended with PC. 99% of 30-day patient-used CCP systems neutralized H₂O₂ to ≤100ppm, below the level detectable by ocular tissues.

POSTER 15

Patient Satisfaction with an Innovative Peroxide Lens Care Solution in a Large Population of 3579 Patients

Marjorie Rah, O.D., Ph.D
Additional Author(s): William Reindel, O.D.
Gary Mosehauer

SPeroxide lens care systems are highly regarded for their cleaning, disinfection and comfort characteristics. To improve the user experience, a manufacturer recently integrated 3 moisturizing agents into a peroxide solution. The purpose of this study was to evaluate patient acceptance of this innovative hydrogen peroxide solution a large patient sample.

538 independent eye care professionals enrolled patients into the evaluation. Patients were dispensed the hydrogen peroxide solution (Bausch + Lomb PeroxiClear solution) with continued use of their habitual contact lens brands. Subjects were instructed to complete an Internet survey at baseline to assess lens wear demographics and after approximately 7 days of use of PeroxiClear to assess the wearing experience.

3579 patients completed the survey. Patients reported their habitual care system as: ClearCare=55.7%, Other H₂O₂ systems=2.3%, MPS=32.1%, Other/Unknown=7.7%, and First time care system=2.2%. The results showed that 88.6% of patients agreed they were more satisfied with their overall experience with PeroxiClear than with their habitual care system; 88.5% agreed PeroxiClear provides superior comfort upon inserting lenses; 86.0% agreed PeroxiClear provides superior end-of-day comfort; 85.9% agreed PeroxiClear keeps lenses moister for longer; 86.1% agreed PeroxiClear keeps my lenses cleaner for longer; 95.6% agreed PeroxiClear is gentle on eyes; 94.4% agreed PeroxiClear does not irritate eyes; 95.3% agreed PeroxiClear does NOT sting/burn eyes when lenses are put on (after soaking for at least 4 hours); and

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73.7% agreed the fact that PeroxiClear allows lenses to be ready to wear in only 4 hours is important. The proportion of subject agreement regarding performance attributes associated these wear experiences were statistically significantly greater than 50% ($p < 0.05$) for the total cohort and for the habitual peroxide and MPS users.

Advances in lens care products are important for improving the wearing experience of contact lens patients. "Real world" evaluations provide valuable insights in how a product will perform in practice. The large patient sample indicated the integration of 3 moisturizing ingredients in a peroxide system can improve patient outcomes.

POSTER 16

Management of Chalazion-Induced Corneal Warpage

Muriel Schornack, O.D.

Chalazia may cause subtle corneal warpage if located near the central eyelid. In some cases, this may result in blurred vision. This case describes the management of a patient who experienced vision loss of this etiology. Following excision of the chalazion, a corneal rigid gas permeable lens was used to facilitate visual rehabilitation.

A 59 year old Caucasian female presented with blurred vision in the left eye of 2 month duration. She reported periodic development of hordeola, and stated that she had recently noticed a non-tender nodule in her upper left eyelid several days before presentation. Best corrected visual acuities of 20/20 OD, 20/30 OS were recorded at presentation. Slit lamp evaluation revealed meibomian gland dysfunction both eyes, along with moderate tear film dysfunction. Mild corneal epitheliopathy was noted in the left eye. A small, posteriorly pointing chalazion was present on her central upper left lid. Corneal topography confirmed mild corneal warpage in the left eye. Mild lens opacity was noted

in both eyes, but was deemed insufficient to result in the patient's measured visual acuity. No retinal or optic nerve abnormalities were noted. In the absence of other ocular pathology, corneal warpage was presumed to be the cause of the patient's reduced vision. The chalazion was excised, and the patient was instructed to perform daily lid hygiene to reduce the likelihood of recurrence. The patient's work required excellent visual acuity in both eyes, so she was temporarily fit with a corneal rigid gas permeable lens. In combination with her spectacles, the lens allowed her to resolve 20/20. Periodic follow-up with topography over the next several months showed a return to baseline refractive error and normalization of corneal contour. Three months after excision of the lesion and initiation of lens wear, topography confirmed resolution of corneal irregularity, and the patient was able to discontinue lens wear.

Chalazia that cause corneal warpage may require excision. Temporary use of a corneal rigid gas permeable lens may improve visual acuity while warpage resolves.

POSTER 17

Pre-Presbyopic Multifocal Contact Lens Wear Yielding Binocular Comfort at Computer and Near

Sharon Park Keh, O.D.

American Millennials spend an average of 18 hours a day consuming media on smartphones, digital tablets and home computers – often multiple forms simultaneously. The visual demands of this type of work are unique and require the use of prolonged intermediate vision. For contact lens-wearing young adults, correcting for this working distance before the onset of presbyopia may contribute to less eye strain and visual discomfort.

26-year-old white female complaining of blurry vision, eye strain and headaches on the computer while wearing single-vision distance contact lenses.

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Medical and ocular history was unremarkable. Manifest refraction after binocular balance was -4.25 OD and -4.00 OS with best-corrected visual acuity of 20/20+ OD, OS, OU. Von Graefe testing in phoropter yielded 3 PD eso at distance and 8 PD eso at near. There was no hyperphoria. AC/A ratio was calculated to be 6:1. This baseline testing confirmed the diagnosis of convergence excess for which plus lenses at near is a recommended treatment. Slit lamp findings were unremarkable and all dry eye testing was negative. The patient was fit in a center-near aspheric design with a MID add. At her one week follow-up, she reported relief from all symptoms and measured 2 PD eso at near.

This case study seeks to explore whether multifocal contact lenses may be a beneficial option for the pre-presbyopic population, particularly those with known binocular-accommodative disorders. 1. Ember, Sydney. "Brands Woo Millennials With a Wink, an Emoji or Whatever It Takes." *New York Times* 28 September 2015: B1. 2. Rueff, Erin. "Contact Lens Induced Dry Eye And Binocular Vision Disorders: A Study Of Similar Symptoms." (2014): Networked Digital Library of Theses & Dissertations. Oct. 2015. 3. Cooper, Jeffrey S., et al. "Care of the patient with accommodative and vergence dysfunction." *American Optometric Association. USA* (1998): 5-10. 4. Rouse, Michael W., et al. "Validity and reliability of the revised convergence insufficiency symptom survey in adults." *Ophthalmic and Physiological Optics* 24.5 (2004): 384-390. 5. Richdale, Kathryn, G. Lynn Mitchell, and Karla Zadnik. "Comparison of multifocal and monovision soft contact lens corrections in patients with low-astigmatic presbyopia." *Optometry & Vision Science* 83.5 (2006): 266-273. 6. Fedtke, Cathleen, et al. "Visual performance of single vision and multifocal contact lenses in non-presbyopic myopic eyes." *Contact Lens and Anterior Eye* 39.1 (2016): 38-46.

POSTER 19

Scleral lens Application in a Failed Corneal Gas

Permeable Wearer Post Blepharoplasty

James Deom, O.D.

Scleral Contact lenses have regained popularity primarily for two reasons. One, the continued development of more breathable gas permeable (GP) materials has made wearing a gas permeable lens design an extremely healthy option in comparison to even the most breathable soft lens materials, and two, precise computer guided lathe manufacturing has allowed for precise custom fit lenses for even the most irregular eyes. Some of the most common applications for scleral contact lenses include keratoconus (KCN), irregular corneas, severe dry eye disease, penetrating keratoplasty, and high ametropias. Some less commonly observed scleral lens applications have to do with eyelid anomalies which either compromise the corneal health or inhibit use with other contact lenses. In this case a patient who had a penetrating keratoplasty (PKP) in 1985 and had worn a corneal gas permeable lens successfully recently got a blepharoplasty which inhibited his ability to wear his corneal GP lens without falling out.

A 50 year old transcontinental airline pilot reported to the office with a chief complaint of not being able to function with his 2 year old corneal gas permeable lenses after receiving a bilateral blepharoplasty. The blepharoplasty was conducted due to visually significant age related dermatochalasis without complication however resulted in the inability to where is corneal gas permeable lenses. Spectacle lenses would have been the best option for him however he had visually significant keratoconus OD and was status post PKP in his left eye which was best correctable to 20/100 with spectacle lenses. Given this individuals profession, scleral contact lenses were the best option for him. He was fit in a pair of 15.8mm diameter Custom Stable Elite scleral contact lenses which corrected him to 20/20 ou and allowed him to return to work successfully.

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Scleral contact lenses are commonly thought of as a treatment option for corneal irregularities including but not limited to keratoconus, post lasik ectasia, PKP, and trauma. However there does exist an additional group of individuals with lid and lash abnormalities which also stand to benefit from the stability, clarity, and health promoting ocular environment that scleral lenses provide. These lid and lash abnormalities include but are not limited to entropion, ectropion, exposure keratitis, and recurrent trichiasis. In the case presented, corneal gas permeable lenses became intolerable given a recent blepharoplasty. Scleral lenses provided a larger diameter which allowed for the new lens and lid relationship to not be an issue. The scleral lenses also provided superior vision, comfort, and corneal health compared to the previous corneal gas permeable lenses. When faced with lid and lash issues physicians should consider Scleral lenses as a viable option versus surgical options.

POSTER 20

Treatment of Recalcitrant Trichiasis in an Elderly Male with a Scleral Contact Lens

James Deom, O.D.

Recurrent Trichiasis from age related entropion can be a severely debilitating condition. With an aging population and a lack of a standard of care for traditional treatment modalities new and efficacious treatment modalities continue to be of interest. When surgical options are contraindicated, not available, or not desirable scleral contact lens application can act as a protective barrier to the cornea in recurrent trichiasis patients with entropion. In addition to providing a non surgical option for treatment of this condition scleral contact lens application can provide a rehabilitative environment to non healing corneal defects and severe dry eye. In this case presentation scleral lens application was shown to provide a successful non-surgical

treatment for recurrent trichiasis from entropion in an 88 year old male Caucasian.

An 88 year old male presented for recurring, recalcitrant, symptomatic trichiasis of his right eye. The patient was in an assisted living facility and was not interested in a surgical solution and had a difficult time traveling to the office for epilation. The patient was fit with a 15.8 mm Custom Stable Elite lens without complication. The patient was taught how to insert and remove the lens with a dalsey adaptive device and was able to do so reliably daily. The patient was left without irritation from the recurrent trichiasis.

Recurrent and recalcitrant trichiasis present significant public health predicaments. Surgical options have unimpressive success rates and often have negative unintended consequences. In this case the successful application of a scleral contact lens demonstrated a safe, effective, non-surgical treatment option for the avoidance of complications from recurring trichiasis in an elderly male with entropion. This case highlights the utility of scleral lenses in the treatment of patients with lid and lash conditions as opposed to just corneal irregularity and ocular surface conditions.

POSTER 21

Graduate Certificate and MBA in the Business of Eye Care

Todd Peabody, O.D.

Additional Author(s): Neil Pence, O.D.

Indiana University's top rated Kelley School of Business (KSB) and the Indiana University School of Optometry (IUSO) are partnering for a new graduate level certificate and MBA degree with an emphasis in business of eyecare to provide participants with the opportunity to receive professional business training in a condensed timeframe. The online format allows practicing doctors of Optometry, or industry professionals to obtain an executive business

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education while conveniently fitting it into their active, professional lives.

The healthcare industry in the United States is one of the fastest growing and most complex sectors of the economy, representing an unusual combination of for-profit businesses, private nonprofits, and public-sector organizations. While a significant number of ODs and individuals working in the eyecare industry recognize the value of an MBA to their work and careers, the program is the first of its kind to target that training to the business of eyecare. Information specific to the management of optometric practices and groups will all be included. A knowledge of important aspects of healthcare compliance and law, human resource topics of hiring and management of employees, technology and IT security issues will also be covered. The coursework in this program takes advantage of the diverse strengths of KSB and IUSO, and is aimed at preparing students to make savvy market-oriented decisions whatever their role in the eyecare and healthcare sector.

Simply put, obtaining an MBA can be practice changing for eye care professionals. As there are common opportunities and challenges in all businesses, a formal business education enables you to harness and apply advanced business concepts and analytics to make data-driven decisions to get the most out of your career.

POSTER 22

UIW Rosenberg School of Optometry

Jeff Rabin, O.D., Ph.D

Additional Author(s): Diane Farrell, Ph.D

Kristine Benne

Timothy Wingert, O.D.

William Miller, O.D., Ph.D

School of Optometry Vision Science Degree Program is a unique and rigorous program of study leading to undergraduate as well as graduate degrees. The Bachelor of Science in Vision Science includes all basic science coursework typically required for entrance into Professional Optometry Programs supplemented with upper division courses in optics, vision science, neuroscience, as well as ocular anatomy, physiology, pharmacology and nutrition. Moreover, the program includes unique training and clinical experience in patient-based settings. A number of UIW students have successfully completed the BS degree and subsequently entered Optometry Programs with considerable success. There is also a 3+4 option which allows qualified students to complete 3 years in the undergraduate program followed by the Optometry Program with the BS in Vision Science awarded after the first Professional Year. The newly developed Graduate Program in Vision Science offers both Master of Science and Doctor of Philosophy degrees in Vision Science. This unique, innovative program targets early to mid-career Department of Defense (DOD) Optometry officers who are fully-funded to pursue MS or PhD degrees. UIWRSO provides core curriculum and mentorship while partnering with DOD entities to provide thesis and dissertation research opportunities. This unique program provides essential knowledge, skills and abilities for the graduate to make substantive contributions to DOD vision research and development, ultimately enhancing performance, safety, and saving lives.

The University of the Incarnate Word Rosenberg

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POSTER 23

UIW Rosenberg School of Optometry Visual
Neurophysiology Service

Jeff Rabin, O.D., Ph.D

Additional Author(s): James Chapman, O.D.

Timothy Wingert, O.D.

William Miller, O.D., Ph.D

The UIWRSO Visual Neurophysiology Service (VNS) is a unique clinical service directed at detection, diagnosis and monitoring of challenging visual conditions affecting all levels of the visual system including retina, optic nerves, midbrain and cortex. The VNS receives numerous tertiary referrals from ophthalmological retinal specialists thereby substantially reinforcing clinical bonds between our Professions. Capabilities of the VNS include comprehensive visual electro-diagnosis conducted in accord with the International Society for the Clinical Electrophysiology of Vision (www.iscev.org): electro-oculograms to assess RPE and outer retinal function, flash electro-retinograms (ERGs) to detect outer and middle retinal dysfunction under daytime and nighttime conditions, multi-focal ERGs (mfERGs) to detect field-specific cone and cone bipolar dysfunction (e.g., CSR, plaquenil toxicity), pattern ERGs to assess inner retina and optic nerve, as well as flash and pattern visual evoked potentials (VEPs) to assess central visual function at the level of the visual cortex and higher areas relevant to acquired and traumatic brain injury. VNS testing also includes advanced computer-based and letter chart color and contrast sensitivity testing, macular pigment optical density, two-color dark adaptometry, as well as anomaloscope, Lantern, D15/FM 100 Hue, and book tests required for comprehensive occupation-specific color vision testing. This illustrative poster will describe unique capabilities of the UIWRSO VNS exemplified by case presentations and clinical research endeavors.

POSTER 24

Assessing Driving Eligibility in a Visually Impaired
Patient with Usher Syndrome

Robert Chun, O.D.

Driving is a major activity of daily living among low vision patients. The loss of driving privileges for patients may have a major psychological impact on their well-being. It is often difficult for optometrists to decide whether some borderline patients with vision impairments should be eligible to drive. We present a case involving a driving assessment that was completed on a young Usher patient with noted constricted visual fields and central vision loss. Objective findings on the initial evaluation prompted further investigations to assess driving performance.

An 18 year-old Caucasian female with Type II Usher Syndrome presented for a low vision evaluation and driving assessment. She had recently failed her vision screening for driver's license renewal. Her medical history included profound hearing loss improved with cochlear implants. Vision was correctable to 10/25 in each eye with a myopic correction. She felt that her central, peripheral, and night-vision had all worsened in the last year but was still very motivated to maintain her driving privileges. Despite evidence of marked nasal and superior constriction on each eye with Goldmann visual field testing, the patient demonstrated a visual field greater than 140 degrees OU. Contrast sensitivity was mildly impaired with Mars Perceptrix testing. Based on the patient's progressive condition and indicated visual field deficits, an additional driving assessment was completed with an occupational therapist and certified driving rehabilitation specialist. Results indicated some minor concerns but showed overall satisfactory performance behind the wheel when investigating the patient's physical, cognitive, and visual abilities. Daytime driving was authorized for 1 year only with

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mandatory follow-up for re-evaluation. Proper counseling was given to set appropriate expectations for the potential of future ineligibility. A 3x ocutech bioptic was introduced to the patient as a future option for spotting.

This case illustrates the challenge that clinicians often face when deciding which visually impaired patients are safe to drive. The variable driving laws in the U.S and vague driving cutoffs set cause confusion when assessing patients with borderline visual function. Driving rehabilitation assessments completed by occupational therapists reveal valuable objective measures depicting actual performance behind the wheel by patients.

POSTER 25

A Hint of Tint: Exploring Glare Control Methods in the Context of Aniridia

Micaela Gobeille

Additional Author(s): Nicole Ross, O.D.

Aniridia is a rare congenital condition caused by a PAX6 mutation. It is clinically observable as iris hypoplasia or absence with foveal hypoplasia, and often nystagmus, congenital cataract, corneal opacity, and glaucoma. These contribute to the decreased visual function experienced by patients who have aniridia. Since decreased vision is common even after surgical intervention, low vision rehabilitation plays an important role in management of patients with aniridia.

A 25 year old male presented to the New England Eye On-Sight Mobile Clinic in July 2015 for a low vision evaluation, with a history of visual impairment secondary to aniridia with congenital glaucoma and microcornea. He reported difficulty with distance spot reading and maintaining a comfortable posture for near reading tasks. He also reported significant glare problems, despite the use of dark tinted spectacle lenses. He had previously undergone cataract extraction, and examination

revealed that fields were moderately constricted 360 degrees, horizontal nystagmus was present, and corneas were clear. A monocular telescope addressed distance spotting issues, and an adjustable monitor arm was recommended for comfortable computer use. Gray polarized filters were inadequate for glare complaints, so commercially available tinted contact lenses were considered. Lack of insurance coverage and high out of pocket costs necessitated a creative approach. Softchrome, an in-office tint system, was used on lenses acquired through CooperVision's "Adopt-a-Patient" program. Proper lens fit, tint, and pupil diameter were determined in order to make lenses both cosmetically and functionally acceptable. Upon follow up, the patient was successfully fit with a bioptic telescope for classroom use.

While acuity is an important consideration in low vision patient management, a focus on quality of life is also critical in meeting visual needs. Methods may include distance and near magnification and glare control, but patient-specific factors that impact feasibility should be considered. When typical glare control methods such as polarized filters do not meet patient needs, tinted contact lenses can provide an effective alternative. In this case, we review the development of a low vision rehabilitation plan, indications and parameters of tinted contact lens use, and the determination of appropriate magnification devices.

POSTER 26

Breaking Barriers: Biopic Telescope Success in a Patient with Dominant Optic Atrophy

Sulman Hans

Additional Author(s): Stephanie Schmiedecke, O.D.
Nancy Amir, O.D.

Dominant optic atrophy (DOA), a genetic condition that exhibits an autosomal dominant inheritance pattern, has no predilection for gender

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or race. While various chromosomes can be affected, an estimated 60-80% of all cases are due to a mutation of the OPA1 gene located on chromosome 3q28-29. Pathologic changes typically include bilateral atrophy of the optic nerves due to the degeneration of retinal ganglion cells. Temporal or diffuse pallor of the optic nerves is often observed during fundus examination and individuals can experience a range of possible symptoms such as reduced visual acuity (varying from mild to legal blindness), central or paracentral visual field defects, and blue-yellow or generalized color vision defects. The onset is typically during early childhood and the condition is often diagnosed in the first decade of life when individuals reach school-age.

A 37-year-old Hispanic male oil field worker presented to the clinic with constant, blurry vision at distance and near in both eyes since childhood. Entering acuities were 10/60 OD, and 10/60-1 OS. A trial frame refraction showed no improvement. Dilated fundus exam revealed temporal pallor of both optic discs. The patient was evaluated with a 4X Ocutech bioptic telescope that enhanced his distance vision to 20/20 OS to meet his goal of driving. Initially, he was ecstatic that he could see 20/20, but when he realized he would have to wear a telescope to drive, he became very agitated and resistant. With education, multiple visits and counseling, he reached acceptance.

Our patient's initial resistance to treatment since he felt he performed complicated functional tasks such as driving effectively, despite a significant reduction in visual acuity, made it challenging to manage and treat his vision loss. It was also interesting to see how important the patient's history was in trying to determine the etiology of his condition. This case emphasizes the importance of knowing legal vision requirements and coordinating care with agencies that provide assistance for individuals with low vision. It also highlights the psychological counseling that goes into diagnosing and managing low vision patients who initially may be resistant and fearful of rehabilitation.

POSTER 27

Low Vision Care of a Patient Affected by Donnai-Barrow/Facio-oculo-acoustico-renal Syndrome

Rebecca Deffler

Additional Authors: Richard Chin

Nicole Ross, O.D.

Donnai-Barrow (DB) and facio-oculo-acoustico-renal syndromes (FOAR) result from mutations in the gene low-density lipoprotein receptor-related protein 2 (LRP2, chromosome 2q24-q31), which encodes the protein megalin. The mechanism by which LRP2 mutations cause clinical findings in DB/FOAR is unknown; however, megalin has numerous roles in endocytosis and signaling pathways, suggesting the mechanism behind the wide range of malformations seen in affected patients. Known findings in DB/FOAR patients include sensorineural hearing loss, high myopia, proteinuria, and developmental delay. As of January 2009, reports of 27 individuals with DB/FOAR syndromes from 15 families have been published. These publications, in addition to this abstract, have informed our understanding of the prognosis for this condition, which currently remains unclear.

A 5-year-old Caucasian female presented for low vision evaluation. Ocular history was notable for optic atrophy of questionable progression, nystagmus, cortical visual impairment, hyperopia, and orthophoria status-post strabismus surgery for left esotropia with possible strabismic amblyopia. Progressive hearing loss and developmental delay were also noted. The diagnosis of DB/FOAR was later confirmed via genetic testing, revealing two LRP2 mutations, consistent with DB/FOAR syndromes. Left eye visual acuity continued to be reduced compared to right eye acuity and patching therapy was re-initiated. In the setting of cortical vision impairment, optic atrophy, and nystagmus it remains unclear if patching will improve vision, and monocular acuity

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progression is still being monitored. Given the complex visual diagnosis, assessments by a qualified Teacher of the Visually Impaired/Orientation and Mobility Specialist are recommended. These should include: Learning Media Assessment to determine the most appropriate learning and literacy media, Functional Vision Assessment to document functional vision in everyday life, and an Orientation and Mobility Assessment to document orientation skills and ability to safely navigate through space.

This case reviews the clinical findings in a case of DB/FOAR and low vision instructional strategies in a child, in the setting of an unknown prognosis for vision and hearing impairment. Collaboration with other professionals and recommendation for an education plan and literacy are reviewed.

POSTER 28

An Exploratory Study of Rehabilitation with the Telescope Implant: A Retrospective Case Series

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In a retrospective study of advanced-stage AMD patients implanted in one eye with a miniature telescope (CentraSight, VisionCare), we assessed the impact of the implant on best corrected visual acuity, the degree to which patient goals were achieved, and what key optometric and occupational therapy rehabilitation strategies were needed to maximize success.

Eleven patients ranging in age from 76 to 90 were implanted from January 2013 to October 2015. Each patient was screened for visual function and tested with an external telescope simulator. All were identified with acuities between 20/160 and 20/800 and expressed functional goals that were realistic for the implant. For all patients, visual function was assessed regularly, and specific rehabilitation strategies were initiated post-implantation.

The pre-implant best corrected visual acuities

ranged from 20/160 to 20/400 and post-implant best corrected acuities ranged from 20/40 to 20/200 with 4 patients (36%) achieving 6 lines or greater improvement (4X) and the mean of all patients achieving a gain of 4.5 lines of acuity. Using the Mann Whitney U test, patients post-implant mean acuity (20/100, 0.7 logMar), was significantly better than pre-implant acuity (20/300, 1.2 logmar), $z = 3.5459$, $p = 0.00038$. All pre-implant goals were assessed throughout rehabilitation and by patient discharge by OT, all patients ($n=11$) achieved at least 2 out of 3 goals with 1 goal either "partially met" or "met with assistance" ($n = 9$) or goals were revised/replaced due to goal complexity ($n=2$). In addition, 5 patients achieved goals with standard implant rehabilitation strategies and 6 patients required rehabilitation adaptations by the rehabilitation team that included additional Problem-Solving (due to decline in cognition, complex visual function, or compliance, $n=3$) or Prolonged Rehabilitation (due to urgent illness/injury; $n=3$).

Eleven patients were successfully implanted and achieved significant visual acuity improvement and reached the majority of their functional goals. The complexity of rehabilitation for this age group requires ongoing team communication and adaptations to rehabilitation strategies to successfully achieve positive outcomes.

POSTER 29

The Role of Age and Visual Factors in Predicting the Driving Patterns of Bioptic Drivers

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Bioptic telescopic spectacles (BTS) allow people with central vision impairment to obtain a driver's license in most U.S. states. Study of the driving

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exposure and habits of these drivers may have relevance in assessing the potential benefits of bioptic driving and for providing context for motor vehicle collision rates of bioptic drivers. The purpose of this study was to determine whether age, driving experience, or visual factors predict the frequency of driving, the number of unique locations visited, or the maximum distance from home that bioptic drivers report.

Ohio bioptic drivers who were patients at the Ohio State University College of Optometry provided an estimation of their yearly miles driven and outlined their destinations and miles traveled during a typical week using a modified version of the Driving Habits Questionnaire. Year of initial licensure, age, visual acuity (logMAR), and contrast sensitivity (Pelli-Robson or Mars) were recorded from patient clinical records. Spearman correlations were used to compare age, vision, and years of licensure with the total number of typical destinations reported, total number of weekly trips, and the furthest distance traveled from home.

73 licensed Ohio BTS drivers were enrolled in the study. Mean (\pm SD) age was 51 ± 16 years. Median binocular logMAR visual acuity was 0.70 (20/100). Median log contrast sensitivity was 1.65 (near normal). Subjects' estimated annual mileage ranged from 100 to 90,000, with a median of 7,000 miles per year. Increasing age (Spearman $\rho = -0.28$, $p = 0.18$), poorer visual acuity ($\rho = -0.25$, $p = 0.03$), and poorer contrast sensitivity ($\rho = 0.42$, $p < 0.001$) were inversely correlated with the farthest distance typically traveled from home, but not with the number of unique destinations or trips during a routine week. Years of licensure was not related to any of the measures of driving exposure.

Older age and poorer vision were associated with reduced distance traveled from home, but not with fewer typical trips or locations visited. These data have implications for the relationships among age, vision, and per-mile motor vehicle collision rate.

POSTER 30

Safety and Efficacy of Latanoprostene Bunod for Lowering of Intraocular Pressure in Open-Angle Glaucoma or Ocular Hypertension

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Latanoprostene bunod (LBN) is a nitric oxide-donating prostaglandin F₂ α analogue in development. We report on the safety and efficacy of LBN ophthalmic solution 0.024% for IOP lowering in patients with open-angle glaucoma (OAG) or ocular hypertension (OHT) across two randomized controlled trials (RCTs).

Safety and efficacy data were pooled from two phase 3, multicenter, parallel-group, non-inferiority studies in which subjects ≥ 18 years of age with OAG or OHT were randomized (2:1) to double-masked treatment with either LBN 0.024% once daily in the evening or timolol maleate 0.5% twice daily for 3 months. Differences between treatments in IOP lowering were evaluated at 9 time points (8 am, 12 pm, and 4 pm at 2 weeks, 6 weeks, and 3 months post-randomization), and proportions of subjects with IOP ≤ 18 mm Hg or IOP reduction $\geq 25\%$ were also compared. Adverse events (AEs) were recorded throughout each study.

831 subjects were randomized across the two studies and 774 (LBN 0.024%, $n=523$; timolol 0.5%, $n=251$) completed the 3 months of double-masked treatment. The reduction in IOP among LBN-treated subjects ranged from 7.5 mm Hg to 9.1 mm Hg, with significantly greater reductions compared to timolol-treated subjects at each timepoint ($P < 0.001$ for all, analysis of covariance). Of LBN- and timolol-treated subjects, 20.2% vs. 11.2% ($P=0.001$) had their IOP reduced $\geq 25\%$ from baseline and 32.9% vs. 19.0%, ($P < 0.001$) had their IOP reduced to ≤ 18 mm Hg over all time points. Ocular AEs were infrequent, although slightly higher with LBN, and mostly mild-moderate in severity. There were no safety concerns based on

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ocular signs, visual acuity, or vital signs.

In this pooled analysis, LBN 0.024% once daily in the evening was effective in reducing IOP in subjects with OAG or OHT with significantly greater IOP-lowering activity compared to timolol 0.5% twice daily. There were no significant safety findings during the 3 months of double-masked treatment.

POSTER 31

SD-OCT and Microperimetry Correlates in Drusen and Drusen-like Lesions

Daniel Epshtein, O.D.

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The maia™ (Macular Integrity Assessment) microperimeter unites perimetry with scanning laser ophthalmoscopy (SLO) and eye tracking technology. The Expert Test enables monitoring of visual threshold at precisely selected fundus loci. This technology enables investigation of the impact of individual drusen on visual sensitivity. The correlation of this functional information with SD-OCT (spectral domain optical coherence tomography) structural analysis provides insight into the relationship between visual sensitivity and localized retinal integrity.

A case series demonstrates variable sensitivity of drusen on maia™. One case demonstrates a patient in whom drusen show differing impacts on visual sensitivity. SDOCT identifies concordant impact of these drusen on the photoreceptor integrity line (PIL): Reduced integrity corresponds with reduced visual sensitivity. Another case shows a patient with dry age-related macular degeneration (AMD) and multiple drusen in whom maia™ identifies a severely reduced threshold over one particular "white spot." SD-OCT reveals this locus to be a finite area of geographic atrophy of the RPE amidst a sea of drusen. Additional cases confirm these relationships between visual sensitivity and retinal integrity.

There is a correlation between the integrity of

the PIL above drusen and visual threshold as measured by microperimetry. Microperimetry enables clinicians to identify visual sensitivity at individual drusen or drusen-like lesions, and to monitor visual thresholds over time.

POSTER 32

Torpedo Maculopathy & Focal Choroidal Excavation: Two Rare Entities Presenting Concomitantly

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Torpedo maculopathy is a rare, congenital nevus of the RPE characterized by the appearance of a "torpedo-shaped" lesion located temporal to the fovea. Although most lesions are hypopigmented, variable pigmentation has been described. While diagnosis is made funduscopically, imaging with optical coherence tomography (SDOCT) has provided some insight, revealing an outer retinal cleft with associated retinal and RPE thinning. Focal Choroidal Excavation (FCE) is another rare maculopathy representing as a discrete excavation of the choroid subfoveally. Clinically the lesions may be described as foveal RPE mottling or a yellow deposit. In contrast to torpedo maculopathy, this condition is exclusively diagnosed via OCT, revealing a subfoveal excavated RPE/choroid.

A 60-year-old Caucasian female presented with a history of longstanding distortion and paracentral scotoma OD, previously attributed to a chorioretinal scar. She had a positive family history of AMD. Best-corrected visual acuity was 20/20 OD, OS. Dilated fundus exam revealed a torpedo-shaped lesion OD with a hypopigmented head pointing towards the temporal fovea and a hyperpigmented tail-end. OCT imaging of the macula OD revealed a subretinal cleft space with underlying thinning of the RPE, increased choroidal reflectivity, as well as RPE and choroidal

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excavation. The patient was diagnosed with concomitant torpedo maculopathy and focal choroidal excavation OD. She will continue home monitoring with Amsler grid and will return in 6 months for follow up.

OCT imaging has been instrumental in developing a deeper understanding of many maculopathies and allowing for accurate diagnosis of macular conditions. Although OCT has provided some insight on these lesions, the etiology remains unclear. Alteration or malformation within the choroid has been speculated in both conditions. Perhaps this may contribute to the concomitant presentation in our case.

POSTER 33

Idiopathic Intracranial Hypertension Masquerading as Malignant Hypertension

Naida Jakirlic, O.D.

Malignant hypertension typically presents with bilateral optic nerve swelling in the presence of acutely elevated blood pressure, typically above 180/120. It is an extremely important differential to consider in the setting of optic nerve swelling due to a high potential of significant morbidity and mortality. However, other causes of bilateral disc swelling must be considered and ruled out if the optic disc edema persists over several months, particularly in the presence of improving blood pressure control.

A 53 year old African American female presented with a longstanding complaint of bilateral distance and near vision blur. Her ocular history was unremarkable and the patient stated that she had never received an eye exam before. Her medical history was positive for type 2 diabetes, hypertension, hypercholesterolemia, COPD, and lupus. The patient reported adequate compliance with her prescribed medications, including baby aspirin, baclofen, benadryl, clonidine, combivent,

flovent, glyburide, hydrochlorothiazide, lisinopril, loratadine, metformin, and simvastatin. She also reported smoking 1 pack of cigarettes daily for the past 30 years. Best corrected VA was 20/60 OD and 20/30 OS. Pupils were round and reactive to light with negative APD. Extraocular motilities were full OU. Anterior segment examination was unremarkable OU. Intraocular pressures were 24 mmHg OU. DFE revealed grade 2 optic disc swelling OD and OS. Maculae were flat and clear OU, there was no evidence of diabetic retinopathy OU, and the vasculature showed mild tortuosity OU. Peripheral retinal exam was unremarkable OU. Blood pressure was 184/110. The patient was diagnosed with malignant hypertension and advised that she would be transported to the ER for acute management. However, she refused to be taken to the ER, and instead opted to drive herself to her PCP. A direct line of communication was established with the patient's PCP to coordinate appropriate care, and the patient was scheduled for follow-up in 2 weeks. Over the period of one month, the patient's blood pressure improved to 163/83, but the bilateral disc edema and VA remained unchanged OU. The patient was then lost to follow up for 6 months. Upon return to clinic, her visual acuities were stable at 20/60 OD and 20/30 OS and blood pressure was measured to be 158/80. Dilated fundus exam revealed grade 2 optic disc edema OU. A complete workup with bloodwork and MRI imaging of the brain and orbits was ordered to rule out a systemic infectious and inflammatory etiology, as well as a possible space occupying lesion. Upon completion of the workup, it was determined that the patient suffered from idiopathic intracranial hypertension which initially masqueraded as malignant hypertension.

Malignant hypertension is defined as bilateral optic nerve edema in the setting of acutely elevated blood pressure, which is usually 180/120 or higher. It is an emergent condition that must be stabilized promptly as it carries high potential for morbidity and mortality. Once the blood pressure improves, the bilateral disc edema should start to improve and eventually resolve over time. In the event of

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persistent disc edema with improved medical management of blood pressure, there should be high suspicion for an alternative etiology which must be ruled out with appropriate bloodwork and neuroimaging.

POSTER 34

Pituitary Apoplexy: optometric management of a medical emergency and its recalcitrant ocular sequelae

Naida Jakirlic, O.D.

Pituitary apoplexy is an acute clinical syndrome caused by a hemorrhage or infarction of the pituitary gland. 60-90% of patient who present with the condition have an existing macroadenoma. The symptoms and signs are caused by a sudden enlargement of the pituitary gland and include severe headache, ophthalmoplegia, and altered mental status. Emergency neurosurgical intervention is necessary to avoid significant morbidity and mortality. However, most patients will usually have a permanent deficit which may include EOM disturbances, diplopia, optic atrophy, or visual field loss, requiring careful and long-term optometric care.

A 49 year old white female was referred to the eye clinic by the neurology department for a consult due to persistent diplopia. Her ocular and medical health history were unremarkable prior to admission to the hospital 2 days prior to her optometry referral. The patient had presented to the ER complaining of sudden onset diplopia, severe headache, altered mental status, and vomiting. Emergency CT revealed an enlarged pituitary gland with hemorrhage, which was confirmed with an emergency MRI. The patient underwent neurosurgery to evacuate the hemorrhage and decompress the tumor. After the emergency surgery, her symptoms of headache, vomiting, and altered mental status resolved. However, she still complained of persistent

horizontal diplopia and slight visual blur in both eyes. On the initial examination, the best corrected VA was 20/30 OD and 20/40 OS. EOMs revealed absent supraduction OU, as well as absent adduction OS. The left eye was essentially in a "down-and-out" position with minimal motility. Pupillary function revealed a sluggish but reactive pupil in the right eye, and a mid-dilated non-reactive pupil in the left eye. There was no APD present. Confrontation fields were full in both eyes. Anterior segment examination was unremarkable OU. Posterior segment examination through dilated pupils was unremarkable OU. Optic nerves were found to be healthy, non-edematous, and well-perfused OU. Automated visual fields were full OU. The patient was diagnosed with a left third nerve palsy as a result of either the acute pituitary syndrome, the neurosurgical intervention, or most likely a combination of both. She was followed closely over the course of one year, but improvement of her eye movements was minimal. The patient was prescribed Fresnel prisms to alleviate her diplopia, and was followed closely in tandem with neurology to monitor for the development of any new neurologic symptoms. Fortunately, the patient remained stable in terms of her neurologic status and did not develop a re-growth of her pituitary tumor. However, the left third nerve palsy remained permanent and stable, necessitating prismatic correction to alleviate the patient's diplopia.

Although optometrists may not typically be the first providers to evaluate a patient with an acute presentation of pituitary apoplexy, they are usually involved very early on in the post-operative care and long-term management of these patients due to significant effect of the condition on the patient's visual and oculomotor function. Such patients require close monitoring by optometry for the development of any new symptoms, as well as management of recalcitrant diplopia that can often persist either as a result of the acute syndrome, the surgical intervention, or both. Optometrists therefore play a critical role in the long-term management of patients with pituitary apoplexy.

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POSTER 35

Glaucoma Tube Shunt Implantation: Why location matters

Stephanie Quesada Moore

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Emily Korszen

Anterior iridio-corneal tube shunt implantation is the conventional treatment option for lowering intraocular pressure (IOP) in eyes with uncontrolled glaucoma. Because anterior chamber shunts avoid the need for vitrectomy, they are the primary surgical option when deciding to insert 9.7% to 20.75% of patients develop corneal decompensation following such procedure. Studies indicate that posterior tube implantation in the ciliary sulcus can be an effective treatment option for patients who develop corneal decompensation following the use of conventional shunt implantation. We report a case of a patient who underwent a secondary surgery to replace the anterior shunt tube implantation for a posterior shunt implantation following severe development of corneal decompensation.

A 58-year Hispanic female presented for evaluation of decreased vision OS x 2 years. Ocular history revealed Glaucoma OU, Cataract OD and Pseudophakia OS. Ocular surgical history was positive for trabeculectomy OD, anterior chamber tube implantation OS, phacoemulsification OS and posterior chamber tube implantation OS. BVA was 20/25 OD and 20/100 OS. Pupils were irregularly shaped OU, with 2+ reaction to light OD, and no reaction to light OS. Biomicroscopy revealed a superior bleb with negative Seidel OD. Biomicroscopy OS revealed a superior filtering bleb, corneal graft with sutures, microcystic edema, posterior chamber intraocular lens, and a posterior chamber shunt OS. The patient was diagnosed with Primary Open Angle Glaucoma OU following trabeculectomy OD, cornea decompensation secondary to anterior shunt implantation OS, and

s/p corneal transplant, s/p Vitrectomy and a properly placed posterior chamber shunt OS.

Anterior placement of a shunt is more common because it avoids the need for vitrectomy. However, there are a number of risk factors including corneal decompensation, especially in patients with shallow anterior chambers. Posterior implantation within the ciliary sulcus serves as a viable option for patients who develop corneal decompensation following anterior shunt placement or for those who are at risk for developing corneal decompensation. As primary eye care providers, it is important to know the various treatment options and adverse effects associated with each procedure.

POSTER 36

Acute Corneal Hydrops Secondary to Re-emergence of Keratoconus after Longstanding Penetrating Keratoplasty

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Additional Author: Pat Segu, O.D.

The re-emergence of keratoconus after a longstanding penetrating keratoplasty is a rare manifestation with limited research to suggest as to why it occurs. Theories such as eye rubbing, hard contact lens wear and atopy have been proposed as possible culprits whereas a more substantial theory suggests a migration of the diseased host's corneal cells to the donor cornea. Acute corneal hydrops is a secondary manifestation of corneal ectatic disorders such as keratoconus and is comprised of sudden vision loss and pain. Recovery, on average, occurs within 2-4 months. There are a handful of cases which discuss the reoccurrence of keratoconus and even fewer reported cases of acute hydrops manifesting post-operatively within the graft.

A 73 year old Caucasian female presented to the clinic with a chief complaint of sudden loss of vision characterized as hazy vision with an onset of one day prior. Associated symptoms included intense

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photophobia, tearing and redness. This was the first episode and the patient was a scleral contact lens wearer for which she had discontinued wear two days prior. Past ocular history was positive for longstanding keratoconus with a worse presentation in the right eye (OD) than the left (OS), full penetrating keratoplasty with a slow re-emergence of keratoconus within the graft OD, Fuch's dystrophy OD and pseudophakia in both eyes (OU). Past medical history was positive for diabetes, hypertension, cardiovascular disease and dyslipidemia which was well controlled with diet and good compliance of medications. Upon examination the best corrected visual acuities (BCVA) were 20/400 OD, 20/30 OS with normal preliminary testing while slit lamp revealed corneal hydrops with a descemet's membrane detachment within the graft and significantly elevated pachymetry measurements OD. Medical therapy was initiated and the patient saw a remarkable recovery with a complete resolution of edema and descemet's detachment over the course of three weeks with a BCVA of 20/50-1 OD.

The re-emergence of keratoconus with secondary manifestations such as acute corneal hydrops after longstanding penetrating keratoplasty manifests via an insidious process which has been more recently proposed to occur due to migration of the host's cells to the donor cornea.

POSTER 37

Repeat Corneal Insult Secondary to Late Neurotrophic Keratopathy

Erica Ashley Lucier

Neurotrophic keratopathy stems from the loss of corneal epithelial cell integrity secondary to lack of neuronal input. Weak and desensitized epithelium becomes prone to corneal insult. Ulcers may manifest in a mildly asymptomatic patient, which can progress and lead to detrimental vision loss.

A 61 y.o. Caucasian female presented for a comprehensive eye exam with complaints of mild, painless, progressive blur in the left eye for two weeks. Medical history was remarkable for removal of a benign meningioma, which resulted in traumatic left sided neurological deficits involving the trigeminal and facial nerves. Ocular history was significant for bilateral Fuchs, Cogan's dystrophy, and PCIOL s/p YAG capsulotomy. Anterior segment O.S. revealed a superior central ulcer, diffuse keratitis, and lagophthalmos. Diagnosis of an infectious corneal ulcer O.S. along with exposure keratopathy secondary to neurotrophic keratopathy was made. Ciprofloxacin q1h O.S. and Erythromycin ung qhs O.U. was initiated. Several follow up visits rendered modifications to medication dosing, punctal plug insertion, and addition of steroid drops to reduce scarring. After complete healing, the epithelial defect re-emerged and an amniotic membrane allograft was inserted. The defect resolved and improved visual acuity was achieved with a scleral lens. After consulting a corneal specialist, 20% autologous serum eye drops were recommended q2h while awake O.S. to improve corneal integrity.

Neurotrophic keratopathy can lead to vision threatening corneal insult with delayed healing. Palliative corneal lubrication, moisture shields, punctal plugs, and medicinal therapy can be considered in cases of severe keratitis on a neurotrophic cornea. Amniotic membrane grafts should be considered in cases of relentless corneal insult. Scleral lenses can work well to improve vision and maintain corneal moisture after healing. In addition, implementing autologous serum eye drops will help re-build and maintain integrity of a weak and susceptible neurotrophic cornea.

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POSTER 38

Monitoring for Hydroxychloroquine-induced Macular Toxicity in a Patient with Preexisting Maculopathy

Ruth Hyatt, O.D.

Additional Author: Saad Shaikh, M.D.

Hydroxychloroquine (HCQ) may be contraindicated when maculopathy exists because of a possible predisposition to developing toxicity. Furthermore, early detection of toxicity may not be possible when overlying maculopathy exists. In some patients, however, HCQ avoidance is unreasonable. This case outlines differentiating between retinal changes due to AMD versus HCQ toxicity.

A 68-year old veteran was referred by rheumatology before initiating HCQ for rheumatoid arthritis. She reported minimal symptom relief with all disease-modifying antirheumatic drugs (DMARDs). Ocular history was significant for bilateral AMD. Best corrected vision measured 20/25 OD, 20/20 OS. Preliminary testing, anterior segment evaluation, and IOP were normal. Posterior segment evaluation revealed mild cataracts. C/D was 0.30 OD, 0.25 OS. Fine, hard macular drusen were present OU, confirmed by OCT. Baseline HVF 10-2 showed symmetrical edge defects consistent with +8.00 trial lens artifact. A serious discussion ensued regarding ocular risks of HCQ in the context of preexisting AMD. Together with her rheumatologist, the patient elected to begin taking HCQ, and was motivated to be actively involved in her own care. Six months after beginning HCQ, she developed exudative AMD OD and was successfully treated with 3 series of anti-VEGF injections. On annual examination, visual acuity, preliminary testing, anterior segment evaluation, and intraocular pressure remained stable. Fine, hard drusen were present OU. The left macula had an isolated dot hemorrhage. OCT macula, fundus autofluorescence, color fundus photos, and

multifocal ERG were more consistent with AMD than HCQ toxicity, although contributions from HCQ could not be entirely ruled out.

If patients are motivated and understand the risks, HCQ therapy may be a viable option in patients with preexisting maculopathy. The challenge in this patient was to distinguish macular toxicity from non-exudative and exudative AMD. Specialized testing assisted in determining which clinical entity was responsible for macular changes so that management could be appropriately directed. In this instance, macular changes were most likely from AMD progression. The patient will continue HCQ and be closely monitored so that if macular toxicity develops it can be detected promptly.

POSTER 39

Utilization of Serial Pachymetry to Aid in Management of HSV Disciform Keratitis with an Anterior Uveitis

Rachel Leland, O.D.

Disciform keratitis is a non-necrotizing form of HSV stromal keratitis that presents with stromal edema. If left untreated, edema can progress leaving a significant reduction in visual acuity and an opacified cornea. Corneal pachymetry is generally thought of as an unchanged measurement taken once to evaluate corneal thickness. It is rarely used as a serial method to monitor the disease progression of stromal edema.

A 50 year old female presented with complaints of pain, foreign body sensation, watering, and light sensitivity in the right eye. Her best corrected visual acuity was 20/80 OD, PHNI, and 20/30 OS. The remaining entrance testing was unremarkable. Upon slit lamp examination she presented with areas of stromal edema without epithelial defect and granulomatous keratic precipitates on the posterior endothelium of the right eye. Intraocular pressures measured 23 mmHg OD and 21 mmHg OS. With the

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Anterior Segment 5 Line Raster on an OCT the corneal thickness was measured to show the disease status of the stromal edema at presentation. Pachymetry at presentation read 636 microns OD and 552 microns OS. The patient was prescribed 400 mg of Acyclovir 5 times daily for 1 week for the treatment of HSV disciform keratitis along with Durezol QID OD for 1 week for the associated uveitis. Following up one week later, the patient was free of symptoms. Her best corrected visual acuity was 20/30 OD and 20/30 OS. Slit lamp examination revealed 70% improvement of stromal appearance and pigmentation of the keratic precipitates. Intraocular pressure remained unchanged. Pachymetry at one week follow-up measured 552 microns OD and 548 microns OS showing resolution of the stromal edema in the right eye. Treatment was adjusted to Acyclovir TID for 2 weeks and Durezol BID OD for 1 week, then QD OD for 1 week.

This case stresses the clinical management of HSV disciform keratitis with an underlying anterior uveitis and the utilization of the common technique of corneal pachymetry to track the status of the disease. Images include OCT Anterior Segment 5 Line Raster marking changes in central corneal thickness.

POSTER 40

Monitoring Patient with Diabetic Retinopathy with AOSLO (Adaptive Optics Scanning Laser Ophthalmoscope) Imaging

Todd Peabody, O.D.

Additional Authors: Zubin Jiwani

Stephen Burns, Ph.D

According to the CDC 29.1 million people in the U.S. have diabetes, which is about 9.3% of total population. This number is expected to continue rising in the coming years and Optometrists will need to manage increasing numbers of cases of diabetes and diabetic retinopathy in the future as

this population grows and ages. Hence, it becomes important to have improved devices and imaging technologies available to help the practitioners monitor this sight threatening condition.

A 35 year old Caucasian male, with uncontrolled Insulin dependent Diabetes was monitored for his diabetic retinopathy. He was diagnosed with severe non-proliferative diabetic retinopathy OU in November 2011. OCT imaging, fundus pictures and AOSLO imaging were performed at that time and the patient was asked to return to the clinic in 6 months. At this visit, AOSLO imaging showed numerous areas of vascular remodeling at the capillary level and areas of local nonperfusion of the retina. The patient finally returned to our clinic in September 2015 for a comprehensive exam. History revealed that his diabetes had remained uncontrolled despite compliance with medications. His VAs were recorded to be OD: 20/20-1 OS: 20/20-2, PERRLA (-) APD, EOMs: full-no pain OU. Amsler grid was normal OD and a paracentral scotoma. External ocular exam was normal OU. Ophthalmoscopic examination revealed OD: Very severe diabetic retinopathy with No CSME and OS: Proliferative Diabetic retinopathy with CSME. At this visit, AOSLO showed that these areas had changed markedly with increased areas of capillary non-perfusion and edema.

To monitor diabetic retinopathy, OCT and ophthalmoscopic examination are considered the standard. Development of new imaging technology has opened new horizons in eye-care and has made it possible to monitor these patients more closely and identify microvascular retinal changes even earlier. AOSLO in particular has the potential to be a useful tool in diagnosis and management of diabetic retinopathy due to its higher resolution and ability to identify subtle changes in the retina and its microvasculature.

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POSTER 41

Clinical Management of Acute Retinal Pigment Epitheliitis

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Additional Author: Olivia Jahnke

Acute Retinal Pigment Epitheliitis (ARPE) is an acute, self-limiting condition that typically presents in young, healthy adults. It is characterized by sudden onset of visual symptoms and a localized disruption in the retinal layers near the macula.

A 20-year-old female presented with unilateral visual disturbances in the right eye. The patient described blurring of vision inferior and temporally to central vision and photopsias. No history of previous illness or viral prodrome was reported. The patient had previously experienced this phenomenon, which resolved after 4 months. Fundoscopic examination revealed a oval pink/grey lesion, superior nasal to the macula, 1/2 DD in size. The location of the lesion was confirmed using the Watzke-Allen technique. The remaining posterior pole and periphery were WNL. Visual field testing was normal. OCT imaging improved visibility of the lesion and revealed inflammation in the retinal pigment epithelium. Over the following three months, the lesion gradually regressed on OCT and the patient experienced decreased symptomology.

Because ARPE is self limiting, monitoring with ophthalmoscopic examination and spectral domain OCT is sufficient. The key to management is a timely and accurate diagnosis so as to prevent unnecessary treatment.

POSTER 42

Pediculus Humanis Capitis- A Case of Nit-Picking

Angela Howell, O.D.

Additional Author: Tyler Lefeber

Pediculus humanis capitis is commonly known to infest head hair and less commonly known to infest the eyebrows and eyelashes. Seen in some populations with rates up to 52% and as far back as 2000 years ago, this insect is neither new nor going away. Clinically, patients present with redness and itching that may worsen upon taking a hot shower. Upon slit lamp examination, the following can be discerned; fecal deposits on the base of the lashes, nits on the lashes, and live animals. Care must be taken to identify which type of louse has infested the patient. *Pthirus pubis* (pubic lice) can also infest the eyelashes, which changes patient education and case management.

A 14 year old white male presented to the clinic with vision insurance complaining of distance blur in both eyes. He reported vision out of current prescription had progressively worsened over the past couple of months with no other complaints. Previous Ocular and medical history was unremarkable except for glasses. Best corrected visual acuities were 20/15 OD, OS, OU and entrance exams were normal with no APD present. SLE revealed mild papillae on palpebral conjunctiva OU with live lice, nits, and fecal matter found at the base of the lashes and the lashes themselves OU. Photos were taken before cleaning of the lashes was initiated with forceps, followed by a lid scrub with Moxeza. Bacitracin BID and Moxeza QID were prescribed and patient was educated to wash all clothing and bedding. It was also recommended that anyone in close contact be evaluated. At 1 week the patient reported noncompliance with the bacitracin ointment due to insurance complications but reported using the Moxeza as prescribed. Despite only 1 of the medications being used, over 90% of this infestation was eradicated.

Presentation of lice in the lashes requires removal and treatment of the infestation as well as determination of louse type. In this particular patient population, extra care was taken to ensure that it was not crab louse. A sexually transmitted louse found present in a minor child could be indicative of

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sexual child abuse.

POSTER 43

The Acute Phase of West Nile Chorioretinitis in a Diabetic Patient

Nathan Osterman, O.D.

Additional Author: Arlene Gold, O.D.

West Nile Virus (WNV) is commonly transmitted by *Culex* mosquitoes. Approximately 70-80% of infections are subclinical. Less than 1% of infected individuals develop severe neuroinvasive disease such as meningitis or encephalitis. WNV with neurological involvement is confirmed by lumbar puncture with a positive enzyme-linked immunosorbent assay (ELISA) to detect WNV-specific IgM in the cerebrospinal fluid. Patients over the age of 60 with comorbidities such as cancer, diabetes and hypertension are at greater risk of death. WNV ocular manifestations can include chorioretinitis, anterior uveitis, retinal vasculitis and optic neuritis. The ocular findings of multifocal chorioretinitis along with meningoencephalitis/malaise are suggestive indicators of a possible WNV infection. This should prompt a comprehensive work-up including a lumbar puncture. Differential diagnoses of these ocular manifestations are syphilis, tuberculosis, sarcoidosis and histoplasmosis. Currently, there are no treatments for WNV, other than supportive therapy.

An established 67-year-old diabetic male presented to the clinic with acute blurred vision and an increased awareness of floaters, in his right eye. A week prior, the patient had been diagnosed with WNV meningitis via lumbar puncture with a positive ELISA for WNV-specific IgM. His visual acuity was 20/50 in both eyes. Dilated examination revealed a unilateral vitritis in the right eye and bilateral multiple, flat, whitish, mid-peripheral, linear "target-like" chorioretinal lesions. Additionally, the patient had clinically significant macular edema in the right

eye and severe nonproliferative diabetic retinopathy in both eyes. The diagnosis of acute WNV chorioretinitis was confirmed by a retina specialist. The patient was subsequently treated with bilateral panretinal photocoagulation due to progressive diabetic retinopathy. Follow-up examinations revealed that the inactive chorioretinitis had become indistinguishable from the panretinal photocoagulation scars. Vitreous haze persisted with chronic diabetic macular edema and progressive diabetic retinopathy.

This is an uncommon presentation of a diabetic patient with WNV due to severe neuroinvasive disease and the presence of both active chorioretinitis and vitritis. This case report will highlight pertinent diagnostic imaging findings in a patient with infectious WNV along with the clinical course of ocular WNV.

POSTER 44

Digging Deeper into Dark Without Pressure, A Case of the Missing Photoreceptor Integrity Line (PIL)

Tamara Petrosyan, O.D.

Dark without pressure fundus lesions have been noted in the literature since the 1970s. The details of these seemingly innocuous lesions have been very scarce and limited. Some literature describes dark without pressure as an early finding in nonproliferative sickle cell retinopathy (SCR), however, very little can be found on its pathophysiology. The presence of an intact photoreceptor integrity line (PIL, aka IS/OS junction) on optical coherence tomography (OCT) is present in virtually all healthy eyes. Most dark without pressure lesions are found in the periphery making it difficult to attain an OCT through the lesion. We saw a young, seemingly healthy patient with two dark without pressure lesions in the posterior pole and were able to run an OCT through the lesions.

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A 9 year old African American female presented to our clinic for her first eye exam with a complaint of distance vision blur in both eyes. All other medical, visual and ocular history was normal. Aside from a low level of myopia, the patient's entrance testing and pre-dilation examination were unremarkable. During the dilated fundus examination two dark brown lesions, diagnosed as dark without pressure, were noted three and a half disc diameters superior temporal to the optic nerve of the right eye. The remaining fundus of the right and left eyes was unremarkable. Fundus photos and a 5 line roster was performed on the lesions with a Cirrus HD OCT. The scan showed a missing photoreceptor integrity line (PIL) isolated to the area of the lesions. The remaining retinal layers were intact and a healthy PIL re-appeared in the surrounding retina. The patient was sent to her pediatrician for bloodwork to screen for sickle cell anemia.

It is possible that dark without pressure is a sequel to vascular occlusive events in the area leading to a loss of the photoreceptor integrity line. Because the ocular complications of sickle cell disease may cause significant vision loss and be the initial indication of the disease itself, we, as optometrists, play an important role in the early recognition and prompt referral of these patients.

POSTER 46

Fungal Keratitis: A Crucial Diagnosis

Leanna Olennikov, O.D.
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A 51 year old Latino female presented for a 1 week follow-up post cataract extraction of the right eye with a complaint of light sensitivity and tearing.

Slit lamp exam (SLE) revealed a peripheral corneal epithelial defect 2.0 mm in size with surrounding white blood cells (WBCs). With a

presumed diagnosis of bacterial keratitis, the patient was started on Vigamox Q2H OD and instructed to stay on her post-operative medications: Ilevro QD OD and Durezol QD OD. The following day SLE revealed an ulcer similar in size with improvement of the surrounding WBCs. No changes were made to the patient's drop regimen. Four days later patient returned with symptomatic worsening of light sensitivity. SLE revealed a non-healing 2.0 mm corneal ulcer with surrounding WBCs similar to the previous visit. Due to the non-healing nature of the ulcer, the diagnosis was presumed viral and the patient was started on Zirgan 5 times per day. Patient returned two days later with no improvement in symptoms, no improvement in ulcer size, increase in the surrounding WBCs and an early endothelial plaque. A confocal was ordered with suspicion of fungal keratitis due to early endothelial plaque formation. Results of the confocal indicated the presence of hyphal elements confirming the diagnosis of fungal keratitis. Patient was started on Amphotericin B 0.15% Q2H OD and Fluconazole 100 mg BID po and told to return two days later. SLE on that visit revealed a decrease in ulcer size to ~1.5 mm and reduction in WBC recruitment. Patient continued to improve over the next several weeks with residual stromal scarring remaining and a final BCVA of 20/20 due to the peripheral nature of the ulcer.

Early diagnosis is crucial to resolution as delayed diagnosis can lead to progression of the ulcer with increased risk for corneal perforation and secondary endophthalmitis. Although clinically fungal ulcers tend to have a more feathery appearance, successful early diagnosis is often difficult with SLE alone. Initial culturing of the ulcer and/or spectral endoscopy is essential to timely intervention.

POSTER 47

Hereditary maculopathies and Irvine Gass Syndrome

Philip Winslow, O.D.

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Patients with pre-existing inflammatory ocular conditions, systemic diseases, and previous ocular surgeries are at increased risk for developing Irvine-Gass Syndrome. Although previous history of uveitis or maculopathy, for example, are not complete contraindications for cataract surgery, clinicians should manage patient expectations post operatively with these considerations.

An 83 year old Portuguese female (PF) initially reported to clinic for her 1 week postoperative visit following cataract extraction of her OS. Her best corrected vision at distance was 20/50-1 OD and 20/80 OS without correction, NI with pinhole. PF had a previous ocular history of uncomplicated cataract extraction OD 3 months previous. Her anterior segment on the initial visit was unremarkable and the PCIOL was clear and centered OD/OS. PF's subjective refraction did not result in an improvement in vision, so a macular OCT OD/OS was subsequently performed. The OCT revealed Irvine-Gass Syndrome (IGS), mild ERM, and RPE disruption centrally with vitelliform lesion worse in the left eye than the right. PF was instructed to start a topical NSAID OU QID x 1 week and RTC 1 week. Upon return the CME OD was stable but CME OS worsened and the patient was subsequently referred to the operating surgeon for Avastin injection. PF returned 2 months after receiving 2 Avastin injections OS and visual acuity was 20/30 OD and 20/60+1 OS. A macular OCT OD/OS was repeated and revealed resolution of the CME but showed persistent vitelliform lesions and ERM, OS being more involved. The fundus photography also revealed pathognomonic "egg yolk" appearance of the macula.

PF had undiagnosed adult vitelliform dystrophy that likely increased her probability of developing IGS. 4 months after cataract extraction OS, PF's visual acuity was still worse than before the surgery and she was understandably disgruntled. I believe this case demonstrates the importance of a thorough posterior segment evaluation before cataract surgery. Perhaps a shift in standard of care that includes performing macular OCT during

preoperative visits on all patients is warranted.

POSTER 48

Refractive Surgery: Relative Contraindication in High Risk Glaucoma Suspects

Judy Bavongkhoun

IOP elevation from placement of suction cup during refractive surgery can go up to 65 mmHg. This makes refractive surgery a relative contraindication for patients with advanced or uncontrolled primary open angle glaucoma. However, this rapid rise in IOP during the surgery should be a cause of concern for even patients without glaucoma - particularly those who fall under the category of high-risk glaucoma suspects as such an event could potentially turn a glaucoma suspect into a glaucoma patient. Because more younger patients are seeking LASIK it is even more imperative that these patients with high glaucoma risk factors understand the potential risk of developing glaucoma over the course of their lifetime.

A 26 year old female glaucoma suspect had been followed for 2 years. Patient was highly myopic (-10.00 sph) and had undergone LASIK surgery 4 years ago, now correctable to 20/20 following the surgery. Patient reported never being told by her surgeon that she was a glaucoma suspect. No positive family history for glaucoma. Examination revealed large c/d ratios 0.9/0.85 in both eyes, IOP's of 16 mmHg OD, and 13 mmHg OS with post-LASIK pachymetry findings of 392 microns OD, 416 microns OS, and superior/inferior thinning of the optic nerve, which was also evident in the OCT findings. Previous visual field tests were within normal limits, however most recent testing showed early nasal step. Patient showed signs of progression and was diagnosed with Normal-Tension Glaucoma.

High-Risk Glaucoma suspects, as with Advanced or Uncontrolled Glaucoma patients, should be thoroughly educated and informed on the risks of

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refractive surgery due to its potential cause of further damaging their optic nerve that may already be in a fragile state. With the increasing number of young patients considering LASIK surgery, it is more crucial that these patients with glaucoma risk factors be educated and followed. It is this young patient population who will more likely see the effects of glaucoma within their lifetime despite treatment as treatment only slows the progression of the disease.

POSTER 49

The Use of Amniotic Membranes to Relieve Visual Distortions Caused by Epithelial Basement Membrane Dystrophy and Recurrent Corneal Erosion

Zelmira Farmer

Epithelial basement membrane dystrophy (EBMD), is one of the most common corneal dystrophies found during routine examination. This dystrophy is commonly observed bilaterally and is characterized by map-like lines with thickened corneal epithelium. Patients will typically experience fluctuating/blurry vision and are predisposed to recurrent corneal erosion (RCE) which can further impact visual acuity. Treatment approaches usually include the use of ointments, artificial tears, topical steroids, hypertonic drops/ointment, and bandage contact lenses. Surgical interventions such as brush therapeutic keratectomy (BTK) and photo therapeutic keratectomy (PTK) can also be used when other treatment options are exhausted. This case study will discuss how the use of amniotic membranes has been successfully utilized in a patient with EBMD, providing improved visual acuity and comfort after its use.

An 82 y/o Caucasian female presented to the clinic complaining of blurry vision (OD>OS) at distance and near. She described her symptoms have been ongoing for a few weeks. She also complained of dry and itchy eyes OU. Her slit lamp exam revealed EBMD, 2-3+ SPK, and a TBUT of 3

seconds OU. Her entrance visual acuities were BCVA was OD: 20/30-2, OS: 20/30+2. We discussed the option of using an amniotic membrane to help improve her symptoms, versus using a conventional treatment approach. She agreed to use the membrane OU at 2 week intervals. At her last follow-up visit she showed improvement in visual acuity, appearance in corneal surface, and overall dry eye symptoms.

The use of amniotic membranes is increasing in popularity and gaining momentum as a treatment option for several ocular surface conditions, to include Stevens-Johnson syndrome, burns, filamentary keratitis, and many others. There have been several studies demonstrating benefit of amniotic membranes in the treatment of EBMD and RCE. The amniotic membrane consists of materials that help restore the cornea and provide relief to patients with EBMD and RCE. In this case study, we were able to see the benefits of using an amniotic membrane to relieve symptoms of dry eye and to improve visual acuity and overall patient comfort.

POSTER 50

Multi-layered Bullous Subhyaloid Macular Hemorrhage Secondary to Ruptured Macroaneurysm: an Atypical Presentation

Amy Moy, O.D.

Additional Author: Abby Raposo

A retinal macroaneurysm is an acquired dilation of a major retinal artery, usually at a major arteriolar bifurcation. It mainly affects elderly patients in the 6th or 7th decade of life, and is usually associated with hypertension. Patients with retinal macroaneurysms are frequently asymptomatic and diagnosed during routine examination. Macroaneurysms can rupture, causing macular edema and multi-layered retinal hemorrhages, usually with a circinate ring of exudates around the affected site. Any impact in the macular region will

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cause reduced vision. Observation is typically the first line of treatment, as the hemorrhages and fluid can spontaneously resolve over time. Photocoagulation, intravitreal injections or other treatment options should be given if vision is threatened or reduced.

An 83-year-old Hispanic male presented with decreased central vision OD, starting 3 weeks prior. The patient was not taking any medications, but had been lost to regular medical care due to living between the U.S. and the Dominican Republic. Entering distance visual acuity was 20/CF at 4' in OD and 20/60 OS, with no improvement by refraction OD, and improvement to 20/40 OS (decreased secondary to cataracts). Posterior segment revealed significant subretinal and preretinal hemorrhage OD. A Spectralis OCT scan revealed substantial bullous elevation and fluid throughout the macular region. Due to the significant decreased vision, the extent of the hemorrhaging, and lack of current medical care, the patient was sent for emergency ophthalmological consult. A multi-layered subhyaloid bullous hemorrhage secondary to ruptured macroaneurysm was diagnosed and confirmed by fluorescein angiography. Blood pressure was 150/88, left arm, sitting. His primary care doctor was contacted for further workup for hypertension. The patient will follow up with the retina specialist in one month, and pars plana vitrectomy/membrane peel will be considered if bleeding persists.

Macroaneurysm is an important condition to consider in patients with hypertension. One study showed that retinal macroaneurysms are misdiagnosed in up to 75% of cases at first presentation. This case emphasizes the importance of including retinal macroaneurysms in an optometrist's differential diagnosis of retinal hemorrhages, especially in older patient with hypertension.

POSTER 51

Atypical Presentation of Giant Cell Arteritis

Stephanie Liebscher, O.D.

Giant cell arteritis is an inflammation of medium-sized blood vessels that can lead to blindness if untreated. It usually presents in patients over the age of 50 with multiple hallmark symptoms including headaches around the temples, scalp tenderness, jaw claudication, and decreased vision. Giant cell can present to the clinic as other serious ocular diseases such as optic neuritis so it is important to assess the ocular health and determine a proper course of treatment as quickly as possible.

An 88-year-old white female presented to the clinic with symptoms of monocular diplopia and a graying out of the vision in her right eye for 1 week. Her ocular history was significant for cataract surgery in 2011 and her medical history was significant for hypertension. One-week prior the patient experienced two events of monocular diplopia and was taken to the emergency room where an MRI was performed, the results of which were unremarkable. She was instructed to follow up with her ophthalmologist where she presented with vision of 20/25 in the right eye and was given artificial tears to use for dry eyes. The patient stated she used the artificial tears as instructed but noticed an increase of vision loss in her right eye. When the patient presented to the clinic for further evaluation her entering vision in the right eye was light perception. A relative afferent pupillary defect of the right eye was noted and the patient experienced pain on eye movements. The dilated exam revealed a unilateral swollen optic nerve with indistinct borders. The patient was diagnosed with optic neuritis and was sent to the hospital to receive IV methylprednisolone. While at the hospital, blood work was performed and it was determined that the patient had Giant Cell Arteritis.

Diagnosing of ocular diseases goes beyond just

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presenting signs and symptoms. In this case a patient presented with the typical signs and symptoms of optic neuritis and it was not until blood work was performed that the diagnosis of giant cell arteritis was made.

POSTER 52

Incidence of Ulcerative Herpetic Keratitis after Cataract Surgery

Jessie Konynenbelt

It is generally accepted that the stress of cataract surgery increases the risk for ocular complications involving herpes simplex virus (HSV), especially in those who have had prior manifestation. This likely occurs through the activation of dormant HSV in the trigeminal ganglia passing anteriorly to the corneal nerve plexus. Topical steroids prescribed after surgery further inhibit the body's ability to prevent HSV activation. Although the HEDS II study demonstrated a significant decrease in recurrence using prophylactic antivirals, little is known about their efficacy during the peri-operative period of cataract surgery. The following outlines the management of a case of recurrent HSV keratitis post cataract surgery.

A 78 year-old Caucasian female presented with peripheral dendritic keratitis in her left eye 3 weeks post cataract surgery. It appeared recurrent, as the patient had sub-epithelial scarring across the central cornea. Five days after initiating oral acyclovir and topical ganciclovir, the epithelium was healed and keratitis resolved. The patient returned 4 months later with complaints of longstanding, constant, blurred vision and foreign body sensation. Visual acuity was 20/60 OS NIPH. The patient reported self-discontinuing her prophylactic acyclovir 2 months prior. Biomicroscopy revealed a peripheral corneal ulcer, and the patient was placed on acyclovir, loteprednol, vitamin C, and preservative free artificial tears. After a month without re-epithelialization, an

amniotic membrane graft and bandage contact lens were placed on the eye for 10 days. The ulcer re-epithelialized, but a small area of adjacent pannus remained. The foreign body sensation resided, and best corrected visual acuity improved to 20/25 OS. She is currently on prophylactic oral acyclovir and being monitored monthly.

When antiviral treatment is insufficient, an amniotic membrane graft may be indicated to resolve herpetic ulcers. Recurrent cases often present in a progressive manner, which demonstrates the need for compliance with prophylactic acyclovir to prevent irreparable damage.

POSTER 53

Central Serous Retinopathy Resulting from an Optic Nerve Pit

Michael Paul Matherne

Optic nerve pits are malformed depressions which are often associated with other abnormalities of the optic nerve and parapapillary retina. Up to 50% of cases may result in Central Serous Retinopathy (CSR); however, occurrences of optic pits are relatively rare being seen in about one in 10,000 people. Optic pits located temporally on the nerve rim are more likely to cause retinopathy. Though various mechanisms have been proposed for this pathology, it appears that liquefied vitreous entering through the optic pit is the origin of the subretinal fluid.

A 22 year old Indian male presented for post-operative monitoring of CSR in OS. Patient's entering BCVA was 20/20 OD and 20/50 OS. Preoperative BCVA was 20/120. Amsler grid revealed central metamorphopsia. DFE revealed 3.5 DD of macular swelling emanating from the optic nerve. OCT revealed 1DD parafoveal area of sensory retinal detachment with surrounding retina schisis-like swelling, accounting for a total of 3.5DD of swelling.

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In June 2014, the patient was first diagnosed in India with CSR which he was told would be self-limiting. Realizing that his vision had not returned after a year, he returned to his eye doctor in India where he was diagnosed as having a retina schisis due to an optic nerve pit. In August 2015 he had a pars plana vitrectomy, ILM peeling, endo laser, and fluid gas exchange performed. Since his condition had not fully resolved during our examination, we sent him to a retina specialist who determined that fluid would continue to reabsorb, but his vision would not improve.

Given that the origin of CSR due to an optic nerve pit is not caused by retinal vasculature, the prognosis for this condition is worse. Cystoid absorption takes much longer and may not fully resolve. Surgical intervention is directed at blocking passage of fluid from the optic pit into the retina via laser photocoagulation. Traction on the retina is relieved with vitrectomy and ILM peeling. Reattachment is aided with gas tamponade. Each of these interventions have been shown individually to improve the outcome of this pathology with the best results seen from vitrectomy.

POSTER 54

Pseudoexfoliation Glaucoma in an Atypical Patient

Ronicha Azard, O.D.

Pseudoexfoliation glaucoma (PXG) is the most common cause of secondary open-angle glaucoma seen often in patients of Northern European and Scandinavian descent. Its presentation generally consists of asymmetric deposits of pseudoexfoliative material (PXM) and pigment on the anterior lens capsule, filtration angle, along with pigment on Schwalbe's line (Sampaolesi's line), transillumination defects (TID) at the pupillary border and pigment on the corneal endothelium. Although the literature is not clear on the exact mechanism, the pigment and protein material in the trabecular meshwork (TM)

may lead to a rise in intraocular pressure and subsequent damage to the optic nerve. These nerve changes present with corresponding retinal nerve fiber layer thinning and glaucomatous visual field defects on perimetry (PXG).

A 72 year-old African female from Uganda diagnosed with glaucoma secondary to pseudoexfoliation syndrome was treated with Latanoprost 0.005% 1 gtt OU QHS. She initially presented with complaints of intermittent headaches behind her right eye that lasted a few seconds. Her medical history was significant for hypertension and respiratory disease. All other systemic findings were unremarkable. The anterior segment exam revealed 2-3 centrally located pigment granules on the corneal endothelium as well as PXM on the anterior lens cortex and TIDs at the pupil margin OU. Her angles were open to CBB 360 on gonioscopy with a heavily pigmented inferior TM along with PXM at the inferior angles OU. Tmax was OD 23 mmHg, OS 22 mmHg. Her cup-to-disc ratios were 0.70/0.70 OD, 0.65/0.65 OS with inferior thinning OD and inferior temporal thinning OS on funduscopy. VF revealed repeatable defects and corresponding RNFL thinning on OCT. On the subsequent office visit, the patient reported good compliance with the medication and no adverse effects. IOPs were reduced to 15 mmHg OU and patient will be monitored for changes with an OCT, VF and fundus exam q3-6mos.

Although PXG is a common diagnosis in patients of Scandinavian descent, it is still important to rule out the condition in patients who do not fit the typical presentation.

POSTER 55

The Phakomatoses: Von Hippel-Lindau Disease

Zach Lancaster

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Von Hippel-Lindau (VHL) disease, one of the phakomatoses, is a disorder that is characterized by formation of tumors and cysts throughout the body. Incidence of VHL is estimated to be 1 in 36,000. It is inherited in an autosomal dominant fashion in 80% of cases, the other 20% being de novo. VHL typically presents in young adulthood. The most common tumors are hemangioblastomas. Retinal hemangiomas, macular exudates, retinal detachments, vitreous hemorrhages, cataracts, glaucoma and ONH damage are known ocular associations. This case report presents photographs, MRI data, and laboratory data regarding diagnosis of VHL in two sisters.

A 16 year old African American presented with a chief complaint of blurred vision OS. Medical history was unremarkable at this time. Entrance tests showed decreased VA and decreased color vision. No APD was present. BCVA was 20/20- OD, 20/50 OS. DFE revealed papilledema. A consult with neurology was obtained, to include MRI. Results of the MRI showed multiple hemangiomas in the 4th ventricle, which were removed. At our follow up examination, a central visual field defect was noted OD. Retinal examination was unremarkable. The patient is seen regularly by both optometry and neurology, with no more incidents to date. The sister presented with ocular tumors OD at the age of 21. She had a history of blindness OD from an ocular tumor with subsequent laser surgery in 2010. BCVA was HM OD and 20/15 OS. DFE revealed multiple, peripheral, lobulated lesions with feeder vasculature OD. Medical history was remarkable for diagnoses of VHL with cerebellar hemangiomas and adrenal pheochromocytoma due to VHL. We are co-managing the patient with a retinal specialist.

VHL presents with direct retinal findings in 50% of affected patients. As our case report shows, indirect findings, such as papilledema, may be reasons the patient visits an optometric physician. CNS, kidney, pancreas, and the adrenal glands are common sites for cysts and tumors associated with

VHL. Lifelong follow-up care is indicated for the entire family because of the inheritance pattern and systemic manifestations can occur years after retinal hemangiomas are noted.

POSTER 56

Bilateral Vision Loss After Emergent Repair of a Ruptured Abdominal Aortic Aneurysm using an Open Abdominal Approach with Cardiopulmonary Bypass

Jeffrey Ho, O.D.

Additional Author: Dorothy Hitchmoth, O.D.

Posterior ischemic optic neuropathy (PION) is an uncommon but devastating condition which may occur after prolonged surgery. A greater incidence of vision loss occurs after cardiac surgeries, especially when cardiopulmonary bypass (CPB) is involved.

An 85 year-old Caucasian male paraplegic was referred to our clinic with best-corrected visual acuities of 20/400 OD and hand motion OS. A relative afferent pupillary defect was observed OS. Intraocular pressures were 15 mmHg OU. Anterior and posterior segment findings were otherwise unremarkable with the exception of bilateral optic nerve pallor, OS greater than OD. Humphrey threshold visual field testing revealed confounding results. Inferior and superior arcuate defects respecting the vertical midline were seen OD. However, there was a distinct pattern of absolute loss that also respected the horizontal midline. The left visual field revealed an overall deeply depressed field OS with no pattern defects of distinction making the exact etiology of overall visual impairment unclear. Review of the patient's medical record revealed a prior undefined cerebrovascular accident, chronic anemia, hyperlipidemia and hypertension. The patient also had a history of emergent repair of a ruptured abdominal aortic aneurysm. Surgical reports indicated an open abdominal approach, combined with CPB induced

hypothermia, was performed. Surgical time was lengthy as a result of intraoperative respiratory failure that required tracheostomy. Upon recovering from anesthesia the patient complained of bilateral vision loss and flaccid paralysis of his extremities. Review of a more recent brain MRI revealed prior infarct of the left cerebellum and very small foci (less than 5mm) infarcts of the right frontal and parietal cortex.

It was concluded that the patient's vision loss was from PION OU as a result of a combination of pre-operative risk factors to include hypertension, anemia, and hyperlipidemia as well as intra- and post-operative complications to include hypovolemia, respiratory failure, and CPB induced hypothermia. CVA was ruled as contributory to the patient's vision loss because the areas of infarct were very small and not consistent with typical pattern defects associated with temporal-parietal infarct.

POSTER 57

Multi-Modal Imaging Characteristics of Pigmented Paravenous Retinochoroidal Atrophy

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Pigmented paravenous retinochoroidal atrophy (PPRCA) is a rare condition characterized by aggregation of pigmentation along retinal veins with neighboring atrophy of the retinal pigment epithelium (RPE) and often the underlying choriocapillaris. Classically, RPE atrophy and pigment accumulation are seen in a radial distribution along retinal veins. Fundus appearance is typically bilateral and symmetric. Patients tend to be asymptomatic but sometimes blur and visual field loss are reported. PPRCA advances very slowly and the cause is unknown. Electroretinography and electrooculography test results often correlate poorly with ophthalmoscopic findings and there is

no established treatment for PPRCA.

This is a two case series of PPRCA whereby multi-modality imaging assisted in the final diagnosis. The first patient is a 57 year old who presented complaining of blur and had best-corrected acuities of 20/20 OU. Confrontation field tests were normal. Posterior segment examination showed a few areas of paravenous bone spicule pigment accumulation with adjacent retinochoroidal atrophy extending radially across the posterior pole. The second patient is an 80 year old who presented requesting updated glasses. His best-corrected acuities were 20/30 OU. He was pseudophakic in both eyes. Dilated examination revealed retinochoroidal atrophy with overlying pigment clumps along the retinal veins in both eyes and peripapillary chorioretinal atrophy in the left eye. Visual field testing showed defects corresponding to the atrophic lesions. An extensive laboratory and imaging workup ruled out degenerative and inflammatory differential diagnoses that can also lead to retinochoroidal atrophy. Ocular coherence tomography, near-infrared, FAF, and multi-color en-face imaging were some of the tests used to support the final diagnosis.

Approximately 100 cases of PPRCA have been reported in the worldwide literature. PPRCA is truly an enigmatic condition associated with a plethora of causative hypotheses. The disparity in the expression, severity of presentation, visual field patterns, and electrodiagnostic findings of PPRCA add to this poorly understood disease's prodigious complexity. Multi-modal imaging in this case series provides further insight.

POSTER 59

Progressive Vision Loss During Pregnancy Due to an Orbital Hemangioma

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Hemangiomas are the most common benign

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neoplasm found in adult orbits. They comprise 5-7% of all diagnosed orbital tumors. Orbital hemangiomas are considered a congenital abnormality that typically goes undiagnosed until symptoms manifest due to tumor growth. A 32-year-old white female presented for routine examination with complaints of progressive vision loss in her right eye that started during her first pregnancy, four years prior. She reported the blurred vision in her right eye resolved after giving birth to her first child, but returned and persisted throughout her second pregnancy. She presented with unaided acuities of 20/25 OD and 20/20 OS. A relative afferent pupillary defect and superior temporal field restriction was noted in the right eye. The field defects were later confirmed with a 30-2 threshold visual field. The right eye failed color vision testing and was proptotic compared to the left. Fundus examination revealed a pale right optic nerve. MRI results were consistent with a right orbital hemangioma. A lateral orbitotomy was performed and the tumor was removed due to compression of the right optic nerve.

The most common presenting symptom, as well as clinical sign, of orbital hemangiomas at time of diagnosis is exophthalmos (90-95%). Other signs and symptoms include: reduced vision, double vision, visual field defects, optic nerve edema/pallor and choroidal folds. Nearly all cases of orbital hemangiomas are unilateral with 2:1 female to male prevalence. Unlike many neoplasms, hemangiomas are not derived from an abnormal single cell proliferation. Instead, they are an abnormal collection of vascular and fibrous tissues. An interesting part of this case is the timing of the patient's vision loss, during her pregnancy. Histological study of orbital hemangiomas has revealed the presence of progesterone receptors. During pregnancy progesterone levels are elevated up to ten times the normal value which may promote tumor growth.

POSTER 60

The Use of Oral Corticosteroids in the Treatment of Bilateral NAION

Heather Bell, O.D.

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Nonarteritic Ischemic Optic Neuropathy (NAION) is a common cause of sudden, painless vision loss that typically presents in patients in the fourth and fifth decades of life. NAION is due to a transient non-perfusion of the optic nerve head and is often associated with systemic risk factors. Vision loss can range from mild to profound. Ocular signs include a + APD, optic disc edema with accompanying flame-shaped hemorrhages, a crowded disc in the fellow eye, and a normal ESR and CRP.

A 74-year-old white male presented complaining of sudden blurry vision in the left eye. Testing revealed a VA of 10/350, + APD, and a unilateral swollen disc with an associated flame-shaped hemorrhage. To rule out AION, blood work was completed and the patient's ESR and CRP were found to be within normal limits for the patient's age. A diagnosis of NAION due to the patient's systemic history of poorly controlled HTN, DM type II, and hyperlipidemia was made. At a 2-month follow-up he reported the vision in his right eye was now becoming blurry. Examination revealed a VA of 20/200 OD, 20/200 OS, blurred disc margins with a new flame-shaped hemorrhage OD and temporal optic nerve head pallor OS. ESR and CRP values were still WNL for the patient's age with a negative result on temporal artery biopsy. A diagnosis of bilateral NAION was made. The patient was started on 60mg oral prednisone QD for 2 weeks followed by a slow taper in an attempt to preserve any usable vision. VA following treatment was 20/60 OD, 20/200 OS.

Disc swelling in NAION generally resolves within three to six weeks leaving behind disc pallor. Incidence of occurrence in the fellow eye is 50% and typically occurs years later. Roughly 50% of patients

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with NAION experience minimal improvement in VA overtime. The use of oral corticosteroids to preserve vision in NAION is highly debated but has been shown to be effective based on selected neuro-ophthalmology case studies. In this case, oral corticosteroids were effective in preserving the vision of the patient's right eye and should be explored further.

POSTER 61

When Worlds Collide: Managing Keratoconus with Concurrent Anterior Uveitis and Trabeculitis

Thuy-Lan Nguyen, O.D.

Additional Author: Alexandra Espejo, O.D.

When patients with keratoconus and a long history of gas permeable contact lens wear complain of blurred vision and ocular discomfort, we typically assume there is a progression of the keratoconus or acute hydrops or perhaps a problem with the contact lenses. However, it is important to remember that keratoconic patients often have other ocular and systemic comorbidities. Keratoconus has been linked with rheumatoid arthritis, ulcerative colitis, and other immune conditions. This case will discuss the management of a keratoconic patient with a concurrent anterior uveitis and trabeculitis associated with Herpes Zoster and HIV.

A 54 year old hispanic male presented with recurrent blurred vision and eye pain in the right eye. He had a history of keratoconus with monovision gas permeable contact lens wear for several years and a prior episode of Herpes Zoster Ophthalmicus with trabeculitis in the right eye 4 years prior. His medical history was also positive for HIV for 5 years. His BCVA's were 20/50 OD and 20/40 OS. His contact lenses were Rose K Gas permeables. Sodium Fluoresceine evaluation of his contact lenses showed well centered gas permeables with minimal apical clearance, adequate edge clearance and lens movement. Essentially, his contact lenses were

fitting well. Pupil evaluation revealed anisocoria, a mid dilated pupil OD, but no afferent pupillary defect. His right cornea had significant keratic precipitates. There was a 1+ anterior chamber reaction in the right eye. IOP's were 35 mmHg OD and 19 mmHg OS. The patient was treated with topical steroids OD and IOP lowered to 14 mmHg within a week.

Keratoconus, a progressive bilateral, asymmetric ectasia of the cornea, is considered a non-inflammatory condition. However, keratoconus may be associated with many allergic and immune conditions. Immunosuppressive conditions such as HIV put patients at a higher risk for secondary Herpes Zoster Ophthalmicus and uveitis. This patient also developed a trabeculitis causing a dramatic spike in IOP. This case is a reminder that optometrists who fit specialty contact lenses for keratoconus and other corneal conditions are often required to manage other ocular pathologies and comanage with primary care physicians as well.

POSTER 62

A Case of Unilateral Disc Edema Secondary to Vestibular Schwannoma-Induced Ventriculomegaly

Luke Cyr, O.D.

Additional Authors: James P. Smith, O.D.

Laura Dowd, O.D.

Jennifer Robichaud, O.D.

Eye care providers often play a significant role in the diagnosis and management of intracranial disease processes, including malignancy. We may monitor visual function and ocular structures of a previously diagnosed lesion. We may also initiate the diagnosis though ocular exam or neurologic eye testing. Elevated ICP, while typically associated with bilateral disc edema, must remain a differential in unilateral presentations as well.

A 45 year old male, new to the clinic, presented complaining of chronic moderate to severe

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headaches, increasing over the past few months. Ocular history was unremarkable. His medical history was significant for a right-sided vestibular schwannoma one year status post radiation therapy. Entrance testing and anterior segment exam were unremarkable. Dilation revealed grade two elevation of the right optic disc with no spontaneous venous pulsation, the left optic nerve, while congested, was flat with distinct borders. Visual field testing found a repeatable superior field defect in the right eye and no defect in the left eye. The most recent MRI revealed a right-sided acoustic schwannoma, inducing ventriculomegaly and mild optic nerve sheath enlargement; both consistent with increased ICP. Lumbar puncture was contraindicated due to increased risk of brain herniation. The patient is currently monitored by neurosurgery and optometry. Radiographic and vision findings have been stable for the past 6 months.

Unilateral disc edema has a wide range of differential diagnoses; the most common are pseudopapilledema, papillitis and ischemic optic neuropathy. It should be noted that mass-induced elevation in intracranial pressure (ICP), while rare, should be included on that list.

POSTER 63

Susac's Syndrome

Natasha Chokshi

Susac's syndrome is a rare autoimmune disorder that affects women 20-40 years old and is characterized by three main problems, encephalopathy, BRAO and inner ear disease.

A forty three year old Hispanic female came in for a retinal consult. She had a history of decreased vision in the right eye due to BRAO. She reported that in 2011 she had an episode of high BP and after that she had sudden vision loss in the right eye. Since then she has had problems with bilateral Meniere's disease, hearing loss (worse on the right

side), and problems with short term memory. Her medical and ocular history included an acute myocardial infarction during carpal tunnel surgery, uncontrolled hypertension, sleep apnea, a small aneurysm behind right ear that was being watched, a head collision injury in 2011 during a car accident, migraine headaches and depression. Her best corrected visual acuity was 20/40 in the right eye and 20/25 in the left eye. The entrance testing, anterior segment and IOP were normal. Her posterior segment exam in the right eye revealed macular RPE defects, A/V nicking, vessel tortuosity, neovascularization in the superior arcade, and shunt vessels. The posterior segment exam of the left eye revealed A/V nicking. An OCT was performed and revealed retinal thinning superior to macula and outer retinal disruption at fovea in the right eye. The left eye was normal. The patient was sent for an MRI, but did not go to the appointment.

In Susac's syndrome, the person's own immune system attacks the endothelial lining of the smallest blood vessels in the brain, retina, and inner ear. When the endothelial cells become injured, they can lead to blockage of small vessels in the brain, retina and inner ear. Symptoms vary and a variety of neurological findings may be present. These include headaches, gait disturbances, slurred speech and cognitive dysfunction. An MRI typically shows characteristic "snowball lesions" in the brain, especially the corpus callosum. FA abnormalities include evidence of a BRAO and vessel wall hyper-fluorescence. The two pharmacological treatments include oral corticosteroids and intravenous immunoglobulins.

POSTER 64

Presentation of Follicular Lymphoma as Multinodular Palpebral Follicular Conjunctivitis

Muriel Schornack, O.D.

Additional Author: Tomo Yamada, O.D.

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Follicular conjunctivitis is commonly seen and usually indicates an infectious or inflammatory etiology. Nevertheless in rare instances, it may also be a manifestation of lymphoma. Twenty percent of patients with conjunctival follicular lymphoma (FL) have systemic involvement at the initial diagnosis. Of those who initially do not have systemic involvement, systemic lymphoma is eventually found in 38% at 5 years, and in 79% at 10 years. FL can present in children as well as elderly patients, with median age of 64 years.

KB, a 49-year-old gentleman, was seen in the eye clinic for bumps on the inside of both lower eyelids. He had had these lesions for the past 2 years, and was told previously that they were allergy-related and was prescribed allergy eyedrops. He denied any eye discomfort otherwise. His systemic history was significant for hypertension, but was otherwise in good health. KB's visual acuity was 20/20 in both eyes. Ocular alignment and motility were normal. His intraocular pressures were 13 mmHg in both eyes. Pupils were round and reactive to light, with no afferent pupillary defects. Visual fields were full in both eyes. Slit lamp examination was remarkable for large, multinodular clusters of follicles lining the palpebral conjunctiva in both lower eyelids. The upper palpebral conjunctivae were flat in both eyes. His corneas, iris, and anterior chambers were normal. Dilated eye examination revealed normal optic discs, with healthy macula, retinal vasculature, and peripheral retina. CBC and blood chemistry were normal. An immunoperoxidase study of a palpebral conjunctiva sample was performed using antibodies directed against CD20, CD3, CD10, CD5, BCL-2, BCL-6, Ki-67, CD43, IgD, cyclin D1, and CD23. The immunohistochemical staining revealed CD10-positive B-cells and markers that were positive for BCL-6, BCL-2, and CD23, with low proliferative rate by Ki-67 staining. Bone marrow biopsy and PET scan were negative for lymphoma, and so KB was diagnosed with stage IA follicular lymphoma. KB is currently undergoing radiation therapy.

FL should be considered in the differential diagnosis of patients with chronic follicular

conjunctivitis. Long term follow up is important as there is a high likelihood of eventual systemic involvement.

POSTER 65

Crystalline Keratopathy: An Uncommon Presentation of Multiple Myeloma

Luanne K Chubb, O.D.

The deposition of corneal immunoglobulins is a rare entity and presents a diagnostic challenge to clinicians. Patients may be asymptomatic or complain of blurred or decreased vision.

An 86 year old African American male presented to the eye clinic with no visual concerns. His ocular history was remarkable for cataract surgery 5 years ago. Best corrected visual acuities were OD 20/20- OS 20/20-. Pupil testing, muscle testing and confrontational fields were normal. Slit lamp evaluation showed OD dense stromal refractile deposits OS dense stromal refractile deposits in a whorl pattern. His intraocular pressure and dilated fundus evaluation were normal. Differential diagnoses of the underlying causes include infection, central crystalline dystrophy of Schnyer, Bietti crystalline corneoretinal dystrophy, cystinosis, and lymphoproliferative disorders. No infectious process was present, and prior clinic examinations were normal which eliminated the dystrophies as an underlying cause. Of note, the patient reported a history of recent weight loss. A review of his record indicated longstanding proteinuria and monoclonal IgG kappa gammopathy in 2000. His eye examination in 2006 was normal with clear corneal findings. Extensive laboratory testing had been ordered but the patient was lost to follow-up. The patient was referred to his primary doctor, and subsequently, to oncology. Updated laboratory testing showed elevated creatinine and highly elevated kappa free light chains. A bone scan showed no large lytic lesions that were identified as

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definite plasmacytomas. A diagnosis of Multiple Myeloma was confirmed, and systemic treatment was started which included Dexamethasone, Velcade, and Cytoxan. The patient returned to the eye clinic 4 months later. Vision remained at 20/20- in both eyes. Biomicroscopy showed a reduction in the density of the refractile corneal deposits. His intraocular pressures and retinal examination remained clear. The level of kappa free light chains continues to be elevated but has improved since the start of treatment. The patient continues with his chemotherapy.

Paraproteinemic crystalline keratopathy is an uncommon presentation of multiple myeloma and other plasma cell dyscrasias. Prompt identification and referral for appropriate treatment of the underlying cause is essential for life expectancy.

POSTER 66

Postoperative Vitreous Cavity Hemorrhage (POVCH) in Proliferative Diabetic Retinopathy

Joanne Chih-Ann Lee, O.D.

Susac's syndrome is a rare autoimmune disorder that affects women 20-40 years old and is characterized by three main problems, encephalopathy, BRAO and inner ear disease.

A forty three year old Hispanic female came in for a retinal consult. She had a history of decreased vision in the right eye due to BRAO. She reported that in 2011 she had an episode of high BP and after that she had sudden vision loss in the right eye. Since then she has had problems with bilateral Meniere's disease, hearing loss (worse on the right side), and problems with short term memory. Her medical and ocular history included an acute myocardial infarction during carpal tunnel surgery, uncontrolled hypertension, sleep apnea, a small aneurysm behind right ear that was being watched, a head collision injury in 2011 during a car accident, migraine headaches and depression. Her best

corrected visual acuity was 20/40 in the right eye and 20/25 in the left eye. The entrance testing, anterior segment and IOP were normal. Her posterior segment exam in the right eye revealed macular RPE defects, A/V nicking, vessel tortuosity, neovascularization in the superior arcade, and shunt vessels. The posterior segment exam of the left eye revealed A/V nicking. An OCT was performed and revealed retinal thinning superior to macula and outer retinal disruption at fovea in the right eye. The left eye was normal. The patient was sent for an MRI, but did not go to the appointment.

In Susac's syndrome, the person's own immune system attacks the endothelial lining of the smallest blood vessels in the brain, retina, and inner ear. When the endothelial cells become injured, they can lead to blockage of small vessels in the brain, retina and inner ear. Symptoms vary and a variety of neurological findings may be present. These include headaches, gait disturbances, slurred speech and cognitive dysfunction. An MRI typically shows characteristic "snowball lesions" in the brain, especially the corpus callosum. FA abnormalities include evidence of a BRAO and vessel wall hyper-fluorescence. The two pharmacological treatments include oral corticosteroids and intravenous immunoglobulins.

POSTER 67

Why Wait? Eplerenone for the Treatment of Central Serous Chorioretinopathy

Lisa C. Stuart, O.D.

Additional Author: Sylvia E. Sparrow, O.D.

Central serous chorioretinopathy (CSCR) is a condition that typically resolves spontaneously but in some cases persists for months. In chronic cases, treatment is necessary. Traditional treatment methods are relatively invasive while recent literature documents the off-label use of eplerenone for chronic CSCR. This may represent a noninvasive

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treatment option.

A 47 year-old Hispanic female presented describing a "bubble" in her vision OS for 2 weeks. The patient's medical history was positive for hepatitis C and her ocular history was positive for CSCR in the right eye, which took approximately 10 months for resolution. BCVA was 20/20 OD and 20/400 @ 4 ft. OS. Chair skills, biomicroscopy and Goldmann applanation tonometry were unremarkable. Dilated fundus examination OD was unremarkable while the OS revealed a large elevated area involving the macula. OCT was consistent with CSCR. After consultation with her PCP regarding her hepatitis treatment, the patient was subsequently started on eplerenone 25 mg po qd for 1 week, then 25 mg po BID x 1 mo. At the one month follow-up, she reported improvement of symptoms with treatment; BCVA was 20/20 OD and 20/40+2 OS. Dilated fundus examination revealed a flat macula OS with confirmation by OCT. The patient was instructed to continue eplerenone 25 mg po BID. At her two month follow-up, she reported that her symptoms had improved since the last visit. Her BCVA was 20/20 OD, OS. Dilated fundus examination again revealed a flat macula OS with no signs of CSCR and was confirmed by OCT. She was instructed to discontinue the eplerenone and to follow-up in 4 months or sooner if necessary.

Using an oral medication is noninvasive and has a generalized effect on all areas of both retinæ. Given this patient's previous history of persistent CSCR, her highly motivated nature, and the limited contraindications and side effects of eplerenone, treatment was initiated early with very positive results. This indicates that the use of eplerenone could be applicable for more acute cases of CSCR.

POSTER 68

Relapsing Polychondritis: An Atypical Etiology of Intraocular Inflammation

Cerina Leigh Buchanan, O.D.

Intraocular inflammation can present in a variety of ways with various etiologies. These can range from an infectious, inflammatory, infiltrative, ischemic, traumatic, surgical, to an idiopathic etiology. Polychondritis is a rare progressive inflammatory condition involving destruction of cartilaginous structures, especially that of the ear and nose. The origin is unknown, however it is suspected that an autoimmune reaction to cartilage occurs. Therapeutic options include administration of corticosteroids and non-steroidal inflammatory drugs (topical and oral), immunosuppressant drugs or in severe cases surgery for collapsed airway.

A 65-year-old white male presented to the office for a second opinion regarding ongoing pain and redness of his left eye for one week. During an otorhinolaryngology exam a week prior, he was diagnosed with Herpes Zoster Neuropathy and given valtrex and gabapentin. Due to lack of improvement, our patient sought another provider. He denied history of shingles, dermatomal rashes, and other signs associated with HZO. He denied known history of a previous occurrence, however he reported coincidental pain associated with spider bites on both ears a few days apart. Systemic history is remarkable for osteoarthritis, gout, and prostate cancer. He also noted an isolated episode of polychondritis years ago which was treated. Remarkable examination findings include a previous posterior synechiae and old keratic precipitates (KPs) OD. Mild tenderness of the left preauricular node, marked circumlimbal injection, active KPs, and 1+ anterior chamber reaction was present OS.

Examination clearly revealed active inflammation of the left eye with signs of previous inflammation in the right. Due to the current issues of bilateral ear pain, swelling, and known history of polychondritis, uveitis secondary to relapsing polychondritis was diagnosed. His ocular inflammation was treated with pred forte every hour for 1 week and then tapered over a 3 week period. His relapsing condition was confirmed by his PCP and was treated with oral prednisone. Resolution was achieved after one

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month. Given that uveitis is often associated with a systemic condition, a thorough examination, review of systems, and proper classification is crucial in elucidating a cause.

POSTER 69

Multimodal Imaging in Punctate Inner Choriodopathy/Multifocal Choroiditis

Muriel Schornack, O.D.

Additional Author: Alaina Softing-Hataye, O.D.

Both Punctate Inner Choroidopathy (PIC) and Multifocal Choroiditis (MFC) are retinal diseases that typically affect young healthy myopic women. They have been differentiated based upon the presence or absence of inflammation and location of lesions within the retina. Based on new imaging technology, there is growing consensus PIC and MFC are actually different presentations of a single disease. This case describes the diagnosis and management of PIC/MFC using multimodal imaging.

A 24 year old woman presented with a blurred spot in the central vision OD. Medical history was unremarkable. Clinical examination revealed BCVA 20/60 OD, 20/20 OS, with no APD. Slit lamp evaluation revealed no corneal opacity, no anterior chamber cell or flare, and no lens opacity in either eye. Dilated fundus examination revealed multiple small, white lesions in the posterior pole of the right eye with no vitritis, and the fovea appeared edematous. Fundus examination of the left eye was normal. Fluorescein angiography (FA) showed normal choroidal flow, window defects that corresponded to the lesions and late leakage consistent with subfoveal choroidal neovascularization (CNV) in the right eye. Indocyanine green angiography (ICG) revealed multiple areas of hypocyanescence corresponding to the lesions and hypercyanescence in the foveal area OD consistent with CNV. OCT revealed central subretinal and intraretinal fluid, moderately

hyperreflective material at the level of the RPE/outer retina, subfoveal disruption of the RPE and areas of retinal atrophy. Fundus autofluorescence (FAF) showed multiple areas of decreased autofluorescence that corresponded to atrophic lesions and an area of hypoautofluorescence with a hyperfluorescent margin which aligned with the active lesion. Treatment has consisted of 10 Avastin injections over the past 2.5 years. Her left eye remains unaffected. Most recent visual acuity was 20/20 OD. She has been advised to continue with birth control because of the risks of anti-VEGF treatments during pregnancy.

PIC and MFCPU exhibit slightly different clinical presentations. However, multimodal testing (including FA, ICG, FAF, and OCT) in eyes classified as either PIC or MFCPU showed similar findings. Furthermore, genetic analysis reveals considerable overlap with interleukin 10 and tumor necrosis factor loci.

POSTER 70

Bilateral C-Shaped Retinal Atrophy: Hereditary or Traumatic?

Emily Korszen

Additional Authors: Jennifer Warne

Nathan Neville, O.D.

Bilateral peripheral retinal degeneration is often caused by hereditary retinal conditions, of which retinitis pigmentosa (RP) is the most common. RP encompasses a diverse subtype of dystrophies that typically involve photoreceptor dysfunction, pigmentary retinal changes, and visual field (VF) loss. In patients suffering from mid-peripheral retinal atrophy and corresponding field loss with slow progression, pericentral and paravenous RP are two variants to consider. Pigmented paravenous retinochoroidal atrophy is another potential etiology, which is sometimes considered a variant of RP. Electrodiagnostics and genetic testing can help

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determine a diagnosis, and a thorough family and medical history should be performed to reveal the heritance pattern and to rule out other causes of retinal damage.

A 58 year-old Hispanic male with a history of occupational welding presented with visual acuity of 20/25 OD, OS. Dilated fundus examination (DFE) revealed optic nerves with cup-to-disc ratios of 0.6/0.6, mid-peripheral retinal atrophy, and pigment clusters along the temporal vascular arcades, OU. A correlating mid-peripheral C-shaped scotoma in each eye was found via Humphrey VF testing. The patient reported no known family history of retinal disease, and no difficulty with mobility or night vision. The patient was then seen every 6 months, and the condition was relatively stable over five years. Electrodiagnostic testing was not completed due to financial constraints.

The etiology of this patient's retinal findings could be a hereditary dystrophy or a traumatic insult. The patient admits to frequently welding without proper eye protection, and reports attempting to avoid directly viewing the welding arc. Therefore, peripheral retinal phototoxicity was considered. Pericentral and paravenous retinitis pigmentosa are two important differentials, as the pattern of pigmentary change and the minimal progression are consistent with this variant of RP. Another possible diagnosis, pigmented paravenous retinochoroidal atrophy, is a rare condition involving bilateral, non-progressive collections of pigment around retinal veins with or without VF defects. In this case, proper management is not contingent upon a definitive diagnosis. However, when possible, further evaluation – including electrodiagnostics and genetic testing – may confirm a specific diagnosis when patients present with bilateral mid-peripheral retinal atrophy.

POSTER 71

Long Term Effects of Toxic Anterior Segment Syndrome, An Uncommon Post-Operative

Complication

Rob Reasoner

While endophthalmitis may be the most devastating post operative complication following intra-ocular surgery, a lesser known complication, Toxic Anterior Segment Syndrome (TASS), can be equally distressing to the patient. TASS has been described as an acute sterile anterior segment inflammatory response after ocular surgery, and was previously known as sterile endophthalmitis. It is very important to quickly and accurately distinguish between infectious endophthalmitis and TASS. Long term effects of TASS can vary widely from case to case, but decreased vision due to longstanding corneal edema, secondary glaucoma and a fixed pupil are possible.

A 67 year old White male presented to the clinic complaining of decreased vision OS for the past 3 months. Upon record review, the patient was positive for a history of Toxic Anterior Segment Syndrome following uneventful cataract extraction OS three years ago. At the patient's last exam 13 months ago, BCVA OS was 20/60 and Muro 128 ung QHS OS was prescribed to manage the remaining corneal edema. His pupil was fixed at 7 mm and IOP was 17 OD/OS and optic nerve head C/D ratio was 0.35 v/h OU with no glaucomatous damage. Examination revealed 2+ corneal edema, pupil fixed at 7 mm and no changes in intra-ocular pressure or optic nerve head appearance. Further questioning revealed the patient had not been using sodium chloride solution as prescribed for the past 4 months.

This patient was put back on Muro 128 ung QHS and we stressed the importance of good compliance. We also educated the patient on the lasting impact that TASS may have on the patient's quality of life and the need for annual examination. This case showcased the major visual outcomes of TASS and the need for close monitoring even after the acute episode occurs. With correct and quick treatment,

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complications due to Toxic Anterior Segment Syndrome can be minimized with a good long term visual outcome.

POSTER 72

Purtscher-Like Retinopathy in a Patient With Acute Pancreatitis

Oscar Leis, O.D.

Additional Authors: Kathleen Abarr, O.D.

Stephanie Aguilar, O.D.

Rachel Berkowitz, O.D.

Purtscher's retinopathy was first described by Othmar Purtscher in a man who fell from a tree and suffered cranial trauma. Since the year 1910, we have learned much about the disease including similar retinal signs in patients who do not suffer from severe trauma in a condition called "Purtscher-like" retinopathy. One such example is in patients who suffer from acute pancreatitis. Although pathophysiology of Purtscher's-like Retinopathy secondary to pancreatitis is not well elucidated. Enzymes released from an inflamed pancreas are believed to lead to complement activation resulting in aggregation of granulocytes with subsequent retinal/choroidal embolization/infarction. Rapid development of visual disturbance is common and dramatic which makes timely and correct diagnosis of this disease vital for improved visual prognosis. Treating the underlying condition, the pancreatitis, is standard of care.

A 46-year-old Caucasian female was referred by the emergency room for evaluation of a visual disturbance. Patient complaints included blurry vision, left eye greater than right for a few days, as well as a central scotoma in her left eye. Medical history was remarkable for recent diagnosis of pancreatitis. She also suffers from alcohol dependence, hypertension, and hypothyroidism. Entering best-corrected visual acuities were 20/20 in each eye but with subjective complaints of

distortion while performing acuities. Amsler grid testing revealed metamorphopsia in both eyes. All other entrance exams were normal. Anterior segment evaluation was unremarkable and intraocular pressures were normotensive and symmetrical. Her dilated fundus examination however, revealed significant cotton wool spots around both optic nerve heads, with scattered Purtscher-flecken. Optical Coherence Tomography showed overall thickening in each quadrant consistent with acute cotton wool spots. Macular Optical Coherence Tomography showed an area of sub-retinal fluid at the fovea in the right eye, and an even larger area of sub-retinal fluid with adjacent intra-retinal cysts in the left eye.

This case illustrates the importance of systemic considerations when diagnosing Purtscher-like retinopathy. Although she was hypertensive, the asymmetry of cotton wool spots to other retinal signs in hypertensive retinopathy warranted consideration of other systemic etiologies. Treatment of the underlying etiology, in this case pancreatitis, lead to resolution of ocular manifestations.

POSTER 73

Pre-Descemet's Membrane Corneal Dystrophy

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Additional Authors: Sylvia E. Sparrow, O.D.

Erin Keim

Lisa Stuart, O.D.

Corneal dystrophies are defined as "a group of progressive, usually bilateral, mostly genetically determined, non-inflammatory opacifying disorders." While many corneal dystrophies have been well classified genetically, Pre-Descemet's membrane corneal dystrophy is not very well defined. There seems to be no definitive pattern of inheritance. It is usually noted in patients older than 30, but has also been reported in young children. It is clinically characterized by multiple, fine, gray-white opacities

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deep in the stroma, just anterior to Descemet's membrane. Differential diagnoses include cornea farinata and fleck corneal dystrophy.

A 64-year-old African American female presented with a complaint of blurry vision at distance and near over the last year. She used spectacle correction, and had a history of dry eye disease and cataracts. She also reported being told at her first eye examination in her 20s that she had a corneal dystrophy. Her medical history was significant for hypertension, hypercholesterolemia and congestive heart failure. Distance best corrected visual acuities were 20/30- OD with -9.25-2.25x160, and 20/25- OS with -10.00-1.50x180. Chair skills and Goldmann applanation tonometry were unremarkable. Biomicroscopy revealed normal lids and lashes, diffuse conjunctival melanosis with mild injection, and superficial punctate keratitis in both corneas. It also revealed fine, diffuse, gray-white opacities throughout the posterior stroma, anterior to Descemet's membrane of both corneas. There was no corneal edema. Lens evaluation revealed nuclear sclerotic, cortical and posterior subcapsular cataracts OU. Dilated fundus examination was positive for optic nerve staphyloma OS and familial drusen OU. Pachymetry revealed thinner than average corneas.

We present a rare case of Pre-Descemet's membrane dystrophy. Many corneal dystrophies are progressive and can have significant visual consequences for the patient. Pre-Descemet's membrane dystrophy has a characteristic appearance, however it does not have a significant effect on vision. Clinicians should consider other etiologies and diagnosis in patients with this condition and decreased vision. Corneal photography and pachymetry will be included with this poster.

POSTER 74

The Cat's Out of the Bag: Serial Analysis of Neuroretinitis Through Spectral Domain OCT and Humphry Visual Field Assessment

Amy A. Puerto, O.D.

Cat scratch disease (CSD) is a systemic infection caused by the bacteria, *Bartonella henselae*. Patients contract the infection after being scratched, bitten, or licked by a cat and commonly report a virus-like illness. Ocular involvement occurs in 5-10% of CSD cases, and only 1% to 2% of patients develop neuroretinitis. The clinical features of neuroretinitis include disc swelling in the presence of an exudative macular star formation. In cases of extreme disc edema, a neurosensory detachment may occur. Neuroretinitis affects persons of all ages, but is more often seen between ages 30 and 40. The condition tends to be self-limiting, for a period of eight to 12 weeks, though oral doxycycline 100mg BID for two to four weeks has emerged as the primary treatment choice. While case studies have presented the clinical features of cat scratch neuroretinitis, none have gone to the detail of illustrating the sequential morphological changes on optical coherence tomography (OCT) nor diagrammed its visual field progression from week one to resolution.

A 30-year-old Arab male presented with painless visual loss in his right eye for three days. The patient reported concurrent fever, malaise, headaches, and chills. Ophthalmoscopic examination showed optic disc edema with macular edema and stellate exudate in the right eye, cotton-wool spots in the right eye, and few choroiditis spots in both eyes. The patient admitted a recent cat scratch or bite three weeks prior. Serological testing confirmed a diagnosis of neuroretinitis secondary to cat-scratch disease. The patient was treated with doxycycline 100 mg bid for 1 month. Each week the patient returned to the clinic for a series of OCT and Visual Field testing. Two months later the optic disc edema resolved and macular star dissipated. His visual acuity in the right eye improved to 20/20 from 20/400.

While neuroretinitis associated with cat scratch disease is well documented in the literature, no studies have examined the serial morphology of

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retinal structures on OCT nor observed a patient's visual field from disease onset to resolution. This case report not only provides this new evidence, but also discusses pertinent findings in ocular cat scratch disease diagnosis and treatment.

POSTER 75

A Multi-year Observation of Adult Onset Vitelliform Macular Dystrophy

Sylvia E. Sparrow, OD..

Additional Author: Nataly M. Fahim, O.D.

Adult onset vitelliform dystrophy (AOVD) is a rare, inherited macular dystrophy of unknown incidence. The other form of vitelliform dystrophy, known as Best disease, usually appears in childhood. AOVD usually presents in the fourth to sixth decade with vision loss that worsens slowly over time. While Best disease is inherited in an autosomal dominant pattern, the inheritance of AOVD is uncertain but may be autosomal dominant. Mutations in the BEST1 and PRPH2 genes are responsible for vitelliform macular dystrophy. BEST1 gene mutations are responsible for Best disease and for some cases of AOVD. PRPH2 gene mutations also cause AOVD; however, less than a quarter of all people with AOVD have a mutation in these genes. For most patients, the cause of AOVD is unknown. While clinically heterogeneous, it typically presents bilaterally with a subretinal, oval or round yellowish dome-shaped macular lesion that is 1/3 to 1 DD in size. Most patients retain visual acuity of 20/50 or better, but a choroidal neovascular membrane may result in drastic vision loss.

A 57 year old white male presented with complaints of distance and near blur. His systemic history was unremarkable and he was taking no medication. His last eye examination was twenty years prior. He was correctable to 20/20 in each eye with a minimal prescription. Anterior segment examination was unremarkable. Posterior segment

examination was unremarkable with the exception of macular drusen in each eye and a 1 DD choroidal nevus in the right eye. Over the next several years, the patient's BCVA mildly decreased in each eye. Amsler grid testing indicated metamorphopsia in each eye. Posterior segment examination revealed a round dome-shaped elevation in the macula of each eye. He was subsequently diagnosed with AOVD and continues to be followed regularly.

Although AOVD is a rare condition, the astute clinician must be able to recognize this hereditary macular dystrophy. Fortunately the disease has a good visual prognosis. As genetic testing becomes more readily available, optometrists should include this information in their patient education and management. This poster will include fundus photos, OCT, electrodiagnostic testing and fundus autofluorescence.

POSTER 76

Traumatic Head Injury Case with later Development of Giant Orbital Mucocele

James Harrison Kyte

Orbital mucoceles often arise in patients who have had a past history of traumatic head injury or chronic sinusitis. Regarding trauma, cracks in the sinus wall can block proper flow of mucoid/serous fluid produced by excretory glands causing cysts to develop and grow mimicking the behavior of a benign orbital growth. These growths, though benign in nature, can grow large enough to push the orbital contents (globe, EOMs, and CNIII) aside resulting in EOM restriction (diplopia) and neuropathy (visual field loss) in the patient.

Patient enters clinic complaining of painless unilateral proptosis of his right eye over the past 1-2 years. The patient stated he had a past history of a motor vehicle accident in which many bones in his face had been broken and surgically repaired. The patient had 20/20 vision OD/OS, and noted diplopia

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in extreme positions of left gaze. The patient also notes feeling a "bump" emerging between his globe and brow bone in his right eye. Hertel exophthalmometer readings were OD:27, OS:17, Base 124. The dilated fundus exam showed a large oval indentation of the retinal tissues in the peripheral superior nasal view in the right eye. Immediate referral for CT imaging showed a giant mucocele emanating from the patient's frontal sinus.

The patient was referred to the oculoplastic surgeon for mucocele removal and sinus obliteration. The patient is currently in stable condition in recovery.

POSTER 77

The Comparison of Central Corneal Thickness Amongst 4 Different Technology Devices

Laura Brown

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Accurate and repeatable central corneal thickness (CCT) measurements are important for a variety of ophthalmic diseases. The purpose of this study was to compare the CCT measurements between the standard ultrasound pachymeter and other non-contact instruments.

CCT measurements were collected from 100 eyes of 50 healthy subjects, recruited from the student population of Southern College of Optometry. Four instruments were evaluated: RTVue OCT, Cirrus OCT, Konan Specular Microscope, and standard handheld ultrasound. Three measurements were performed on each eye using each of the four instruments. Most results were automatic after the measure, but CCT from the Cirrus scans were measured by a blinded second investigator.

Paired samples t-tests performed on the mean differences and standard deviations between the ultrasound and the other instruments showed that there were no significant differences between the

measures. Despite high correlations, none of the other instruments were statistically indistinguishable to the ultrasound. Cirrus had the smallest mean difference with the ultrasound while the RTVue had the smallest standard deviation of the difference. Regression models determined the ability of the Cirrus, RTVue and Konan to explain variance in the ultrasound measurements. The RTVue explained 96% of the variance in the ultrasound value while the Cirrus explained 94% and the Konan 89%. Though not statistically different, the RTVue was found to underestimate the CCT measurement relative to the ultrasound by 24.3 micrometers. The Cirrus and Konan were also found to both underestimate by 5.5 and 18.4 micrometers respectively. High correlations ($p < 0.001$) were found between all instruments.

All three instruments were found to be viable alternatives to ultrasound pachymetry. RTVue was found to be a slightly better, but not statistically, alternative as it has greater stability across measurements, higher correlation with ultrasound, and explains more of the variance in ultrasound values. All three of the instruments underestimated CCT compared to ultrasound. Due to the difficulty in touching the exact center of the cornea perpendicularly using the probe, it is likely that ultrasound pachymetry gives an artificially thick CCT. Therefore, the measurements from the other three instruments may better reflect the actual corneal thickness.

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POSTER 78

Therapeutic Effects of Increased Hydration for Plasma Osmolality, Tear Osmolarity, and Tear Stability in Dry Eye Patients

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Dry eye is a multifactorial disease that affects the tears and cornea causing symptoms of discomfort, visual disturbance, tear film instability and potential damage to the ocular surface. There are many ways to define dry eye in a clinical setting including symptoms based diagnosis, measurement of the stability of the tear film, and increased tear osmolarity (Tosm). Previous studies have shown a correlation between dry eye patients (defined by increased tear osmolarity) and total body hydration (defined by an increased Plasma osmolality (Posm)).

20 adult subjects completed this study in the desert population of Arizona. Subjects completed a dry eye questionnaire (DEQ) and underwent objective evaluation for signs of dry eye including tear osmolarity, tear break up time (TBUT), ocular surface evaluation; in addition systemic hydration was assessed by plasma osmolality. After obtaining baseline testing, the subjects were randomly divided into two groups: therapeutic and habitual hydration. The therapeutic hydration group consumed a prescribed volume as determined by ; the habitual group hydrated normally. Both groups were required to track liquid intake between visits. A follow up visit was completed one week after the baseline where all assessments were repeated. All patients within the therapeutic hydration group reported compliance throughout the study.

The volume of liquid consumed over a seven-day period was related to the tear osmolarity level ($p < 0.03$) and TBUT ($p < 0.05$) at the follow up visit. The

amount of liquid consumed was not related to the plasma osmolality level which was very stable between the two visits for all patients and the same for both groups. There was a slight a slight decrease in DEQ scores (1 point) which was not statistically significant but deserves further clinical investigation.

Patients get multiple ocular benefits from increased hydration in our desert population. Increased hydration is correlated with improved osmolarity and TBUT, however the patients did not show a significant subjective improvement of their symptoms in this time frame. Further studies with more subjects and a longer course of therapeutic hydration are needed. This study did not show a correlation between tear osmolarity and plasma osmolality.

POSTER 79

Stage 4 Hypertensive Retinopathy in a 26-year-old with IgA Nephropathy

Jeff Binstock, DVM, O.D.

Additional Author: Gelea Ice, O.D.

IgA nephropathy, also known as Berger's disease, is a type of glomerulonephritis characterized by deposits of IgA antibodies in the kidneys. Clinical signs can range from asymptomatic hematuria to complete renal failure. Treatment is aimed at reducing glomerular permeability and scarring, as well as controlling blood pressure. This case describes a young patient with ocular signs due to uncontrolled hypertension as a result of IgA nephropathy.

A 26-year-old white male presented for an emergency visit with the complaint of blurry vision OD. He works as a behavioral therapist and reported getting hit over the right eye by a child the day before. Ocular history was otherwise unremarkable, although his last exam was 10 years prior. Systemic history was positive for IgA nephropathy. He was taking Enalapril, but reported that he had been off

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the medication for several months. Best-corrected VA was 20/400 OD and 20/25 OS. Confrontations, ocular motility, and pupils were normal. IOP was 16 and 17 OD/OS. Anterior segment by biomicroscopy was unremarkable. The optic nerves showed a cup-to-disc ratio of 0.3 OU, however, there was nasal disc edema OD. In addition, both eyes demonstrated severe hypertensive retinopathy with macular edema OD. The peripheral retina was flat and attached. The patient had stage 2 hypertension with an in office blood pressure of 182/131. He was immediately referred to the emergency room for blood pressure management and to ophthalmology for imaging. Macular OCT demonstrated profound macular edema OD at 880 microns. An Avastin injection was offered OD but he declined. He was referred to nephrology and started on Amlodipine and Enalapril. At the time of this report, the patient is no longer with our service, but reported that he is doing well with his treatment.

This case presents a rare occurrence of ocular sequelae of malignant hypertension due to uncontrolled IgA nephropathy. Although the patient presented for what he thought was an acute trauma, his ocular symptoms were due to unmanaged systemic disease, which stresses the importance of optometry as a vital component to the overall health care team.

POSTER 80

Reducing Migraine Frequency and Symptoms with the Use of Spectacle Tints

Amy Moy, O.D.

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It has been reported that patients with migraines may benefit from tinted lenses to relieve symptoms of photophobia. The question remains as to which tints are most effective. This clinically successful case is intended to contribute to the limited, but growing knowledge base regarding the use of tints in the

management of migraines.

A 26 year-old African-American female presented for an annual exam with the complaint that her glasses were exacerbating and increasing the frequency of her migraines during the past year. The patient reported she had been experiencing migraines 3-5 times per week since age five. She could not continue glasses wear for as long as was required by her school course load due to severe symptoms of photophobia. Her physician was following her migraines, but with no success with medication. The patient reported no preceding visual aura and no association with specific triggers. Refraction remained unchanged, with care taken to avoid over-minusing. Treatment for dry eye was minimally successful in aiding her symptoms. Subsequent Humphrey visual field testing was within normal limits each eye. The patient was asked to try different tint colors (yellow, blue, pink, brown, and gray) with 30% tinting. She noted that a blue tint gave her the most relief from fluorescent overhead lighting. After one month of using her 30% blue-tinted spectacles of the same Rx, she reported a significant decrease in symptoms of photophobia and migraine frequency decreased from almost daily to only four episodes per month.

This case illustrates the challenges faced when managing a patient's migraine symptoms. After 21 years of suffering from migraines, the patient was able to find relief from her severe photophobia and experience a reduction in migraine frequency through the use of a 30% blue tint in her lenses. The success in significantly improving this patient's quality of life through a spectacle tint further indicates the significance of tints in management of migraines, triggers for migraines, and symptoms of photophobia. Further research is warranted to establish a protocol for selecting various tints and filters to assist in reducing symptoms associated with ocular conditions.

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POSTER 81

Evaluation and Management of Thyroid Eye Disease

Keren H. Yang, O.D.

Thyroid eye disease (TED) often presents with chemosis, proptosis, keratitis, and conjunctival injection. Elevated intraocular pressure (IOP), visual field (VF) defects, decreased visual acuity (VA), and diplopia may occur in severe cases. TED affects up to 50% of patients with Graves' disease, and it can precede hyperthyroidism. Because TED often mimics the clinical presentations of dry eyes, allergic conjunctivitis, and open-angle glaucoma, the diagnosis of TED can be challenging, especially in the early stages of the disease.

A 56-year-old male presented with pain in both eyes (OU). He had previously been treated for chronic dry eyes with topical drops, punctual plugs, and bandage contact lenses. His corrected VAs were 20/20 OD and 20/20 OS. Confrontational VFs, EOM, pupils, and color vision were normal OU. No proptosis was observed. Anterior segment exams revealed bilateral superior punctate epithelial erosions (PEE) and three filaments on the superior cornea OS. He was diagnosed with superior limbic keratoconjunctivitis OU and sent for a thyroid work-up. Radioiodine imaging, TSH, T3, T4 results were consistent with Graves' disease, and he was commenced on Methimazole 20mg PO once daily. At the three-month follow-up, the patient reported persistent pain and redness OU. Anterior segment exams showed improved PEEs, but IOP was elevated to 32mmHg OU. HVF 30-2 revealed depressions in the total deviation map OS. A gonioscopy exam showed open angle OU. Color vision, EOM, and pupils were normal OU. Corrected VA remained at 20/20 OU. He was put on IOP-lowering drops and sent for a maxillofacial CT. The CT revealed exophthalmos, enlarged inferior extraocular muscles, and enlarged lacrimal glands OU. Oral prednisone, 60mg PO once daily, was started to reduce orbital

congestion, but it was only minimally effective. IOP remained elevated despite a maximum use of IOP-lowering drops. The patient eventually underwent orbital decompression surgery in both eyes.

Diagnosing TED is often delayed because its presentations mimic many other ocular diseases. Early detection is crucial for preventing complications of TED. This case highlights the importance of obtaining a detailed medical history and having a sound understanding of various ocular presentations of TED for a timely diagnosis.

POSTER 82

A Case of Retinitis Sclopetaria

Justin Pao, O.D.

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Retinitis sclopetaria is a term that describes retinal and choroidal trauma secondary to high velocity projectile to the orbit. The trauma causes the retina and choroid to retract, which leaves an area of visible sclera. Retinal and vitreal hemorrhages often develop immediately after the trauma. The condition leads to the proliferation of fibrous and scar tissues that adheres the retina to the choroid. Due to this mechanism, retinal detachments are unlikely to occur.

19 year old black male presented to the clinic due to a BB gunshot wound to the right eye. Upon clinical examination, the patient was found to have a significant upper and lower eyelid contusion with bleeding. Anterior segment indicated diffuse injection of the conjunctiva and a negative seidel sign. A dilated fundus examination revealed extensive subretinal, retinal, and vitreal hemorrhage of the superior temporal quadrant with choroidal rupture from the impact of the BB pellet. The biomicroscopy ultrasound revealed no retinal detachment or intraocular foreign body. An X-ray of the patient's skull showed a 4.4mm pellet lodged in the upper lid. Patient was referred to oculoplastics

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for removal of the pellet.

The patient will be closely monitored for angle recession, elevated IOP, and retinal detachment. Patient's vision remains 20/20 in both eyes uncorrected, which is rare in cases of retinitis scopolitaria. Visual acuity is often decreased due to macular choroidal rupture, development of epiretinal membranes, and optic nerve damage.

POSTER 83

The Link Between the Eye and Marfan's Syndrome

Douglas Go

Marfan's syndrome is a genetically inherited systemic disorder affecting an individual's connective tissue. This tissue is abundantly distributed amongst fat, cartilage, bone and blood, which demonstrates wide spread influence over the body. Due to this nature most organs and structures can be affected, including the eyes. Ocular signs associated with the loose connective tissue include lens subluxation, myopia, corneal thinning, glaucoma, strabismus, and retinal detachments. The looseness of the tissue can lead to stretching and thinning, which correlates the myopic feature of the eye with potential retinal detachments. This project will explore the affects of Marfan's on our ocular health, and potential treatment options.

A 15 y/o white male presented with blurred vision, centrally in the left eye, for the past 5 days. The recent gradual onset led the patient to believe it was an error in contact lens RX, due to the absence of pain, photophobia or headaches. He did however experience intermittent flashes and floaters. His BCVA in his right eye was 20/20; while his left was 20/50. He had no EOM restrictions, and his pupils were both round and reactive with no APD present. His IOP with Goldmann were: OD: 17mmHg; OS: 13mmHg @ 11:15am. A 30-2 FDT visual field was administrated, which revealed a superior altitudinal defect OS. Posterior fundus exam revealed OD WNL,

but an inferior break with retinal detachment near equator in OS. CSME was discovered in the left eye along with Tobacco dust in the anterior vitreous with an associated vitreous hemorrhage. A macular OCT and 5-line raster were performed confirming the inferior retinal detachment threatening the macula.

Further questioning revealed that patient had a positive family history of Marfan's disease, with his Maternal Grandfather, and uncle both being diagnosed. Both relatives had also suffered retinal detachments, as well as lens subluxation leading to early IOL treatment. Our patient was referred and scheduled for same-day retinal surgery involving a sclera buckle. It was also recommended to the patient to get genetic and blood testing done to confirm our Marfan suspicion. He underwent successful treatment and is being monitored for further complications.

POSTER 84

Central Serous Retinopathy can be Equally Effective in Men and Women in the Northeast

Livia Derdova, O.D.

Central Serous Retinopathy (CSR) is a condition linked to people with type A personalities who are under a lot of stress, more commonly around age 45. Previous population based research done in Olmsted, Minnesota from 1980 – 2002 showed that CSR is eight times more common in men than women. A new population research should be conducted in CSR looking at gender ratios in more developed regions throughout the US. Certain regions in the US such as the Northeast show a higher percentage of women working in higher positions in their companies. This could lead to a more stressful working environment and potentially alter the CSR incident gender ratios.

A 48-year-old Caucasian female complains of cloudy vision in her left eye with glasses since yesterday. She stated that she was attending a

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business analyst for a well-known financial company in New York City. She explained that she's been working for her current company for three years and lately has been under more stress. She denies any other ocular symptoms. The patient's ocular, medical, and social history was unremarkable. She is currently not taking medications. She reports allergies to penicillin and sulfa medication. Her best corrective visual acuities were 20/20 in the right eye and 20/50 in the left eye. Her refraction showed a hyperopic shift in her left eye comparing to her current spectacles. Her anterior exam was unremarkable. Patient's dilated fundus examination with biomicroscopy and indirect ophthalmoscopy showed the characteristics of CSR including round, shallow, and well defined serous macular neurosensory detachment without foveal reflex. Furthermore, OCT of the retina confirmed the CSR diagnosis.

Central Serous Retinopathy (CSR) is very likely related to stressful environments. Over the years, there has been an increase in women holding higher and more stressful positions in the Northeast compared to other regions in the country such as the Northwest. This could lead to more women developing CSR due to work stress level. Therefore, possibly altering CSR incident ratios, making them lower, if not equal between the two genders in the Northeast.

POSTER 85

Vitamin B12 Deficiency Causing Abducens Palsy: An Increasingly Common Association and Rapid Recovery to Treatment

Katherine Nickerson, O.D.

Additional Authors: James Patrick Smith, O.D.

Laura Dowd, O.D.

Abducens palsy has many known etiologies such as diabetes and hypertension, viral infection, or a

lesion along the 6th cranial nerve pathway. Due to the potential of a serious underlying morbidity, a new-onset CN VI palsy often warrants a thorough diagnostic evaluation. However, when initial testing is inconclusive, patient characteristics as well as associated symptoms can be very helpful in prioritizing which diagnostic tests to perform.

This case involves a 63 year old woman presenting to the eye clinic with a new-onset horizontal diplopia and an abduction deficit in her left eye. The patient was neither diabetic nor hypertensive, as blood pressure measured 113/75. Additional workup included head CT, fasting blood glucose, glycosylated hemoglobin, ESR, CRP, CMP, RPR, FTA-ABS, Lyme Titer, and MRI/MRA, all of which proved negative. Following the onset of her diplopia, she also reported to her PCP neurological symptoms including fatigue, lightheadedness, numbness/tingling, and balance issues. Subsequent lab testing revealed a Vitamin B12 Deficiency as the only remarkable finding. Upon initiating B12 supplements, her abducens palsy along with her other symptoms resolved fully within approximately 7 days.

Vitamin B12 deficiency results from either an inability to absorb the vitamin in the digestive tract or a lack of Vitamin B12 in the diet. A deficiency of Vitamin B12 can result in various neurological symptoms, often mimicking Multiple Sclerosis or other demyelinating processes. Neurological findings in the literature that have been associated with Vitamin B12 deficiency include cranial nerve palsy, nystagmus, and internuclear ophthalmoplegia. Vitamin B12 is found naturally in only animal products, including meat, fish, poultry, eggs, and dairy products. With an increasingly aging population as well as the rise in popularity of vegetarian and vegan lifestyles, Vitamin B12 is becoming more common and should remain on the differential diagnosis list for unexplained neurological and oculomotor findings.

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POSTER 86

Cerulean Cataracts in a Patient with Down Syndrome

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Down syndrome is the most common chromosomal disorder, occurring in about 1 in 700 live births. Children with Down syndrome have a high frequency of ocular anomalies, including congenital cataracts of the cerulean type. These bilateral, blue-white dot cataracts are composed of amyloid-B deposits scattered throughout the lens cortex. This type of cataract is slowly progressive and generally causes minimal visual loss.

A 36 yo African American female presented to the eye clinic with complaints of a dried discharge in her left eye for 2 weeks. The patient's medical history was positive for Down syndrome. The patient's mother vaguely remembered being told about "specks" in the patient's eyes. She took no medications and had never been a smoker. Entrance testing was unremarkable. BCVA was 20/30- in each eye. Anterior segment examination revealed mild blepharitis OU and multiple blue dot opacities in each lens. The posterior segment was unremarkable. The patient continues to be followed on a yearly basis.

Examining patients with Down syndrome may pose a challenge; however, it is important to be aware of clinical conditions with which these patients may present. Even though cataracts requiring surgical intervention are rare in a young patient with Down syndrome, periodic monitoring is an essential part of the optometric examination. This poster will include anterior segment photography.

POSTER 87

Access to Eye Exams for Young Children in Massachusetts with Medicaid Insurance (MassHealth)

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To identify optometrists and ophthalmologists in Massachusetts who provide care for young children (under five years old) with the Massachusetts Medicaid insurance (MassHealth). Use geomapping techniques to visualize provider distribution, then evaluate the distribution's impact on access to eye exams and vision health outcomes for this population.

Target sample size of providers was determined to be 1200. Contact information and addresses for each eye care provider were obtained using an online search engine. If target information of accepted insurances and specialties was available via the eye care provider's website, it was considered current and valid and was entered in the data collection tool. To obtain this information from the remaining optometrists and ophthalmologists, practices were contacted by telephone and were asked a series of scripted questions. Practice addresses of providers who met the criteria of care for young children and accepting MassHealth insurance were converted to Global Positioning System (GPS) coordinates to be mapped. Calls that were made to offices that did not answer were tried for a second and third time. After the third try the office was categorized unreachable and excluded from the study.

291 ophthalmologists were identified per described methodology; all were called. 50 (17%) provide care to patients less than five years old and accept MassHealth insurance. 872 optometrists were identified per described methodology; all were called. 185 (21%) provide care to patients less than five years old and accept MassHealth insurance.

There is disparity in geographic access to eye exams and ongoing vision care by eye care

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professionals for children under age five who are insured by MassHealth insurance. This is exacerbated when care by an ophthalmologist is required. Future studies are needed to determine capacity limits of existing providers relative to 'wait times.'

POSTER 88

Academic Value of Eyecare for Urban Children in Third Grade through High School

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Valarie Conrad, O.D.

Decreased vision is a common impairment of school aged children. Vision problems are more common among minority. Children with vision problems have been found to have poorer academic outcomes. It is the purpose of the study to show treatment results in higher academic achievement

The Illinois Eye Institute at Princeton (opened January 2011 as a school-based vision clinic . Children from Chicago Public Schools receive comprehensive eye exams. Data from the exams and standardized reading and math tests and GPAs were matched.

- No effect of visiting the clinic was found on students' reading scores.
- A significant positive effect was found on math scores after visiting the clinic.
- A significant positive effect was found on GPAs.
- Refractive error: students with moderate-severe hyperopia have significantly higher GPAs following their visit.
- There are no significant effects on math or reading scores in students relative to their degree of refractive error.
- Race/ethnicity: Latino students are the only group with a significant increase in reading scores following their visit and the improvement persists.
- Grade level: Students who first visited the clinic

when they were in third or fourth grade or when they were in high school experience greater gains in math test scores than students who first visited the clinic in fifth through seventh grades. The youngest group of students also experiences significant increases in GPAs

The evidence is clear that receiving glasses can have a positive impact on academic performance. It is believe that part of the reason for the small impact seen was the fact that children lost or broke their glasses or did not wear them as recommended by the eyecare provider. A future study should include a process to monitor whether the child wears the glasses during the year following the exam. One suggestion is to offer teachers an incentive to check periodically if the child is wearing their glasses.

POSTER 89

The Sunshine Act First Year Results: The Status of Optometry

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Financial relationships between physicians and the medical industry, with their desire to sell drugs and devices, can create conflicts of interest for physicians that potentially impact patient care. Studies consistently show that industry promotion influences prescribing behavior, despite physicians' belief that they are unaffected. Optometrists take an oath to protect patients above personal gain, so increasing awareness and understanding of these financial relationships can improve patient care. The Physician Payments Sunshine Act of 2010 requires payments from industry to physicians to be reported. Each transaction is publicly available on the Centers for Medicare & Medicaid Services (CMS) Open Payments Website. This provides transparency beyond that of previous policies and may provide insight into the patterns and nature of these

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relationships. The first mandatory reporting period covered the end of 2013. The second reporting period became available on July 1, 2015, which covered 2014. These data have been analyzed within many medical disciplines, including ophthalmology, but to the authors' knowledge, no data has yet to be organized and analyzed within optometry.

This IRB approved study used retrospective review of de-identified publicly-available data. All participants were optometrists registered for CMS Open Payments. Disclosed payment details in the CMS database between January 1, 2014 and December 31, 2014 are included in a state by state and national analysis.

In 2014, 165,035 transactions were paid to optometrists totaling \$18,289,816.66, with an average transaction value of \$110.82. Of this total, \$13,166,996.34 was received by individuals representing the top 10% of payment recipients. Individual state analyses revealed that subtotals were highest in California, Texas, Pennsylvania, Florida and North Carolina, and lowest in Vermont, Montana, Delaware, Maine and South Dakota.

Financial relationships with medical industry are widespread in optometry. These relationships are variable among providers, with the majority of payments going to a relative minority of providers. However, research in the social psychology of gifts suggests that even small gifts have influence. Individual physicians and professional institutions may use the findings as a reference when developing policies to eliminate potential conflicts of interest. Further study should include similar search parameters within ophthalmology to draw comparison between professions.