

RESIDENT / FELLOW RESEARCH DAY

**Department of Ophthalmology
and Visual Sciences**

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**Roy J. and Lucille A. Carver
College of Medicine**

University of Iowa Hospitals & Clinics

Iowa City, Iowa



Papers

Braley Auditorium, 01136 Lower Level, Pomerantz Family Pavilion

Friday, April 22, 2011, 8:00 AM-4:20 PM

Posters

Department of Ophthalmology, Elevator K, 1st Floor, Pomerantz Family Pavilion

Thursday, April 21, 2011, 5:00-7:00 PM

**The University of Iowa
Department of Ophthalmology and Visual Sciences
Resident and Fellow Research Program
would like to recognize**

The William C. and Dorothea Gaedke Charitable Trust

**for their continued support of
resident and fellow research**

Research at The University of Iowa Department of Ophthalmology
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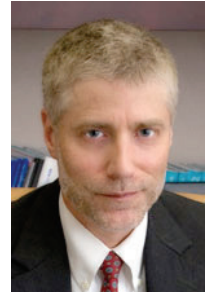


RESIDENT/FELLOW RESEARCH DAY - 2011

GUEST FACULTY

2nd Annual Distinguished Ophthalmic Educator

Peter A. Netland, M.D., Ph.D., is the DuPont Guerry III Professor of Ophthalmology and Chairman of the Department of Ophthalmology at the University of Virginia. He completed his undergraduate education at Princeton University, after which he obtained a medical degree from the University of California, San Francisco, and a Ph.D. degree from Harvard University. He completed his ophthalmology residency and a glaucoma fellowship at the prestigious Massachusetts Eye and Ear Infirmary and Harvard Medical School. Prior to his current appointment, he held faculty positions at King Khaled Eye Specialist Hospital (Riyadh, Saudi Arabia) and the University of Tennessee (Memphis).



Dr. Netland has received both the Achievement Award and the Senior Achievement Award from the American Academy of Ophthalmology. He is a Special Associate Examiner for the American Board of Ophthalmology. He has given hundreds of presentations to regional, national, and international societies and organizations. He has published over 300 original scientific articles, reviews, and abstracts as well as five textbooks.

3rd Annual Ophthalmology Alumni Society Representative

Michael V. Boland, M.D., Ph.D., is an Assistant Professor of Ophthalmology at the Wilmer Eye Institute of the Johns Hopkins University. Dr. Boland received a B.S. in electrical and computer engineering and an M.D. from the University of Pittsburgh. He earned his Ph.D. from Carnegie Mellon University. He completed his ophthalmology residency at the University of Iowa and a glaucoma fellowship at the Wilmer Eye Institute of Johns Hopkins University. His current research efforts include medical informatics in ophthalmology and computer-assisted diagnosis.



2nd Annual Leinfelder Award Society Representative

Scott A. Larson, M.D., is an Assistant Professor of Ophthalmology and Visual Sciences, Pediatric Ophthalmologist at the John A. Moran Eye Center, The University of Utah, Salt Lake City. Dr. Larson received his M.D. from Loma Linda University School of Medicine, Loma Linda, California. He completed his ophthalmology residency and a pediatric ophthalmology and strabismus fellowship in Pediatric Ophthalmology at the University of Iowa, during which time he was a two-time winner of the prestigious Leinfelder Award for the best Research Day presentation.



RESIDENT/FELLOW RESEARCH DAY - 2011

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Michael D. Wagoner, M.D., Ph.D.

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GLAUCOMA

James H. Burden, M.D.

NEURO-OPHTHALMOLOGY

Yanjun (Judy) Chen, M.D., Ph.D.
Scott R. Haines, M.D.

OCULOPLASTIC SURGERY

Conley B. Call, M.D.

PEDIATRIC OPHTHALMOLOGY

Michael S. Floyd, M.D.
Alina V. Dumitrescu, M.D.

VITREORETINAL DISEASE

Andrew S. Davis, M.D.
Christine N. Kay, M.D.
A. Brock Roller, M.D.
Ryan M. Tarantola, M.D.
Lucas J.A. Wendel, M.D.

RESIDENT/FELLOW RESEARCH DAY - 2011

RESIDENTS

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Jason P. Brinton, M.D.
Leslie T.L. Pham, M.D.
Brian K. Privett, M.D.
Gina M. Rogers, M.D.
Janet Y.M. Tsui, M.D.

SECOND-YEAR RESIDENTS

Priya Gupta, M.D.
Esther S. Hong, M.D.
Shaival S. Shah, M.D.
Matthew S. Ward, M.D.
Christopher E. Watts, M.D.

FIRST-YEAR RESIDENTS

John J. Brinkley, M.D.
John J. Chen, M.D.
Amy C. Maltry, M.D.
Jordan J. Rixen, M.D.
Meredith A. Saylor, M.D.

ORTHOPTICS – TRAINING

Shemeka Butler, B.S., Second Year
Grant Casey, B.S., First Year
Alicia Rosenborough, B.S., First Year

OTHER PRESENTERS

Jessica Skeie, Ph.D.

**RESIDENT / FELLOW
RESEARCH DAY**

April 21-22, 2011

Department of Ophthalmology
and Visual Sciences

University of Iowa
Roy J. and Lucille A. Carver
College of Medicine

University of Iowa
Hospitals and Clinics

Iowa City, Iowa

**OPHTHALMOLOGY RESIDENT/FELLOW RESEARCH DAY
SCHEDULE OF EVENTS**

Friday, April 22, 2011, 8:00 AM - 4:15 PM

8:00 **Registration**, Entry Foyer, Braley Auditorium 01136 PFP

8:15 Welcome: **Michael D. Wagoner, M.D., Ph.D.**

8:25 – 9:45	Scientific Papers, Session I Braley Auditorium Moderator: Scott A. Larson, M.D.
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8:25 Introduction of the Moderator

8:30 **Shemeka Butler**, Susannah Q. Longmuir, Supervisor 1
Surgical success of prism adaptation for esotropia in
patients with high hypermetropia

8:45 **Lucas J.A. Wendel**, Vinit B. Mahajan, Supervisor 2
Prevalence of the metabolic syndrome in diabetic retinopathy

9:00 **John J. Chen**, Elliott H. Sohn, Supervisor 3
Resolution of foveal cystoid changes in idiopathic juxtafoveal
telangiectasia with carbonic anhydrase inhibitors

9:15 **Amanda C. Maltry**, Nasreen A. Syed, Supervisor 4
Determining the timeline of ocular blood breakdown using
hemosiderin staining

9:30 **Jordan J. Rixen**, Kenneth M. Goins, Supervisor 5
Glycerin-preserved corneas for keratoprosthesis use

9:45 – 10:15	Morning Break
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10:15 Introduction of Keynote Speaker

10:20 **Peter A. Netland, M.D., Ph.D.**, Keynote Address

10:45 – 11:45	Scientific Papers, Session II Braley Auditorium Moderator: Peter A. Netland, M.D., Ph.D.
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10:45 **Meredith A. Saylor**, Richard C. Allen, Supervisor 6
Eyelid procedures in patients with Boston keratoprosthesis

11:00 **Priya Gupta**, Michael D. Abramoff, Supervisor 7
Is fluorescein angiography effective for management of
suspected CNV? FFA plus OCT versus OCT alone in the
diagnosis of choroidal neovascularization

11:15 **Shaival S. Shah**, Richard J. Olson, Supervisor 8
Validation of home use of web-based vision screening tool

**OPHTHALMOLOGY RESIDENT/FELLOW RESEARCH DAY
SCHEDULE OF EVENTS**

Friday, April 22, 2011, 8:00 AM - 4:15 PM

- 11:30 **Christopher E. Watts**, Thomas A. Oetting, Supervisor 9
Surgical simulator improves early resident learning curve for
cataract surgery

11:45 – 1:15

Buffet Luncheon

Melrose Conference Center, 5th Floor, PFP

1:15 – 2:35

Scientific Papers, Session III

Braley Auditorium

Moderator: Michael V. Boland, M.D., Ph.D.

- 1:15 Introduction of Moderator
- 1:20 **James H. Burden**, John H. Fingert, Supervisor 10
Unique iris transillumination pattern in patients with
exfoliation syndrome
- 1:35 **Conley B. Call**, Richard C. Allen, Supervisor 11
In vivo examination of meibomian gland morphology in
patients with impaired function of the orbicularis oculi using
infrared meibography
- 1:50 **Yanjun (Judy) Chen**, Randy H. Kardon, Supervisor 12
Investigating the effect of pupil size and iris color on pupillary
light reflex using brimonidine induced miosis
- 2:05 **Alex W. Cohen**, Kenneth M. Goins, Supervisor 13
Outcomes of corneal transplantation with Boston type 1
keratoprosthesis
- 2:20 **Michael S. Floyd**, Arlene V. Drack, Supervisor 14
Etiology of isolated infantile nystagmus in a tertiary care
pediatric ophthalmology practice

2:35 – 3:05

Afternoon Break

3:05 – 4:20

Scientific Papers, Session IV

Braley Auditorium

Moderator: Peter A. Netland, M.D., Ph.D.

- 3:05 **Scott R. Haines**, Randy H. Kardon, Supervisor 15
Use of macular optical coherence tomography to detect
homonymous hemianopia

**OPHTHALMOLOGY RESIDENT/FELLOW RESEARCH DAY
SCHEDULE OF EVENTS**

Friday, April 22, 2011, 8:00 AM - 4:15 PM

3:20	Christine N. Kay , Edwin M. Stone, Supervisor 16 Morphological analysis of vitelliform macular dystrophy with Spectral Domain Optical Coherence Tomography
3:35	Ryan M. Tarantola , Vinit B. Mahajan, Supervisor 17-18 An evidence-based approach to understanding new vitrectomy techniques and complications
3:50	John J. Brinkley , Randy Kardon, Supervisor 19 Correlation of optic disc morphology and nerve fiber layer thickness via Cirrus HD-OCT in patients with nonarteritic anterior ischemic optic neuropathy
4:05	Jessica M. Skeie , Vinit Mahajan, Supervisor. 20 Personalized proteomics in the management of uveitis
	Poster List 21-24

Morning Session, Paper 1

Surgical success of prism adaptation for esotropia in patients with high hypermetropia

Shemeka Butler, B.S.

Primary Supervisor: Susannah Q. Longmuir, M.D.

Additional Supervisors: Wanda O. Pfeifer, OC(C), C.O.M.T., Arlene V. Drack, M.D., Richard J. Olson, M.D., William E. Scott, M.D.



Background/Purpose: Partially accommodative esotropia has historically been surgically managed by basing the surgery on the residual deviation in the full hyperopic correction. Standard surgery can result in undercorrection and some have advocated “augmented surgery” to address this undercorrection. Prism Adaptation has been shown to have a beneficial overall effect in the surgical outcome of patients with acquired esotropia. Many variables associated with the prism adaptation test (PAT) have been studied, but we set out to determine the effect high hyperopia (greater than + 4D) had on the surgical outcome of the patients that were treated with prism adaptation.

Methods: A retrospective chart review of patients that underwent prism adaptation for esotropia between 1998 and 2008 at University of Iowa Hospitals and Clinics was started. We created a database in order to further analyze prism adaptation in these patients with high hyperopia and to characterize the influence of this variable and its impact on surgical outcome.

Results: Currently, we have reviewed 95 patients who underwent prism adaptation. Thirty-two of these patients had high hyperopia with greater than 4 diopters of refractive error. Pre-operatively, 10 patients (31%) responded to prism adaptation, 6 (19%) were motor responders, and 16 (50%) did not respond to prism adaptation. Eighty percent of those patients who were originally prism-responders demonstrated sensory fusion and had a small, less than 8 prism diopter, esotropia on final exam. However, 20% of these initial responders became exotropic over time. Of the 6 patients who exhibited motor response at pre-operative examination, but not sensory fusion, 66% became responders developing sensory fusion and an esotropia of less than 8 prism diopters at final examination; however, 17% percent of the initial motor responders became exotropic over time. Of the pre-operative non-responders, 43% demonstrated sensory and motor fusion at final exam. Only 22% of the preoperative non-responders remained non-responders at final examination. (Preliminary)

Conclusion: Seventy eight percent of patients with high hyperopia and esotropia who underwent preoperative prism adaptation (responders, motor responders and non-responders) demonstrated an esotropia of less than 8 prism diopters at final examination, but only 59% of these patients also demonstrated sensory fusion over time. This preliminary research suggests that patients with high hyperopia and esotropia may have poorer sensory outcomes than previously published data. (Preliminary)

Financial Disclosure: None

Morning Session, Paper 2

Prevalence of the metabolic syndrome in diabetic retinopathy

Lucas J.A. Wendel, M.D.

Primary Supervisor: Vinit B. Mahajan, M.D., Ph.D.

Additional Supervisors: John J. Chen M.D., Ph.D., Emily S. Birkholz M.D., John G. Vallone, M.D., Fei Yu Ph.D.



Background/Purpose: To determine the prevalence of the metabolic syndrome in diabetic retinopathy.

Methods: A retrospective case - control chart review was completed of patients examined at the University of Iowa. Cases included a random selection of 108 patients with proliferative diabetic retinopathy (PDR) or non-proliferative diabetic retinopathy (NPDR) and 100 controls without diabetes. The presence or absence of the metabolic syndrome (MS) was determined using the 2006 International Diabetes Foundation (IDF) definition. This definition requires abdominal obesity be present, defined as a waist circumference >94 cm for males and >80 cm for females or a body mass index (BMI) > 30 kg/m². Then two of the following four criteria must be met; (1) serum triglycerides > 150mg/dl, (2) serum HDL-cholesterol < 40 mg/dl in males or <50 mg/dl in females, (3) elevated blood pressure defined as systolic blood pressure >130 mmHg or diastolic blood pressure >85 mmHg, or (4) fasting plasma glucose > 100 mg/dl. Specific treatment for dyslipidemia, hypertension or diabetes is accepted as meeting the respective criteria.

Results: The overall prevalence of metabolic syndrome (MS) in subjects with diabetic retinopathy was 65.7% (71/108). This was significantly different from control subjects where the prevalence was 27% (27 /100) (p<0.0001). There was no significant difference in the prevalence of MS between the PDR and NPDR groups, with rates of 53.1% and 71.1%, respectively (p=0.081). The average BMI was 34.0 ± 8.5 kg/m² in the diabetic patients versus 28.7 ± 7.0 kg/m² in the control group (p<0.0001). The NPDR cohort's average BMI was 35.3 ± 8.9 kg/m², and the average BMI of the PDR group was 30.9 ± 6.7 kg/m² (p=0.014). Overall, 65.7% of the diabetic patients met the IDF criteria for abdominal obesity and 89.8% met the IDF criteria for hypertension. 73.1% of the diabetics met criteria for hypertriglyceridemia and 80.6% met the criteria for abnormal HDL cholesterol.

Conclusion: There is a high prevalence of the metabolic syndrome in patients with diabetic retinopathy. Also, the metabolic syndrome and obesity may represent a new modifiable risk factor for diabetic retinopathy.

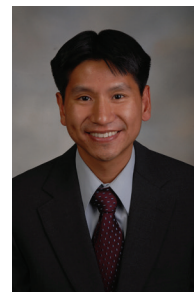
Financial Disclosure: None

Morning Session, Paper 3

Resolution of foveal cystoid changes in idiopathic juxtafoveal telangiectasia with carbonic anhydrase inhibitors

John J. Chen, M.D., Ph.D.

Primary Supervisor: Elliott H. Sohn, M.D.



Background/Purpose: Idiopathic juxtafoveal telangiectasis (IJT) is an uncommon disease characterized by telangiectatic vessels in the juxtafoveolar region of one or both eyes. There is currently no treatment and the natural progression of the disease results in significant visual loss in the majority of patients. Recent studies have demonstrated that carbonic anhydrase inhibitors (CAIs) are effective in the treatment of macular edema associated with retinitis pigmentosa and x-linked retinoschisis and may improve visual function in these diseases. Patients with IJT also often have subfoveal cystoid changes. This study evaluates the effect of CAIs in the treatment of IJT.

Methods: Retrospective review of all patients with the diagnosis of IJT seen between 1990-2010 at a university hospital. The age, gender, presenting and final visual acuity, treatments, and optical coherence tomography results (including central macular thickness and presence of cystoid changes in the macula) were recorded.

Results: Carbonic anhydrase inhibitors were used in seven eyes of four patients with IJT. Two patients were treated with topical dorzolamide and two patients were treated with systemic methazolamide. Four of seven eyes had resolution of cystoid changes. Visual acuity improved in two eyes from two separate patients, one treated with topical dorzolamide and one treated with methazolamide. Improvement was seen within two months and maintained for two and three years, respectively. Two eyes had no change in visual acuity. Three eyes had a gradual worsening of visual acuity. Follow-up ranged between 1 to 9 years. Nine eyes of five patients with IJT were identified that did not receive treatment. Visual acuity decreased in five eyes and remained stable in four eyes, with follow-up between 1 to 11 years. There was no improvement in visual acuity or changes in cystic spaces in any of the patients that did not receive treatment.

Conclusion: Carbonic anhydrase inhibitors, both topical and systemic, may decrease the macular cystoid changes seen in IJT that could correspond to improvement in visual acuity.

Financial Disclosure: None

RESIDENT / FELLOW RESEARCH DAY - 2011

Morning Session, Paper 4

Determining the timeline of ocular blood breakdown using hemosiderin staining

Amanda C. Maltry, M.D.

Primary Supervisor: Nasreen A. Syed, M.D.



Background/Purpose: To determine if the presence of hemosiderin may be used to establish a timeline of blood breakdown in various ocular tissues.

Methods: Gross and histopathologic examination was performed on 49 eyes enucleated after traumatic injury where the exact timing of the injury is known. The presence of hemosiderin in ocular tissues was assessed with Perl's Prussian blue stain performed at two separate levels. The patient's chart was reviewed to determine the number of days from the trauma event to enucleation.

Results: Pending

Conclusion: Pending

Financial Disclosure: None

Morning Session, Paper 5

Glycerin-preserved corneas for keratoprosthesis use

Jordan J. Rixen, M.D.

Primary Supervisor: Kenneth M. Goins, M.D.



Background/Purpose: The use of penetrating keratoplasty (PKP) has been successful in the treatment of many corneal diseases which require surgical management. There is, however, a subset of patients with corneal disease in which PKP is unlikely to succeed. In these cases, an artificial cornea or keratoprosthesis (KPro) is considered an alternative treatment option. The Boston KPro, has been used successfully with increasing frequency. Donor corneal graft tissue is needed during the placement of the Boston KPro. To date, only fresh donor corneal has been used in the Boston KPro. The use of glycerin is another method of donor corneal tissue preservation in grafts which do not require functional endothelium. The current method of glycerine preservation uses a desiccant to produce dehydration and allows for storage without vacuum at room temperature for years. Recently, people have studied the use of glycerine preserved corneal tissue in corneal transplant procedures such as small diameter PK for treatment of eccentric perforations and deep anterior lamellar keratoplasty (DALK). In the Boston KPro, the donor tissue provides only a corneal skirt around the prosthesis and endothelial function is not a requisite for clear central visual axis. This makes the procedure a good fit for the use of glycerin preserved corneal donor tissue. As the use of the Boston KPro increases, there will be increasing demand for fresh corneal tissue which is already in short supply worldwide. Given the extended length of time that glycerin preserved corneas can be stored, they are more abundant in supply. In this study, we prospectively compare the outcomes of fresh corneal tissue donor tissue versus the use of glycerin preserved corneal donor tissue in patient receiving the Boston KPro.

Methods: Twenty patients meeting criteria for Boston keratoprosthesis will be recruited and randomized into a test and control group. The test group will be comprised of 10 patients receiving the Boston KPro incorporating glycerol preserved corneal tissue. The control group will be comprised of 10 patients receiving the Boston KPro incorporating standard, fresh corneal tissue. Randomization will take place in coordination with the Iowa Lions Eye Bank. The surgeon will be aware of corneal tissue preservation but patients will be blinded.

Results: Pending

Conclusion: Pending

Financial Disclosure: None

Morning Session, Paper 6

Eyelid procedures in patients with Boston keratoprosthesis

Meredith A. Saylor, M.D.

Primary Supervisor: Richard C. Allen, M.D., Ph.D.



Background/Purpose: Due to the high risk of corneal regrant failure or to the severity of ocular surface disease, in some patients, artificial corneas or keratoprotheses are used to provide a clear corneal window. The Boston Keratoprosthesis (Boston KPro) represents one of the two artificial corneas currently FDA-approved in the United States. Interestingly, a significant percentage of patients undergoing corneal transplant surgery with the Boston KPro require eyelid surgery; however, to our knowledge, no literature addressing the issues surrounding the Boston KPro and eyelid procedures exists. Furthermore, eyelid surgery (blepharotomy and tarsorrhaphy) is part of the standard procedure for patients undergoing Boston Type 2 KPro procedures. With the mounting support for using these devices to treat severe corneal disease and corneal blindness, it is prudent for oculoplastic surgeons to be aware of the need for eyelid alterations in patients who have undergone Boston KPro procedures.

Methods: This is a retrospective chart review of patients from the University of Iowa Department of Ophthalmology and Visual Sciences who underwent a Boston Type 1 Keratoprosthesis or Boston Type 2 Keratoprosthesis procedure from March 2008 to March 2011. Patients were identified through the cornea service.

Results: Sixty one patients underwent a Boston Keratoprosthesis (Boston KPro) procedure at the University of Iowa from March 2008 to March 2011; 59 Boston Type 1 KPro procedures and 2 Boston Type 2 KPro procedures were performed. Ten (16.4%) of these patients required eyelid procedures. In addition to the 2 Boston Type 2 KPro patients, 8 Boston Type 1 KPro patients required eyelid surgeries. These eyelid surgeries included: 8 tarsorrhaphies (including Type 2 patients), 2 blepharotomies, and 2 ptosis repairs; one patient also received Botox injections for ptosis. Interestingly, the majority (75%) of Boston KPro patients who required eyelid surgery following their Boston KPro procedure had also undergone eyelid surgery prior to their Boston KPro procedure. Surgical revisions were necessary for several patients.

Conclusion: A significant number of patients with Boston KPros require subsequent eyelid surgery. With limited existing literature and more frequent use of Boston KPros for treating corneal disease, it is important for oculoplastic surgeons to be aware of the need for eyelid alterations in these patients as well as the surgical intricacies surrounding these cases.

Financial Disclosure: None

Morning Session, Paper 7

Is fluorescein angiography effective for management of suspected CNV? FFA plus OCT versus OCT alone in the diagnosis of choroidal neovascularization

Priya Gupta, M.D.

Primary Supervisor: Michael D. Abramoff, M.D., Ph.D.



Background/Purpose: Fluorescein angiography (FA) has long been the standard modality to diagnose and manage choroidal neovascularization (CNV), and is a requirement for Medicare reimbursement for managing this condition. However, FA is costly, has a mortality of 1/220000, and considerable morbidity from allergic reactions. Since the advent of anti-VEGF therapy for CNV, optical coherence tomography (OCT), a non-invasive imaging method free of these disadvantages, is used extensively to manage CNV, and FA is only used to make the initial diagnosis. We hypothesize that FA changes the management of patients that are initially suspected of having CNV in less than 5% of cases. If this hypothesis is confirmed, it would cast doubt on the clinical as well as cost-effectiveness of FA for diagnosing CNV, except in treatment failures and non-standard cases. The purpose of this pilot study is to more fully explore this hypothesis.

Methods: We will retrospectively review the FA, OCT and clinical histories of 200 initial visits from 200 patients (200 eyes) who had an initial presentation of confirmed CNV. After deidentification, 3 retinal specialists masked to each other will review, in randomized order, the standardized brief clinical history, the posterior pole color fundus image, and complete OCT scan of the initial visit, and choose whether they will manage each case by three consecutive injections, further imaging, or other (FA- arm). After re-randomization, corresponding early, mid and late phase FA images will be added to each patients case data, and the 3 experts will again choose from these 3 management options (FA+). We will determine for each expert the case discordance, i.e. the percentage of cases where they differed between FA- and FA+, and inter-observer discordance, i.e. percentage of cases where all 3 experts differed. We will also do a random model of mixed effects to look at interaction with patient age and fellow eye history

Results: Pending

Conclusion: Pending

Financial Disclosure: None

RESIDENT / FELLOW RESEARCH DAY - 2011

Morning Session, Paper 8

Validation of home use of a web-based vision screening tool

Shaival S. Shah, M.D.

Primary Supervisor: Richard J. Olson, M.D.

Additional Supervisors: Susannah Q. Longmuir, M.D., Arlene V. Drack, M.D.



Background/Purpose: Amblyopia is the most common cause of monocular vision impairment in children under 10 years of age. Early recognition and referral are crucial to prevent permanent vision loss. The Internet is still a relatively untapped resource for vision screening, and holds the potential for widespread, free testing if it can be validated for home use without the assistance of a trained examiner. The purpose of this study is to determine the sensitivity and specificity of a novel web-based vision screening tool.

Methods: In this prospective study, we enrolled a combined total of 100 patients and accompanying siblings between ages 3-12 who presented to the pediatric ophthalmology clinic at the University of Iowa. Visual acuities obtained in clinic were compared acuities obtained in the study subject's home using the web-based vision screening tool administered by the parent. Critical lines were vision <20/40 for children ages 3-5, vision <20/30 for children older than 5, or a 2-line difference between eyes for all children.

Results: Pending

Conclusion: Pending

Financial Disclosure: None

RESIDENT / FELLOW RESEARCH DAY - 2011

Morning Session, Paper 9

Surgical simulator improves early resident learning curve for cataract surgery

Christopher E. Watts, M.D.

Primary Supervisor: Thomas A. Oetting, M.S., M.D.



Background/Purpose: To compare the operative times and sentinel complications of residents performing their first 5 cataract surgeries who have had exposure to and training with the EyeSi surgical simulator (VRmagic, Mannheim, Germany with software version 2.5.1) to those residents who have not.

Methods: A retrospective case study of quality assurance data was performed over the 2005 through 2010 academic years. The study population was divided into 2 groups. Group I consisted of 13 residents who did not have access to the EyeSi surgical simulator. Group II was made up of 10 residents who had access to and training on the surgical simulator. The total intraoperative case time and sentinel complications from the first 5 cataract cases where the resident acted as the primary surgeon for each study group was compared. Sentinel complication was defined as compromise of the zonules or posterior capsule requiring anterior vitrectomy.

Results: Residents in Group II had a shorter mean case time (45.6 minutes; SD 10.5 minutes) than those in Group I (51.5 minutes; SD 19.3 minutes) ($P = 0.053$). A lower sentinel complications rate occurred in Group II compared to Group I (2% vs 5%; $P = 0.850$).

Conclusion: Use of the EyeSi surgical simulator provides an introduction to intraocular operative skills prior to performing surgery on a human patient. Experience on the EyeSi surgical simulator may speed the learning curve for residents who are learning cataract surgery and enhance patient safety.

Financial Disclosure: None

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Afternoon Session, Paper 1

Unique iris transillumination pattern in patients with exfoliation syndrome

James H. Burden, M.D.

Primary Supervisor: John H. Fingert, M.D., Ph.D.

Additional Supervisors: Young H. Kwon, M.D., Ph.D.; Wallace L.M. Alward, M.D.



Background/Purpose: We identified a pattern of concentric circular transillumination defects in a few patients with exfoliation syndrome using an infrared detection system. This pattern of iris abnormality has been termed Marcel iris transillumination defects. The objective of the current study is to determine if Marcel iris transillumination defects are specific to exfoliation syndrome and may have some diagnostic utility for identifying early cases of disease.

Methods: The irides of 67 volunteers from the University of Iowa Glaucoma Clinic with normal eyes or diagnoses of either exfoliation syndrome, pigment dispersion syndrome, or open angle glaucoma were enrolled in the study. The subjects were examined by one physician who was masked to their diagnosis, using infrared videography. The presence of Marcel transillumination defects on the videos was graded as none, possible, definite, or prominent. The results were evaluated using the Fisher's exact test to determine the correlation between the presence of the Marcel iris transillumination defects and the diagnosis of pseudoexfoliation syndrome.

Results: The presence of any Marcel iris transillumination defects was detected in 5 of 20 (25%) normal subjects, 6 of 26 (23%) POAG patients, 3 of 8 (38%) pigment dispersion syndrome patients, and 8 of 11 (73%) of exfoliation syndrome patients. The presence of either definite or prominent marcel transillumination was detected in 0 of 20 (0%) normal subjects, 1 of 26 (4%) POAG patients, 1 of 8 (13%) pigment dispersion syndrome patients, and 6 of 11 (55%) of exfoliation syndrome patients. When the frequency of Marcel iris transillumination was compared between each of the patient groups and normal controls using Fisher's exact test, a significant difference was detected between exfoliation syndrome patients and controls (p-value = 0.0209)

Conclusion: Detection of Marcel iris transillumination defects with an infrared system is easy, inexpensive, rapid, and relatively specific in exfoliation syndrome. Future larger studies will be needed to confirm the findings of this small pilot study. Furthermore, this examination technique has the potential to help physicians to make earlier diagnoses of exfoliation syndrome and to better plan for future surgeries to minimize risk of complication.

Financial Disclosure: None

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Afternoon Session, Paper 2

***In vivo* examination of meibomian gland morphology in patients with impaired function of the orbicularis oculi using infrared meibography**

Conley B. Call, M.D.

Primary Supervisor: Richard C. Allen, M.D., Ph.D.

Additional Supervisors: Keith D. Carter, M.D.



Background/Purpose: The causes of ocular surface abnormalities and associated ocular discomfort can be multifactorial. Meibomian gland dysfunction has been shown to be a major contributor in many cases. The purpose of this study was to investigate the effect of orbicularis oculi weakness on meibomian glands using infrared video meibography.

Methods: Patients with a unilateral case of facial nerve weakness of variable duration were recruited from the Department of Ophthalmology and Visual Sciences at the University of Iowa Hospitals and Clinics. Meibomian glands from both the affected side and unaffected side were visualized using infrared video meibography. Seventeen affected eyelids in eleven patients were examined. The opposite unaffected lids served as a control. Each lid was examined and assigned a value (0-3) based on the degree of morphological change in each of three categories: gland dropout, shortening, and distortion. The three values were summed to give a total value for each lid which we termed “meibograde”. The meibograde ranged from 0-9. A meibograde of nine represented gland dropout and morphological changes affecting more than two-thirds of the lid.

Results: Six patients (mean age, 50.5 years) demonstrated facial nerve weakness for greater than 6 months. The meibograde for the lower lids (n=5) in this group was significantly higher than the control group ($p = 0.031$). The meibograde for the affected upper lids (n=3) in this group was not statistically different from the control group ($P=0.264$). Five patients (mean age, 73.8 years) demonstrated facial nerve weakness of less than 6 months duration. The meibograde for both the upper (n=5) and lower lids (n=4) in this group showed no significant difference between the study and control groups.

Conclusion: Over time, weakness of the orbicularis oculi muscle is associated with morphological changes in the meibomian glands of the affected lower lids. These changes include increased gland dropout, shortening and distortion. Further study is required to see if the same correlation can be found in the glands of the affected upper lids.

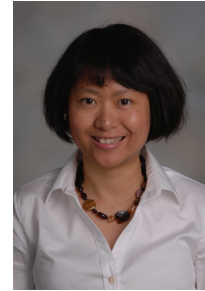
Financial Disclosure: None

Afternoon Session, Paper 3

Investigating the effect of pupil size and iris color on pupillary light reflex using brimonidine induced miosis

YanJun (Judy) Chen, M.D., Ph.D.

Primary Supervisor: Randy H. Kardon, M.D., Ph.D.



Background/Purpose: A pilot study to investigate the effect of pupil size and iris color on the afferent and efferent paths of the pupillary light reflex, using brimonidine induced miosis.

Methods: Pupil responses were recorded using a dual channel binocular eye frame pupillometer (Arrington Research, Scottsdale, AZ), to a series of diffuse, wide field light stimuli displayed using a light emitting diode ColorDome Ganzfeld electroretinogram apparatus (Diagnosys, Lowell, MA). A trial of stimulus consisting series of pairs of red and blue stimuli with a continuous stepwise increase in stimulus intensity was given, first in dark background then in blue background. One eye of each of eight normal subjects was treated with 0.2% brimonidine tartrate ophthalmic solution to achieve a reduction in pupil size. The pupil responses were recorded before and after brimonidine treatment. Recorded pupil data were analyzed offline using custom designed software program using Igor Pro (Wave Metrics, Inc.). Descriptive statistics was used for interpretation of the data.

Results: Pupil response was analyzed by the effect on entrance pupil size on the afferent input to the pupillary light reflex (treated, miotic pupil effect on consensual pupil response). A separate analysis was performed to assess the efferent mechanical effects of miosis on pupil contraction (miotic eye stimulated, pupil contraction of treated miotic eye compared to that of untreated eye). Brimonidine treatment produced significant reduction in pupil size in normal subjects (mean reduction in pupil size: 1.78 and 0.77 mm in dark and blue background conditions, respectively, $p < 0.05$). The treated, miotic eye, when stimulated with equal stimulus intensity, demonstrated limited pupil contraction compared to untreated eye in both dark and light iris subjects. The treated, miotic eye produced decreased consensual pupil response in subjects with dark iris, but not in subjects with light iris.

Conclusion: Reduction in pupil size may cause decreased pupil contraction associated with limited iris mechanics in both dark and light iris subjects. It may lower the amount of retinal illumination thus reduce the afferent input to the pupillary light reflex in subjects with dark iris.

Financial Disclosure: None

Afternoon Session, Paper 4

Outcomes of corneal transplantation with the Boston type 1 keratoprosthesis

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Primary Supervisor: Kenneth M. Goins, M.D.

Additional Supervisors: Michael D. Wagoner, M.D., Ph.D.; Anna S. Kitzmann, M.D.



Background/Purpose: To evaluate the clinical outcomes of the Type 1 Boston Keratoprosthesis (Kpro-1)

Methods: To evaluate the clinical outcomes of Type 1 Boston Keratoprosthesis (Kpro-1)

Results: Forty eight eyes met the inclusion criteria. . The indications for Kpro-1 were failed graft in 37 (77.1%) eyes, neurotrophic keratopathy in 5 (10.4%) eyes, Steven's Johnson syndrome in 3 (6.2%) eyes, corneal scar in 3 (6.2%) eyes, and ocular cicatricial pemphigoid in 1 (2.1%) eye. The mean patient age was 60.3 years (range, 11 to 87). Graft retention occurred in 46 (95.8%) eyes during a mean follow-up period of 11.8 months (range, 3 to 31). There was a statistically significant improvement in the mean logMAR best corrected visual acuity (BCVA) from 1.72 (range 0.39 to 2.20) preoperatively to 1.46 (range, -0.07 to 2.20) at the most recent examination ($P < 0.001$). A final BCVA of $\geq 20/20$, $\geq 20/40$, or $\geq 20/200$ was obtained in 3 (6.1%) eyes, 15 (30.6%) eyes, and 30 (61.2%) eyes, respectively. Overall, the BCVA improved in 35 (72.9%) eyes, remained the same in 7 (14.6%) eyes, and worsened in 6 (12.5%) eyes. One of more major complications occurred in 23 (47.9%) eyes. These included epiretinal membrane in 9 (18.8%) eyes, escalation of glaucoma therapy in 6 (12.5%) eyes, cystoid macular edema in 9 (18.8%) eyes, retroprosthetic membrane in 6 (12.5%) eyes, retinal detachment in 4 (8.3%) eyes, and endophthalmitis in 1 (2.1%) eye. These complications were responsible for the 6 (12.5%) eyes which experienced worsened postoperative vision.

Conclusion: The use of the Kpro-1 is a viable alternative for eyes with a poor prognosis with conventional keratoplasty. Although the sight-threatening complications are common, most eyes retain the keratoprosthesis and experience significantly improved visual acuity after the procedure.

Financial Disclosure: None

Afternoon Session, Paper 5

Etiology of isolated infantile nystagmus in a tertiary care pediatric ophthalmology practice

Michael S. Floyd, M.D.

Primary Supervisor: Arlene V. Drack, M.D.

Additional supervisors: Richard J. Olson, M.D., Tiffany Grider, M.S.,
Susannah Q. Longmuir, M.D.



Background/Purpose: To identify the causes of isolated infantile nystagmus in children referred to a tertiary care pediatric ophthalmology practice.

Methods: Retrospective chart review. Subjects were referrals to the pediatric ophthalmology service from 1993 to 2010 with an ICD-9 code for congenital nystagmus. Inclusion criteria and definition of isolated infantile nystagmus were onset of nystagmus less than 6 months of age and no accompanying neurologic or systemic abnormalities. Diagnosis was made on the basis of complete eye exam, family history, and, as indicated, electroretinogram (ERG), optical coherence tomography (OCT), molecular genetic testing, and brain MRI. Nystagmus was classified using CEMAS criteria.

Results: Eighty eight of 316 patients with infantile nystagmus met inclusion criteria. 52 were male and 36 female. Follow up averaged 7.7 years. 15/88 had a family history of nystagmus or ocular disease. 35 underwent brain imaging. 7 had an abnormal test. All 7 were ordered to rule out midline defects based on a clinical diagnosis of optic nerve hypoplasia. Macular OCT was performed in 6 patients and 2 had foveal hypoplasia. 18 ERGs were performed. 9/18 were abnormal. Molecular testing was performed on 14 and 8 had mutations in genes known to cause retinal degeneration. Nystagmus etiology: 49 presumed infantile motor nystagmus (5 X linked), and 39 vision loss nystagmus (17 albinism, 8 optic nerve hypoplasia, 3 cone dystrophy, 3 LCA, 2 macular dragging secondary to ROP, 2 retinal coloboma, 1 congenital cataracts, 1 retinitis pigmentosa, 1 CSNB, and 1 optic nerve atrophy). 35/49 patients with infantile motor nystagmus had optotype vision recorded at their last visit and the average acuity was 20/37. By comparison, 34/39 of those with vision loss nystagmus had an average acuity of 20/220 ($p=0.0003$).

Conclusion: Forty four percent of patients with isolated infantile nystagmus, who presented to our tertiary care pediatric ophthalmology practice, had an ocular disorder causing vision loss nystagmus (sensory). The majority of patients with presumed infantile nystagmus (motor) had normal vision. No child with a normal neurologic examination who was scanned had an abnormal MRI. Complete eye examination, followed by ERG, may be the most fruitful initial workup for children with isolated infantile nystagmus.

Financial Disclosure: None

Afternoon Session, Paper 6

Use of macular optical coherence tomography to detect homonymous hemianopia

Scott R. Haines, M.D.

Primary Supervisor: Randy H. Kardon, M.D., Ph.D.



Background/Purpose: Optic tract syndrome is classically described with optic atrophy in a “bowtie” pattern. OCT of the retinal nerve fiber layer (RNFL) has been reported for optic tract syndrome, but most cases do not show a bow-tie pattern. We investigated whether OCT of the macula may be a more useful method for detecting optic tract syndrome.

Methods: Fifteen subjects were identified with homonymous hemianopia and who also had macular and RNFL spectral domain OCT scans that were part of a routine protocol in our neuro-ophthalmology clinic. Based on a careful review of neuroimaging studies, patients were categorized as having a likely lesion of the optic tract, a possible lesion of the optic tract, or a definite retro-geniculate lesion. Macula OCT scans were evaluated subjectively and quantitatively by comparing the ratio of the temporal retinal thickness in the intact and the hemianopic retina and also for the nasal retina.

Results: Eleven of 15 patients had possible or likely optic tract lesions based on imaging. None of the patient had a clear pattern of “bow tie” atrophy on either fundus photography or OCT of the RNFL. Six of the 11 patients had a subjective appearance of homonymous retinal thinning based on the macular OCT and correlated with a ratio of 1.1 or greater comparing the “intact” retina with hemianopic retina.

Conclusion: OCT of the macula is an effective tool for evaluating retinal ganglion cell and axon loss from optic tract lesions. Further evaluation is being conducted to investigate the appearance of macular OCT in retrogeniculate lesions.

Financial Disclosure: None

Afternoon Session, Paper 7

Morphological analysis of vitelliform macular dystrophy with spectral domain optical coherence tomography

Christine N. Kay, M.D.

Primary Supervisor: Edwin M. Stone, M.D., Ph.D.



Background/Purpose: To describe the anatomical location of the vitelliform lesion and other phenotypes of Best vitelliform macular dystrophy (BVMD) with spectral domain optical coherence tomography in a large series of patients with confirmed mutations in the *BEST1* gene. Secondly, automated optical coherence tomography (OCT) was used to compare the thickness of the photoreceptor outer segments and retinal pigment epithelium (RPE) in molecularly confirmed BVMD patients to control patients in an extrafoveal location.

Methods: The study protocol was approved by the Institutional Review Board for Human Subjects Research at the University of Iowa, and the study adheres to the tenets set forth in the Declaration of Helsinki. Fifteen subjects (30 eyes) with clinical diagnosis of BVMD dystrophy and molecular confirmation of a mutation in the Best-1 gene (the John and Marcia Carver Nonprofit Genetic Testing Laboratory at the University of Iowa) and fifteen control patients (30 eyes) with normal outer retina were imaged using the Spectralis (Heidelberg, Germany) 3D volume scan protocol (6x6x2.2mm, 64 (y), 1048 (x), 1024 (z) voxels. Color fundus photographs and spectral domain OCT were evaluated for all BVMD patient. Fundoscopic appearance of recognized phenotypic patterns of disease were correlated with anatomic OCT features. Using our validated fully 3D OCT segmentation algorithm, 11 intraretinal surfaces (1 corresponding to internal limiting membrane, 11 to Bruch's membrane) were determined in all eyes, and photoreceptor equivalent thickness (PET), the thickness between surface 8 (photoreceptor inner segment/outer segment junction) to 11 (Bruch's membrane) was determined in all A-scans averaging over itself and 4 neighbors. A macular region outside the central lesion for BVMD subjects and outside the fovea in control patients was manually selected in each eye. Mean PET for BVMD subjects and controls were calculated and compared using t tests at a significance level of 0.05.

Results: The anatomic OCT features were evaluated for the recognized patterns in BVMD. The classically described vitelliform lesion was noted to consist of dense material above RPE and below the outer segment tips, the pseudohypopyon lesion to consist of an inferior zone of hyperreflective subretinal material with a superior zone of hyporefective subretinal fluid, the fibrotic nodule to be located sub-RPE, and the atrophic lesion to consist of disruption of the outer retina. Automated PET measurement could be performed in all subjects. Patients with BVMD had mean PET = 53.9 μ m and control subjects had PET = 48.2 μ m, an average difference of 5.7 μ m (p=0.0012).

Conclusion: Using spectral domain OCT to describe anatomic features, we revisit the premolecular classification system for the various recognized patterns in BVMD in patients with molecularly confirmed disease. The OCT equivalent of photoreceptor outer segments and RPE was 5.7 μ m thicker on average in patients with BMVD than in controls, outside of macroscopically visible lesions. The increased thickness of this region may reflect accumulation of outer segment debris. This may indicate that photoreceptor outer segments and RPE are affected in the macula in regions outside visible central lesions.

Financial Disclosure: None

Afternoon Session, Paper 8

An evidence-based approach to understanding new vitrectomy techniques and complications

Ryan M. Tarantola, M.D.

Primary Supervisor: Vinit B. Mahajan, M.D., Ph.D.



Background/Purpose: To examine intraoperative sclerotomy-related complications encountered during 23-gauge pars plana vitrectomy (PPV) and test a novel method for triplanar sclerotomy construction.

Methods: *Choroidal Detachments:* A retrospective consecutive case series was assembled of patients who underwent 23-gauge PPV over 16 months. Main outcomes included choroidal detachment incidence, location, extent, relation to infusion cannula location, and postoperative course. Laboratory study of human donor eyes were conducted by placing 23-gauge cannulas at various angles through the pars plana and injecting viscoelastic following cannula retraction.

Sclerotomy-related breaks: A retrospective consecutive case series was assembled of patients who underwent 23-gauge PPV over 29 months. Main outcomes the included sclerotomy-related break incidence, break location, lens and PVD status, and incidence of post-operative retinal detachment. All eyes had a minimum postoperative follow-up of 3 months.

Triplanar sclerotomy: A prospective consecutive case series of 180 sclerotomies from 60 eyes undergoing 23-gauge PPV was studied. Following conjunctival dissection, triplanar trans-scleral wounds were created with a 23-gauge trocar using a standardized technique. At the conclusion of surgery, an air-fluid exchange was performed and cannulas were removed. Unsutured scleral wound integrity was then tested for permeability to vitreous, gas, and fluid by manual Weck-Cel application, observation for escape of gas, and Seidel testing, respectively. Postoperative intraocular pressures were recorded. Main outcomes included the incidence of sclerotomy leakage, the sensitivity of different testing methods to detect sclerotomy leakage, and the incidence of post-operative hypotony. Laboratory studies with fresh human donor globes were conducted to evaluate the histologic characteristics of triplanar sclerotomies.

Results: *Choroidal Detachments.* Among 338 consecutive 23-gauge vitrectomy cases, 12 (3.55%) intraoperative choroidal detachments occurred. These included 6 (1.77%) serous detachments, 4 (1.18%) limited hemorrhagic detachments, and one case each of gas and silicone oil detachment. In 4 of 6 serous detachments and 3 of 4 hemorrhagic detachments, the detachment originated from the infusion cannula site. Intraoperative infusion cannula retraction (5 of 12 cases) and blockage (2 of 12 cases) caused transient hypotony. All cases of serous, hemorrhagic, and gas detachment resolved without intervention. Cannulae were placed at various angles to the sclera in human donor eyes. Choroidal detachments were produced injecting viscoelastic through obliquely placed cannulas after 1-mm of retraction.

Sclerotomy-related breaks. Five hundred forty eight eyes met inclusion criteria. Surgical indications included 145 eyes that underwent PPV for repair of a rhegmatogenous retinal detachment (RRD) and 403 eyes for other indications. Sclerotomy-related retinal breaks

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were found in 8 of 548 (1.45%) eyes. No sclerotomy-related breaks were found in the 145 RRD eyes. In non-RRD eyes, 8 of 403 (1.98%) eyes developed a sclerotomy-related break. All breaks occurred in the superior retina. In eyes with breaks, the primary surgical indication was vitreomacular traction in 6/8 eyes and epiretinal membrane in 2/8 eyes. Posterior vitreous detachment was absent in 6/8 eyes, and 5/8 eyes were phakic. Eyes with vitreomacular traction had a significantly higher incidence of breaks when compared with all other eyes and with each subgroup examined ($p < 0.0001$). Eyes without a RRD had a higher incidence of breaks, but this did not reach statistical significance when compared to eyes with a RRD ($p = 0.087$). No eye in the non-RRD group developed a postoperative retinal detachment.

Triplanar sclerotomy: Unsutured triplanar wounds were closed to vitreous, gas, and fluid in 169/180 (94%) sclerotomies. Eleven sclerotomies were open and were positive to only one testing method each. In these cases, vitreous was detected in one wound, gas escaped from eight wounds, and Seidel testing was positive in two wounds. Complex retinal detachment repairs had a higher rate of wounds requiring suture placement. One patient had transient postoperative day 1 hypotony.

Conclusion: Infusion cannula retraction is an important mechanism and risk factor for the development of intraoperative choroidal detachment during 23-gauge PPV. Precautions to prevent retraction and intraoperative repositioning may help avoid this complication. 23-gauge PPV was associated with a low incidence of sclerotomy-related retinal breaks and post-operative retinal detachment. Eyes with breaks were more likely to be phakic and without a preoperative posterior vitreous detachment. The presence of vitreomacular traction may be a risk factor for the development of intraoperative sclerotomy-related breaks. It is possible to achieve high rates of unsutured wound closure with 23-gauge triplanar sclerotomies. Wound leakage can be subtle and surgeons should employ multiple methods to adequately assess sclerotomy closure.

Financial Disclosure: None

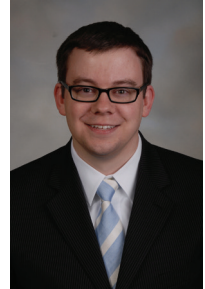
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Afternoon Session, Paper 9

Correlation of optic disc morphology and nerve fiber layer thickness via Cirrus HD-OCT in patients with nonarteritic anterior ischemic optic neuropathy

John J. Brinkley, M.D.

Primary Supervisor: Randy H. Kardon, M.D., Ph.D.



Background/Purpose: To compare several measures of optic disc morphology via Cirrus HD-OCT with residual nerve fiber layer thickness in patients with NAION.

Methods: Retrospective review of patients diagnosed with NAION by the neuro-ophthalmology service at University of Iowa Hospitals and Clinics and analyzed via Cirrus HD-OCT from February 2008 to present day. Primary outcome measure is correlation of optic disc size and residual nerve fiber layer thickness following resolution of optic disc edema in NAION group. Secondary analysis to focus on comparison of optic disc morphology between NAION and control groups, and residual nerve fiber layer thickness following corticosteroid therapy vs. untreated patients in the NAION group.

Results: Pending

Conclusion: Pending

Financial Disclosure: None

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Afternoon Session, Paper 10

Personalized proteomics in the management of uveitis

Jessica M. Skeie, Ph.D.

Primary Supervisor: Vinit B. Mahajan, M.D., Ph.D.

Additional Supervisor(s): James C. Folk M.D., Edwin M. Stone M.D., Ph.D.



Background/Purpose: To identify vitreous cytokines associated with Autosomal Dominant Neovascular Inflammatory Vitreoretinopathy (ADNIV), an inherited vitreoretinopathy with features of posterior uveitis, neovascular retinopathy, proliferative vitreoretinopathy, and retinitis pigmentosa.

Methods: Phenotypic ascertainment of eight eyes in patients with ADNIV were classified into stage II (3/8), stage III (4/8), and stage IV (1/8). Vitreous specimens from ADNIV and non-inflammatory control eyes were applied to an antibody array to quantitatively detect 200 unique human cytokines. Cytokines and inflammatory pathways were evaluated using ANOVA analysis in PARTEK and pathway analysis in MetaCore. Public databases were queried for ophthalmic drugs that targeted ADNIV-associated cytokines.

Results: ANOVA ($p < 0.05$), cluster, and pathway analysis identified 27 cytokines that distinguished the three ADNIV stages and control group. We identified cytokine pathways that regulate angiogenesis, Th17-mediated autoimmunity, and fibrosis. This analysis supported the use of local anti-VEGF, steroid, and targeted T-cell therapies. There was no significant expression of TNF-alpha or B-cell pathway cytokines, indicating they are not potential targets for treatment.

Conclusion: Proteomic screens identified specific cytokines and inflammatory pathways associated with ADNIV. Specific therapies that target these pathways provide a rational approach to uveitis therapy. This technique has the potential to provide therapeutic insight into a large group of inflammatory eye diseases for which the molecular mechanisms are largely unknown.

Financial Disclosure: None

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Poster Number 1

Use of post-acquisition centering method can improve the repeatability of thickness measurements in SD-OCT volumes

Bhavna Antony, Ph.D.

Primary Supervisor: Michael Abramoff, M.D., Ph.D.

Poster Number 2

Proteomic analysis of vitreous biopsy techniques

Emily Birkholz, M.D.

Primary Supervisor: Vinit Mahajan, M.D., Ph.D.

Poster Number 3

Outcomes of corneal transplantation with the Boston type I keratoprosthesis

Alex Cohen, M.D., Ph.D.

Primary Supervisor: Kenneth Goins, M.D.

Poster Number 4

Identification and characterization of genetic factors responsible for cavitory optic disc anomalies

Ralph Hazlewood, B.S.

Primary Supervisor: John Fingert, M.D., Ph.D.

Poster Number 5

Predictors for lid crease formation after frontalis suspension surgery in acquired myogenic ptosis

Esther Hong, M.D.

Primary Supervisor: Richard Allen, M.D., Ph.D.

Poster Number 6

Automated method for structural mapping and artery venous classification of retinal vessels

Vinayak Joshi, M.S.

Primary Supervisor: Michael Abramoff, M.D., Ph.D.

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Poster Number 7

Visual recovery after Descemet's stripping automated endothelial keratoplasty for pseudophakic corneal edema

Gina Rogers, M.D.

Primary Supervisor: Michael Wagoner, M.D., Ph.D.

Poster Number 8

Diagnostic vitreous biopsy with small-gauge vitrectomy instrumentation

Shaival Shah, M.D.

Primary Supervisor: Vinit Mahajan, M.D., Ph.D.

Poster Number 9

Detection of the presence of irregular shaped abnormalities in fundus photographs

Li Tang, Ph.D.

Primary Supervisor: Michael Abramoff, M.D., Ph.D.

Poster Number 10

Sclerotomy-related retinal breaks during 23-gauge vitrectomy

Janet Tsui, M.D.

Primary Supervisor: Vinit Mahajan, M.D., Ph.D.

Poster Number 11

Comparison of an automated method for volumetric quantification of papilledema with the Frisen scale

Jui-Kai Wang, M.S.

Primary Supervisor: Mona Garvin, Ph.D.

Poster Number 12

Photorefractive keratectomy modification of post-keratoplasty refractive error

Matthew Ward, M.D.

Primary Supervisor: Michael Wagoner, M.D., Ph.D.

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Poster Number 13

Retinal vessel width measurements based on a graph-theoretic model

Xiayu Xu, M.S.

Primary Supervisor: Michael Abramoff, M.D., Ph.D.

Poster Number 14

Reduction of endoplasmic reticulum stress prevents glaucoma phenotypes in a novel murine model of primary open angle glaucoma

Gulab Zode, Ph.D.

Primary Supervisor: Val Sheffield, M.D., Ph.D.

Poster Number 15

Lack of immunoglobulin does not prevent C1q binding to RGC and does not alter the progression of experimental glaucoma

Qiong Ding, Ph.D.

Primary Supervisor: Markus Kuehn, Ph.D.

Poster Number 16

Characterization of hereditary angle closure glaucoma in Basset hounds

Dina Ahram, M.S.

Primary Supervisor: Markus Kuehn, Ph.D.

Poster Number 17

Examining the LYSTbg-J mutation to extend genetic pathways of exfoliation syndrome

Tryphena Cuffy, B.S.

Primary Supervisor: Michael Anderson, Ph.D.

Poster Number 18

Molecular mechanisms of underlying iris transillumination defects in exfoliative glaucoma

Adam Hedberg-Buenz, M.S.

Primary Supervisor: Michael Anderson, Ph.D.

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Poster Number 19

Mapping the gene underlying central corneal thickness QTL 1

Demelza Koehn, Ph.D.

Primary Supervisor: Michael Anderson, Ph.D.

Poster Number 20

New strategies to slow disease progression in retinal degeneration

Alina Dumitrescu, M.D.

Primary Supervisor: Arlene Drack, M.D.

Poster Number 21

Effect Of AREDS vitamins on mouse endothelial cell activation: possible implications for AMD

Shemin Zeng, Ph.D.

Primary Supervisor: Robert F. Mullins, Ph.D.

Poster Number 22

Comparison of the impact of storage media on endothelial cell survival in precut donor tissue

Gregory Schmidt, B.S., C.E.B.T.

Primary Supervisor: Robert F. Mullins, Ph.D.

Poster Number 23

Comparison of femtosecond laser versus microkeratome prepared DMEK/DMAEK grafts in an eye bank setting

Gregory Schmidt, B.S., C.E.B.T.

Primary Supervisor: Robert F. Mullins, Ph.D.

Poster Number 24

TruthMarker: A tablet-based approach to the annotation of biomedical images

Mark A. Christopher, B.S.

Primary Supervisors: Michael D. Abramoff, M.D., Ph.D.; Todd E. Scheetz, Ph.D.