

Journal Highlights

NEW FINDINGS FROM *OPHTHALMOLOGY*, *AJO*, AND *ARCHIVES*

Ophthalmology

Dot Hybridization Assay to Diagnose Fungal Keratitis

Ophthalmology

Published online Sept. 10, 2012

Kuo et al. developed a dot hybridization assay that can be used to diagnose fungal keratitis in the laboratory and found that it demonstrated high sensitivity and specificity. In addition, the procedure was completed in one day. The authors are currently investigating the clinical impact of this dot hybridization assay on patient outcomes.

The authors based the assay on a fungus-specific oligonucleotide probe targeting the 5.8S rRNA gene. They analyzed 50 corneal scrapes from consecutive patients with clinically suspected microbial keratitis and compared results from the assay with those obtained by culture. They based performance on evaluations of sensitivity, specificity, and positive and negative predictive values.

Ten scrapes demonstrated positive results by both assay and culture. However, 11 scrapes demonstrated positive results by assay and negative

results by culture. Sensitivities for diagnosis of fungal keratitis by dot hybridization assay and culture were 100 percent and 50 percent, respectively, while specificities were 96.7 percent and 100 percent, respectively.

No Increased Risk of Early or Late AMD Following Cataract Surgery

Ophthalmology

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Wang et al. conducted a paired-eye comparison study among a cohort of patients aged 65 years and older who underwent a cataract operation in one eye. The authors found no increased risk of developing late age-related macular degeneration (AMD), early AMD, or soft or reticular drusen in the three years following surgery. However, retinal pigmentary abnormalities were more frequent in operated eyes.

The authors recruited patients from the Australian Cataract Surgery and Age-Related Macular Degeneration study who had remained unilaterally phakic for at least 24 months. Using generalized estimating equation models, the authors made paired comparisons between operated and nonoperated fellow eyes. Of the 308 patients who had unilateral operations and were at risk for late AMD, the disease developed in four operated and seven nonoperated

fellow eyes. Of the 217 patients who had unilateral operations and were at risk for early AMD, the disease developed in 23 operated and 21 nonoperated fellow eyes. Although incident retinal pigment abnormalities were more frequent in operated eyes, there was no difference in the three-year incidence of soft or reticular drusen between operated and nonoperated fellow eyes.

Anterior Segment OCT for Diagnosing Congenital Corneal Opacities

Ophthalmology

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In a noncomparative case series, Majander et al. found that anterior segment optical coherence tomography (OCT) represents a valuable tool for diagnosing congenital opacities. They surmised that the imaging device, which is fast and does not require contact, could be used with neonates and for frequent follow-up exams. And since it provides anatomically demonstrative visual presentation and both cross-sectional and segmental views, the authors concluded that anterior segment OCT can provide deeper insight into the complex nature of these corneal disorders.

The study involved seven consecutive patients between 2 days and 2.5 years of age with bilateral congenital corneal opacity. The authors observed three distinct phenotypes of congenital corneal opacity: central corneal



opacity with iridocorneal adhesions consistent with type 1 Peters anomaly, central corneal opacity with lenticulo-corneal adhesions consistent with type 2 Peters anomaly, and complete corneal opacity with features of congenital corneal staphyloma. Anterior segment OCT also provided structural information through opaque corneas in higher resolution than that of ultrasound, and without the need for general anesthesia. They noted that this finding allows for early assessment of the ocular risks and benefits of surgical intervention.

Laser-Induced Chorioretinal Venous Anastomosis for CRVO

Ophthalmology

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Currently, the only treatment for central retinal vein occlusion that addresses the underlying etiology of the condition is the creation of a laser-induced chorioretinal venous anastomosis (L-CRA). McAllister et al. conducted a cohort study with 55 patients to determine which factors could predict an increased likelihood of developing a successful anastomosis, as well as which eyes would be at an increased risk of local neovascularization.

According to the authors, the ultimate goal of this study is to tailor treatment to individuals who could benefit most from this approach, as well as to identify those who would be at an increased risk of complications and thus require closer monitoring.

The authors found that younger age, better baseline visual acuity, and the absence of hypertension were factors associated with an increased chance of success in L-CRA. In addition, they found that evidence of a rupture in the vein wall at the time of the laser attempt had a highly significant and positive effect on success rates. On the other hand, factors associated with a higher incidence of neovascular complications included high baseline central venous pressure, prolonged fluorescein transit time, and the presence of any retinal ischemia.

American Journal of Ophthalmology

Childhood Pterygium

November's *AJO*

In this observational case series, Monga et al. described the demographic features, clinical characteristics, and management of childhood pterygium. They found that the development of pterygium in younger age groups is not associated with any identifiable predisposing factors, either environmental or familial. A majority of patients required only conservative management.

The authors evaluated 19 children (26 eyes) under the age of 16 presenting with pterygium. Of these patients, 10 were female and nine were male. The mean age at presentation was 10.6 years, and seven patients (37 percent) had bilateral involvement. No patient had a family history. Median refractive astigmatism was found to be -0.5 D cylinder. All eyes had primary pterygium, except for one that had recurrent pterygium. Twenty-two eyes (85 percent) were managed conservatively. Four eyes (15 percent) required surgery with pterygium excision and conjunctival-limbal autograft with fibrin glue attachment. Follow-up ranged from five to 38 months. One patient experienced a recurrence one year after surgery.

Effect of Timolol on Myopic Regression After LASIK

November's *AJO*

Shojaei et al. performed a randomized clinical trial to determine how timolol affected refractive outcomes in eyes with myopic regression after LASIK. They found that, compared with a control group, timolol application was indeed effective for the treatment of myopic regression. Its benefits lasted for at least six months after discontinuation.

The authors examined 124 eyes with myopic regression after LASIK and randomized patients to receive either timolol 0.5 percent (group 1) or artificial tears (group 2) for six

months. In group 1, spherical equivalent improved from -1.48 D before treatment to -0.88 D six months after initial treatment and -0.86 D six months after discontinuation. The authors also noted that improvement of spherical equivalent decreased in these eyes by 0.26 D every four months after initial LASIK. In group 2, spherical equivalent worsened from -1.57 D before treatment to -1.83 D six months after initial treatment and -1.91 D six months after discontinuation.

Retinal Imaging in the Management of Noninfectious Posterior Uveitis

November's *AJO*

Campbell et al. performed a prospective, observational case series to determine whether the use of wide-field imaging changes the management or determination of disease activity in patients with noninfectious posterior uveitis. Although this index study had several design limitations, the results suggest that wide-field imaging may alter management decisions, compared with standard-of-care imaging and clinical examination.

A total of 43 patients with noninfectious posterior uveitis underwent standard clinical examination, followed by wide-field scanning laser ophthalmoscope (SLO) imaging and angiography. Investigators determined disease activity and current management decisions based on clinical examination, examination plus simulated 30- or 60-degree fluorescein angiography, examination plus wide-field SLO images, and examination plus wide-field fluorescein angiography. The primary outcome measure was the percentage of patients whose management changed based on the availability of wide-field imaging, compared with standard imaging and examination. The secondary outcome was detection of disease activity with and without wide-angle imaging.

Management was altered in seven of 43 patients (16 percent) based on examination and limited fluorescein angiography, whereas 21 of 43 patients (48 percent) had a change in management with the use of wide-field imag-

ing and angiography. Disease activity was detected in 22 of 43 patients (51 percent) based on examination and simulated conventional imaging, and in 27 of 43 (63 percent) with wide-field imaging and angiography.

The authors concluded that additional studies are needed to determine whether these findings, or any subsequent management alterations, can improve patient outcomes.

YAG Laser Lysis of Retained Cortex After Phacoemulsification Cataract Surgery

November's *AJO*

In an interventional, retrospective case series, Hood et al. found that Nd:YAG laser can be used to lyse residual cortex after uncomplicated phacoemulsification cataract surgery or in cases with intraoperative posterior capsular rupture and can lead to improvement in subjective and distance-corrected visual acuity. Elevated IOP was a common complication.

The authors reviewed laser logs from 2005 to 2011 to identify consecutive patients who underwent Nd:YAG laser treatments for residual cortex at the University of Michigan. Main outcome measures were improvement in subjective vision and distance-corrected visual acuity.

For this study, the authors included 18 eyes of 18 patients (mean age, 66 years). Eight eyes (44 percent) had intraoperative posterior capsule rupture. Before treatment with the Nd:YAG laser, all patients had subjective visual complaints, with six patients reporting counting fingers or worse visual acuity. Eleven patients (61 percent) were successfully treated with one session of cortical lysis, while five patients underwent two sessions, and two patients underwent three or more treatments. Five patients (28 percent) had elevated IOP within one day of treatment, and one patient developed cystoid macular edema. All patients had resolution of subjective visual symptoms; and, at final follow-up, distance-corrected acuity was 20/25 or better in 13 patients (72 percent).

Archives of Ophthalmology

Examination of Human Foveal Development Using OCT and Histology

October's *Archives*

Dubis et al. assessed outer retinal layer maturation during late gestation and early postnatal periods, using optical coherence tomography (OCT) and histological examination. They found that handheld OCT imaging is a viable technique for evaluating neonatal retinas. In premature infants who did not develop retinopathy of prematurity, the foveal region followed a developmental time course similar to maturation in utero.

The authors used handheld OCT to image 39 patients ranging from 32 weeks postmenstrual age to 4 years. Foveal images from 16 patients were normal and evaluated for inner retinal excavation and presence of outer retinal reflective bands. Reflectivity profiles of central, parafoveal, and perifoveal retina were then compared with age-matched histological sections.

Foveal pit morphology in infants was generally distinguishable from that of adults. Reflectivity profiles showed a single hyperreflective band at the fovea in all infants younger than 42 weeks postmenstrual age. Multiple bands were distinguishable in the outer retina at the perifovea by 32 weeks postmenstrual age and at the fovea by 3 months post-term. By 17 months after birth, the characteristic appearance of four hyperreflective bands was evident across the foveal region. These features were also consistent with previous results from histology. A temporal divot was present in some infants. Foveal pit morphology and extent of inner retinal excavation were variable.

Safety of Pars Plana Vitrectomy in Eyes With Plaque-Irradiated Posterior Uveal Melanoma

October's *Archives*

Bansal et al. reviewed the medical records of 47 patients (47 eyes) to determine the long-term safety of pars plana vitrectomy (PPV) in eyes

with plaque-irradiated posterior uveal melanoma. The investigators found that vitrectomy was safe and did not increase the risk of intraocular, local, orbital, or systemic tumor dissemination.

In this retrospective case series, the main study outcomes were the rates of intraocular melanoma dissemination, extrascleral extension, local melanoma recurrence, and systemic metastasis after vitrectomy. Forty-seven eyes of 47 patients underwent PPV for vitreous hemorrhage following iodine-125 plaque radiotherapy for choroidal melanoma.

The mean interval between the onset of vitreous hemorrhage and PPV was 13 months. The mean time from PPV to last follow-up was five years. The authors reported no cases of intraocular melanoma dissemination or extrascleral extension of melanoma following PPV. One patient developed local choroidal melanoma recurrence and was successfully managed with transpupillary thermotherapy. Four patients developed systemic melanoma metastasis following PPV. The mean time from plaque radiotherapy to metastasis was five years; the mean time from PPV to metastasis was three years.

Medial Rectus Recession and Lateral Rectus Resection for Divergence Paralysis Esotropia

October's *Archives*

In this study, Chaudhuri and Demer examined whether medial rectus (MR) recession is as effective as lateral rectus (LR) resection for divergence paralysis esotropia. They found that recession of the MR provides binocular single vision without inducing convergence insufficiency at near and that it is convenient to make intraoperative adjustments under topical anesthesia.

The authors conducted a retrospective analysis of the clinical and surgical records of patients with divergence paralysis esotropia, comparing LR resection with MR recession. The authors defined divergence paralysis esotropia

as symptomatic distance esotropia at least double the asymptomatic esotropia of 10 or less prism diopters (PD) at near. Twenty-four patients with the condition underwent surgery.

Six patients underwent bilateral LR resection, and two underwent unilateral LR resection (group L, eight patients). Thirteen patients underwent bilateral MR recession, and three underwent unilateral MR recession with target angles set as double the distance esotropia measurement (group M, 16 patients). One patient in group L and 15 patients in group M underwent intraoperative adjustable surgery under topical anesthesia. Mean preoperative central gaze esotropia measured 15 PD at distance and 4.1 PD at near in group L, and 10.4 PD at distance and 0.6 PD at near in group M.

Postoperatively, no patient in either group had symptomatic diplopia or convergence insufficiency from 8.5 to 40 months. Correcting distance deviation required twice the usual surgical degree of MR recession per PD com-

pared with the degree that is recommended for esotropia generally and for LR resection.

Prevalence of and Risk Factors for Myopia in Children

October's Archives

Kleinstein et al. reported on the proportion of new cases of myopia in a racially and geographically diverse group of school-aged children who participated in the Collaborative Longitudinal Evaluation of Ethnicity and Refractive Error Study. The authors found that 16 percent of children enrolled in the study developed myopia. The percentage increased yearly until age 11, after which the percentage decreased. New cases of myopia also varied by racial/ethnic group.

For their investigation, the authors included 4,556 children without myopia whose ages ranged from 5 to 16 years and measured the right eye's refractive error annually using cycloplegic autorefractometry. They defined a new

case of myopia as autorefractometry results of -0.75 D or more in both principal meridians of the eye.

Overall, 749 children (16 percent) became newly myopic during the study. Of those children, the age of diagnosis varied from 7 to 16 years, with the largest number, 136 (18 percent), diagnosed at age 11. New cases of myopia occurred in 27.3 percent of Asian-Americans, 21.4 percent of Hispanics, 14.5 percent of Native Americans, 13.9 percent of African-Americans, and 11 percent of Caucasians. Females experienced more new cases (18.5 percent) than males (14.5 percent). Children with normal birth weight experienced more new cases (16.9 percent) than those children with low birth weight (15.5 percent).

Ophthalmology summaries are written by Lori Baker Schena, EdD, and edited by John Kerison, MD. American Journal of Ophthalmology summaries are edited by Thomas J. Liesegang, MD. Archives of Ophthalmology summaries are written by Amitha Domalpally, MD.

ROUNDUP OF OTHER JOURNALS

New Susceptibility Loci Identified for Primary Angle-Closure Glaucoma

Nature Genetics

Published online Aug. 26, 2012

In an attempt to provide further insight into the genetic mechanisms responsible for individual susceptibility to primary angle-closure glaucoma (PACG), Vithana et al. identified three new loci for the disease. The authors hope that these findings constitute another step toward the creation of a viable genetic profile to identify susceptible patients and develop a risk stratification strategy that leads to effective treatments.

The first part of this genome-wide association study included 1,854 PACG patients and 9,608 controls across five independent collections in Singapore, Hong Kong, India, Malaysia, and Vietnam. The investigators then conducted replication experiments with

1,917 PACG patients and 8,943 controls across two independent collections in China and four in Singapore, India, Saudi Arabia, and the United Kingdom. They reported significant associations for PACG at three new loci: rs11024102 in *PLEKHA7*, rs3753841 in *COL11A1*, and rs1015213 located between *PCMTD1* and *ST18* on chromosome 8q.

Argon Green Laser to Treat Conjunctivochalasis

Cornea

Published online Aug. 27, 2012

In this study, Yang and Choi found that conjunctivoplasty using an argon green laser is a simple and effective treatment alternative in patients with mild to moderate conjunctivochalasis (CCh). The authors noted that this procedure can be done easily and quickly in an outpatient setting

without serious adverse complications. They also recommend using this method before employing other surgical approaches.

The study included 18 CCh patients (29 eyes) with a mean age of 69 years who did not respond to conventional therapy. All patients were treated using a 532-nm argon green laser. Before the procedure and at one, three, and six months after, the authors evaluated CCh grade, Ocular Surface Disease Index scores, tear breakup time, and Schirmer test results.

Six months after the laser conjunctivoplasty, the grade of CCh decreased in 25 eyes (86 percent). The reduction rates of CCh grades 1, 2, and 3 were 100 percent, 69 percent, and 48 percent, respectively. Most of the patients also experienced significant symptomatic improvement at six months, and Ocular Surface Disease Index scores decreased from 0.41 to 0.22. Although

breakup time increased from 9.1 to 10.2 during this period, Schirmer test results did not show any differences.

Pterygium Surgery as Inciting Event for Infectious Scleritis

Cornea

Published online Aug. 15, 2012

In a retrospective review of 55 patients (56 eyes) with infectious scleritis, Hodson et al. demonstrated that this condition can occur days to years after ocular surgery and can involve a wide range of microorganisms. The most common inciting event was pterygium excision, with infection occurring after a longer interval compared with other types of surgery. In addition, poor visual acuity (VA) at presentation of the disease represented the strongest prognostic factor for subsequent visual loss.

The median duration between inciting factors and infectious scleritis symptoms was 1.9 months. Patients with a history of pterygium surgery had a median of 49 months from surgery to symptoms. In contrast, patients with a history of surgery for glaucoma, cataract, or retinal disorders had a median of 1 to 1.6 months. Moreover, patients with infectious scleritis due to fungus, *Nocardia*, and mycobacteria experienced a longer duration of time between symptoms and diagnosis than patients with gram-positive and gram-negative bacteria. Poorer VA outcomes were associated with presenting VA of worse than 20/200 and concomitant keratitis or endophthalmitis.

Novel Retinal Prosthetic Incorporates Both Encoder and Transducer

Proceedings of the National Academy of Sciences

Published online Aug. 13, 2012

Prosthetics offer hope for patients with retinal degenerative diseases. Current retinal prosthetics, however, are still very limited in the vision that they provide. For example, they allow for perception of spots of light and high-contrast edges, but not natural images. Efforts to improve

prosthetic capabilities have focused largely on increasing the resolution of the device's stimulators through either electrodes or optogenetic transducers. In this study, Nirenberg and Pandarinath demonstrated that for a retinal prosthetic to be effective, a second factor is also critical: driving the stimulators with the retina's neural code.

They used the mouse as a model system and generated a prosthetic that incorporates this neural code. The authors' unique prosthetic system consists of two parts: an encoder that converts visual input into the retina's code and a transducer that drives the ganglion cells to fire as code specifics. Using 9,800 optogenetically stimulated ganglion cell responses, they found that this coupling dramatically increased the system's capabilities well beyond what could be achieved by simply increasing resolution.

Roundup of Other Journals is written by Lori Baker Schena, EdD, and edited by Deepak P. Edward, MD.

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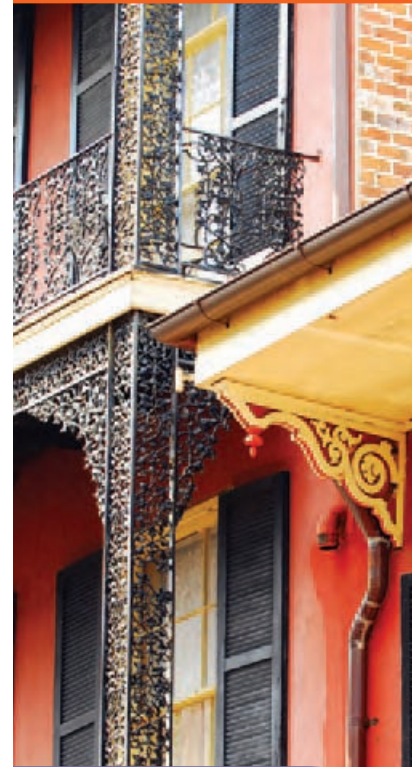
Framing the Question and Designing Research will be facilitated by Graham E. Quinn, MD. **When:** Monday, Nov. 12, 3:30-4:30 p.m. **Where:** Theater 1 of the Learning Lounge (Booth 107). **Access:** Free.

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