

# Journal Highlights

## NEW FINDINGS FROM *OPHTHALMOLOGY*, *AJO*, AND *JAMA OPHTHALMOLOGY*

### ***Ophthalmology***

#### **Risk of Scar Formation From Ranibizumab and Bevacizumab Injections**

*Ophthalmology*

Published online Dec. 4, 2013

**D**aniel et al. assessed risk factors for scar formation related to intravitreal injections of ranibizumab or bevacizumab for age-related macular degeneration (AMD) in patients from the Comparison of AMD Treatments Trials (CATT). They found that almost one-half of eyes developed retinal scarring.

This prospective cohort study was part of CATT, which was itself a randomized clinical trial. After the researchers excluded patients with a scar at baseline and those without gradable photographs, 1,059 eyes were eligible for analysis of scar risk factors. Scars were classified as either fibrotic, with well-demarcated elevated mounds of yellowish white tissue, or nonfibrotic, with discrete flat areas of hyperpigmentation with varying amounts of central depigmentation.

At the end of one year of treatment, 339 eyes (32 percent) had developed a scar. After two years of treatment, a total of 480 eyes (45.3 percent) had developed a scar, including 262 eyes (24.7 percent) with a fibrotic scar, and 218

eyes (20.6 percent) with a nonfibrotic scar.

Predictors of scar formation included angiographic characteristics such as classic choroidal neovascularization, blocked fluorescence on fluorescein angiography, and larger choroidal neovascular lesions at baseline. In addition, characteristics detected via optical coherence tomography were predictive of scar formation; these included foveal retinal thickness greater than 212  $\mu\text{m}$  and the presence of foveal subretinal fluid and subretinal hyper-reflective material. Eyes with elevation of the retinal pigment epithelium had lower risk of scarring.

The choice of ranibizumab or bevacizumab or the dosing regimen employed did not strongly influence scar development. Moreover, AMD genotypes were not associated with an increased risk of scarring.



#### **Parental Concerns and the Decision to Perform Strabismus Surgery for Intermittent Exotropia**

*Ophthalmology*

Published online Dec. 4, 2013

**H**att et al. evaluated the associations between several health-related quality of life (HRQOL) scores and the decision to perform

strabismus surgery in children with intermittent exotropia. The researchers found that increased parental concerns were directly associated with higher surgery rates.

For this retrospective chart review, the researchers identified 106 children aged 2 to 16 years (mean, 6 years) with intermittent exotropia. Nineteen children (18 percent) underwent surgery. The researchers then distributed the Intermittent Exotropia Questionnaire, which has three components: a child self-report, a proxy report, and a parent report. Both the proxy and parent reports were designed to be completed by the child's parents. The proxy report measures the impact of the child's strabismus on the child, while the parent report measures the impact of the child's strabismus on the parent. Clinical measures of control, angle of deviation, and stereoacuity also were taken into account.

The researchers found that after accounting for poor control of the exodeviation at distance, poorer parental and proxy HRQOL scores were strongly associated with surgery. For example, children with intermittent exotropia whose parent reported poorer HRQOL scores—for example, agreeing with a statement such as “I worry that my child will not be able to see the board at school”—were more likely to undergo surgery than those children whose parents reported better HRQOL scores.

According to the researchers, these findings suggest that it is important to recognize the impact of parental concerns. As such, the role of parental educational or counseling interventions should be considered.

### Retinal Vascular Changes in Glaucomatous Eyes With Single-Hemifield Damage

*Ophthalmology*

Published online Dec. 2, 2013

**S**ehi et al. found that in glaucomatous eyes with single-hemifield damage, retinal blood flow (RBF) is significantly reduced in the hemisphere associated with the abnormal hemifield. In addition, they noted that the reduced RBF was associated with a thinner retinal nerve fiber layer (RNFL) and ganglion cell complex (GCC) in the affected hemisphere.

For this prospective nonrandomized study, the researchers compared 30 eyes of 30 glaucoma patients who had visual field loss confined to a single hemifield with 27 eyes of 27 control patients. All eyes underwent spectral-domain optical coherence tomography and standard automated perimetry.

Total and hemispheric RBF, venous cross-sectional area, and arteriolar cross-sectional area were significantly reduced in those eyes with glaucoma; however, venous blood flow velocity was similar in both groups. In the abnormal hemisphere, the reduced RBF was associated with thinner RNFL and GCC. Reduced RBF and RNFL as well as GCC loss also were observed in the perimetrically normal hemisphere of glaucomatous eyes.

*American Journal of Ophthalmology*

### Ex-Press Glaucoma Filtration Device vs. Trabeculectomy

February *AJO*

**I**n this randomized multicenter trial, Netland et al. compared the clinical outcomes of trabeculectomy with implantation of the Ex-Press glaucoma filtration device. The researchers found that control of intraocular pres-

sure (IOP) and surgical success were similar after both procedures. The Ex-Press device, however, was associated with less variance of IOP during the early postoperative period, more rapid visual recovery, and fewer complications.

The researchers analyzed a total of 120 eyes in 120 subjects, including 59 eyes implanted with the Ex-Press device and 61 eyes that underwent trabeculectomy. Both groups were treated intraoperatively with mitomycin C and followed postoperatively for two years. Surgical success was defined as IOP between 5 and 18 mmHg without further glaucoma surgery.

Postoperative IOP was similar in both groups, with mean IOP at two years of  $14.7 \pm 4.6$  mmHg and  $14.6 \pm 7.1$  mmHg in the Ex-Press and trabeculectomy groups, respectively. The variance of early postoperative IOP values was also similar in both groups on the first postoperative day but higher at week 1 in the trabeculectomy group. At two years, success rates were 83 percent and 79 percent in the Ex-Press and trabeculectomy groups, respectively.

Visual acuity was significantly decreased on day 1 in both groups, although return to baseline was more rapid in the Ex-Press group (one month) than the trabeculectomy group (three months). The researchers also noted that the total number of postoperative complications was higher after trabeculectomy.

### Rotational Stability of a Single-Piece Acrylic Toric IOL

February *AJO*

**H**irnschall et al. evaluated the visual performance of the Tecnis Toric single-piece intraocular lens (IOL) and found that it was rotationally stable and demonstrated excellent capsular bag performance and refractive outcomes. In addition, postoperative spherical aberrations were low.

In this prospective, single-center study, the researchers included 30 patients with age-related cataract and corneal astigmatism of 1 to 3 D. Before

surgery, rotating Scheimpflug scans were performed, and the cornea was marked with the patient sitting at the slit lamp. Patients then received the single-piece hydrophobic acrylic IOL. Immediately and three months after surgery, retroillumination photographs were obtained to assess the rotational stability of the IOL. At three months, the researchers also performed autorefraction, subjective refraction, uncorrected and distance-corrected visual acuity, keratometry, and Scheimpflug and ocular wavefront measurements.

Mean absolute difference between the IOL axis at the one-hour postoperative examination and the three-month follow-up was 2.7 degrees (standard deviation, 3.0 degrees). The IOL rotation was less than 3 degrees in 62 percent of all cases, and less than 6 degrees in 95 percent. Three-month postoperative unaided and distance-corrected visual acuity was  $-0.05$  and  $-0.17$  logMAR, respectively. At the same follow-up, the researchers also noted almost no spherical aberrations in all patients.

### Anterior Stromal Puncture for the Treatment of Recurrent Corneal Erosion Syndrome

February *AJO*

**Z**auberman et al. evaluated the clinical features and outcomes of patients with recurrent corneal erosion syndrome who underwent anterior stromal puncture with a 25-gauge bent needle. The researchers found that this procedure is simple, cost-effective, and safe for symptomatic relief and that repeat treatment may be performed prior to additional surgical intervention.

In this retrospective nonrandomized consecutive case series, the researchers reviewed the charts of 30 patients (35 eyes) who underwent anterior stromal puncture at a tertiary-care cornea clinic. Outcome measures included demographics, laterality, history of corneal trauma, prior ocular history, frequency and duration of symptoms, failed treatments, degree of symptom resolution, additional treat-

ments needed, and complications.

Mean patient age at presentation was 37 years. Of the 30 patients, eight were male, and 27 had unilateral disease.

In total, 63 percent of eyes had prior history of corneal trauma, 3 percent had prior LASIK, and 97 percent had symptoms of pain upon awakening in the morning. The researchers also noted microcysts, fingerprint lines, loose epithelium, and faint scars in 97 percent of eyes.

Mean follow-up was 14 months. At final follow-up, 63 percent of eyes were symptom free, and 37 percent experienced milder episodes. In total, 17 percent required additional treatment, including superficial keratectomy, repeat anterior stromal puncture, and phototherapeutic keratectomy. No complications were observed.

### Dry Eye Disease and Loss of Productivity in Users of Visual Displays

February *AJO*

**U**chino et al. investigated the relationship between dry eye disease (DED) and work productivity in individuals using visual display terminals (VDTs). They found that DED status was indeed associated with lower work productivity and impaired work performance in young VDT users.

In this cross-sectional study, 672 young and middle-aged Japanese workers from a single office completed a questionnaire designed to measure at-work performance deficits and productivity losses. Using the Japanese dry eye diagnostic criteria, the researchers classified respondents into three groups: definite DED, probable DED, and no DED.

Of the 672 office workers, 553 (82 percent), including 366 men and 187 women, completed the questionnaire and underwent clinical evaluation. In terms of total loss of workplace productivity, the no DED group had a loss of 3.6 percent, those with probable DED had a loss of 4.0 percent, and those with definite DED had a loss of 4.8 percent.

DED was also associated with significantly lower on-the-job time man-

agement and mental and interpersonal functioning. Annual DED productivity losses were estimated to be \$6,160 per employee in the definite DED group, \$2,444 in the probable DED group, and close to \$1.5 million for the office as a whole.

The researchers concluded that disease management programs may present an opportunity to enhance the quality of life of DED patients and, at the same time, limit losses in on-the-job productivity.

### *JAMA Ophthalmology*

#### Trabeculectomy for Open-Angle Glaucoma

January *JAMA Ophthalmology*

**T**akahara et al. examined the effect of previous phacoemulsification on success of trabeculectomy with mitomycin C for open-angle glaucoma. They found that in pseudophakic eyes, trabeculectomy after phacoemulsification was less successful in achieving target intraocular pressure (IOP) compared with phakic eyes.

The researchers examined all open-angle glaucoma patients from a Japanese university hospital who were 55 years or older with IOP of 22 mmHg or higher. In this cohort, 39 eyes were phakic and 25 were pseudophakic following phacoemulsification. The primary outcome measure was the probability of surgical success one year after trabeculectomy, defined as three different IOP levels: lower than 21 mmHg (criterion A), lower than 18 mmHg (criterion B), and lower than 15 mmHg (criterion C). Secondary outcome measures included the number of postoperative antiglaucoma medications, the number of laser suture lysis procedures, and postoperative complications.

The probabilities of success at one year in the phakic versus pseudophakic groups were, respectively, 95 percent versus 74 percent for criterion A ( $p = 0.02$ ), 84 percent versus 62 percent for criterion B ( $p = 0.04$ ), and 67 percent versus 53 percent for criterion C ( $p = 0.10$ ). Postoperative IOP in the pseu-

dophakic group was higher than that in the phakic group at six and nine months after trabeculectomy.

No differences were observed for any other outcome measures.

#### Natural History of Visual Outcomes in Branch Retinal Vein Occlusion

January *JAMA Ophthalmology*

**H**ayreh and Zimmerman investigated the natural history of visual outcomes in major branch retinal vein occlusion (BRVO) and macular BRVO. They found that these are distinct clinical entities and that initial visual status and final visual outcome in the two types are quite different. The researchers also noted that upon resolution of macular edema in both major and macular BRVO, visual acuity and visual fields improved to a variable degree without any treatment in the majority of eyes.

This study included 144 eyes with major BRVO and 72 eyes with macular BRVO seen within three months of onset. At the first visit, all patients had a detailed ophthalmic and medical history and comprehensive ophthalmic evaluation. At the initial and follow-up visits, ophthalmic evaluation included recording best-corrected visual acuity and visual fields.

The median time to resolution of macular edema was 21 months in those eyes with major BRVO and 18 months in those with macular BRVO. Overall, for eyes with initial visual acuity of 20/60 or better, acuity improved or remained stable in 75 percent of major BRVO eyes and 86 percent of macular BRVO eyes. For eyes with initial visual acuity of 20/70 or worse, acuity improved in 69 percent of major BRVO eyes and 53 percent of macular BRVO eyes, with median final visual acuity of 20/60 for both BRVO types.

*Ophthalmology summaries are written by Jean Shaw and edited by Susan M. MacDonald, MD. American Journal of Ophthalmology summaries are edited by Thomas J. Liesegang, MD. JAMA Ophthalmology summaries are based on authors' abstracts as edited by senior editor(s).*

## ROUNDUP OF OTHER JOURNALS

### No Link Between Use of Oral Fluoroquinolone and Retinal Detachment

*Journal of the American Medical Association*  
Published online Nov. 27, 2013

**P**asternak et al. investigated whether there was an association between the use of an oral fluoroquinolone and retinal detachment and found no such link.

In this Danish cohort study, the researchers used health care and administrative registries for the years 1997 to 2011 to obtain patient characteristics, number and type of filled prescriptions, and cases of retinal detachment with surgical treatment. The final cohort included 748,792 episodes of fluoroquinolone use and 5,520,446 episodes of nonuse.

In total, 566 cases of retinal detachment occurred, corresponding to an incidence rate of 19.5 per 100,000 person-years; only five of these cases occurred at the same time a patient was taking a fluoroquinolone. Of the retinal detachments, 465 (82 percent) were rhegmatogenous. The mean age at diagnosis of retinal detachment was 66.1 years, and most of the affected patients were female (56 percent).

Moreover, fluoroquinolone users were more often male and had a higher prevalence of diabetes, cardiovascular disease, and renal disease. They also had a higher prevalence of cataract and other eye surgery. Ciprofloxacin was the oral fluoroquinolone most often prescribed (88.2 percent).

### Safety of Anterior Chamber IOLs and Uveitis

*Journal of Cataract and Refractive Surgery*  
Published online Nov. 18, 2013

**I**s the implantation of an anterior chamber intraocular lens (ACIOL) associated with a higher rate of postoperative complications in eyes with uveitis than in eyes with no history of the disease? Suelves et al. investigated

this question and found no significant difference between uveitic and non-uveitic eyes at one year of follow-up.

This retrospective study assessed 39 patients (40 eyes), all of whom had an ACIOL implanted between 2005 and 2011. Of this group, 17 patients (17 eyes) had a history of uveitis, which was quiescent at the time of surgery, and 22 control patients (23 eyes) had no history of intraocular inflammation. Thirteen eyes in the uveitis group and 18 in the control group required anterior vitrectomy during surgery; pars plana vitrectomy was performed in one eye in the uveitis group and in two eyes in the control group.

The researchers found no significant differences in the incidence of intraoperative and postoperative complications between the two groups during follow-up (range, 12 to 68 months). The most common postoperative complication in the uveitis group was deposits on the surface of the ACIOLs; other complications in these patients included uveitis flare-ups attributed to the IOL and epiretinal membrane formation. Both groups experienced similar incidence of an early rise in intraocular pressure, secondary glaucoma, hypotony, hyphema, worsening or emergence of macular edema, and bullous keratopathy.

Two patients with a diagnosis of idiopathic panuveitis and Vogt-Koyanagi-Harada syndrome had their ACIOLs explanted after 18 months of follow-up because of chronic low-grade inflammation.

### Assessing the Correction of Astigmatism With Toric IOLs

*Journal of Cataract and Refractive Surgery*  
2013;39(12):1803-1809

**K**och et al. examined eyes implanted with toric intraocular lenses (IOLs) and assessed the prediction errors of total corneal astigmatism using five different devices: one that

measures both anterior and posterior corneal astigmatism, and four that measure only the anterior surface. The researchers found that all devices overestimated with-the-rule (WTR) astigmatism, while the latter four underestimated against-the-rule (ATR) astigmatism.

The researchers measured astigmatism before and three weeks after cataract surgery in 41 eyes of 41 patients. Seventeen of the patients had WTR astigmatism; the remaining 24 had ATR astigmatism. Mean age of the patients was  $71 \pm 9$  years (range, 46 to 91 years), and the mean IOL power was  $18.0 \pm 6.0$  D (range, 6.0 to 28.0 D).

Of the five devices used in this study, four (IOLMaster, Lenstar, Atlas, and manual keratometer) estimated total corneal astigmatism based on anterior surface measurements only. In using these devices, the researchers found that WTR astigmatism was overestimated by 0.5 to 0.6 D, and ATR astigmatism was underestimated by 0.2 to 0.3 D. The fifth device (combined Placido and dual Scheimpflug) measures both anterior and posterior corneal astigmatism. With this device, WTR astigmatism was overestimated by 0.57 D, and there were no ATR prediction errors.

The researchers developed a new toric IOL nomogram to overcome these inaccuracies. This nomogram, which is presented as a table in the study, takes into account the mean values of posterior corneal astigmatism that they found and aims to leave eyes with small amounts of WTR refractive astigmatism. The rationale for the latter goal was the ongoing ATR shift that occurred in most eyes, even after temporal clear corneal cataract surgery.

The researchers called for further studies to evaluate the performance of this nomogram.

Roundup of Other Journals is written by Jean Shaw and edited by Deepak P. Edward, MD.