

News in Review

COMMENTARY AND PERSPECTIVES

As the Academy Annual Meeting approaches, *EyeNet* brings you a preview of some papers to be presented there. Each was chosen by its session chair because it either constitutes important news in the field or is illustrative of a trend. Although only five subspecialties are represented below, there also will be paper sessions for intraocular inflammation/uveitis, neuro-ophthalmology, ocular tumors/pathology, orbit/lacrimal/plastic surgery, and pediatric ophthalmology/strabismus. Look for a complete list of papers in the *Final Program* (pages 137-155), *Meeting Guide* (pages 97-101), or Mobile Meeting Guide (www.aao.org/mobile).

Cornea Paper

Early OCT Helps to Predict DMEK Attachment

Only an air bubble and the endothelium's sealing action secure the extremely thin graft of a Descemet membrane endothelial keratoplasty (DMEK). As with Descemet stripping automated endothelial keratoplasty (DSAEK), graft detachments remain the primary challenge.¹

For this reason, researchers at the Netherlands Institute for Innovative Ocular

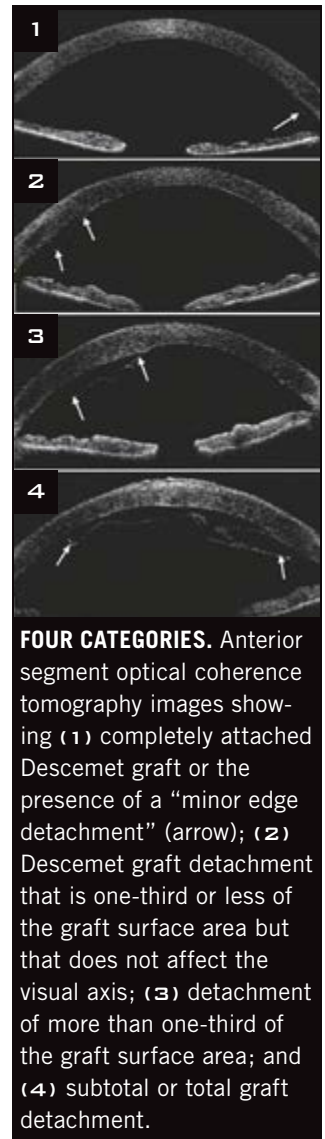
Surgery (NIIOS) in Rotterdam retrospectively explored whether visualization using anterior segment optical coherence tomography (AS-OCT) at different times following DMEK could predict which grafts needed rebubbling and which might spontaneously resolve.¹

Surgeons had performed AS-OCT in 87 eyes at one hour, one week, one month, three months, and six months after surgery, categorizing

the severity of detachment at each of the intervals:

1) no detachment; 2) a detachment of one-third or less of the total graft surface area, but not affecting the visual axis; 3) a detachment greater than one-third of the total graft surface area; and 4) complete detachment.

"We expected that a graft attached at one hour would remain attached and that larger detachments would remain detached," said lead researcher, Ru-Yin Yeh, MD, FEBO, in the department of ophthalmology at Centre Hospitalier Régional de la Citadelle, Liège, Belgium. Instead, the researchers found a less predictable adherence pattern.



FOUR CATEGORIES. Anterior segment optical coherence tomography images showing (1) completely attached Descemet graft or the presence of a "minor edge detachment" (arrow); (2) Descemet graft detachment that is one-third or less of the graft surface area but that does not affect the visual axis; (3) detachment of more than one-third of the graft surface area; and (4) subtotal or total graft detachment.

One-hour OCT. Although it is not typical to do OCT one hour after DMEK, said Dr. Yeh, OCTs performed at this time point proved to be the most accurate in predicting which grafts would be attached six months postoperatively. Ninety percent of cases that were completely attached or less than one-third detached at one hour remained stable or had improved at six months. Likewise, graft detachments of greater than one-third total graft surface area at one hour reattached in only 25 percent of cases at six months, with 62.5 percent showing more than one-third of the graft per-

sistently detached and 12.5 percent completely detached at the six-month mark.

One-week OCT. By contrast, the study found that a high rate of graft detachment at one week was not mirrored at six months. The finding that graft attachment may be a dynamic process with temporary detachments is important to know, said Dr. Yeh.

With a false-positive graft status in 23 percent of eyes, one-week OCT had the worst positive predictive value. Therefore, those who rely on one-week results alone may rebubble unnecessarily, said Dr. Yeh. "If the detachment [at one week]

is less than one-third of the surface area and the graft is attached at the visual axis, we found that the visual outcome is very good without rebubbling."

One plus one. All grafts that were attached at one week remained attached at six months, so combining the results from one hour and one week may prove most helpful for planning any intervention after surgery, said Dr. Yeh. "If we see that there is a graft detach-

ment at both one hour and one week, we can perform a rebubbling earlier." This is particularly helpful, she said, because the best time to do rebubbling is within two to four weeks, before the graft becomes more rigid and challenging to attach. —Annie Stuart

1 Yeh RY et al. *Ophthalmology*. 2013;120(2):240-245.

Dr. Yeh reports no related financial interests.

■ **Predictive Value of OCT in Graft Attachment After Descemet Membrane Endothelial Keratoplasty.** *When: Monday, Nov. 18, 2:24-2:31 p.m., during the cornea and external disease paper session (2-4:45 p.m.). Where: Room 271. Access: Free.*

Retina Paper

HARBOR Study Answers

3 Clinical Questions

In patients with wet age-related macular degeneration (AMD), individualized dosing (PRN) of 0.5 mg of ranibizumab over time has comparable effectiveness to monthly dosing, with fewer injections, according to the HARBOR two-year results. "This reaffirms that the PRN approach, which is commonly used in clinical practice, is safe and effective and may be appropriate for most patients with

wet AMD," said HARBOR investigator Brad J. Baker, MD, in private practice with Vitreo-Retinal Associates of Worcester, Mass.

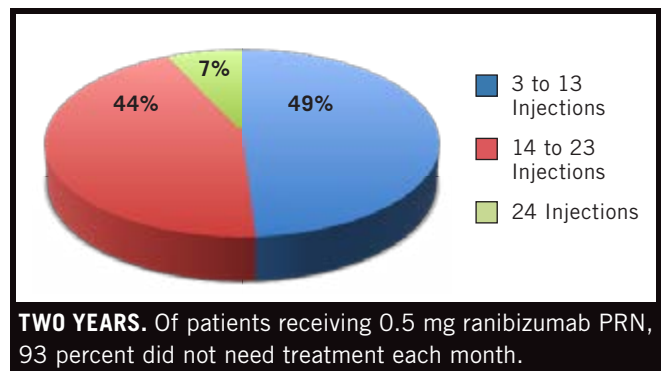
The study answers three key questions.

1. Visual acuity. Do PRN and monthly ranibizumab provide similar visual acuity gains over 24 months?

Yes. After three monthly loading doses, PRN groups were evaluated monthly and treated if there was

■ **HARBOR 2-Year Results Support Less Frequent Dosing in Patients With Wet Age-Related Macular Degeneration.**

When: Tuesday, Nov. 19, 11:12-11:19 a.m., during the second retina and vitreous paper session (10 a.m.-noon) Where: Room 271. Access: Free. (There is also an earlier retina and vitreous paper session. When: Monday, Nov. 18, 3:45-5:15 p.m. Where: Room 255. Access: Free.)



a decrease in vision of more than 5 letters from their previous visit or any evidence of disease activity on SD-OCT. Mean visual acuity gains in the 0.5-mg ranibizumab groups at 24 months were 7.9, 6.7, and 9.7 letters in patients receiving injections, on average, every month, every one to two months, or more than every two months, respectively.

2. Frequency of dosing. How many injections did the 0.5-mg PRN group receive over 24 months?

This group received an average of 13.3 injections over two years (5.6 injec-

tions in year 2) and had an average treatment interval of 9.9 weeks after three monthly loading doses. The 0.5-mg monthly group received an average of 21.4 injections over two years (10.1 injections in year 2).

3. Safety. Does a higher dose of ranibizumab pose greater safety risks over 24 months?

No. Although the 2.0-mg dose is not approved for use in clinical practice, the HARBOR trial evaluated it, both monthly and PRN, to see if there were any added benefits or safety concerns with the higher dose. The

Cataract Paper

Aphakic Refractions Appear Beneficial

Can intraoperative aberrometry make the refractive results of femtosecond laser cataract surgeries better? Ophthalmologists at The Eye Center of North Florida think the answer is yes, based on outcomes achieved before and after addition of the Opti-wave Refractive Analysis (ORA) aberrometry system (WaveTec) to some of their

ocular and systemic safety profile in the second year was similar among all four treatment groups and was consistent with previous ranibizumab trials in AMD. As in HARBOR one-year results, all four arms of the study showed a benefit, but the higher dose did not provide additional benefit.

The HARBOR group compared its PRN results with the two-year CATT and VIEW trials. “Making cross-trial comparisons with caution, we found that PRN dosing with ranibizumab in year 2 may be comparable in terms of visual outcomes and number of injections to other anti-VEGF agents on the market,” said Dr. Baker. Given that patients may respond to one drug but not another, this is a welcome finding, he said.

—Gabrielle Weiner

Dr. Baker is a clinical investigator for DRCR.net, Genentech, Ophthalmotech, and Regeneron.

cataract surgery protocols.

The Eye Center, based in Panama City, offers femtosecond laser-assisted cataract surgery as part of all-inclusive refractive packages that patients can buy, said medical director Bret L. Fisher, MD. Since 2012, these packages have included ORA, which measures the aphakic eye’s refractive power through aberrometry.

“We believe that if you’re paying to get a certain refractive outcome, then we’re going to use all the tools that we think are necessary to help you achieve that goal,” Dr. Fisher explained. “My subjective impression was that the addition of ORA was helping me, but without actually looking at the data I couldn’t quantify that or prove it. I simply wanted to know whether this new technology really was helping me do a better job for my patients.”

The study. In his retrospective study, Dr. Fisher compared visual outcomes between two groups of femtosecond laser cataract cases: 53 eyes operated upon before the ORA’s arrival and 61 in which the preoperative refractive plan was fine-tuned based on an aphakic intraoperative refraction with ORA.

In all eyes, the surgeon used a LenSx femtosecond laser (Alcon) to make the incisions and the capsulorhexis and to prefragment



CHECKING THE PREOP PLAN. Paul E. Garland, MD, attending surgeon at The Eye Center of North Florida, verifies a patient’s intraoperative aberrometry measurements during refractive cataract surgery.

the lens before phacoemulsification and aspiration. Patients received a multifocal or toric intraocular lens (IOL) or a monofocal IOL plus astigmatic correction with laser incisions.

Preliminary results. Assessment of statistical significance of the figures will be presented at the Annual Meeting, Dr. Fisher said. However, the initial comparisons revealed that two weeks to two months after surgery:

- Uncorrected visual acuity (UCVA) was 20/25 or better in 61 percent of the aberrometry eyes, compared with 51 percent in the no-aberration group. UCVA was 20/20 or better in 33 percent versus 23 percent,

respectively.

- Mean absolute prediction error improved to 0.32 D \pm 0.28 D in aberrometry cases, compared with 0.44 D \pm 0.42 D without aberrometry.
- 82 percent of ORA and 76 percent of non-ORA eyes were within 0.5 D of the predicted refractive target.

In absolute terms, those improvements might seem small, but they would be important to the “very select group of patients in whom we’re already using the very best available technology to get increasingly precise results,” said Dr. Fisher.

—Linda Roach

Dr. Fisher recently was a clinical investigator for WaveTec.

■ Visual Acuity and Predictability in Femtosecond Laser Cataract Surgery With Intraoperative Aberrometry.

When: Sunday, Nov. 17, 4:30-4:37 p.m., during the second cataract paper session (3:30-5:10 p.m.). Where: Room 255. Access: Free. (There also is an earlier cataract paper session. When: Sunday, Nov. 17, 10:30 a.m.-12:15 p.m. Where: Room 243. Access: Free.)

Glaucoma Paper

Study Finds Value in Tx

A recent U.S. government study¹ questions the value of glaucoma screening and therapy. But Gary C. Brown, MD, MBA, a retina specialist and head of the Center for Value-Based Medicine, Flourtown, Pa., has found otherwise, at least for glaucoma therapy.

The government study, commissioned by the Agency for Healthcare Research and Quality (AHRQ), found no evidence “addressing direct or indirect links between glaucoma treatment

and visual impairment or patient-reported outcomes.” It did, however, acknowledge that “a number of medical and surgical treatments clearly lower IOP and can prevent visual field loss and optic nerve damage.”

Yet Dr. Brown’s study on the comparative-effectiveness and cost-effectiveness of glaucoma therapy found that timolol therapy, which costs \$7,500 annually in 2012 dollars, has a net 21-year return on investment of more than \$440,000 to

patients and society. The return is realized in the form of increased employment, decreased caregiver costs, and reduced rates of depression, trauma, and nursing home admissions. That translates to a 19 percent gain in patient value, which is far higher than many other common interventions. Systemic antihypertensive drugs, for example, yield a 6.3 to 9.1 percent gain.

Dr. Brown based his calculations on a meta-analysis of randomized clinical trials,² primary patient data

from Wills Eye Hospital and Manhattan Eye and Ear Infirmary, and Walmart pricing. His model may be applied to any glaucoma drug. In fact, he found earlier that latanoprost confers greater patient value than timolol.

—Miriam Karmel

1 www.ncbi.nlm.nih.gov/books/NBK95391. Accessed Sept. 4, 2013.

2 van der Valk R et al. *Ophthalmology*. 2005;112(7):1177-1185.

Dr. Brown is an equity owner in the Center for Value-Based Medicine.

■ **Comparative-Effectiveness and Cost-Effectiveness of Glaucoma Therapy.** *When: Tuesday, Nov. 19, 10:48-10:55 a.m., during the glaucoma paper session (8:30-11:30 a.m.). Where: Room 255. Access: Free.*

Refractive Surgery Paper

Inlays: 2-Year Results

Good news for the over-40 crowd: The Kamra corneal inlay (AcuFocus) demonstrated the ability to counter the effects of presbyopia at up to two years after implantation, according to a study of more than 10,000 patients, aged 40 to 65, who underwent surgery at a single center in Tokyo. The device is designed to increase depth of field and improve near and intermediate vision.

This study involved two groups: ametropic presbyopes, who received simultaneous LASIK and implantation of the corneal inlay; and post-LASIK presbyopes, who underwent inlay implantation only. At baseline, patients in the first group had spherical equivalent

refractions from -9.0 D to $+3.0$ D with less than -3.0 D cylinder; while patients in the second group, whose LASIK was performed at least one month earlier, had binocular corrected distance visual acuity of at least 20/25 and uncorrected near visual acuity (UNVA) worse than or equal to J3.

Minoru Tomita, MD, PhD, principal investigator and executive medical director of the Shinagawa LASIK Center, reported that at the two-year post-operative follow-up, the ametropic group’s mean uncorrected distance visual acuity (UDVA) and UNVA had improved from 20/125 and J6 preoperatively to 20/20 and J2, respectively. In the post-LASIK group,

the mean UDVA and UNVA had changed from 20/16 and J6 after initial LASIK to 20/20 and J2 at one year after inlay implantation.

Steroid use. Dr. Tomita described his postsurgical medication and steroid-tapering schedule to control the corneal healing response for the inlay-implanted eye. On day 1, the regimen consists of one drop of 0.1 percent topical dexamethasone, 0.5 percent moxifloxacin hydrochloride ophthalmic solution, and 0.1 percent hyaluronate sodium ophthalmic solution every hour until bedtime. For the next six days, these medications were given five times per day. Beginning at week 2, all prior topical medication was discontinued and 0.1 percent fluorometholone was



IMPLANTING THE INLAY. A pocket interface under the previous LASIK flap.

initiated at four times per day for up to a month. This was tapered to three times per day from one to three months, twice a day from three to six months, and once a day from six months to one year, and then discontinued.

—Marianne Doran

Dr. Tomita is a consultant for AcuFocus and Ziemer Group.

■ **Corneal Inlay Implantation for the Treatment of Presbyopia: Over 10,000 Cases.** *When: Monday, Nov. 18, 11:27-11:34 a.m., during the refractive surgery paper session (10:15 a.m.-noon). Where: Room 255. Access: Free.*