Ophthalmology Times®
CUTTING-EDGE ADVANCEMENTS
October 15, 2013 VOL. 38, NO. 20
CLINICAL DIAGNOSIS | SURGERY | DRUG THERAPY

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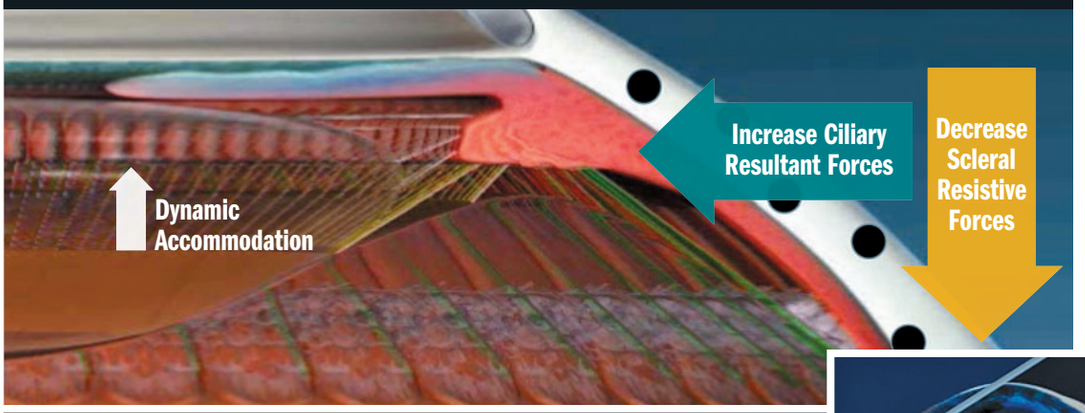
Scleral CXL mimics age-related ocular rigidity

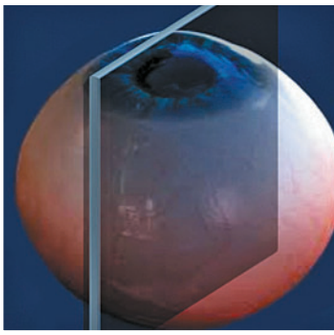
Model used to validate potential new ocular rejuvenation treatment for presbyopia

MECHANISM OF ACTION OBJECTIVE: DECREASE OCULAR RIGIDITY



IN VIEW "The elastic foundation for the posterior zonules located in the choroid, as well as the surrounding sclera, undergo degenerative changes with age that restrict the forward movement of the ciliary muscle and resulting accommodative movements of the lens. Treating the sclera to reduce scleral rigidity reduces the restrictive drag on the ciliary muscle, modulating and enhancing the accommodative change in the lens," said Daniel Goldberg, MD.[1-3]

VIDEO Watch an animation of the restoration of dynamic accommodation. Go to **http://bit.ly/1d2Rvwv** *(Image and video courtesy of Daniel Goldberg, MD)*



By Lynda Charters;
Reviewed by AnnMarie Hipsley, DPT, PhD, and George O. Waring IV, MD

A NEW BIOMEDICAL engineering model may provide more information about the effect of ocular rigidity on loss of accommodation.


Dr. Waring

Ultimately, it may become a model to demonstrate the mechanism of action of how reduced ocular rigidity could facilitate more control over ocular accommodation in humans.

The Laser Anterior Ciliary Excision (LaserACE) procedure (Ace Vision Group) uses a laser to create matrices of micropores in the sclera over the ciliary muscle complex. The group performed a pilot study that showed the impact of this novel procedure on ocular rigidity.

"We have suspected for some time that crosslinking impacts the cornea, the sclera, and crystalline lens," said George O. Waring IV, MD, assistant professor of ophthalmology, Medical University of South Carolina, Charleston, and adjunct assistant professor of bioengineering, Clemson University, Clemson, SC.

"This study induced these changes in a laboratory setting to model aging changes," Dr. Waring added. "Furthermore, it allows us to undo the aging changes with biomechanical manipulation of the aging eye."

In a research setting at the National Taiwan University Biomedical Engineering Department, scleral crosslinking was used to alter the ocular rigidity in porcine eyes to a predetermined ocular rigidity

*(Continues on page 14 : **Ocular rigidity**)*

Special Report

WHAT ATTENDEES NEED TO KNOW FOR THIS YEAR'S AAO

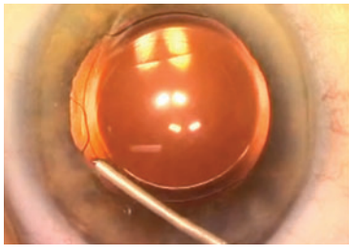
NEW ORLEANS :: **AS THE 2013 MEETING OF THE** American Academy of Ophthalmology (AAO) convenes here Nov. 16 to 19, attendees will notice several new additions.

The Ophthalmic News and Education Network has been redesigned so it is easier to find developments in the field. Evidence-based updates include improved mobile compatibility, increased personalized options for customizable education plans, and a free image library and enhanced social media.

*(See story on page 8 : **In advance**)*

Drug Therapy

SUSTAINED-RELEASE DRUG DELIVERY SHOWS PROMISE



LOS ALTOS, CA :: **SUSTAINED-RELEASE** intraocular drug delivery post-cataract surgery is one step closer to reality with the completion of a dose ranging trial of a novel biodegradable form of injectable dexamethasone.

More than half of eyes showed complete anterior chamber cell clearing by day 8 following routine cataract surgery with good safety results. "These are very promising results," said David F. Chang, MD, clinical professor, University of California, San Francisco, and private practice, Los Altos, CA.

*(See story on page 29 : **Sustained release**)*

For the reduction of IOP in patients with POAG or OHTN

When it's important to consider ocular and systemic side effects...

An alternate route to IOP reduction

- Effective at lowering IOP throughout the day and over the long term[1-3]
- Excellent systemic safety profile including no deleterious effects on CV or pulmonary function in clinical studies[1]
- Established ocular side effects profile: In clinical trials comparing RESCULA and timolol,* both were generally well tolerated regarding ocular adverse events, with similar incidence of hyperemia and similar changes to eyelash length and density[1,4,5]
  - The only events seen significantly more often with RESCULA than with timolol were burning and stinging and burning/stinging upon instillation; these events were generally mild and transient[2,4]
- No labeled drug-drug interactions[1,4]

Indication

RESCULA (unoprostone isopropyl ophthalmic solution) 0.15% is indicated for the lowering of intraocular pressure in patients with open-angle glaucoma or ocular hypertension.

Important Safety Information

RESCULA is contraindicated in patients with hypersensitivity to unoprostone isopropyl or any other ingredient in this product.

RESCULA has been reported to increase pigmentation of the iris, periorbital tissues, and eyelashes. Patients should be advised about the potential for increased brown iris pigmentation which is likely to be permanent.

RESCULA should be used with caution in patients with active intraocular inflammation (e.g., uveitis) because the inflammation may be exacerbated.

Macular edema, including cystoid macular edema, has been reported. RESCULA should be used with caution in aphakic patients, in pseudophakic patients with a torn posterior lens capsule, or in patients with known risk factors for macular edema.

*In pooled safety analyses of pivotal trials comparing RESCULA with timolol maleate 0.5%.[4]

Please see Brief Summary on reverse and full Prescribing Information, available from your Sucampo representative.

Rescula®
(Unoprostone isopropyl
ophthalmic solution) 0.15%

Brief Summary of Prescribing Information for RESCULA.

INDICATIONS AND USAGE
Rescula (unoprostone isopropyl ophthalmic solution) 0.15% is indicated for the lowering of intraocular pressure in patients with open-angle glaucoma or ocular hypertension.

DOSAGE AND ADMINISTRATION
The recommended dosage is one drop in the affected eye(s) twice daily.

Rescula may be used concomitantly with other topical ophthalmic drug products to lower intraocular pressure. If two drugs are used, they should be administered at least five (5) minutes apart.

CONTRAINDICATIONS
Rescula is contraindicated in patients with hypersensitivity to unoprostone isopropyl or any other ingredient in this product.

WARNINGS AND PRECAUTIONS
Iris Pigmentation
Unoprostone isopropyl ophthalmic solution may gradually increase the pigmentation of the iris. The pigmentation change is believed to be due to increased melanin content in the melanocytes rather than to an increase in the number of melanocytes. The long term effects of increased pigmentation are not known. Iris color changes seen with administration of unoprostone isopropyl ophthalmic solution may not be noticeable for several months to years. Typically, the brown pigmentation around the pupil spreads concentrically towards the periphery of the iris and the entire iris or parts of the iris become more brownish. Neither nevi nor freckles of the iris appear to be affected by treatment. Treatment with Rescula solution can be continued in patients who develop noticeably increased iris pigmentation. Patients who receive treatment with Rescula should be informed of the possibility of increased pigmentation.

Lid Pigmentation
Unoprostone isopropyl has been reported to cause pigment changes (darkening) to periorbital pigmented tissues and eyelashes. The pigmentation is expected to increase as long as unoprostone isopropyl is administered, but has been reported to be reversible upon discontinuation of unoprostone isopropyl ophthalmic solution in most patients.

Intraocular Inflammation
Rescula should be used with caution in patients with active intraocular inflammation (e.g., uveitis) because the inflammation may be exacerbated.

Macular Edema
Macular edema, including cystoid macular edema, has been reported. Rescula should be used with caution in aphakic patients, in pseudophakic patients with a torn posterior lens capsule, or in patients with known risk factors for macular edema.

Contamination of Tip and Solution
To minimize contaminating the dropper tip and solution, care should be taken not to touch the eyelids or surrounding areas with the dropper tip of the bottle. Keep bottle tightly closed when not in use. There have been reports of bacterial keratitis associated with the use of multiple-dose containers of topical ophthalmic products.

Use with Contact Lenses
Rescula contains benzalkonium chloride, which may be absorbed by soft contact lenses. Contact lenses should be removed prior to application of solution and may be reinserted 15 minutes following its administration.

ADVERSE REACTIONS
Clinical Studies Experience
Because clinical studies are conducted under widely varying conditions, adverse reaction rates observed in the clinical studies of a drug cannot be directly compared to rates in the clinical studies of another drug and may not reflect the rates observed in practice.

In clinical studies, the most common ocular adverse reactions with use of Rescula were burning/stinging, burning/stinging upon drug instillation, dry eyes, itching, increased length of eyelashes, and injection. These were reported in approximately 10–25% of patients. Approximately 10–14% of patients were observed to have an increase in the length of eyelashes (≥ 1 mm) at 12 months, while 7% of patients were observed to have a decrease in the length of eyelashes.

Ocular adverse reactions occurring in approximately 5–10% of patients were abnormal vision, eyelid disorder, foreign body sensation, and lacrimation disorder.

Ocular adverse reactions occurring in approximately 1–5% of patients were blepharitis, cataract, conjunctivitis, corneal lesion, discharge from the eye, eye hemorrhage, eye pain, keratitis, irritation, photophobia, and vitreous disorder.

The most frequently reported nonocular adverse reaction associated with the use of Rescula in the clinical trials was flu-like syndrome that was observed in approximately 6% of patients. Nonocular adverse reactions reported in the 1–5% of patients were accidental injury, allergic reaction, back pain, bronchitis, increased cough, diabetes mellitus, dizziness, headache, hypertension, insomnia, pharyngitis, pain, rhinitis, and sinusitis.

Postmarketing Experience
The following adverse reactions have been identified during post-approval use of Rescula. Because these reactions are reported voluntarily from a population of uncertain size, it is not always possible to reliably estimate their frequency or establish causal relationship to drug exposure.

Voluntary reports of adverse reactions occurring with the use of Rescula include corneal erosion.

There have been rare spontaneous reports with a different formulation of unoprostone isopropyl (0.12%) of chemosis, dry mouth, nausea, vomiting and palpitations.

USE IN SPECIFIC POPULATIONS
Pregnancy Category C - There are no adequate and well-controlled studies in pregnant women. Because animal studies are not always predictive of human response, RESCULA should be used during pregnancy only if the potential benefit justifies the potential risk to the fetus.

Pediatric Use - the safety and efficacy of RESCULA in pediatric patients have not been established.

It is not known whether RESCULA is excreted in human milk. Because many drugs are excreted in human milk, caution should be exercised when RESCULA is administered to a nursing woman.

No overall differences in safety or effectiveness of RESCULA have been observed between elderly and other adult populations.

CLINICAL PHARMACOLOGY
Mechanism of Action
Rescula is believed to reduce elevated intraocular pressure (IOP) by increasing the outflow of aqueous humor through the trabecular meshwork. Unoprostone isopropyl (UI) may have a local effect on BK (Big Potassium) channels and ClC-2 chloride channels, but the exact mechanism is unknown at this time.

STORAGE AND HANDLING
Store between 2°–25°C (36°–77°F).

For more detailed information please read the Prescribing Information.

Marketed by:

Sucampo Pharma Americas, LLC
Bethesda, MD 20814

Revised 01/2013

References: **1.** RESCULA [package insert]. Bethesda, MD: Sucampo Pharmaceuticals, Inc; 2012. **2.** Data on file. CSR C97-UIOS-004. Sucampo Pharmaceuticals, Inc. **3.** Data on file. CSR C97-UIOS-005. Sucampo Pharmaceuticals, Inc. **4.** Data on file. Integrated summary of clinical safety. Sucampo Pharmaceuticals, Inc. **5.** McCarey BE, Kapik BM, Kane FE; Unoprostone Monotherapy Study Group. Low incidence of iris pigmentation and eyelash changes in 2 randomized clinical trials with unoprostone isopropyl 0.15%. *Ophthalmology*. 2004;111(8):1480-1488.

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Match made in medicine

In Germany, ophthalmology struggles to attract strong applicants

By Peter J. McDonnell, MD

director of the Wilmer Eye Institute, Johns Hopkins University School of Medicine, Baltimore, and chief medical editor of *Ophthalmology Times*.

He can be reached at 727 Maumenee Building
600 N. Wolfe St. Baltimore, MD 21287-9278
Phone: 443/287-1511 Fax: 443/287-1514
E-mail: pmcdonn1@jhmi.edu

MY COLLEAGUE, Berthold Seitz, is professor and chairman of ophthalmology, Saarland University Medical Center, Homburg/Saar, Germany. He is also president of the German Ophthalmological Society (DOG) and a distinguished clinician-scientist who helped conduct much of the early work on laser corneal trephination as a possible means to minimize postkeratoplasty astigmatism.

Recently, I had the opportunity to speak with Dr. Seitz about ophthalmic education in his country. What he told me came as a surprise, showing that there are major differences between our countries that had escaped me.

"You have an enviable situation when it comes to applicants to your residency programs that department [chairpersons] in Germany could only dream about," my friend said.

FINDING A MATCH

Berthold had reviewed the statistics from our residency-matching program in the United States that show a much larger number of qualified applicants than available positions.

This is one situation where statistics don't lie—with most ophthalmology programs in this country filling with students having excellent academic records and glowing letters of recommendation and turning away many very strong students who would obviously make solid contributions to our field.

In the most recent match, about 1,000 of the roughly 29,000 residency positions in U.S. teaching hospitals went unfilled. In a supplemental match, most of the unmatched students found a position. Of the specialties that did not fill, child neurology led the way with 17, followed by preliminary general surgery (10), psychiatry (7), neurology and internal medicine (each with 6), and family medicine (5).

One theme that sticks out in the statistics about unfilled training slots in the United States is that almost all of them are nonsurgical fields (with the ironic exception of "preliminary general surgery.")

There may be a lesson there.

In Germany—surprisingly, to an American—ophthalmology struggles to attract strong applicants. According to Dr. Seitz, this is probably the consequence of German training programs not providing surgical instruction to all residents. Rather, after a standard residency, certain residents are kept on in order to learn ophthalmic surgery.

But Herr Professor has been working on strategies to help ensure that brilliant young minds in his country will pursue careers in ophthalmology. He values not only high IQ, but high EQ (emotional intelligence) as well.

He is also after flexible team players with a strong work ethic.

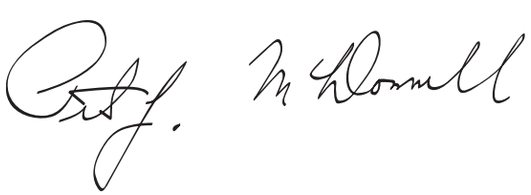
"Geniuses are often difficult to integrate [into a team]," said Dr. Seitz, so he will not offer a position in his department to someone he suspects falls in this category.

He reaches out to young students (undergraduates, young medical students) and exposes them to courses about the eye. The top medical students are offered a special wet lab course in ophthalmology, taught by the department's best instructors, to help them understand the rewarding aspects of our field, including an introduction to operating on the eye.

He provides opportunities for research electives where students can experience the thrill of presenting their work at regional and national ophthalmology meetings. As president of the DOG, he has focused on making sure research grants are available to young ophthalmologist clinician-scientists.

In a bow to the Generation Y phenomenon, Dr. Seitz stresses: "Young doctors tick differently than you did 20 years ago."

By this, he means I am old and failed to do a good job with the work-life balance thing (both of which I freely admit). ■



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Editorial
24950 Country Club Blvd.,
Suite 200
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Advertising
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Production
131 W. First St.
Duluth, MN 55802-2065
800/346-0085
FAX: 218/740-7223,
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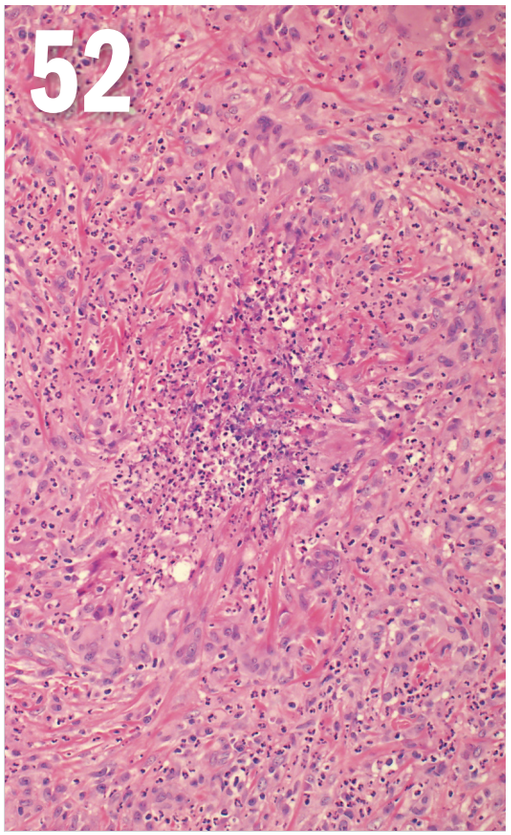
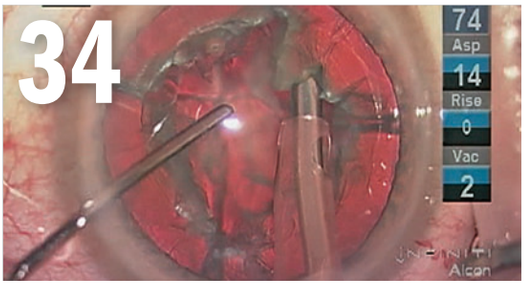
Ophthalmology Times *Mission Statement*

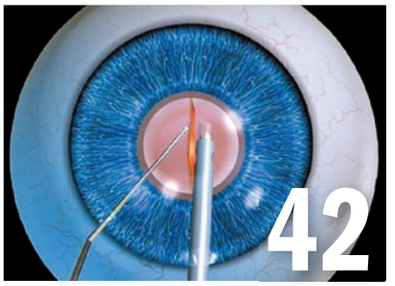
Ophthalmology Times is a physician-driven media brand that presents cutting-edge advancements and analysis from around the world in surgery, drug therapy, technology, and clinical diagnosis to elevate the delivery of progressive eye health from physician to patient.

Ophthalmology Times' vision is to be the leading content resource for ophthalmologists.

Through its multifaceted content channels, *Ophthalmology Times* will assist physicians with the tools and knowledge necessary to provide advanced quality patient care in the global world of medicine.







Special Report on page 8

AAO MEETING PREVIEW

Surgery

Clinical Diagnosis

Drug Therapy

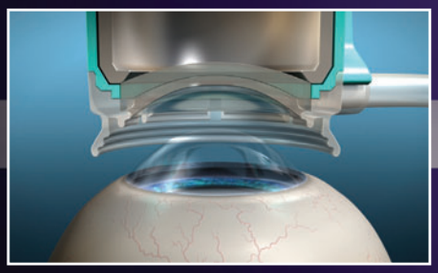
Technology

Practice Management

Grand Rounds

In Every Issue

Smarter, Better, Faster.[1]
Advancing Every Femtosecond.



INTRODUCING THE NEW

LenSx® SoftFit™ Patient Interface

SMARTER
- Enhances patient comfort
- Minimizes corneal compression
- Fixates cornea for precise incisions

BETTER
- Free-floating capsulotomies in nearly every case
- Pristine capsulotomy edges
- Lower IOP rise of only 16 mmHg during the procedure
- Less energy required

FASTER
- Reduction in laser time with overall reduction in procedure time
- Simpler, easier docking process

1. Multicenter prospective clinical study (n=197 eyes); Alcon data on file.

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(FIGURE 1) **The Ernest N. Morial Convention Center in New Orleans will host the 117th annual meeting of the American Academy of Ophthalmology as it returns to "The Big Easy."**

AAO: CUTTING-EDGE MULTIMEDIA TAKES OVER

New innovative options will be incorporated to make attendees' experience more interactive and user-friendly

By Rose Schneider, *Content Specialist,* Ophthalmology Times

take-home

The 2013 meeting of the American Academy of Ophthalmology will convene in New Orleans from Nov. 16 to 19. Visit *www.aao.org* for the latest updates or to register.

NEW ORLEANS ::

As the 2013 meeting of the American Academy of Ophthalmology convenes here Nov. 16 to 19, attendees will notice several new additions.

The Ophthalmic News and Education (ONE) Network has been redesigned so that it is easier to stay informed about developments in the field. Evidence-based updates include improved mobile compatibility, increased personalized options for customizable education plans, and a free image library and enhanced social media.

A demonstration of the ONE Network will be held in the Academy Resource Center, where attendees can visit during exhibit hall hours for custom tours by academy staff.

AAO has launched a video collection as well for attendees who treat retinal conditions.

The retina informed consent video collection is a set of 21, 5-minute patient educational videos. Topics include retinal conditions, age-related macular degeneration, diabetic retinopathy, and detached retina.

The videos are offered in both English and Spanish, and outline

(Convention Center: Photo Courtesy New Orleans Convention & Visitors Bureau by Kathy Anderson Photography)

TECHNOLOGY INNOVATION LEADS OIS

When the 2013 Ophthalmology Innovation Summit (OIS) convenes Nov. 14, attendees will hear from various speakers in an atmosphere designed to address key issues impacting the ophthalmic field. Find out more: *http://bit.ly/H1ygWz*

the risks, benefits, and alternatives of various treatments or procedures.

Those who are interested can visit the product information booth on Nov. 15 at Retina Subspecialty Day, as well as in the patient education section of the academy's resource center during exhibit hall hours.

The academy has also added two new lectures to the schedule:

- **The Michael F. Marmor, MD Lecture in Ophthalmology and the Arts will be held Nov. 17 at 11:30 a.m. The presentation, "Degas, New Orleans and eyes greatly in need of care," will be given by Richard Kendall, an art historian, curator, and Degas expert.**
- **The Bruce E. Spivey, MD Lecture in Risk Management and Patient Safety will be held Nov. 17 at 2 p.m. The lecture will be given by Susan Day, MD.**

2013 SUBSPECIALTY DAYS

The annual meeting will be preceded by Subspecialty Days, Nov. 15 and Nov. 16.

Attendees can choose from seven meetings that feature in-depth reviews on current clinical developments in each subspecialty area:

- ***CORNEA*** **Through the Looking Glass—Where We Are Now, Where We're Headed (Saturday)**
- ***GLAUCOMA*** **The Future is Now! (Saturday)**
- ***NEURO-OPHTHALMOLOGY*** **What to Make of This? Recognizing the Distinctive Neuro-Ophthalmic Symptom, Sign, or Test (Saturday)**
- ***OCULOFACIAL PLASTIC SURGERY*** **Blues, Blephs, and Blowouts (Saturday)**
- ***PEDIATRIC OPHTHALMOLOGY*** **Preparing for the Next Generation (Saturday)**
- ***REFRACTIVE SURGERY*** **Perfecting Vision (Friday and Saturday)**
- ***RETINA*** **Let the Good Times Roll (Friday and Saturday)**

Participants who register for 1-day meetings can float between the meetings taking place that day. Two-day registrants can attend any presentation taking place on Friday or Saturday.

OPENING SESSION

The opening session will be held Sunday from 8:30 to 10 a.m. It will include the presentation of the Laureate Award to Daniel Albert, MD, MS.

Opening and concluding remarks will be given by Jonathan B. Rubenstein, MD. The keynote presentation will be given at 9:10 a.m., while the Jackson Memorial Lecture will be given at 9:32 a.m. by Mark S. Blumenkranz, MD.

ELECTRONIC HEALTH RECORDS

Many courses and special events will focus on a subject that is top of mind for many ophthalmologists: electronic health records (EHRs).

For those looking for basic helpful hints, "Top 10 Success Tips for your EHR Implementation" (Sunday, 4:30 to 5:30 p.m.) will be useful, as well as "An Approach to Selecting and Implementing Electronic Health Records in Your Practice" (Sunday, 2 to 3 p.m.) and Monday's "Big Data: Leveraging Analytics to Improve Your Bottom Line" (7:30 to 8:30 a.m.).

Programs on the impact of EHRs and malpractice claims are also on the schedule.

LEARNING LOUNGE

For those wanting to continue the conversation with colleagues, visit the Learning Loung to participate in informal, small group- facilitated discussions led by experts in the field.

Included highlights are:

- **Femtosecond Laser Cataract Surgery in Challenging Cases,** Saturday, 1:45 p.m.
- **Presbyopia- Correcting OLs,** Saturday, 12:30 p.m.
- **Complicated and Challenging Cases in Cataract Surgery,** Sunday, 10:30 a.m.
- **Advanced Techniques in Strabismus Surgery** Sunday, 12:15 p.m.
- **Preparing for Retirement: Financially and Emotionally** Monday, 10:30 a.m.
- **Fillers and Botox Basics** Tuesday, 11 a.m.

Continues on page 10 : ***AAO meeting***

Special Report 〉 **AAO MEETING PREVIEW**

AAO MEETING

(*Continued from page 9*)

FOCUS ON CATARACT

Monday will feature comprehensive programming dedicated to cataract surgery.

Planned events include:

- **Spotlight on Cataract Complications: M&M Rounds—Learning From My Mistakes**
  8:15 a.m. to 12:15 p.m.
- **Advanced IOL Power Calculations for the Cataract and Refractive Surgeon**
  9 to 11:15 a.m.
- **Astigmatism in the Cataract Patient**
  10:15 a.m. to 12:30 p.m.
- **Manual Extracapsular Cataract Extraction Surgery: Indications and Techniques**
  10:30 a.m. to 12 p.m.

ACADEMY CAFÉ

These popular sessions are open to all attendees. Enjoy free coffee while listening in on lively panel discussions and sending questions via text message.

The lineup includes:

- **SATURDAY: Maintenance of Certification Update**, 1 to 2:15 p.m.; Cataract, 2:30 to 3:45 p.m.
- **SUNDAY: Oculoplastics**, 10:30 to 11:45 a.m.; Cornea and External Diseases, 1 to 2:15 p.m.; Retina, 2:30 to 3:45 p.m.
- **MONDAY: Glaucoma**, 8:30 to 9:45 a.m.; Uveitis, 10:30 to 11:45 a.m.
- **TUESDAY: Cataract**, 8:30 to 9:45 a.m.

BREAKFAST WITH THE EXPERTS

Another popular, interactive event is Breakfast with the Experts. Tickets are $30 in advance and $40 at the door. These sessions will be held Sunday through Tuesday, with several options each day.

EXHIBITION HALL

The world's largest exhibition of ophthalmic technology, products, and services will be open from 9 a.m. to 5 p.m. Saturday, Sunday, and Monday, and 9 a.m. to 1 p.m. on Tuesday.

Visit the Virtual Exhibition online to plan your visit ahead of time. Create a "My Expo" account by entering your e-mail address and choosing a password. Search the list of exhibitors by company name, booth number, product categories, or medical specialty. You can then tag the exhibitors you plan to visit and print a personalized plan before you travel to New Orleans.

Be sure to visit *Ophthalmology Times* at Booth 1028.

PRACTICE MANAGEMENT COURSES

Many practice management courses being offered are especially pertinent to physicians.

Some highlights include:

- **Keeping Your Practice Out of Legal Hot Water: An HR and Compliance Workshop**
  Saturday, 9 a.m. to 4 p.m.
- **Bending the ASC Performance Curve**
  Saturday, 12 to 4 p.m.
- **Big Data: Leveraging Analytics to Improve Your Bottom Line**
  Sunday, 7:30 to 8:30 a.m.
- **Open Your Eyes to New Opportunities: A Guide to the Student Loan System**
  Sunday, 7:30 to 8:30 a.m.
- **Compounding Pharmacies: Legal and Regulatory Issues**
  Sunday, 2 to 3 p.m.
- **Creating a Clinical Trial Unit**
  Monday, 9 to 10 a.m.
- **Step 1 to Running on Time: Scheduling**
  Monday, 10:15 to 11:15 a.m.
- **Electronic Health Records: "Great Expectations,"**
  Tuesday, 10:15 to 11:15 a.m.
- **Hiring an Ophthalmologist for Your Practice: Avoiding the Pitfalls Needing for Failed Blebs: All You Need to Know**
  Tuesday, 11:30 a.m. to 12:30 p.m.

OTHER HIGHLIGHTS

Among the many other highlights planned for the meeting:

- ***CONQUERING ICD-10-CM FOR OPHTHALMOLOGY***
  ICD-10 is one of the biggest changes happening to coding in the past 30 years. A three 3-hour interactive course will be held Saturday from 8 to 11 a.m. to discuss what practices need to know in order to get paid timely and correctly starting Oct. 1, 2014.
- ***THE AFFORDABLE CARE ACT AND HEALTH CARE REFORM IN 2013***
  Pearls and Potential Perils (NMA) will talk about the law, its impact on physician shortage, and the changing payment methods. The discussion will be held on Monday from 10:15 to 11:45 a.m.

Within New Orleans' downtown and French Quarter, attendees will discover a multitude of dining and entertainment options.

- ***ACADEMY RESOURCE CENTER***
  Review and purchase clinical references, patient education, and practice management/coding products. Experience demos of these online resources: ONE Network, Academy Online Community, EyeWiki, and the new GetEyeSmart.org, eye health information for the public. Join or pay dues for the AAO, AAOE, and International Society of Refractive Surgery.
- ***TECHNOLOGY PAVILION***
  This is the "hot spot" to discuss the latest in hardware, software, social networking, and e-prescribing. AAO members and independent consultants offer user-friendly presentations in the Technology Pavilion Theater, which showcases the latest technology trends that can benefit medical practices.

ORBITAL GALA

The Foundation of the AAO will host the 2013 Orbital Gala on Sunday from 6 to 10 p.m. at the National World War II Museum. The evening will start with a cocktail reception and silent auction. This will be followed by a buffet dinner and dancing in the museum's new showcase, the U.S. Freedom Pavilion: The Boeing Center, which pays tribute to the 16 million Americans who served in the war.

The gala supports the AAO's priority programs and projects, including educational, quality-of-care research, and service programs. To learn more or purchase tickets, visit *www.faao.org*. ■

(French Quarter; Photo Courtesy New Orleans Convention & Visitors Bureau by Chris Granger)

His glaucoma. Our motivation.

Image is designed to represent glaucoma visual impairment and is not intended to be medically accurate. For illustrative purposes only.

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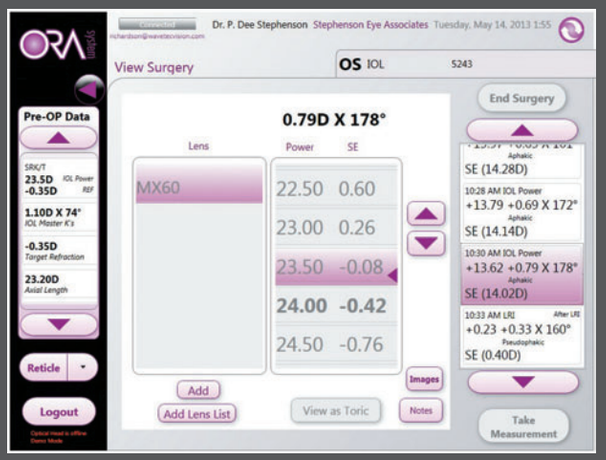
Combination of technology maximizes cataract outcomes

Intraoperative wavefront aberrometry and aspheric hydrophobic acrylic IOL enhances visual acuity and quality-of-vision results, ophthalmologist explains

By Cheryl Guttman Krader; *Reviewed by P. Dee G. Stephenson, MD*



Patient's preoperative ORA screen showing the IOL power selection based on the presurgical measurements (left).

The patient's first aphakic ORA reading (right).
(Figures courtesy of P. Dee G. Stephenson, MD, FACS)

TAKE-HOME

- ***Cataract surgery performed with intraoperative wavefront aberrometry while implanting a new aspheric hydrophobic acrylic IOL maximizes visual acuity and quality-of-vision results.***

TAMPA ::

Implantation of a new aspheric hydrophobic acrylic IOL (enVista, Bausch + Lomb) with intraoperative wavefront aberrometry (ORA System, WaveTec Vision) to guide IOL power selection is a reliable approach for delivering refractive and visual outcomes in cataract surgery, according to P. Dee G. Stephenson, MD.

"LASIK-like results" were achieved in her first 50 recipients of the lens who were operated on utilizing intraoperative wavefront aberrometry to confirm the IOL power, said Dr. Stephenson, associate professor of ophthalmology, University of South Florida, Tampa, and in private practice, Venice, FL.

Distance uncorrected visual acuity was 20/30, or better in 92% of eyes, and 20/25, or better in 76% of eyes. All eyes achieved 20/20 or better best-corrected visual acuity and had an SE within 0.5 D of target, while 72% of eyes were ±0.25 D of the target refraction. Mean absolute prediction error was 0.17±0.12 D.

The power implanted matched that chosen preoperatively based on A-scan measurement in only 12% of eyes, while the intraoperative wavefront aberrometer measurement confirmed the preoperative selection in 34% of eyes and influenced the choice in 54%.


Dr. Stephenson

"With its aspheric, aberration-free optic and optically clear, glistening-free material, this new IOL provides great quality of vision," Dr. Stephenson said.

"I was able to get great refractive results from the start by using the intraoperative aberrometer to guide power selection," she said. "Combining these technologies, I know I can deliver the best vision results possible and meet the high expectations of today's cataract surgery patient population."

BENEFITS OF APPROACH

The proprietary glistening-free material of the new acrylic IOL was a major attraction that led Dr. Stephenson to its use. The acrylic copolymer is highly crosslinked and prehydrated to an equilibrium water content of 4% so that there is no egress of water into the lens while it remains on the shelf.

"Glistenings can affect quality of vision, and if all factors are equal otherwise, I would prefer a lens without glistenings," she said.

The large, 6-mm aberration-free aspheric optic also improves contrast sensitivity and minimizes dysphotopsias, even in the presence of mild decentration or tilt.

With its continuous 360° square posterior edge and haptics that vault the optic posteriorly, the lens is well designed to minimize the development of posterior capsule opacification.

The IOL also remains pristine in the eye because the acrylic material is durable and resists surface damage that can be induced during folding and implantation. Implantation is performed using a new inserter system that allows placement through a 2.2-mm incision with a wound-assisted technique.

"I perform coaxial microincisional surgery through a 1.8-mm incision, and after enlarging the incision to 2.2-mm for IOL implantation, I still maintain the benefit of minimal surgically induced astigmatism," Dr. Stephenson said.

The new inserter also allows implantation with minimal manipulation of the lens inside the eye.

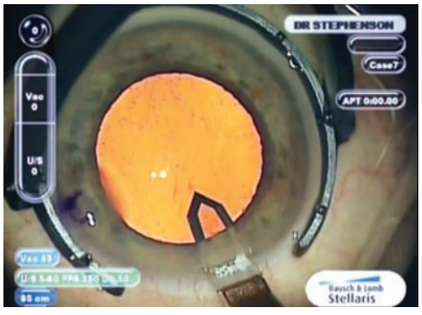
Once inserted, the lens unfolds smoothly and gently, thus allowing easy rotation into position and removal of all viscoelastic from behind and in front of the lens.

MAXIMIZING SUCCESS

Dr. Stephenson began using intraoperative wavefront aberrometry to guide IOL power implantation more than 4 years ago, and she is now using it in almost all of her cases.

Checking the aphakic refraction with the intraoperative aberrometer has allowed Dr. Stephenson to achieve reproducibly good refractive results, even when making modifications to her standard surgical technique.

MICROINCISIONAL SURGERY



VIDEO Watch a microincisional cataract surgery procedure using the new hydrophobic acrylic IOL. Go to **http://bit.ly/18q10Ht**. *(Video courtesy of P. Dee G. Stephenson, MD, FACS)*

"Intraoperative wavefront aberrometry has been an invaluable adjunct that allows me to consistently achieve my refractive target and happy patients," she said.

"It adds just 30 seconds to the surgical time and has improved by outcomes by at least 20% to 25%, thereby also reducing the need for IOL exchange or enhancement surgery," Dr. Stephenson said. ■

P. DEE G. STEPHENSON, MD

E: *eyedrdee@aol.com*

Dr. Stephenson is on the speakers' bureau for Bausch + Lomb and is a member of the WaveTec Vision surgical advisory board.

OT OphthalmologyTimes.com *ONLINE EXCLUSIVE*

SURGEON'S RESULTS WITH GLISTENING-FREE IOL

PHYSICIAN PERSPECTIVE P. Dee G. Stephenson, MD, FACS, explains more about her surgical outcomes with use of intraoperative wavefront aberrometry and an aspheric glistening-free IOL. The technology has allowed Dr. Stephenson to raise the bar for cataract outcomes to be even better than LASIK outcomes, she notes. Go to **http://bit.ly/HOhqr5.**

OCULAR RIGIDITY

(Continued from page 1)

coefficient that correlates with a specific age (Pallikaris, et al.). This allowed an in vitro assessment of the effects of the LaserACE procedure to enhance ocular resilience—a key factor thought to improve the eye's ability to accommodate.


Dr. Hipsley

"Lens stiffness has been correlated with loss of accommodation in aging adults," said AnnMarie Hipsley, DPT, PhD, founder and chief executive of ACE Vision Group, Silver Lake, OH. "However, ocular rigidity also has been correlated with accommodative loss."

She cited a 2012 Greek study that evaluated the biomechanics of ocular rigidity.[4]

Based on the premise of that and other recent studies, Ace Vision Group researchers hypothesized that decreased ciliary muscle force and increased scleral rigidity resulted in decreased accommodative ability in aging eyes.

The study showed that eyes with induced rigidity mimicking that of an elderly 60-year-old eye had the rigidity of a 30-year-old eye after LaserACE treatment, which was equivalent to controls.

The LaserACE technology is designed to restore dynamic accommodation and does so by increasing scleral resilience, increasing the net forces of the ciliary body, and thereby facilitating accommodation, Dr. Hipsley said.

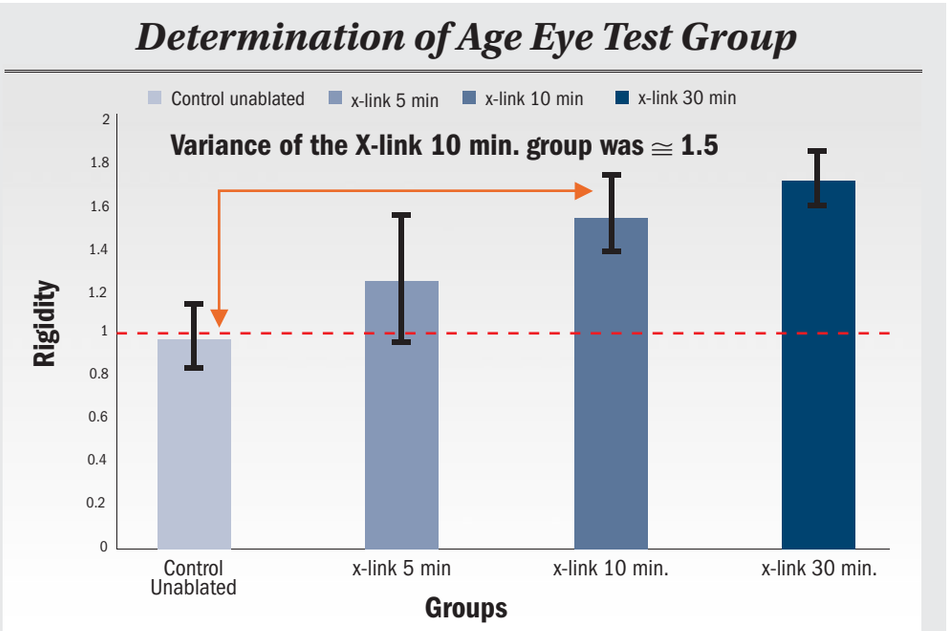
LABORATORY STUDY

Dr. Hipsley and her colleagues conducted a laboratory study that aimed to:

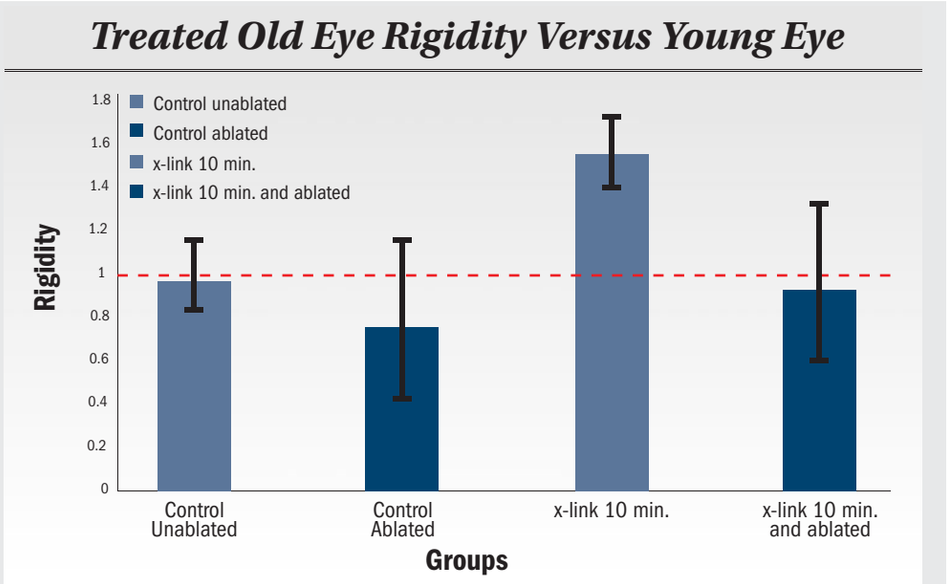
- Develop a method of scleral crosslinking to mimic age-related ocular rigidity.
- Assess the potential effects of the procedure to decrease ocular rigidity.
- Establish a biomechanical model to test the benefit of intraocular accommodative resultant force efficiency as it relates to decreased ocular rigidity in vitro.

In the study, 50 freshly harvested porcine eyes were separated into four groups:

- **GROUP A:** Unablated controls that simulated normal or young eyes.
- **GROUP B:** Crosslinked eyes with different degrees of crosslinking to simulate aging eyes.
- **GROUP C:** Ablation with LaserACE without crosslinking to simulate young control eyes.
- **GROUP D:** Eyes that underwent crosslinking then ablation to simulate aging eyes treated with LaserACE.



(Figure 1) Rigidity by group with values of each x-linked group compared with the control unablated group. It was found that the x-link × 10 min. group's ocular coefficient correlated most strongly with the 60 years or old eye. This group was selected for ablation and analysis of effects.



(Figure 2) After establishing the comparison groups, the control or young (30 years simulation), rigidity was compared with the x-link 10 min. old (60 years simulation). In the young eye, the ablation resulted in a 20% decrease in rigidity. In the old eye, the treatment resulted in a 36% decrease in rigidity. Rigidity reduction appeared to be proportionate to the amount of rigidity. After treatment, the x-link 10 min. eye (old eye rigidity was reduced to the rigidity coefficient that almost identically matched the control or young eye.) *(Figures courtesy of AnnMarie Hipsley, DPT, PhD)*

In groups C and D, a nine-spot matrix LaserACE pattern was applied in the four oblique quadrants of the sclera to the porcine eyes using a VisioLite 2.94 Er:YAG laser.

The laser effects were measured using a pressure transducer, dosage injector controller, data computerized reader, and tissue holding frame. The eyes were fixed in the frame and distilled water was injected into the vitreous chamber at a rate of 8.42 ul/sec.

Scleral crosslinking was performed with 0.8 ml of 2% glutaraldehyde. Eyes were wrapped with cotton gauze and soaked for 5, 10, or 30 minutes.

Pressure was plotted against the injected volume curve to estimate the changes in the

ocular rigidity from the slope of the linear regression line.

AGE, RIGIDITY CORRELATIONS

The age-versus-rigidity correlations were established from a referenced model for the cross-linked groups, according to Dr. Hipsley.

The collagen crosslinking represented various distinct markers of ocular rigidity over time, she said.

Groups treated with the LaserACE pattern had a significant decrease in ocular rigidity.

"The ocular rigidity was positively correlated with the crosslinking time," Dr. Hipsley said. "The ocular rigidity in the group that underwent scleral crosslinking for 10 minutes corresponded to the rigidity coefficient of 60-year-old eyes at, and the control unablated group corresponded to the rigidity of the 30-year-old eyes of the referenced model.[5]

"The selected comparison groups—young and old eyes—showed that the rigidity coefficient of the LaserACE-treated old eyes achieved a resultant 'coefficient of rigidity' that was almost identical to the untreated young eye," she said.

Improved ocular resilience may be beneficial to decrease the mechanical resistance of the ocular wall to improve the resultant centripetal forces of mechanical accommodation.

Collagen crosslinking may be a novel tool to evaluate the effect of ocular rigidity on the globe and it may be a method to determine the mechanism of action of the LaserACE procedure and its impact on accommodative resultant force efficiency, she said.

The investigators concluded that the scleral crosslinking method might be a useful model to correlate age with ocular rigidity.

When performed on porcine eyes in a laboratory setting, the LaserACE procedure reduced ocular rigidity and improved ocular resilience.

This study could be a first indicator of the mechanism of action and an early indicator of the potential value of ocular rejuvenation solutions for restoring accommodation without manipulating the visual axis or using implants.

Further studies will investigate additional modeling, characteristics and further applications. ■

References

1. Tamm E, Lütjen-Drecoll E, Jungkunz W, et al. Posterior attachment of ciliary muscle in young, accommodating old, presbyopic monkeys. *Invest Ophthalmol Vis Sci.* 1991;32:1678–1692.
2. Lutjen-Drecoll E, Kaufman PL, Wasielewski R, Ting-Li L, Croft MA. Morphology and accommodative function of the vitreous zonule in human and monkey eyes. *Invest Ophthalmol Vis Sci.* 2010;51:1554-1564.
3. Croft MA, McDonald JP, Katz A, Lin TL, Lütjen-Drecoll E, Kaufman PL. Extralenticular and lenticular aspects of accommodation and presbyopia in human versus monkey eyes. *Invest Ophthalmol Vis Sci.* 2013;54:5035-5048. doi: 10.1167/iovs.12-10846.
4. Detorakis ET, Pallikaris IG. Ocular rigidity: Biomechanical role, in vivo measurements and clinical significance. *Clin Experiment Ophthalmol.* 2012 May 18. doi: 10.1111/j.1442-9071.2012.02809.
5. Pallikaris IG, et al. Ocular rigidity in living human eyes. *Invest Ophthalmol Vis Sci.* 2005;46:409-414.

ANNMARIE HIPSLEY, DPT, PHD
E: *ahipsley@acevisiongroup.com*
Dr. Hipsley is the founder and chief executive of ACE Vision Group.

GEORGE WARING IV, MD
E: *georgewaringiv@gmail.com*
Dr. Waring is director of Ace Vision Group's scientific advisory board.

Assessing predictive value of testing

Selective screening may lower risk of adverse events among some vitreoretinal patients

By Roxanne Nelson; *Reviewed by Ajay Shalwala, MD*

TAKE-HOME

- ***Not all patients may benefit from routine testing prior to surgery. A better option may be selective screening for those at greatest risk for adverse systemic events.***

PHILADELPHIA :: **MEDICAL TESTING PRIOR** to vitreoretinal surgery may help to reduce the risk of adverse events in some patients.

However, routine testing may not benefit all patients. In some cases, a better option may be selective screening for those who are at the greatest risk for adverse systemic events.

"We believe that our results demonstrate that routine preoperative testing does not measurably improve the safety of vitreoretinal surgery, and that reduction of such testing may considerably reduce health-care costs," said study author Ajay Shalwala, MD, Wills Eye Institute, Philadelphia.

Dr. Shalwala—pointing out that the research itself was conducted at Vanderbilt Eye Institute, Nashville, TN—also noted that individuals with certain comorbidities were at a greater risk of complications.

"Our results also suggest that patients with coronary artery disease, asthma, and chronic renal disease and those undergoing general anesthesia are at greater risk of postoperative systemic complications," he said. "Therefore presence of these risk factors should alert physicians to the need for greater preoperative and postoperative monitoring.

"Conversely, the absence of these risk factors may allow physicians to reduce the burden and cost of preoperative testing," Dr. Shalwala added.

As with other types of procedures, screening medical tests are routinely performed on patients in preparation for vitreoretinal surgery.

However, the benefit of routine testing is uncertain.

Routine preoperative medical testing prior to elective surgery has been questioned. Some data suggest that there are no significant differences in the rates of either intraoperative and postoperative events between patients who did or did not undergo the standard battery of preoperative testing.

In addition, preoperative testing is expensive and adds to the overall economic healthcare burden.

ABOUT THE STUDY

In this study, Dr. Shalwala and colleagues assessed the predictive value of routine medical testing for postoperative systemic adverse events among patients who were undergoing vitreoretinal surgery.

In a retrospective single center study, the researchers evaluated the medical charts of 2,296 patients who were 17 years of age and older and who underwent vitreoretinal surgery between January 2002 and November 2011 at Vanderbilt University.

The charts for 2,215 patients were reviewed for information on baseline comorbidities, preoperative testing, and postoperative adverse events that occurred within 30 days of their surgery.

Charts with less than 7 days of documented follow up were excluded from the study.

Logistic regression analysis was performed to correlate adverse events with preoperative testing and comorbidities that were present at baseline.

Within this cohort, 89 patients experienced adverse events, and 12 patients had multiple events, for a total of 102 events. Within this subgroup, 73 (72%) of the adverse events occurred within the first 24 hours after surgery, while the remaining 29 (28%) occurred between postoperative days 1 and 30.

Overall, the incidence of adverse events following vitreoretinal surgery in this series was 4%.

COMMON ADVERSE EVENTS

The most common adverse events observed were bradycardia (26 events) and desaturation (22 events).

More serious events that were identified included 2 cases of myocardial infarction, 1 case of acute heart failure, and 3 patients with respiratory failure who subsequently required mechanical ventilation, according to Dr. Shalwala.

"There were no deaths observed in our study cohort," he said. "The majorities of adverse systemic events, however, were mild, transient, and did not result in permanent morbidity."

Co-existing medical illnesses appeared to influence the occurrence of adverse events. The study results showed that coronary artery disease, chronic renal failure, and asthma all were independent predictors of post-surgical events ($p < 0.05$).

However, age, race, and smoking history, and the presence of diabetes, COPD, smoking history, history of cerebrovascular accident, chronic liver disease, and systemic malignancy were not associated with events.

> 'The absence of . . . risk factors may allow physicians to reduce the burden and cost of preoperative testing.' *– Ajay Shalwala, MD*

The use of general anesthesia also increased the risk, as compared with use of a local anesthetic ($p < 0.001$). Multivariate logistic regression analysis demonstrated no significant correlation between preoperative testing and postoperative adverse events. By the end of the study, no test was found useful to change the rate of adverse events

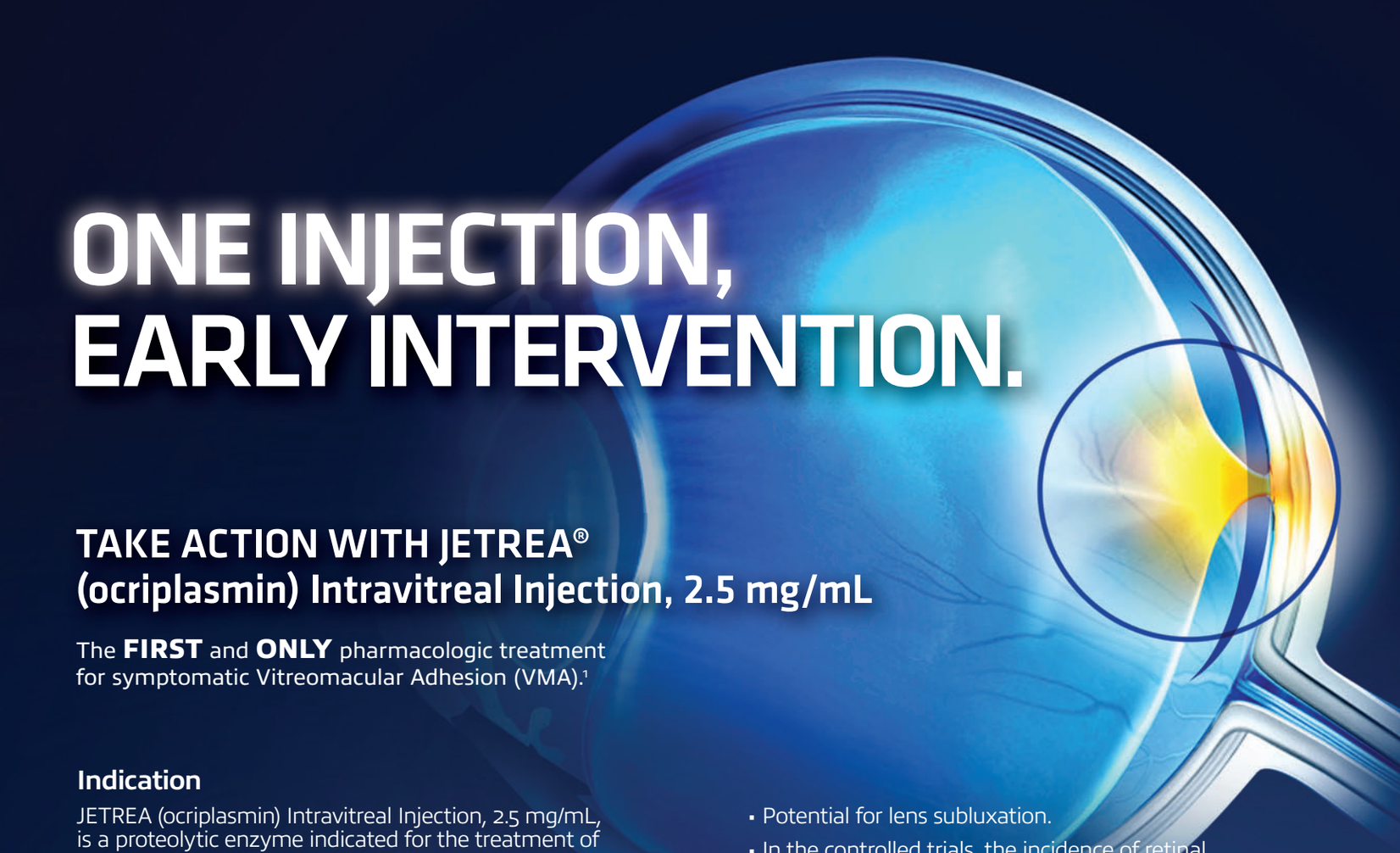
The authors conclude that general anesthesia and the presence of specific comorbidities increased the risk of adverse events.

The data in this study may therefore assist in selective preoperative testing for patients who are at the greatest risk of adverse events, and lower the burden of routine testing for those who are at low risk. ■

AJAY SHALWALA, MD

E: *ashalwal@gmail.com*

The authors declare no financial relationships. Grant support for the study was given by Research to Prevent Blindness to Vanderbilt Eye Institute.



ONE INJECTION, EARLY INTERVENTION.

TAKE ACTION WITH JETREA®
(ocriplasmin) Intravitreal Injection, 2.5 mg/mL

The **FIRST** and **ONLY** pharmacologic treatment for symptomatic Vitreomacular Adhesion (VMA).[1]

Indication

JETREA (ocriplasmin) Intravitreal Injection, 2.5 mg/mL, is a proteolytic enzyme indicated for the treatment of symptomatic vitreomacular adhesion.

Important Safety Information

Warnings and Precautions

- A decrease of ≥ 3 lines of best-corrected visual acuity (BCVA) was experienced by 5.6% of patients treated with JETREA and 3.2% of patients treated with vehicle in the controlled trials. The majority of these decreases in vision were due to progression of the condition with traction and many required surgical intervention. Patients should be monitored appropriately.
- Intravitreal injections are associated with intraocular inflammation/infection, intraocular hemorrhage and increased intraocular pressure (IOP). Patients should be monitored and instructed to report any symptoms without delay. In the controlled trials, intraocular inflammation occurred in 7.1% of patients injected with JETREA vs 3.7% of patients injected with vehicle. Most of the post-injection intraocular inflammation events were mild and transient. If the contralateral eye requires treatment with JETREA, it is not recommended within 7 days of the initial injection in order to monitor the post-injection course in the injected eye.
- Potential for lens subluxation.
- In the controlled trials, the incidence of retinal detachment was 0.9% in the JETREA group and 1.6% in the vehicle group, while the incidence of retinal tear (without detachment) was 1.1% in the JETREA group and 2.7% in the vehicle group. Most of these events occurred during or after vitrectomy in both groups.
- Dyschromatopsia (generally described as yellowish vision) was reported in 2% of all patients injected with JETREA. In approximately half of these dyschromatopsia cases there were also electroretinographic (ERG) changes reported (a- and b-wave amplitude decrease).

Adverse Reactions

- The most commonly reported reactions (≥ 5%) in patients treated with JETREA were vitreous floaters, conjunctival hemorrhage, eye pain, photopsia, blurred vision, macular hole, reduced visual acuity, visual impairment, and retinal edema.

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Please see Brief Summary of full Prescribing Information on adjacent page.

ThromboGenics®

JETREA™
(ocriplasmin)
Intravitreal Injection, 2.5 mg/mL

Reference: 1. JETREA [package insert]. Iselin, NJ: ThromboGenics, Inc.; 2012.

05/13 OCRVMA0072 JA1 G

JETREA™
(ocriplasmin)
Intravitreal Injection, 2.5 mg/mL

BRIEF SUMMARY OF FULL PRESCRIBING INFORMATION

Please see the JETREA® package insert for full Prescribing Information.

1 INDICATIONS AND USAGE
JETREA is a proteolytic enzyme indicated for the treatment of symptomatic vitreomacular adhesion.

2 DOSAGE AND ADMINISTRATION
2.1 General Dosing Information
Must be diluted before use. For single-use ophthalmic intravitreal injection only. JETREA must only be administered by a qualified physician.

2.2 Dosing
The recommended dose is 0.125 mg (0.1 mL of the diluted solution) administered by intravitreal injection to the affected eye once as a single dose.

2.3 Preparation for Administration
Remove the vial (2.5 mg/mL corresponding to 0.5 mg ocriplasmin) from the freezer and allow to thaw at room temperature (within a few minutes). Once completely thawed, remove the protective polypropylene flip-off cap from the vial. The top of the vial should be disinfected with an alcohol wipe. Using aseptic technique, add 0.2 mL of 0.9% w/v Sodium Chloride Injection, USP (sterile, preservative-free) into the JETREA vial and gently swirl the vial until the solutions are mixed.

Visually inspect the vial for particulate matter. Only a clear, colorless solution without visible particles should be used. Using aseptic technique, withdraw all of the diluted solution using a sterile #19 gauge needle (slightly tilt the vial to ease withdrawal) and discard the needle after withdrawal of the vial contents. Do not use this needle for the intravitreal injection.

Replace the needle with a sterile #30 gauge needle, carefully expel the air bubbles and excess drug from the syringe and adjust the dose to the 0.1 mL mark on the syringe (corresponding to 0.125 mg ocriplasmin). THE SOLUTION SHOULD BE USED IMMEDIATELY AS IT CONTAINS NO PRESERVATIVES. Discard the vial and any unused portion of the diluted solution after single use.

2.4 Administration and Monitoring
The intravitreal injection procedure should be carried out under controlled aseptic conditions, which include the use of sterile gloves, a sterile drape and a sterile eyelid speculum (or equivalent). Adequate anesthesia and a broad spectrum microbiocide should be administered according to standard medical practice.

The injection needle should be inserted 3.5 - 4.0 mm posterior to the limbus aiming towards the center of the vitreous cavity, avoiding the horizontal meridian. The injection volume of 0.1 mL is then delivered into the mid-vitreous.

Immediately following the intravitreal injection, patients should be monitored for elevation in intraocular pressure. Appropriate monitoring may consist of a check for perfusion of the optic nerve head or tonometry. If required, a sterile paracentesis needle should be available.

Following intravitreal injection, patients should be instructed to report any symptoms suggestive of endophthalmitis or retinal detachment (e.g., eye pain, redness of the eye, photophobia, blurred or decreased vision) without delay *[see Patient Counseling Information]*.

Each vial should only be used to provide a single injection for the treatment of a single eye. If the contralateral eye requires treatment, a new vial should be used and the sterile field, syringe, gloves, drapes, eyelid speculum, and injection needles should be changed before JETREA is administered to the other eye, however, treatment with JETREA in the other eye is not recommended within 7 days of the initial injection in order to monitor the post-injection course including the potential for decreased vision in the injected eye.

Repeated administration of JETREA in the same eye is not recommended *[see Nonclinical Toxicology]*.

After injection, any unused product must be discarded.

No special dosage modification is required for any of the populations that have been studied (e.g. gender, elderly).

3 DOSAGE FORMS AND STRENGTHS
Single-use glass vial containing JETREA 0.5 mg in 0.2 mL solution for intravitreal injection (2.5 mg/mL).

4 CONTRAINDICATIONS
None

5 WARNINGS AND PRECAUTIONS
5.1 Decreased Vision
A decrease of ≥ 3 line of best corrected visual acuity (BCVA) was experienced by 5.6% of patients treated with JETREA and 3.2% of patients treated with vehicle in the controlled trials *[see Clinical Studies]*.

The majority of these decreases in vision were due to progression of the condition with traction and many required surgical intervention. Patients should be monitored appropriately *[see Dosage and Administration]*.

5.2 Intravitreal Injection Procedure Associated Effects
Intravitreal injections are associated with intraocular inflammation / infection, intraocular hemorrhage and increased intraocular pressure (IOP). In the controlled trials, intraocular inflammation occurred in 7.1% of patients injected with JETREA vs. 3.7% of patients injected with vehicle. Most of the post-injection intraocular inflammation events were mild and transient. Intraocular hemorrhage occurred in 2.4% vs. 3.7% of patients injected with JETREA vs. vehicle, respectively. Increased intraocular pressure occurred in 4.1% vs. 5.3% of patients injected with JETREA vs. vehicle, respectively.

5.3 Potential for Lens Subluxation
One case of lens subluxation was reported in a patient who received an intravitreal injection of 0.175 mg (1.4 times higher than the recommended dose). Lens subluxation was observed in three animal species (monkey, rabbit, minipig) following a single intravitreal injection that achieved vitreous concentrations of ocriplasmin 1.4 times higher than achieved with the recommended treatment dose. Administration of a second intravitreal dose in monkeys, 28 days apart, produced lens subluxation in 100% of the treated eyes *[see Nonclinical Toxicology]*.

5.4 Retinal Breaks
In the controlled trials, the incidence of retinal detachment was 0.9% in the JETREA group and 1.6% in the vehicle group, while the incidence of retinal tear (without detachment) was 1.1% in the JETREA group and 2.7% in the vehicle group. Most of these events occurred during or after vitrectomy in both groups. The incidence of retinal detachment that occurred pre-vitrectomy was 0.4% in the JETREA group and none in the vehicle group, while the incidence of retinal tear (without detachment) that occurred pre-vitrectomy was none in the JETREA group and 0.5% in the vehicle group.

5.5 Dyschromatopsia
Dyschromatopsia (generally described as yellowish vision) was reported in 2% of all patients injected with JETREA. In approximately half of these dyschromatopsia cases there were also electroretinographic (ERG) changes reported (a- and b-wave amplitude decrease).

6 ADVERSE REACTIONS
The following adverse reactions are described below and elsewhere in the labeling:

- Decreased Vision *[see Warnings and Precautions]*
- Intravitreal Injection Procedure Associated Effects *[see Warnings and Precautions and Dosage and Administration]*
- Potential for Lens Subluxation *[see Warnings and Precautions]*
- Retinal Breaks *[see Warnings and Precautions and Dosage and Administration]*

6.1 Clinical Trials Experience
Because clinical trials are conducted under widely varying conditions, adverse reaction rates in one clinical trial of a drug cannot be directly compared with rates in the clinical trials of the same or another drug and may not reflect the rates observed in practice.

Approximately 800 patients have been treated with an intravitreal injection of JETREA. Of these, 465 patients received an intravitreal injection of ocriplasmin 0.125 mg (187 patients received vehicle) in the 2 vehicle-controlled studies (Study 1 and Study 2).

The most common adverse reactions (incidence 5% - 20% listed in descending order of frequency) in the vehicle-controlled clinical studies were: vitreous floaters, conjunctival hemorrhage, eye pain, photopsia, blurred vision, macular hole, reduced visual acuity, visual impairment, and retinal edema.

Less common adverse reactions observed in the studies at a frequency of 2% - < 5% in patients treated with JETREA included macular edema, increased intraocular pressure, anterior chamber cell, photophobia, vitreous detachment, ocular discomfort, iritis, cataract, dry eye, metamorphopsia, conjunctival hyperemia, and retinal degeneration.

Dyschromatopsia was reported in 2% of patients injected with JETREA, with the majority of cases reported from two uncontrolled clinical studies. In approximately half of these dyschromatopsia cases there were also electroretinographic (ERG) changes reported (a- and b-wave amplitude decrease).

6.2 Immunogenicity
As with all therapeutic proteins, there is potential for immunogenicity. Immunogenicity for this product has not been evaluated.

8 USE IN SPECIFIC POPULATIONS
8.1 Pregnancy: Teratogenic Effects
Pregnancy Category C. Animal reproduction studies have not been conducted with ocriplasmin. There are no adequate and well-controlled studies of ocriplasmin in pregnant women. It is not known whether ocriplasmin can cause fetal harm when administered to a pregnant woman or can affect reproduction capacity. The systemic exposure to ocriplasmin is expected to be low after intravitreal injection of a single 0.125 mg dose. Assuming 100% systemic absorption (and a plasma volume of 2700 mL), the estimated plasma concentration is 46 ng/mL. JETREA should be given to a pregnant woman only if clearly needed.

8.3 Nursing Mothers
It is not known whether ocriplasmin is excreted in human milk. Because many drugs are excreted in human milk, and because the potential for absorption and harm to infant growth and development exists, caution should be exercised when JETREA is administered to a nursing woman.

8.4 Pediatric Use
Safety and effectiveness in pediatric patients have not been established.

8.5 Geriatric Use
In the clinical studies, 384 and 145 patients were ≥ 65 years and of these 192 and 73 patients were ≥ 75 years in the JETREA and vehicle groups respectively. No significant differences in efficacy or safety were seen with increasing age in these studies.

10 OVERDOSAGE
The clinical data on the effects of JETREA overdose are limited. One case of accidental overdose of 0.250 mg ocriplasmin (twice the recommended dose) was reported to be associated with inflammation and a decrease in visual acuity.

13 NONCLINICAL TOXICOLOGY
13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility
No carcinogenicity, mutagenicity or reproductive and developmental toxicity studies were conducted with ocriplasmin.

13.2 Animal Toxicology and/or Pharmacology
The ocular toxicity of ocriplasmin after a single intravitreal dose has been evaluated in rabbits, monkeys and minipigs. Ocriplasmin induced an inflammatory response and transient ERG changes in rabbits and monkeys, which tended to resolve over time. Lens subluxation was observed in the 3 species at ocriplasmin concentrations in the vitreous at or above 41 mcg/mL, a concentration 1.4-fold above the intended clinical concentration in the vitreous of 29 mcg/mL. Intraocular hemorrhage was observed in rabbits and monkeys.

A second intravitreal administration of ocriplasmin (28 days apart) in monkeys at doses of 75 mcg/eye (41 mcg/mL vitreous) or 125 mcg/eye (68 mcg/mL vitreous) was associated with lens subluxation in all ocriplasmin treated eyes. Sustained increases in IOP occurred in two animals with lens subluxation. Microscopic findings in the eye included vitreous liquefaction, degeneration/disruption of the hyaloideo-capsular ligament (with loss of ciliary zonular fibers), lens degeneration, mononuclear cell infiltration of the vitreous, and vacuolation of the retinal inner nuclear cell layer. These doses are 1.4-fold and 2.3-fold the intended clinical concentration in the vitreous of 29 mcg/mL, respectively.

14 CLINICAL STUDIES
The efficacy and safety of JETREA was demonstrated in two multicenter, randomized, double masked, vehicle-controlled, 6 month studies in patients with symptomatic vitreomacular adhesion (VMA). A total of 652 patients (JETREA 464, vehicle 188) were randomized in these 2 studies. Randomization was 2:1 (JETREA:vehicle) in Study 1 and 3:1 in Study 2.

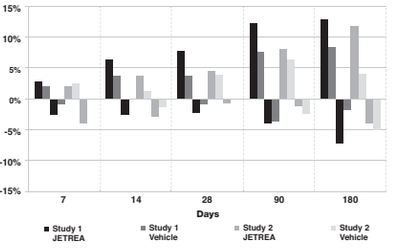
Patients were treated with a single injection of JETREA or vehicle. In both of the studies, the proportion of patients who achieved VMA resolution at Day 28 (i.e., achieved success on the primary endpoint) was significantly higher in the ocriplasmin group compared with the vehicle group through Month 6.

The number of patients with at least 3 lines increase in visual acuity was numerically higher in the ocriplasmin group compared to vehicle in both trials, however, the number of patients with at least a 3 lines decrease in visual acuity was also higher in the ocriplasmin group in one of the studies (Table 1 and Figure 1).

Table 1: Categorical Change from Baseline in BCVA at Month 6, Irrespective of Vitrectomy (Study 1 and Study 2)

Study 1			
	JETREA	Vehicle	Difference
	N=219	N=107	(95% CI)
≥ 3 line Improvement in BCVA			
Month 6	28 (12.8%)	9 (8.4%)	4.4 (-2.5, 11.2)
> 3 line Worsening in BCVA			
Month 6	16 (7.3%)	2 (1.9%)	5.4 (1.1, 9.7)
Study 2			
	JETREA	Vehicle	Difference
	N=245	N=81	(95% CI)
≥ 3 line Improvement in BCVA			
Month 6	29 (11.8%)	3 (3.8%)	8.1 (2.3, 13.9)
> 3 line Worsening in BCVA			
Month 6	10 (4.1%)	4 (5.0%)	-0.9 (-6.3, 4.5)

Figure 1: Percentage of Patients with Gain or Loss of ≥ 3 Lines of BCVA at Protocol-Specified Visits



16 HOW SUPPLIED/STORAGE AND HANDLING
Each vial of JETREA contains 0.5 mg ocriplasmin in 0.2 mL citric-buffered solution (2.5 mg/mL). JETREA is supplied in a 2 mL glass vial with a latex free rubber stopper. Vials are for single use only.

Storage
Store frozen at or below -4°F (-20°C). Protect the vials from light by storing in the original package until time of use.

17 PATIENT COUNSELING INFORMATION
In the days following JETREA administration, patients are at risk of developing intraocular inflammation/infection. Advise patients to seek immediate care from an ophthalmologist if the eye becomes red, sensitive to light, painful, or develops a change in vision *[see Warnings and Precautions]*.

Patients may experience temporary visual impairment after receiving an intravitreal injection of JETREA *[see Warnings and Precautions]*. Advise patients to not drive or operate heavy machinery until this visual impairment has resolved. If visual impairment persists or decreases further, advise patients to seek care from an ophthalmologist.

Manufactured for:
ThromboGenics, Inc.
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Iselin, NJ 08830

U.S. License Number: 1866

Version 1.0
Initial U.S. Approval: 2012
ThromboGenics U.S. patents: 7,445,775; 7,547,435; 7,914,783 and other pending patents.

05/13 OCRVMA0072 PI G

Small-incision toric lens surgery helps to reduce astigmatism

New IOL easily implanted through 2.2-mm incision, helping to tighten spread of refractive results

By Kevin Lavery, MD; *Special to* Ophthalmology Times

TAKE-HOME

- ***Kevin Lavery, MD, describes his technique for implanting a 1-piece acrylic astigmatic lens (Tecnis Toric IOL, Abbott Medical Optics) through a 2.2-mm incision or even smaller.***

BATTLE CREEK AND JACKSON, MI ::

THE TREND IN CATARACT SURGERY toward smaller incisions is an important one. By making smaller incisions, ophthalmologists can reduce the amount of surgically induced astigmatism (SIA) and promote faster visual recovery.

In contemporary cataract surgery, results have already become so refined that reducing both the magnitude and standard deviation of SIA is critical to perfecting results in all cases. It is particularly relevant when implanting a premium toric IOL that is intended to neutralize astigmatism and provide excellent uncorrected distance vision.

However, in the rush to small-incision surgery, it is important to make sure that all components of the procedure can be performed effectively through the small incision—from lens disassembly and phacoemulsification to IOL insertion and positioning.

Additionally, when implanting a toric lens, one wants to be certain the lens can be easily positioned on the correct axis and that it remains stable postoperatively.

SMALL-INCISION TECHNIQUE

As seen in the accompanying video, we have recently been very successful in implanting a new 1-piece acrylic astigmatic lens (Tecnis Toric IOL, Abbott Medical Optics) through a 2.2-mm incision or even smaller.

Preoperatively, reference marks are critical, especially if one does not use a device for intraoperative imaging and axis placement.

I use a Mastel marker to mark the cornea at 3 and 9 o'clock with the patient sitting upright and fixating on a target. I make a 2.2-mm temporal incision as posteriorly as possible without getting into conjunctiva, because that posterior position also reduces SIA.

Although I will occasionally move the incision to the steep axis, I find that a consistent and ergonomically comfortable hand position for wound creation is actually more important to the predictability of SIA than always making an on-axis incision.

I use a pre-chop technique.

In this case, I removed the cataract without incidence using a phacoemulsification system (Infiniti, Alcon Laboratories) and a 45° curved Kelman phaco tip.

I like the Unfolder Platinum 1 injector for the Tecnis Toric lens, because the tip of the inserter cartridge fits nicely into a 2.2-incision. With other 1-piece toric lenses, the insertion requires more wound assist—which can stretch the incision.

Once the lens is loaded in the injector, my technician uses a Sinskey hook to tease out the leading haptic.

POSITIONING THE HAPTIC

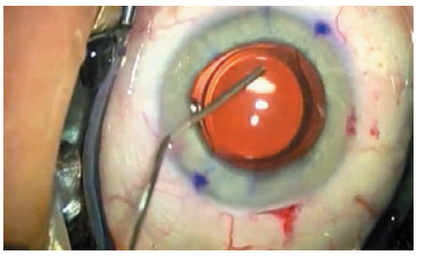
It is important that the haptic be positioned in a "candy cane" configuration—not straight. That slight bend protects the haptic and puts it into the right orientation with the plane of the lens so that everything follows in behind it smoothly.

There are a few advantages to pulling the leading haptic out before insertion.

- **First, it "thins out" the lens profile so that it injects more easily through my small incision.**
- **Secondly, by having the haptic stretched out it leads directly into the bag, rather than the sulcus.**
- **Finally, this ensures a very consistent insertion because it is almost impossible for the haptics to stick to each other or to the lens optic.**

After injecting the lens, I will begin to rotate the lens clockwise toward my desired axis.

SMALL-INCISION SURGERY



VIDEO Watch a small-incision toric lens surgery showing implantation of a 1-piece acrylic astigmatic lens (Tecnis Toric IOL, Abbott Medical Optics). Go to **http://bit.ly/1c2xq9X**. *(Video courtesy of Kevin Lavery, MD)*

However, for some axes (such as 180°), I will actually rotate counterclockwise a few degrees before the haptics have fully extended. This counterclockwise maneuver prior to the opening of the haptics saves time.

I cannot stress enough the importance of removing all the ocular viscoelastics under the lens before final lens positioning.

For final lens positioning, a two-handed, but single-instrument technique has worked well.

I use a 5-cc syringe filled with balanced salt solution and antibiotic drawn from the bottle and topped with a square-tip hydrodissecting cannula.

With the cannula in one hand and the other hand on the plunger, I "walk" the lens into position and am able to move the whole lens if necessary or rotate either pole of the haptics independent of each other.

This maintains the chamber—creating a very stable environment while I precisely seat the lens.

I prefer this over a typical two-handed technique with irrigation in one hand and an instrument in the other.

Having two instruments in the eye increases the potential for the lens to "jump."

Moreover, the dimpled markings reflect

Continues on page 20 : ***Small incision***

SMALL INCISION

(Continued from page 19)

the microscope light almost like a roadside marker, making it very easy to visualize the whole lens simultaneously and quickly position it in the eye.

Postoperatively, the IOL looks beautiful in the eye. As I have found with other lenses in the Tecnis family of IOLs, the acrylic material stays clear and true, with no anterior scuff marks on the lens after insertion.

Published data from Tecnis Toric clinical trials corroborate my impression that this lens is very stable, with minimal rotation.

I believe that ophthalmologists will be able to inject the lens through an even smaller incision of 2 mm, or even 1.8 mm.

In initial attempts, the limiting factor is actually not the lens or the inserter, but the instrumentation.

For example, Utrata forceps that are designed for a 2.75-mm incision can create wound lock in a small-incision environment. In order to truly move to microincisions, surgeons may need to make a number of instrumentation changes.

BETTER RESULTS ARE GOOD FOR PATIENTS AND PRACTICE

The potential to control SIA more precisely and the accuracy of the refractive result with small-incision toric IOL surgery are exciting advances.

In my opinion, toric IOLs represent the easiest entry point to becoming a premium IOL surgeon.

Patient expectations are not as high as they are in multifocal IOL cases. The Tecnis Toric IOL is not technically demanding to implant and ultimately, very forgiving.

Patients are generally thrilled with their brighter, clearer vision and ability to see without glasses after surgery.

> ‘Toric IOLs represent the easiest entry point to becoming a premium IOL surgeon.’
>
> — Kevin Lavery, MD

Surgeons have long realized the results with higher-powered toric IOLs for patients who would otherwise have very poor uncorrected vision.

Many surgeons underestimate the value of toric IOLs to patients with lower levels of astigmatism, perhaps reasoning that those patients can achieve a pretty good result without paying for a premium IOL.

Though it is true that a patient with low astigmatism may achieve a 20/40 result with a non-toric lens, a toric IOL can make the difference between spectacle independence and reliance on glasses.

Currently, at least 30% of my cases involve a toric IOL.

I now recommend a toric IOL for ≥0.87 D against-the-rule astigmatism and for ≥1.0 D of with-the-rule astigmatism.

Continuing to reduce the “noise” in results with a consistently low magnitude and standard deviation of SIA will drive better outcomes and greater patient satisfaction at all levels of correction. ■

KEVIN LAVERY, MD, *practices at TLC Eyecare and Laser Centers in Battle Creek and Jackson, MI. Readers may contact him at 517/782-1213 or lavery.tlc@gmail.com. He did not indicate any financial interest in the subject matter.*

Military review supports laser surgery safety

SAN ANTONIO ::

REFRACTIVE SURGERY IS A SAFE method for correcting refractive error, according to a retrospective review of all cases of the surgery performed over a 7-year period at a U.S. military laser refractive surgery center.

The review, presented by Major Vashuda A. Panday, MD, identified a very low rate of postoperative microbial keratitis that compares very favorably with the infection rate reported in other series.

Between January 2005 and December 2011, a total of 24,446 refractive surgery procedures were performed at the Joint Warfighter Refractive Surgery Center, Wilford Hall Medical Center, San Antonio, TX.

However, only a single case of microbial keratitis was identified for an incidence of 0.0041%.

“Most published information on microbial keratitis after refractive surgery is anecdotal, and the true incidence is unknown,” said Dr. Panday, cornea/refractive surgeon at the center. “However, a paper published in 2004 reported the rate varied between 0.02% and 1.5%, and findings from surveys conducted by the ASCRS in 2001, 2004, and 2008 indicate rates ranging from 0.034% to 0.091%.

“This data and our study indicate that by in large, refractive surgery is a safe means of correcting refractive error—however, the rate of microbial keratitis at our center appears to be much lower than in other reports, and we have a few ideas as to why,” she said.

The Joint Warfighter patient population and the care they receive are unique in several respects, Dr. Panday said.

All of the patients are active-duty military personnel, and as an extension of that, are generally young and healthy without any significant comorbidities.

They are also managed with highly regimented preoperative and postoperative protocols that include a mandatory 5- to 7-day period of postoperative convalescent leave when they must stay out of work.

Furthermore, the fact that there is no cost to the patient for the surgery or any medications likely contributes to compliance, because follow-up failure can lead to punitive action.

In addition, the surgery center has dedicated eye technicians who work only in refractive surgery.

“It is probably a combination of these factors that helps us to keep our incidence of microbial keratitis so low,” Dr. Panday said. ■

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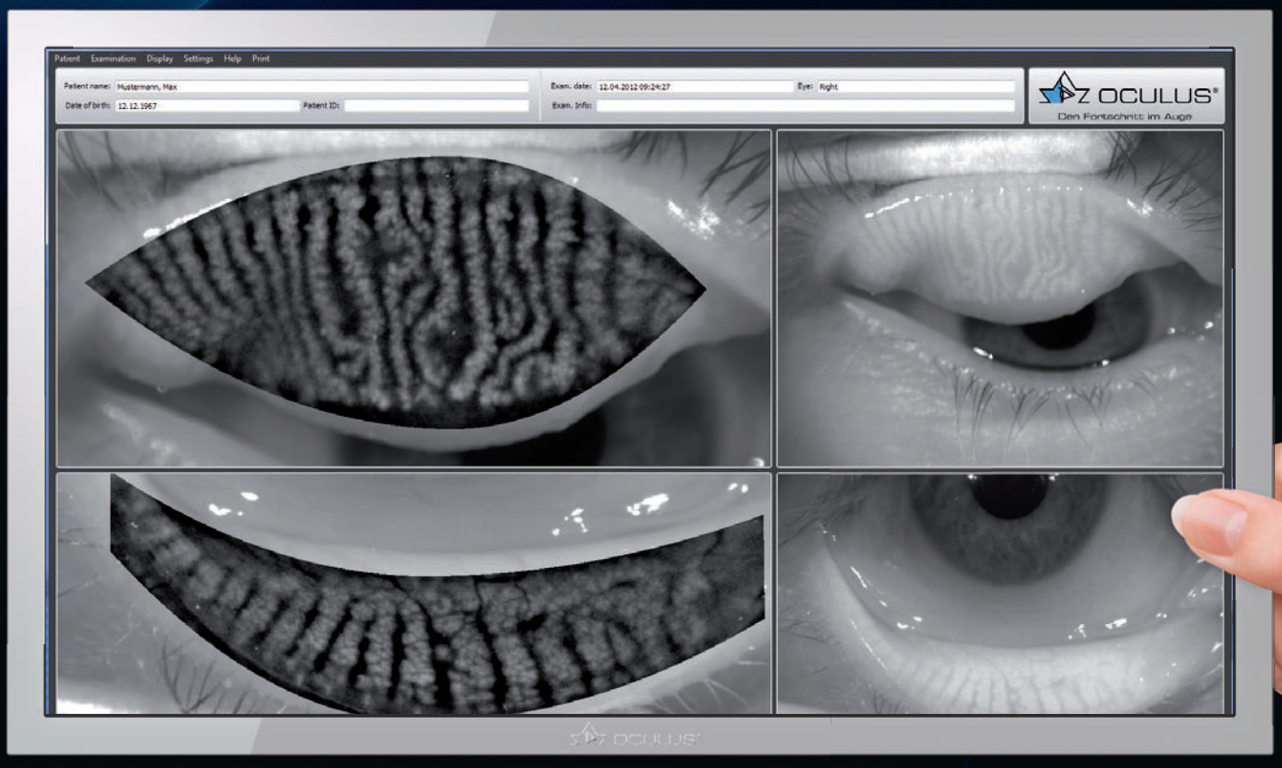

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How DNA testing screens for corneal dystrophy

Genetic test helps clinicians to identify carriers of rare autosomal dominant mutation

By Lynda Charters; *Reviewed by David Whiting, MD*

TAKE-HOME

- ***A new genetic test for Avellino corneal dystrophy identifies carriers of this rare autosomal dominant mutation. Its presence can lead to visual deterioration and ultimate blindness following corneal refractive surgeries.***

ST. LOUIS PARK, MN ::
A NEW GENETIC TEST FOR Avellino corneal dystrophy (Avellino Gene Detection System, Avellino Lab USA Inc.) identifies carriers of this rare autosomal dominant mutation, which, if present, can cause vision to deteriorate and ultimate blindness following corneal refractive surgeries.

Also referred to as granular corneal dystrophy, the mutation has two genotypes:

- **In homozygous individuals, the corneal manifestations are seen in early childhood and the children usually become blind in adolescence.**

- **In heterozygous individuals, gray-white granular protein deposits can appear on the cornea during early adolescence but many affected people do not have symptoms until much later at a time when they might be considering a refractive procedure.**

These individuals are the target population for screening, explained David Whiting, MD, in private practice, St. Louis Park, MN.

He performs the DNA testing on his patients who are potential candidates for a refractive surgery, and explained that a procedure such as LASIK can worsen the corneal cloudiness in genetically predisposed patients at almost any time postoperatively.

Unless the corneal spots are visible, the dystrophy cannot be identified by any other means other than genetic testing at this point in time.

"We hope to do the DNA screening on every patient who wants to undergo a vision-correction procedure," Dr. Whiting said.

HOW THE TEST IS DONE

Using the DNA kit to test for the presence of the gene mutation is a simple noninvasive procedure that only involves rubbing a sterile cotton swab on the inside of the patient's cheek.

The sample is then placed into a vial, sealed, and mailed to the Avellino laboratory for processing.

Dr. Whiting generally receives the test results sent via e-mail the following day.

The genetic mutation is rare, and the exact prevalence rate presently is unknown. However, 1 in 1,000 patients is thought to carry the gene mutation.

To date, Dr. Whiting has screened roughly 250 patients and has seen no positive test results.

He anticipates, given the suspected prevalence, that one affected patient will be identified among the first 670 patients screened.

He also pointed out that the prevalence rates may vary with different locations around the country and world because of variations in ethnicities.

A concern is that there may be a higher incidence in Southeast Asian populations or Korean patients.

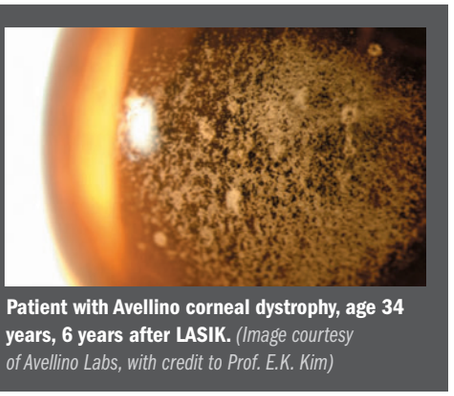
COST CONSIDERATIONS

The cost effectiveness of using this screening tool also is still undetermined considering the relative rarity of the disease.

Dr. Whiting put that in perspective by commenting about the effort and money that have been invested in ferreting out other pre-existing conditions in refractive surgery candidates, such as keratoconus and ectasia.

"We know that LASIK worsens those conditions," Dr. Whiting. "The numbers are also hard to ascertain, but we know that perhaps one in 2,000 individuals have an underlying tendency for corneal thinning.

"Nonetheless, we use expensive instruments to screen all patients," he said. "Having this information affects the decision to perform or not to perform LASIK. The incidence of ACD could be even higher than that of keratoconus and ectasia."



Patient with Avellino corneal dystrophy, age 34 years, 6 years after LASIK. *(Image courtesy of Avellino Labs, with credit to Prof. E.K. Kim)*

To Dr. Whiting's knowledge, he is the only ophthalmologist in the Minneapolis area who offers this DNA test to his potential refractive surgery patients.

"In my practice, we made the decision to perform the DNA test on all patients before they undergo a refractive procedure, and we do not pass the cost of the test along to our patients," he said.

"Because of the volume of refractive surgeries in my practice—with half of my clinical time dedicated to performing LASIK—my need to know if a patient is affected by this corneal dystrophy is important compared with a practice with a smaller volume of refractive surgeries," Dr. Whiting said.

SAFETY ASPECT

Performing this DNA test enhances Dr. Whiting's comfort level and keeps his practice at the cutting edge of technology.

"I am very risk-adverse," said Dr. Whiting, who has performed more than 95,000 LASIK procedures.

"The cost of the test is secondary to determining if this is a meaningful test for my patients," Dr. Whiting underscored. "Safety is of the utmost importance and this is an important message to convey to patients." ■

DAVID WHITING, MD
E: *david.whiting@whitingclinic.com*
Dr. Whiting has no financial interest in this technology.

Clinicians seek the lowdown on downbeat nystagmus

What ophthalmologists need to know about etiologies, strategies for this abnormality

The Neuro-Connection *By Angelina Espino, MD, Michael L. Morgan, MD, PhD, and Andrew G. Lee, MD*

TAKE-HOME

- ***In patients with new onset downbeat nystagmus, ophthalmologists should consider a diversity of causes.***

Downbeat nystagmus (DBN) is characterized by slow upward drift of the eye, followed by a fast downward phase. DBN is the most common form of acquired involuntary ocular oscillation overriding fixation.[1]

Slow phase velocity increases on lateral and downward gaze and on convergence although atypical presentations with enhancement of DBN on upward gaze or suppression on convergence may occur.[1]

DBN may also result from lesions to the vestibulocerebellum and less commonly from bilateral paramedian brainstem pathology.[1]

MANY POSSIBLE ORIGINS

The etiologies of DBN are diverse (See "Common causes of downbeat nystagmus" on Page 24).

Craniocervical malformations were the first to be described in association with DBN.[2] In fact, the first survey on DBN found craniocervical malformation to be the most common identifiable etiology.[3] DBN is still considered to be a localizing sign of cervicomedullary junction pathology.

A recent review of 116 DBN cases reported that the most frequent identifiable cause was cerebellar degenerative disease (20%), including multisystem atrophy, spinocerebeller ataxia, and sporadic adult onset ataxia. Posterior fossa vascular lesions (9%) and craniocervical malformation with cerebellar ectopia (7%) followed.

Up to 38% of DBN cases remained idiopathic, however.

Continues on page 24 : ***Nystagmus***

NYSTAGMUS

(Continued from page 23)

Toxic effects related to medication may also cause downbeat nystagmus.

Autoimmune conditions can also result in DBN, such as in the setting of anti-glutamic acid decarboxylase (GAD) antibodies.[4-7]

DBN has been attributed to damage to the brainstem-cerebellar loop. In affected patients, the inhibitory GABAergic cerebellar input from the Purkinje cells to the vestibular nuclei is disrupted. This disruption is hypothesized to decrease the downward VOR tone allowing the upward slow phase eye movement.[8]

Treatment thus aims to restore the GABAergic cerebellar influence on the brainstem. Clonazepam (GABAa agonist) and baclofen (GABAb agonist) have been reported to reduce DBN.

However, improvement has been modest, and neither of these GABA agonists has been evaluated in a randomized controlled clinical trial.

More recently, potassium channel blockers in the aminopyridine class, in particular 4-aminopyridine (4-AP), have shown improvement in symptomatic DBN associated with cerebellar degeneration.[9, 10]

They are believed to stabilize axonal membranes aiding in action potential propagation and are particularly active in the cerebellar Purkinje cells.[11]

Side effects include seizures and cardiac arrhythmias. Patients should have an ECG before and 30 minutes after ingestion of the drug to monitor for QT interval prolongation.

Memantine and gabapentin have also been reported to improve DBN and could be considered.[12]

DOWNBEAT NYSTAGMUS AND GAD

GAD is the enzyme catalyzing the conversion of glutamic acid to gamma-aminobutyric acid (GABA) and is expressed in GABA secreting neurons, which are widely represented in the central nervous system.[5]

Usually, downbeat nystagmus is of central origin and is associated with lesions of the vestibulocerebellum and underlying medulla.[5]

Though the right and left horizontal semicircular canal system activities balance each other, the activity of the anterior canal (responsible for upward eye movement) on one side must be balanced by the activity of the posterior canal (responsible for downward eye movement) on the contralateral side.[5]

The cerebellar flocculus inhibits anterior canal pathways, but not the posterior canal pathways[5]—a finding confirmed by experimental lesions to the vestibulocerebellum (flocculectomy in the monkey) that resulted in removal of inhibition from the anterior, but not posterior canal projections, with production of downbeat nystagmus.[13]

Floccular neurons receive GABAergic transmission from Purkinje cells.

Thus, a possible mechanism of downbeat nystagmus with anti-GAD antibodies is that GAD-antibodies act against GABAergic Purkinje neurons, leading to chemical denervation of the floccular neurons which results in DBN.[5]

In summary, in a patient with new onset DBN, the ophthalmologist should consider medication side effects, drug overdose (illicit or prescribed), magnesium and other deficiency states, autoimmune processes, infections, inflammatory states, demyelinating disease, and structural brainstem lesions at the cervicomedullary junction (especially Chiari malformation).

Neuroimaging is recommended (specifically cranial MRI with and without contrast material) and specific evaluation might include serum magnesium level, thiamine and other vitamin deficiency testing, or testing for paraneoplastic or anti-GAD antibodies.

Many cases of DBN remain idiopathic, however. Symptomatic treatment options include discontinuation of potentially offending medications, a trial of a medication to dampen nystagmus, and—if a null point where the nystagmus is least symptomatic exists—prism or surgical treatment to align that null point with primary position. ■

References

1. Wagner JN, Glaser M, Brandt T, Strupp M. Downbeat nystagmus: aetiology and comorbidity in 117 patients. *J Neurol Neurosurg Psychiatry.* 2008;79:672-677.
2. Cogan DG, Barrows LJ. Platybasia and the Arnold–Chiari malformation. *AMA Arch Ophthalmol.* 1954;52:13–29.
3. Cogan DG. Down-beat nystagmus. *Arch Ophthalmol.* 1968;80:757–768.
4. Ances BM, Dalmau JO, Tsai J, Hasbani MJ, Galetta SL. Downbeating nystagmus and muscle spasms in a patient with glutamic-acid decarboxylase antibodies. *Am J Ophthalmol.* 2005;140:142-144.
5. Antonini G, Nemni R, Giubilei F, Gragnani F, Ceschin V, Morino S, Bucci E, Accornero N. Autoantibodies to glutamic acid decarboxylase in downbeat nystagmus. *J Neurol Neurosurg Psychiatry.* 2003;74:998-999.
6. Tilikete C, Vighetto A, Trouillas P, Honnorat J. Anti-GAD antibodies and periodic alternating nystagmus. *Arch Neurol.* 2005;62:1300-1303.
7. Tilikete C, Vighetto A, Trouillas P, Honnorat J. Potential role of anti-GAD antibodies in abnormal eye movements. *Ann N Y Acad Sci.* 2005;1039:446-454.
8. Marti S, Straumann D, Büttner U. A model-based theory on the origin of downbeat nystagmus. *Exp Brain Res.* 2008;1888:613–631.
9. Strupp M, Thurtell MJ, Shaikh AG, et al. Pharmacotherapy of vestibular and ocular motor disorders, including nystagmus. *J Neurology.* 2011;258:1207–1222.
10. Kalla R, Glasauer F. 4-Aminopyridine restores vertical and horizontal neural integrator function in downbeat nystagmus. *Brain.* 2007;130:2441–2451.
11. Shi R, Sun W. Potassium channel blockers as an effective treatment to restore impulse conduction in injured axons. *Neurosci Bull.* 2011;27:36–44.
12. Averbruch-Heller L, Tusa RJ, Fuhry L, et al. A double-blind controlled study of gabapentin and baclofen as treatment for acquired nystagmus. *Ann Neurol.* 1997;41:818–825.
13. Zee DS, Yamazaki A, Butler PH, et al. Effects of ablation of flocculus and paraflocculus on eye movements in primate. *J Neurophysiol.* 1981;46:878–899.

Common causes of downbeat nystagmus

- Medications (e.g., anti-epileptic agents, lithium)
- Deficiency states (e.g., magnesium)
- Autoimmune (e.g., anti-glutamic acid decarboxylase antibodies)
- Metabolic (e.g., Wernicke encephalopathy)
- Cerebellar degenerative disease (e.g., spinocerebellar or multisystem atrophy)
- Posterior fossa neoplasms
- Vascular (e.g., dolichoectasia, ischemic, hemorrhagic, stroke) lesions
- Demyelination
- Trauma
- Structural anatomic abnormality (specifically craniocervical malformations, such as Arnold-Chiari malformation).[1]

ANGELINA ESPINO, MD, *is affiliated with the Department of Ophthalmology, Houston Methodist Hospital, Houston.*

MICHAEL L. MORGAN, MD, PHD, *is affiliated with the Department of Ophthalmology, Houston Methodist Hospital, Houston.*

ANDREW G. LEE, MD, *Chairman, Department of Ophthalmology, Houston Methodist Hospital, Houston, is editor of The Neuro-Connection column.* *The authors have no conflicts of interest in this article. This work was supported in part by an unrestricted grant from Research to Prevent Blindness.*

Incidence of TASS on decline

Trends also include increased use of adequate flushing volumes, decreased use of reusable cannulas

By Liz Meszaros; *Reviewed by Nick Mamalis, MD*

TAKE-HOME

- ***A recent analysis has found that the incidence of toxic anterior segment syndrome has declined. Improvements in materials and methods may be the reason.***

SALT LAKE CITY ::

THE INCIDENCE OF toxic anterior segment syndrome (TASS) is on the decline, according to recent analysis of survey data collected from 2007 to the present, said Nick Mamalis, MD.

Dr. Mamalis

As an acute postoperative inflammation of the anterior segment, TASS is sterile and non-infectious. In almost all cases, it occurs after an uneventful cataract surgery or more recently, after phakic IOL implantation, and usually with an immediate onset (12 to 48 hours postoperatively or sooner).

Clinical findings of TASS include diffuse "limbus-to-limbus" corneal edema and widespread endothelial damage, explained Dr. Mamalis, director of the Ophthalmic Pathology Laboratory, University of Utah Health Care, Salt Lake City, and director of the Intermountain Ocular Research Center.

In addition, patients with TASS will also have marked anterior segment inflammation, fibrin, and hypopyon.

SIFTING THROUGH DATA

To ascertain the incidence of TASS, researchers analyzed data culled from submitted questionnaires. From 2007 to the present, the task force received responses from surgical sites that were self-reporting cases of TASS. In 2010, Cutler-Peck et al. published a retrospective analysis of the first half of the survey data.

Dr. Mamalis and colleagues presented an updated analysis of the survey data collected to date, and included information collected by the American Society of Cataract and Refractive Surgery TASS Task Force during site visits.

Continues on page 26 : ***On decline***

ON DECLINE

(Continued from page 25)

Surveys were collected between June 1, 2007 and March 1, 2012. Questions were designed to elicit information about cleaning and instrument processing, and medications and products used in the perioperative period.

A retrospective analysis was done on data collected. Results from June 2, 2009 to March 1, 2012 (Group B) were compared with earlier results from January 1, 2007 through May 31, 2009 (Group A) to identify trends.

One-hundred thirty questionnaires were submitted and included in the analysis, along with data from 71 site visits. There were a total of 1,570 cases of TASS of the approximately 69,000 cataract surgeries performed at reporting centers.

Upon analysis, data showed that instrument processing was the factor most commonly associated with TASS. This included inadequate flushing of phaco and irrigating/aspirating handpieces, use of enzymatic cleaners, detergents, poor instrument maintenance and processing, and reuse of single-use products.

Product questionnaires were directed at finding the incidence of products associated with TASS. such as use of antibiotics in balanced salt solution, preserved epinephrine, inappropriate agents for skin preparation, and powdered gloves.

OUTBREAKS DROPPING

Dr. Mamalis and colleagues found the number of outbreaks reported is trending downward. There was no spike in outbreaks seen in association with the discontinuation of several brands of preservative- and stabilizer-free epinephrine.

"In conclusion, the frequency of TASS outbreaks has declined, and encouraging trends in the adequate cleaning and processing of ophthalmic instruments were noted," Dr. Mamalis said. "However, the increased use of enzymatic detergents and ultrasound baths was an unfavorable trend. Increased awareness of TASS and its most common risk factors may reduce the risk of TASS." ■

TASS: What's trending now

POSITIVE TRENDS WERE seen in recent data regarding the incidence of toxic anterior segment syndrome, noted Nick Mamalis, MD, including:

MORE SITES REPORTED ADEQUATE HANDPIECE FLUSHING VOLUMES. In Group B, handpiece flushing volume of 120 ml or more was reported by 66% of respondents, as compared with only 48% of those in Group A. In addition, the number of respondents using less than 120 ml was greater in Group A than in Group B (39% versus 26%, respectively).

FEWER SITES USED REUSABLE CANNULAS. In Group A, 86% of respondents used reusable cannulas, compared with only 77% in Group B.

THE USE OF DISTILLED/DEIONIZED FINAL RINSE SOLUTIONS WAS INCREASED. In Group A, 46% of respondents reported using deinonized/distilled rinse water, compared with 68% in Group B. In addition, a full 32% of the respondents in Group A reported using sterile/pyrogen-free rinse water, compared with only 13% in Group B. The use of tap water in these groups was 19% versus 11%, respectively.

ANTIOBIOTICS WERE ADDED TO BALANCED SALT SOLUTION LESS FREQUENTLY. This difference, however, was not great; with 80% of respondents from Group B adding no antibiotics, compared with 76% of those in Group A. Similar as well were the rates of those who added vancomycin (15% versus 20%, respectively) and gentamycin (5% versus 3%).

THE USE OF PRESERVED INTRACAMERAL ANESTHETICS WAS DECREASED. In Group A, 77% of respondents reported not using these solutions, compared with 84% in Group B. One negative trend, Dr. Mamalis noted, was the increased use of enzymatic detergents and ultrasonic baths, which was seen to be increased in Group B compared with Group A (71% versus 62%, respectively). In addition, the use of enzymatic detergents increased, with 49% of Group A reporting used, compared with 58% of Group B.

J Cataract Refract Surg. 2012;38:1902-1910. doi: 10.1016/j.jcrs.2012.06.053. Epub 2012 Sep 19.

Suggested reading

- Bodnar Z, Clouser S, Mamalis N. Toxic anterior segment syndrome. Update on the most common causes.

NICK MAMALIS, MD
E: *801/581-6586*
E: *nick.mamalis@hsc.utah.edu*

Dr. Mamalis is a consultant/advisor for Abbott Medical Optics, Anew Optics, Medennium, and OptiMedica. He also performs contract research studies for Abbott Medical Optics, Alcon Laboratories, Allergan, Anew Optics, Bausch + Lomb, Calhoun Vision Inc., MBI, and Power Vision Inc.

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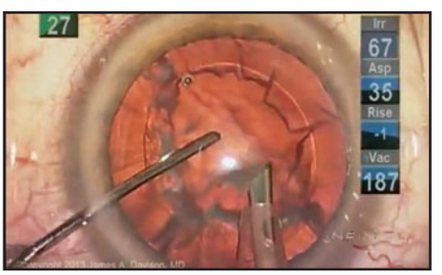

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Many don't link diabetic eye disease

Hispanic patients less likely to be aware of association, indicates national survey

By Lynda Charters; *Reviewed by Rohit Varma, MD, MPH*

CHICAGO ::

THOUGH DIABETIC retinopathy is the primary cause of new cases of blindness in working aged U.S. adults, many with the disease do not know that it affects vision.

This disturbing data was found in an analysis of the National Health and Nutrition Survey (NHANES) conducted between 2005 and 2008 by the National Center for Health Statistics Centers for Disease Control and Prevention.

Dr. Varma

In addition, Hispanic patients are more likely to be unaware of this association. Many patients with diabetic retinopathy also did not undergo an annual dilated eye exam, the survey found.

"Because diabetic retinopathy is a progressive disease, early detection is critical to prevent visual loss," said Rohit Varma, MD, MPH, professor and chairman, Illinois Eye and Ear Infirmary, Department of Ophthalmology and Visual Sciences, University of Illinois at Chicago.

"The 2012 ADA guidelines recommend patients with diabetes have a comprehensive eye examination, including pupil dilation, soon after diagnosis and at least annually thereafter," he said.

TAKE-HOME

- ***Many individuals with diabetic retinopathy do not know that the disease affects vision, a study finds.***

Dr. Varma and colleagues designed a study to determine the proportion of people with diabetic retinopathy who were unaware diabetes had affected their eyes, the percentage reporting they had not had a dilated eye examination in the past year, and factors that were associated with these outcomes.

NHANES was the data source.

STUDY ANALYSIS

The study had two cohorts of patients: one included patients with self-reported diabetes, and the second included patients with diabetes and either mild non-proliferative retinopathy, moderate-to-severe non-proliferative retinopathy, or proliferative diabetic retinopathy (PDR) determined by standardized fundus photograph grading.

All patients were 40 years or older for whom fundus photographs were available and who completed sociodemographic, medical, and family information interviews.

Of the 286 participants with diabetic retinopathy, 70% (95% confidence interval [CI], 64% to 77%) were unaware diabetes had affected their eyes, 62% (95% CI, 54% to 71%) reported not having been examined by a diabetes specialist during the previous year, and 33% (95% CI, 26% to 40%) reported not having undergone a dilated eye examination during the previous year, Dr. Varma noted.

The weighted frequency—representing the estimated total number of adults in the U.S. population based on the 2000 Census data—was 3,821,514 individuals.

"After controlling for other factors, Hispanic patients were less likely to be aware of diabetic eye disease compared with non-Hispanic white patients (odds ratio [OR], 0.45, 95% CI: 0.20 to 0.99, $p = 0.05$)," Dr. Varma said. "As expected, patients with a longer duration of diabetes, that is, 10 years or longer, were more likely to be aware of eye disease."

Compared with uninsured individuals, insured patients were more likely to have undergone a dilated eye examination during the past year (OR, 7.55, 95% CI: 3.30 to 17.27, $p < 0.001$) and visited a diabetes specialist during the past year (OR, 3.03, 95% CI: 1.62 to 5.67, $p < 0.001$), after controlling for other factors, he said.

Investigators drew the following conclusions from their analyses.

"These nationally representative data suggested that many individuals with diabetic retinopathy are not aware the disease has affected their eyes," Dr. Varma said. "Hispanic patients were less likely to be aware of diabetic eye disease (compared with non-Hispanic white patients).

"Many of these diabetic retinopathy patients may not be complying with ADA guidelines to undergo an annual dilated eye exam," he said. "Uninsured patients were less likely to have had a dilated eye exam or visit a diabetes specialist during the previous year compared with insured patients." ■

ROHIT VARMA, MD, MPH

E: *rvarma@uic.edu*

Dr. Varma did not indicate any proprietary interest related to the subject matter.

Injectable sustained-release drug delivery shows promise

Majority of eyes in trial showed complete anterior chamber cell clearing after cataract surgery

By Fred Gebhart; *Reviewed by David F. Chang, MD*

TAKE-HOME

- ***An injectable intraocular sustained-release, drug-delivery system demonstrated favorable safety and efficacy results in a multicenter phase II clinical trial.***

LOS ALTOS, CA ::

Sustained-release intraocular drug delivery post-cataract surgery is one step closer to reality with the completion of a dose ranging trial of a novel biodegradable form of injectable dexamethasone, according to David F. Chang, MD.

More than half of the eyes in the trial showed complete anterior chamber cell clearing by day 8 following routine cataract surgery with good safety results.

Dr. Chang

"These are very promising results," said Dr. Chang, clinical professor, University of California, San Francisco, and private practice, Los Altos, CA. "We can—with a single application of drug administered into the anterior chamber at the conclusion of intraocular surgery—get dosing that appears to be safe and efficacious in the context of this trial.

"The next step is a larger trial," Dr. Chang said. "Every ophthalmologist would love to have this kind of sustained-release drug delivery if, indeed, it works."

EXAMINING THE DRUG

Dr. Chang discussed trial results for the experimental sustained-release formulation of dexamethasone (IBI-10090, Icon Bioscience).

The bioabsorbable injectable drug-delivery system is designed for short-term delivery of therapeutic levels of dexamethasone within the eye.

Continues on page 30 : ***Sustained release***

SUSTAINED RELEASE

(Continued from page 29)

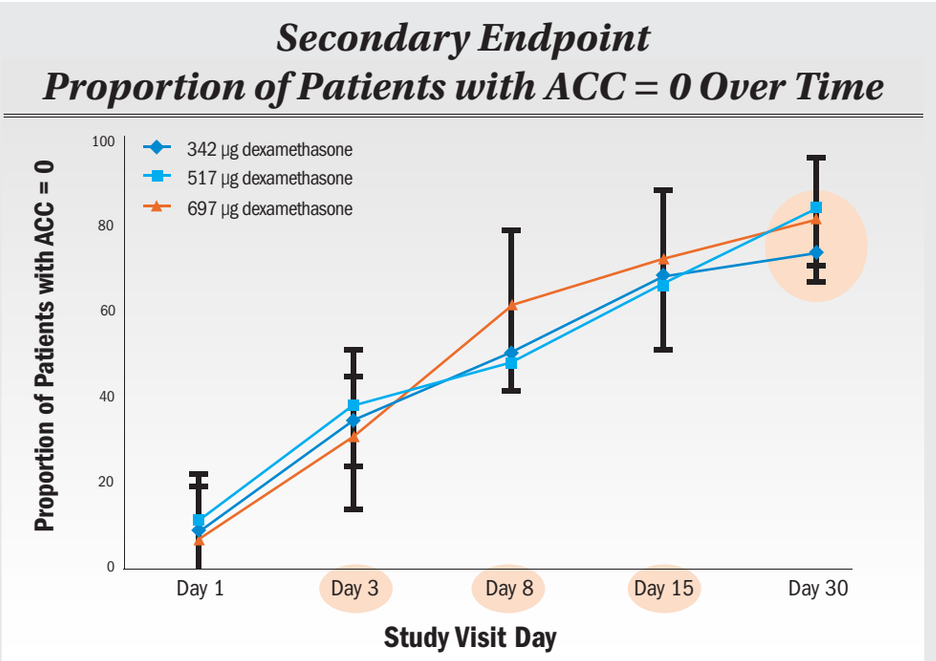
A small droplet—5 µl—is injected into the eye following surgery and forms a surface tension-based sphere. The drug is released into the eye as the droplet is absorbed, providing controlled delivery directly to the target tissue for 11 to 21 days, depending on the formulation.

When the drug depot is fully absorbed, drug delivery stops.

"The next major advances in the field of ocular anti-inflammatory pharmacology will be in terms of drug delivery," Dr. Chang said. "We are still limited, in most patients, to using anti-inflammatory eye drops with all the attendant disadvantages."

The advantage of a sustained-release delivery system is that it relieves the patients of the responsibility and inconvenience of instilling eye drops. It simplifies their lives, while at the same time more effectively delivering medication to the target tissue without systemic exposure, he noted.

"This intraocular delivery system gives . . . continuous high levels of drug rather than the variable peaks and troughs that occur with intermittent dosing, and it completely eliminates the issue of corneal penetration," he said.



(Figure 1) For the secondary endpoint of proportion of patients with anterior chamber cell clearing over time, in the low-dose group, the proportion was 53.4% at Day 8 and increased to 69% at Day 30. In the medium-dose group, the proportion was 51.8% at Day 8 and increased to 78.6% at Day 30. In the high-dose group, the proportion was 63.8% at Day 8 and increased to 77.6% at Day 30. There was no statistically significant difference among the three groups at any timepoint. Note: The *p*-value (overall) for the overall comparison among all treatment groups is based on a two-sided Fisher's exact test and was not statistically significant ($p > 0.30$ in all cases) at any time point. *(Figure courtesy of David F. Chang, MD)*

ABOUT THE TRIAL

Surgeons at 13 centers across the country enrolled 172 patients for this post-cataract surgery inflammation trial. Patients were randomly assigned to one of three doses: 342 µg sustained-release dexamethasone (58 patients), 517 µg (56 patients), or 697 µg (58 patients).

Each patient received a single injection of 5 µl of the drug, delivered through a 25-gauge cannula directed behind the iris. The injection forms a visible sphere that is absorbed over time.

Patients in the trial had to be:

- **Aged 40 or more years.**
- **Undergoing unilateral phacoemulsification, with best-corrected visual acuity between 20/30 and 20/200, a visual potential greater than 20/30 in the study eye, and a baseline endothelial cell count of 2,000 cells/mm² or greater.**

Patients were excluded if they had a recent history of ocular, topical, or oral steroids or NSAIDS, or had received any intravitreal sustained-release drug delivery.

The primary efficacy endpoint was anterior chamber cells (ACC), graded as a score of 0 (cells absent) to 4 (hypopyon), assessed by slit lamp biomicroscopy. The safety analysis was based on both ocular and non-ocular adverse events for the first 90 days following surgery.

The mean age of patients was about 70 years and the majority of patients were female.

The sustained-release delivery was clearly successful, Dr. Chang said.

At day 8 postoperatively, 53.4% of patients in the 342-µg group had complete ACC clearing, 51.8% of the 517-µg group, and 63.8% of the 697-µg group. While there were numerical differences in ACC among the three dosage groups, there was no statistically significant difference between them ($p > 0.50$).

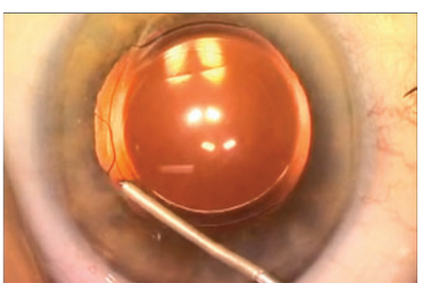
Overall, 94% of all patients had ACC scores of 0 to 1 (1 to 5 cells) by 8 days.

"This study measured the number of patients with complete clearing of AC cells following uncomplicated cataract surgery, and followed the design of other FDA clinical trials for anti-inflammatory medication" Dr. Chang said. "For example, using difluprednate, 22% of patients had zero AC cells by day 8; with bromfenac, it was 24%.

If this is a safe and effective way to deliver medication without eye drops, sustained release could be especially useful for higher-risk eyes that are more prone to inflammation," he said.

"As a surgeon, you know the eye will get the proper medication dosing with a sustained-release intraocular delivery system," Dr. Chang continued. "In addition, there is a significant reduction in the chair time and staff time that comes with prescribing topical medications and reviewing the instructions with patients and family members. This system would be a win-win for patients and ophthalmologists alike." ■

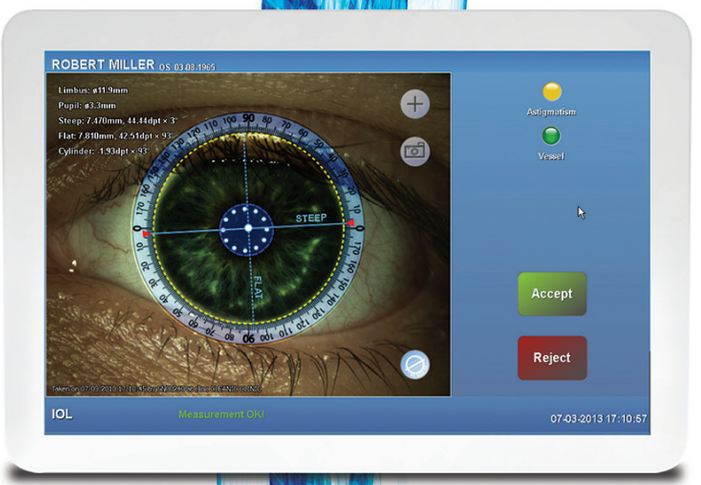
INTRAOCULAR INJECTION



VIDEO To see more about sustained-release dexamethasone intraocular injection post-cataract surgery, go to **http://bit.ly/19Nj59C**. *(Video courtesy of David F. Chang, MD)*

DAVID F. CHANG, MD
E: *dceye@earthlink.net*

Dr. Chang disclosed stock options in Icon Bioscience.



Pre-op

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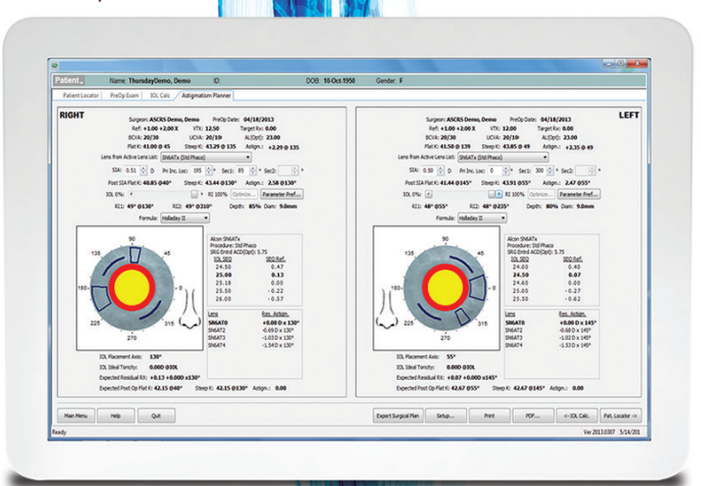
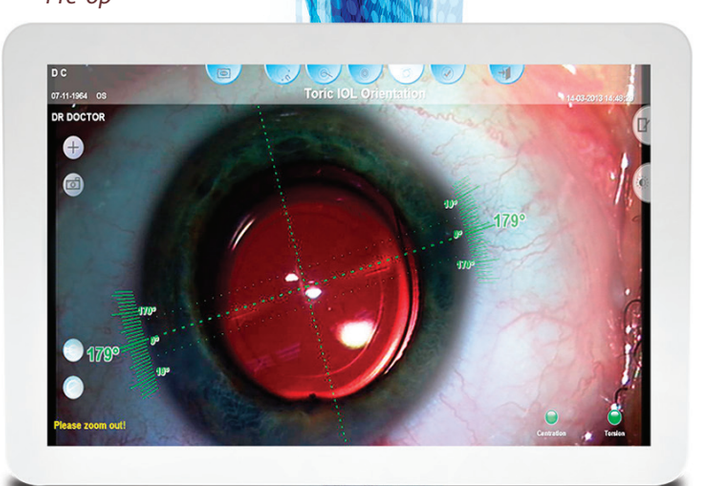


Pre-op

Plan.



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Long-term delivery strategies show promise for neovascular AMD

Need to establish efficacy of systems aimed to achieve solid transmission of agents

By Cheryl Guttman Krader; *Reviewed by David S. Boyer, MD*

LOS ANGELES :: **THE DEVELOPMENT OF** strategies able to provide longer-acting therapeutic delivery for neovascular age-related macular degeneration (AMD) is an area of active research with some promising technologies now in clinical trials.

However, the viability of these approaches awaits further study that establishes their efficacy and safety, especially considering the effects of chronic anti-vascular endothelial growth factor (VEGF) therapy are unknown, according to David S. Boyer, MD.

TAKE-HOME

- ***The chronicity of neovascular age-related macular degeneration and the burden of frequent intravitreal anti-vascular endothelial growth factor injections are driving research to develop long-term delivery therapeutic strategies.***

"There is not a retinal specialist who would not like to have a system for treating neovascular AMD that would eliminate the burden of frequent injection while maintaining the same vision benefit," said Dr. Boyer, clinical professor of ophthalmology, Keck School of Medicine, University of Southern California, Los Angeles. "While there are agents being investigated that are based on topical or episcleral drug delivery, these approaches may have limitations."

APPROACHES

Intravitreal implantation of a device encapsulating VEGF receptor Fc-fusion protein-releasing cells (NT-503, Neurotech) is one approach for achieving long-term therapeutic delivery to treat neovascular AMD.

The encapsulated cell technology device is implanted in the vitreous through a tiny scleral incision and anchored by a single suture. It has a semipermeable membrane allowing for outward diffusion of the drug plus other cellular metabolites and inward diffusion of nutrients to support cell survival while protecting the contents from host cellular immunologic attack.

The VEGF receptor Fc-fusion protein, currently in a phase I/II trial, is 20-fold more efficient at neutralizing VEGF than ranibizumab, and studies in rabbit eyes demonstrated constant release for up to 1 year.

A microelectromechanical system offers another interesting approach to achieving chronic intravitreal drug delivery. The device has an electrolysis chamber with electrolysis actuation to release the desired volume of drug solution, and a drug reservoir with a refill port. The reservoir is implanted in the subconjunctival space, and a flexible cannula is inserted through an incision into the posterior segment.

The Port Delivery System (ForSight Vision4) is another refillable device in development. The delivery system is placed through the pars plana on the outside of the sclera and delivers drug into the vitreous cavity through a small tube. The procedure for implantation requires a trip to the operating room, but no sclera sutures are required, and the device is refilled in the office setting.

ForSight Vision4 and Genentech are developing the technology for intravitreal delivery of ranibizumab, which has entered clinical testing.

Genentech is also collaborating with SurModics in the development of biodegradable ranibizumab-loaded microparticles. This technology is expected to provide drug delivery for a period of 4 to 6 months, although it has not advanced into clinical development.

Other techniques in development—including microneedles and microcatheter delivery (iTrack, iScience Interventional)—target drug delivery into the suprachoroidal space. However, of all of the approaches, gene delivery is probably the most exciting, and there are a number of companies working in this space, Dr. Boyer said.

As an example, he cited data showing long-term VEGF suppression after subretinal delivery of AVA-101 (Avalanche Biotech)—a platform based on adeno-associated viral vector delivery of a gene for an anti-VEGF protein. ■

DAVID S. BOYER, MD

E: *vitdoc@aol.com*

Dr. Boyer is a consultant/advisor to Alcon Laboratories, Alimera Sciences, Allergan, Genentech, Neurotech, Regeneron, and Ohr Pharmaceuticals, and a speaker for Alcon, Allergan, Genentech, and Regeneron.

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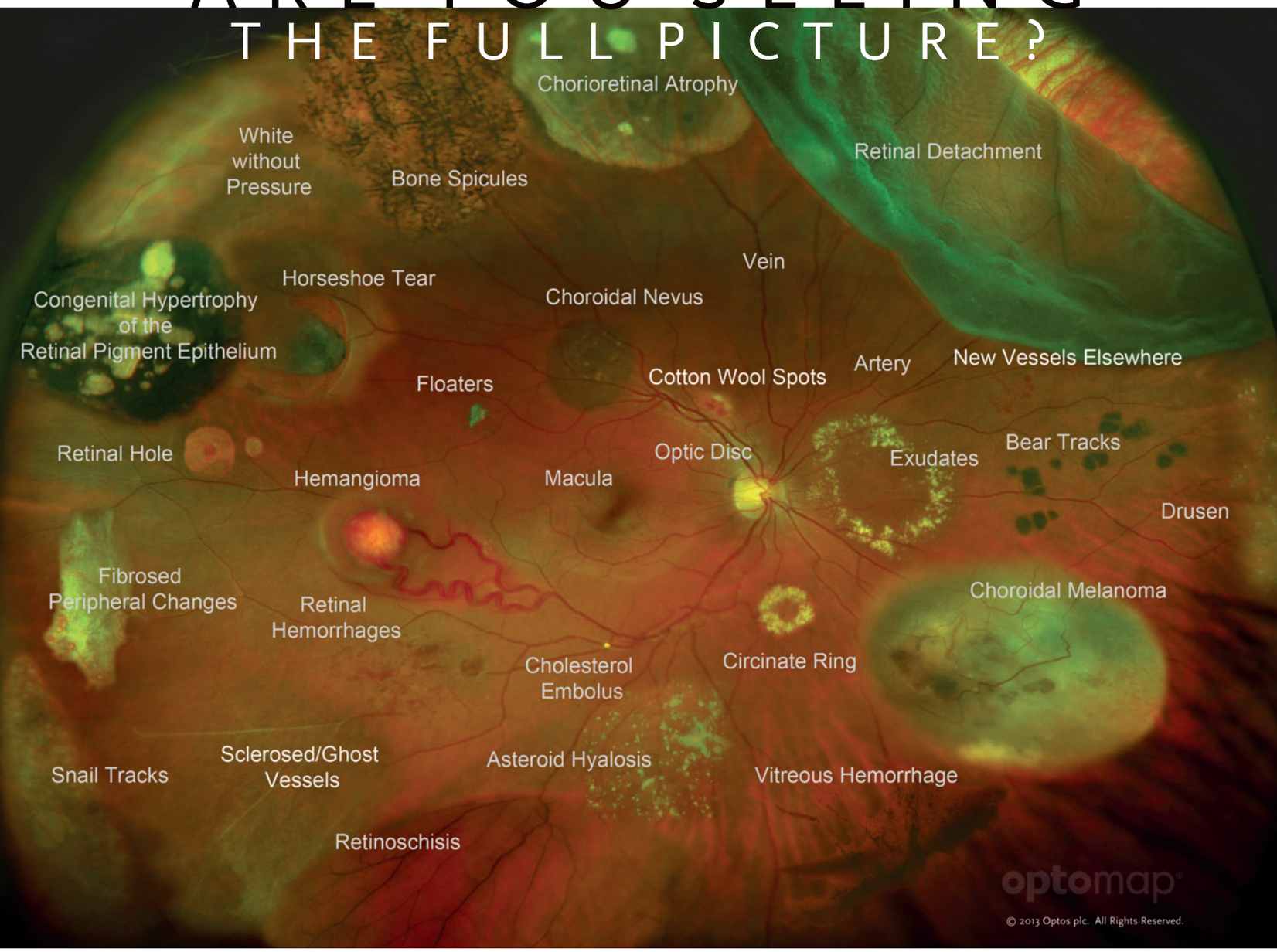

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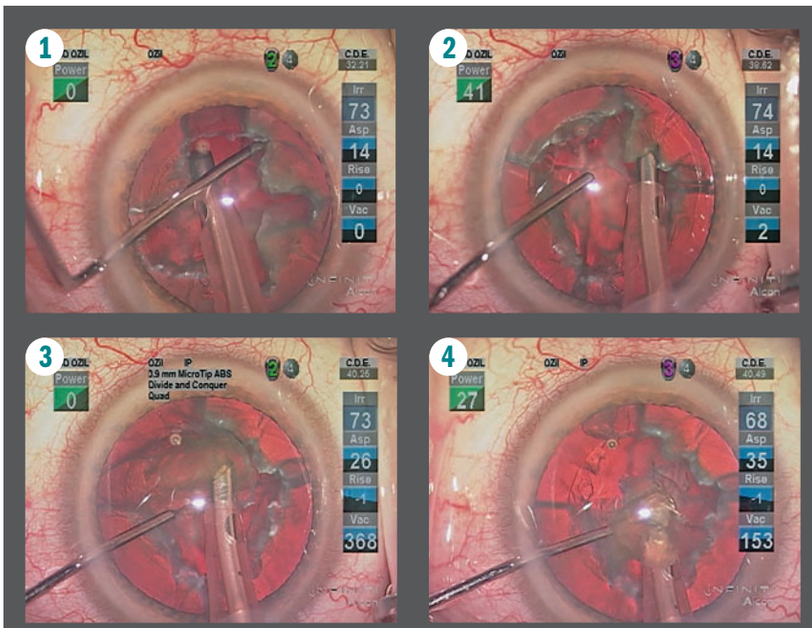
Phaco technology evolves in new era of cataract surgery

Multiple innovative developments enhance hard cataracts, other challenging situations



1 The cyclodialysis spatula and phaco tip push against the nuclear corners in cross-handed fashion as they fracture the posterior nuclear plate.

2 The obliquely oriented tip is shaving the firm corner off the fourth quadrant in the final step of creating the thin nuclear bowl.

3 Vacuum has built to 368 mm Hg, providing good suction adherence and allowing the first plate to be rolled into the bowl that is now partial as it is comprised of three plates.

4 In FP 3, vacuum, ultrasonic energy, and flow simultaneously and in concert deform, emulsify, and aspirate the nuclear emulsate.

By Cheryl Guttman Krader;
Reviewed by James A. Davison, MD, FACS

MARSHALLTOWN, IA ::

A new phacoemulsification platform (Centurion Vision System, Alcon Laboratories) is propelling cataract surgery into an entirely new era, according to James A. Davison, MD, FACS.

"Surgeons who presume that the [new phaco platform] is a minor makeover should think again and would do well to take a close look at this . . . new system," said Dr. Davison, who specializes in cataract and refractive surgery at the Wolfe Eye Clinic, Marshalltown and West Des Moines, IA.

"The [new system] is an exponential advance compared [with] any of the machines that have been available

TAKE-HOME

- ***James A. Davison, MD, describes the features and performance of a new phacoemulsification system (Centurion Vision System, Alcon Laboratories).***

5 The cassette features a dual-hemispheric pump with elastomeric interface, rotary vent valves, and laser sensitive pressure sensors for infusion and aspiration pressures.

6 The new-generation peristaltic pump features seven individually spring-loaded rollers to generate smooth, effective, and responsive high vacuum through smaller bore aspiration tubing.

up until this time," he said. "I expect that, just as I did, surgeons who try it will very quickly appreciate the revolutionary differences."

Dr. Davison

ENHANCED PERFORMANCE

Dr. Davison had the opportunity to use the new phaco system in premarket testing and believes that it stands out for making cataract surgery easier and safer, particularly when operating on hard cataracts and in other challenging situations.

"Every step is easier when operating on a hard cataract with this new system, and so those cases really seem to be no different than those with average nuclei," Dr. Davison said.

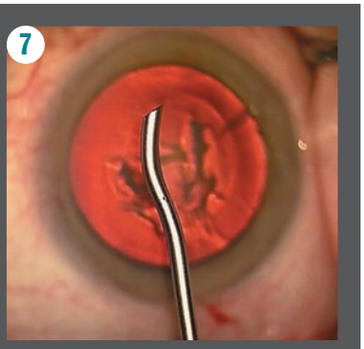
Among the innovations found in the new phaco system is proprietary new fluidics technology (Active Fluidics Technology). This automated system allows surgeons to set and maintain a target IOP during the procedure for enhanced anterior chamber stability.

"With the new fluidics system, surgeons no longer have to develop customized settings or make any adjustments in bottle height when operating on eyes with dense nuclei, at risk for IFIS, or with small pupils," Dr. Davison said. "Now, they can program the unit with a single set of parameters to use in all cases and be assured of tight fluidics control.

"For instance, if an incision is leaking more than it should, laser controlled sensors will read the lower pressure at the eye and increase flow so that the target IOP can be maintained," he said. "The efficiency of live feedback in Active Fluidics makes high vacuum and flow parameters unnecessary, resulting in a quieter experience for the surgeon and greater comfort for the patient."

The new phaco system also features Balanced Energy Technology that enhances phacoemulsification efficiency through use of OZil Intelligent Phaco and the new Intrepid Balanced Tip. The new Balanced Tip, which is available in both 30° and 45° aperture configurations, can be used for all cataracts. However, it particularly shines in cases with hard nuclei

Continues on page 36 : ***Platform***



7 The computer-designed, 0.9-mm, 45° aperture balanced tip generates extremely efficient torsional shearing action while minimizing shaft movement at the incision. *(Images courtesy of James A. Davison, MD)*

PLATFORM

(Continued from page 35)

where, thanks to the unique tip motion, the lens material appears to essentially dissolve.

"With the combination of the motion of the Balanced Tip and the new fluidics, we don't need to move the tip around within the eye re-acquiring nuclear fragments," Dr. Davison said. "The nuclear material flows to the tip and stays on it so that it virtually disappears as it is emulsified at the shearing plane.

"The performance of the new tip in hard cataracts was so phenomenal that during the trial period with the new platform, we actually moved cases with hard cataracts on a few occasions while waiting for the new tips to be supplied," he said.

His own preference is to use the 45° version of the Balanced Tip as he finds that configuration makes cutting a little easier for his preferred divide and conquer–thin bowl technique, Dr. Davison noted.

He suggested that surgeons who are "choppers" may favor the 30° tip.

DESIGN AND INTEGRATION

In addition to its enhanced performance, the new phaco system has a new highly ergonomic and aesthetic design, and features an elegant battery-powered wireless foot pedal. The operating room staff enjoy using it because it rolls and sets up easily, and is easy to program using the intuitive touch-screen display, Dr. Davison said.

The new phacoemulsification system was also developed to be seamlessly integrated with other Alcon surgical technologies, including the Verion System for registration of pre- and intraoperative images, the LenSx Laser, and the LuxOR Surgical Microscopes with Q-VUE 3-D assistant. Dr. Davison noted his center is just beginning to take advantage of that capability, but he believes it will be a valuable asset.

"Any innovation in measurement, automation, and inter-machine communication that limits the possibility for error from human interaction is a good thing for improving outcomes," Dr. Davison said. ■

> 'Every step is easier when operating on a hard cataract with this new system.'
>
> — James A. Davison, MD, FACS

JAMES A. DAVISON, MD, FACS
E: *jdavison@wolfeclinic.com*

Dr. Davison is a consultant to Alcon Laboratories, but has no financial interest in any of the devices mentioned. Ophthalmologists attending the annual meeting of the American Academy of Ophthalmology in New Orleans in November will be able to see live surgery sessions with the new phacoemulsification system.

Round anterior optic edged-IOL superior

SALT LAKE CITY ::

IOLS WITH ROUND ANTERIOR OPTIC EDGES are more suitable than those with anterior and posterior square optic edges for sulcus fixation, according to recent study results presented by Liliana Werner, MD, PhD.

The pathologic comparison study—which evaluated pseudophakic postmortem eyes—was done using cadaver eyes obtained from eye banks, and information on IOL implantation date was received through interaction with the eye donor's family, said Dr. Werner, associate professor of ophthalmology and co-director of the Intermountain Ocular Research Center at the John A. Moran Eye Center, University of Utah, Salt Lake City.

Eyes were fixated in formalin, and then IOL fixation, tilt, and decentration were evaluated by imaging with high-frequency ultrasound and MRI. Next, eyes were bisected for gross examination of the anterior segment from a posterior view.

A total of 13 eyes were identified with a hydrophobic acrylic 3-piece IOL with square anterior/posterior optic edges. There were 14 eyes with 3-piece IOLs with round anterior optic edges, of which 13 were silicone and 1 was hydrophobic acrylic.

Gross examination of eyes showed nearly all had complicated surgery with posterior capsule rupture.

The two groups were comparable for decentration, tilt, pigmentary dispersion, and transillumination defects. However, histopathology findings were much more prominent in the group of 3-piece lenses with an anterior square optic edge, particularly with regard to the presence of pigment in the trabecular meshwork, Dr. Werner said. ■

Trifocal IOL scores high for near, intermediate, distance vision

Patient satisfaction after cataract surgery fills gap left by standard diffractive lenses

By Lynda Charters; *Reviewed by Luis Izquierdo Jr., MD, PhD*

TAKE-HOME

- ***A trifocal IOL (FineVision, Physiol) provides good visual outcomes for distance, intermediate, and near vision and high levels of patient satisfaction after cataract surgery.***

LIMA, PERU ::
PATIENTS HAVE ACHIEVED high levels of satisfaction after cataract surgery—and good visual outcomes for distance, intermediate, and near vision—with a new trifocal IOL (FineVision, Physiol).

This new IOL fills the gap left by standard diffractive IOLs that provide adequate distance and near vision, but less than satisfactory intermediate vision, said Luis Izquierdo Jr., MD, PhD.

The trifocal IOL is a hydrophilic acrylic with a refractive index of 1.46 and a negative spherical aberration of –0.11 µm on the posterior surface. The IOL filters blue light.

The lens is available in powers ranging from 10 D to 35 D in 0.5-D increments. Lens implantation can be accomplished through 2.2-mm or 1.8-mm incisions, according to Dr. Izquierdo, Oftalmosalud Instituto de Ojos, Universidad Mayor de San Marcos, Lima, Peru.

The trifocal optic provides far vision, near vision of 3.5 D and intermediate vision of 1.75 D. The overall diameter is 10.75 mm with an optical zone of 6.15 mm.

The design of this IOL is a combination of two diffractive structures, which provides three levels of focus. This is in contrast to the typical diffractive IOL concentric rings typically generate two levels of focus: distance and near.

To test the efficacy of the trifocal lens, Dr. Izquierdo and colleagues conducted a study to determine the visual outcomes after cataract surgery during which the trifocal IOL was implanted in 30 eyes of 15 patients (age range, 55 to 80 years). All patients underwent bilateral cataract surgeries with implantation of the trifocal IOL. The visual outcomes and

Continues on page 39: ***Trifocal IOL***

Flared tip offers efficient sculpting

Non-flared design presents less occlusion time when removing dense cataracts, study finds

By Cheryl Guttman Krader; Reviewed by Christer Johansson, MD

KALMAR, SWEDEN ::

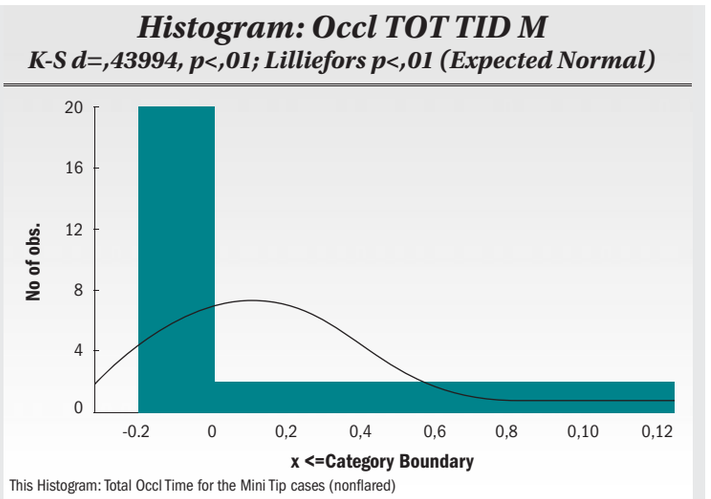
WHEN PERFORMING TORSIONAL phacoemulsification (Infiniti Vision System with OZil handpiece, Alcon Laboratories) in eyes with dense cataracts, use of a Kelman flared phaco tip (Mini-Flared, Alcon) affords significantly better sculpting efficiency compared with a Kelman non-flared tip (0.9 Mini Tip, Alcon).

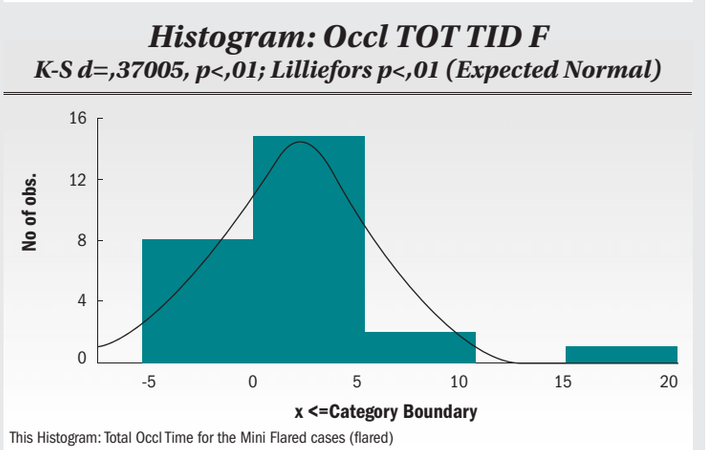
However, occlusion time during nuclear removal is significantly less using the non-flared tip, according to the results of a prospective controlled study conducted by Christer Johansson, MD.

Dr. Johansson

"Both tips for torsional phacoemulsification work very well over the range of different nuclear densities," said Dr. Johansson, Kalmar, Sweden. "However, the take-home message of my study is that the non-flared tip, which was designed to enhance performance with torsional phaco, is especially beneficial for rock-hard cases.

"Whereas surgeons using a sculpting technique when operating on very hard nuclei can benefit from the better efficiency with the flared tip to sculpt and divide the nucleus, the non-flared tip will perform better during the removal phase in these cases," Dr. Johansson said.





NON-FLARED VERSUS FLARED TIP

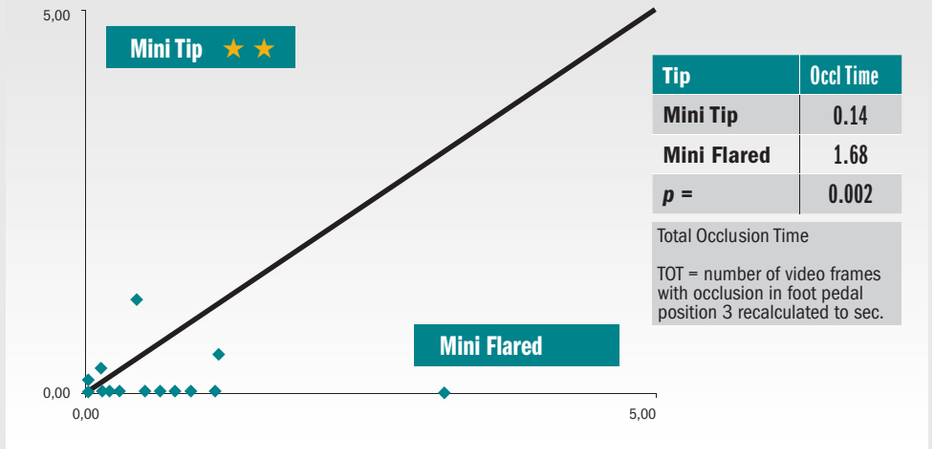
The clinical trial enrolled 26 patients with bilateral dense cataracts who had the first eye randomly assigned to phacoemulsification using either the newer, non-flared tip or the flared tip. Then, the fellow eye procedure was performed with the alternate tip.

Dr. Johansson performed all of the surgeries using the same modified stop-and-chop technique and machine settings.

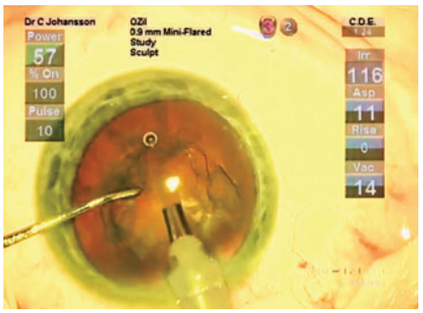
Data from a frame-by-frame analysis were analyzed to determine four endpoints:

1. **Cumulated dissipated energy (CDE) usage during the sculpting phase.**
2. **CDE during nuclear removal.**
3. **Time for nuclear removal.**
4. **Total occlusion time (measured as the number of video frames with occlusion in footpedal position 3 recalculated to seconds).**

The results showed mean CDE during sculpting was significantly lower using the flared tip than in the non-flared tip procedures, 3.73 versus 6.71.



PHACO TIP PERFORMANCE



VIDEO Watch a video clip with the Mini Tip showing sculpting first with longitudinal phaco and then with torsional. Go to **http://bit.ly/1auyHQu.** *(Video courtesy of Christer Johansson, MD)*

"The cataracts in this series were relatively hard and it took some time to enter a large enough patient population with bilateral dense cataract determined to be similar density in the two eyes based on preoperative slit-lamp evaluation," Dr. Johansson said. "In fact, mean nuclear density graded was 3.26 in the non-flared tip cases and 3.15 for eyes where the flared tip was used, and the difference between groups was not statistically significant."

The difference in cutting performance during sculpting is explained by the larger cutting edge of the tip with the flared design, Dr. Johansson added.

At the bevel, the non-flared tip measures 0.80 mm in its outer diameter with a lumen size of 0.57. The flared tip has an outer diameter of 0.91 mm at the bevel and inner diameter of 0.74 mm.

There were no significant differences between the non-flared and flared tips in mean CDE values for removal of nuclear material (7.13 versus 6.39) or removal time for nuclear material (54.99 versus 56.48 sec).

Mean total occlusion time was significantly lower in the non-flared tip procedures than in eyes operated on with the flared tip, 0.14 versus 1.68 sec.

Discussing the latter difference, Dr. Johansson explained that episodes of prolonged occlusion are more likely with the flared tip, because—compared with the non-flared tip—the flared tip narrows more distally and thus allows the accumulation of nuclear material.

"In this study, there was a tendency for the prolonged occlusion to occur more often when removing the second half of the nuclear material, and that difference was slightly greater in the procedures with the flared tip than with the non-flared tip," Dr. Johansson said. ■

CHRISTER JOHANSSON, MD

E: *christer.ptab@telia.com*

Dr. Johansson is a consultant to Alcon Laboratories.

TRIFOCAL IOL

(Continued from page 37)

defocus curve were evaluated 3 months after implantation (distance vision at 4 m, intermediate vision at 70 cm, and near vision at 40 cm), he explained.

Dr. Izquierdo reported that the mean uncorrected distance visual acuity was 0.00 (~20/20 Snellen acuity) logarithm of the minimum angle of resolution (logMAR) and the mean uncorrected intermediate and near visual acuity were 0.35 and 0.30 logMAR (~20/30 Snellen acuity), respectively.

The vast majority of eyes (97%) had a spherical equivalent within ±0.5 D. The mean defocus at –3 D was 0.03 logMAR. No patient reported experiencing any adverse photic phenomena.

"All patients had 20/20 or better uncorrected distance visual acuity," Dr. Izquierdo said. "The average manifest refraction was about -0.23 D. Regarding the near and intermediate visual acuity levels, 93% of the patients had 20/30 or better."

When investigators compared the defocus curves from a multifocal diffractive IOL with that from the trifocal IOL, they found the trifocal defocus curve was "much better" than the standard defocus curve, especially with regard to intermediate vision.

POSTOP VISUAL OUTCOMES

Patients were asked to respond to a questionnaire regarding postoperative visual outcomes with the trifocal IOL. When asked how they rated their near vision postoperatively on a scale of 1 to 10—with 1 indicating the worst possible vision and 10 indicating the best possible vision—about 70% of the patients rated their vision between 8 and 9, Dr. Izquierdo noted.

When rating intermediate vision, about 60% reported vision to be between 8 and 9. All patients rated distance vision between 8 and 10.

"The current diffractive multifocal IOLs typically provide good distance and near vision, but the intermediate vision is at a disadvantage with this IOL design," Dr. Izquierdo said. "The new trifocal IOL successfully restored all levels of vision after cataract surgery, as indicated by the defocus curve testing.

The increasing far-vision dominance of the IOL as the pupil size increased may effectively reduce the photic phenomena that are frequently associated with multifocal IOLs, he said.

"The study patients were very satisfied with their uncorrected vision at all distances," Dr. Izquierdo concluded.

The FineVision IOL is not yet approved in the United States. ■

LUIS IZQUIERDO JR., MD, PHD

E: *izquierdojrluis@hotmail.com*

Dr. Izquierdo has no financial interest in any aspect of the subject matter.

MUE program sets payment limits

What health-care providers need to know about the Medically Unlikely Edits initiative

coding.doc **By L. Neal Freeman, MD, MBA**

TAKE-HOME

- ***Though the Medically Unlikely Edits program began in 2007, many providers are still unfamiliar with the intent and mechanism of this project, which aims to reduce the rate of erroneously reported Medicare claims.***

Ophthalmologists are now accustomed to the new environment of coding and reporting limits imposed by various payers. One of the less-recognized, but nonetheless important, programs that moves Medicare further in that direction is the Medically Unlikely Edits (MUEs) initiative.

The MUE program began in 2007, but many providers are still unfamiliar with the intent and mechanism of this project. The stated intent of the program is to reduce the rate of erroneously reported Medicare claims.

These edits are generated by the same contractor responsible for National Correct Coding Initiative (NCCI) edits. Many providers know the NCCI edits as the "bundling" edits. Your local Medicare contractor enforces the edits.

The Centers for Medicare and Medicaid Services (CMS) website *(http://www.cms.gov/Medicare/Coding/NationalCorrectCodInitEd/MUE.html)* addresses this program. At this site, the program is described and a link to MUE values for practitioners is provided.

HOW IT WORKS

The basic concept behind this program is the edits place maximums on the number of units of service per code that can be reported by a provider for the same beneficiary on the same date of service. Any claim line where the "claim line MUE" value is exceeded will be denied.

The edits are established based on various factors, such as anatomic considerations and customary medical practice. These edits have not been generated for all CPT codes, however.

The medically unlikely edit value for total splenectomy (CPT 38100) is "1," because we have only one spleen.

A substantial majority of ophthalmic procedure codes carry an MUE value of "1." There are some exceptions, such as some strabismus and oculoplastics codes.

The MUE program is a prepayment program. This means the service will be denied before payment is generated. The program applies to all Part B services, including ambulatory surgery center and hospital outpatient claims. Patients may not be balance billed following a denial based upon an MUE.

Bilateral procedures should be reported with the –50 modifier to Medicare. Therefore, bilateral trabeculoplasty on a given date of service would be reported on one claim line as CPT 65855-50 with one unit of service. This would pass the edit screen, because the MUE value for 65855 is "1."

CMS has chosen not to publish all the MUE values against which it adjudicates claims. The stated intent of this policy is to prevent fraud. The apparent concern is that publication of high MUE values might encourage unscrupulous providers to report services at high volume, knowing that the edit will not be surpassed.

TYPES OF MUES

There are two varieties of MUEs.

- **The first is known as a "claim line" or "unit of service" edit. With a claim line edit, each line of a claim is compared with the MUE value. Claim lines for which the reported units of service are no greater than the MUE value will pass the edit.**

- **As of April 2013, a new type of MUE known as a "date-of-service" edit was created. With this type of MUE, the total number of units for a given code reported for a single date is compared with the edit value. Passing the edit requires that the total units for the given date does not exceed the listed value, regardless of the number of claim lines used to report the service.**

The list of codes subject to date-of-service edits, as opposed to claim line edits, is not released by CMS.

In situations where it is medically appropriate to report services in excess of a claim line edit, the edit may be bypassed with the use of particular modifiers. For example, a patient undergoing anterior chamber paracentesis of the right eye that needs a repeat paracentesis that day could be reported as 65800-76.

> 'The stated intent . . . is to reduce the rate of erroneously reported Medicare claims.' — L. Neal Freeman, MD, MBA

There is a mechanism by which these edits may be changed. However, the recommended first step is to contact a major ophthalmic organization, such as the American Academy of Ophthalmology, as it may be able to provide insight to the rationale for the edit value. Edit values are revised quarterly by CMS.

It will be well worthwhile to follow developments in this program, in addition to others that potentially limit reimbursement for services. ■

L. NEAL FREEMAN, MD, MBA, *is president and founder of CPR Analysts, Melbourne, FL (http://www.cpranalysts.com/). He advises physicians nationally on coding, reimbursement, and practice management. Dr. Freeman is a practicing ophthalmic plastic surgeon and a certified specialist in physician coding. Readers may contact Dr. Freeman at nfreeman@cpranalysts.com.*

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6:30-8:00 AM Interactive CME Symposium

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8:00-9:15 PM Dinner Reception

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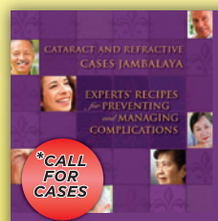

MONDAY, NOVEMBER 18, 2013
Cataract and Refractive Cases Jambalaya: Experts' Recipes for Preventing and Managing Complications

6:30-7:00 AM Registration & Breakfast Buffet
7:00-8:30 AM Interactive CME Symposium

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* This program includes a "**Call For Cases"** invitation for case submission. Please see the program registration site for more information.

** This program includes a Q&A Session with **"What Is Your Challenge?"** Discussion. Please see the program registration site for more information.

These CME symposia are not affiliated with the official program of the AAO Annual Meeting.

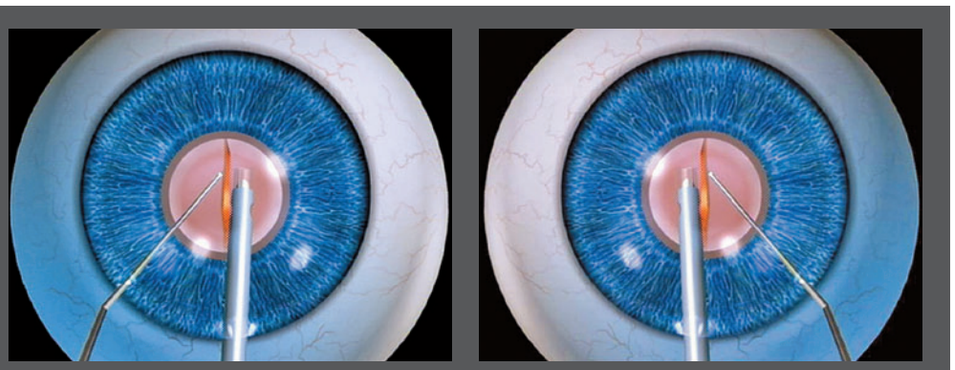
Ongoing debate over ISBCS

Political meddling in bilateral cataract surgery penalizing patient care, reimbursement

By Lynda Charters; *Reviewed by Steve A. Arshinoff, MD, FRCSC*

TAKE-HOME

- ***Immediately sequential bilateral cataract surgery may be in peril as a procedure because it is penalized to varying degrees by government-imposed reimbursement cuts.***



Considering the medical condition of some patients, bilateral cataract surgery is necessary, according to Steve A. Arshinoff, MD, Toronto. However, the procedure is becoming difficult to perform with governments worldwide imposing various restrictive funding models. Health-care delivery should be based on what is best for the patient, he noted. *(Images courtesy of Steve A. Arshinoff, MD, FRCSC)*

TORONTO :: **IMMEDIATELY SEQUENTIAL BILATERAL** cataract surgery (ISBCS) is being performed in numerous countries worldwide. In many countries, however, surgery performed in the second eye is seriously penalized financially.

Dr. Arshinoff

Steve A. Arshinoff, MD, FRCSC, co-president of the International Society of Bilateral Cataract Surgeons, offered arguments for equal payment for the second surgery.

"A large number of countries simply do not know what they are doing with regard to the finances of cataract surgery," said Dr. Arshinoff of the Departments of Ophthalmology and Visual Sciences, University of Toronto and McMaster University and Ben Gurion University of the Negev, Beer Sheva, Israel.

EXTENSIVE EXPERIENCE WITH ISBCS

Dr. Arshinoff reviewed his routinely performed ISBCS cases from January 1996 to December 2012—for a total of 8,046 eyes of a total of 10,406 cataracts (i.e., ISBCS represents 77.3% of all cataracts).

"Numerous articles and presentations have shown that ISBCS is as safe as delayed sequential bilateral cataract surgeries [DSBCS]," he said. "The incidence of complications is not higher with ISBCS and patients prefer ISBCS."

Dr. Arshinoff recounted the case of a 28-year-old man with Duchenne X-linked muscular dystrophy who traveled 200 miles to undergo ISBCS. The patient is unable to lift his arms and has 10% bone density.

The convenience of both surgeries was implicit since the patient spends his life in a wheelchair, with watching television and reading as his only activities. He underwent ISBCS with monovision on Jan. 2, 2013, after which his visual acuity was 20/20 at near and far on postoperative day 1.

Considering this patient and others who also are aged and/or infirm, the convenience of bilateral cataract surgeons performed in one session cannot be overstated.

"The choice of a medical procedure should be based on the weight of the medical evidence, or, if a new procedure, the expectation of improvement of the current practice by careful study and discussion among the profession, and not by politicians or administrators dictating practice based on poor understanding of the issues," Dr. Arshinoff said.

NO REIMBURSEMENT LOGIC

He argued that there is no logic to reimbursing the surgery on the second eye by less than the amount reimbursed for the surgery on the first eye.

In the United States, the physician is reimbursed only 50% for the surgery on the second eye.

In Japan and Israel, there is no reimbursement for the second eye.

In Ontario, Canada, historically, reimbursement for the second eye has been 15% less than that of the first eye.

It is becoming very difficult to perform bilateral cataract surgery in Ontario, Canada, with different jurisdictions imposing varying restrictive funding models that make no sense in eye care or any branch of health care, Dr. Arshinoff noted.

"In June 2012, the government of Ontario significantly changed surgical funding models, such that hospitals were no longer funded to perform bilateral cataract surgery in a socialized health-care system, thus financially eliminating the procedure," he said.

FEE ADJUSTMENTS

Ontario retroactively reduced the facility fees for surgery and issued a "patient-centered philosophy," meaning that a facility only gets paid for the first procedure performed. The logic behind this is that the patients, not procedures, are counted, and no money is reimbursed for any second procedure.

In October 2012, the Ontario government reversed the payment policy for the second eyes, but the amount paid to the facility was less than that for the first eye, specifically, $497 for the first eye and $326 (66%) for the second eye.

This rate scale was guaranteed for only 5 months, Dr. Arshinoff explained. Surgeons' cataract fees were reduced (inflation adjusted); in 2012 the rate was $397, with 15% less for the

Continues on page 44: ***'Meddling'***

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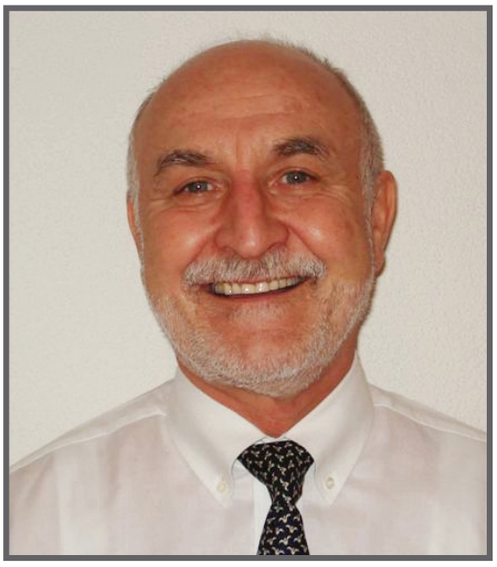

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'MEDDLING'

(Continued from page 42)

second eye ($337) compared with $966 (inflation adjusted dollars) per eye in 1987.

"In Canada, ISBCS generally has been an on-again, off-again proposition, with the surgery prohibited in my own jurisdiction from Aug. 1 to Oct. 31, 2012," Dr. Arshinoff explained. "We were then told that we must perform 400 more ISBCS cases (800 eyes) from Nov. 1, 2012, to March 31, 2013."

On Jan. 25, 2013, ISBCS was again halted. On March 1, physicians were told that they must perform 11 more ISBCS eyes by March 31, he added.

"We were subsequently given exact allocations from April 1, 2013 to March 31, 2014, with an exact number of ISBCS and DSBCS ± 0, with the second eyes of ISBCS again heavily discounted," Dr. Arshinoff pointed out. "In other words, we were told that we must perform an exact number of bilateral and an exact number of unilateral cataract surgeries, irrespective of what problems the patients presented."

SAVINGS IN MONEY AND TIME

Previous studies have supported the savings in money and time that ISBCS affords. A study by Leivo, et al. (*J Cataract Refract Surg.* 2011;37:1003-1008) estimated that the savings was €1,600 per patient.

O'Brien, et al. (*Can J Ophthalmol.* 2010; 45:596-601) enumerated the decreased social costs (to patients, families, and employers), institutional costs, and extra medical care costs due to fewer visits for ISBCS, yielding similar savings with ISBCS to the study of Leivo, et al.

If the estimated frequency of simultaneous bilateral endophthalmitis (SBE) is in the range of 1:100 million cases, as suggested in the literature, the potential cost savings of bilateral cataract surgery, if reimbursed fully, to the payer is about $100 billion U.S. dollars per anticipated SBE.

A logical approach to ISBCS would be for governments and other payers to pay the same fee for the second ISBCS surgery as for the first surgery, because the ISBCS surgeon is already saving the system more than $1,000 U.S. dollars per patient, Dr. Arshinoff noted.

"Sharing a small part of the financial gain from ISBCS with the surgeon would remove disincentives for ISBCS and save health-care systems huge amounts of money," he said.

"Delivery of health care should be based upon scientific evidence of what is best for the patient," Dr. Arshinoff concluded. "Ophthalmologists, globally, should politically resist imposed ill-conceived restrictive health-care schemes." ■

STEVE A. ARSHINOFF, MD, FRCSC
E: *ifix2is@sympatico.ca*

Dr. Arshinoff has no financial interest in the subject matter.

5 steps for better contact lens wear

Maximize success with contact lens patients by minimizing surface deposits

By David Kading, OD, FAAO, and Mile Brujic, OD, FAAO

Patients who wear contact lenses are constantly searching for a cleaner, more comfortable lens. Consider these 5 steps to help recommend a cleaner, healthier lens-wearing experience.

1 RUB LENSES

Although many patients have adopted a no-rub regimen for lenses that require lens care, rubbing still has significant value.

Part of the reason for not rubbing may be because of previous package labeling, and part may be secondary to complacent instructions given to patients by practitioners when recommending care solutions.

Within the past 3 years there have been three new contact lens solutions on the market; none have no-rub labeling. It is incumbent upon the eye-care practitioner (ECP) to educate patients on this vital habit to optimize lens-wearing success.

It has been well established that patients who rubbed their lenses reduced deposits on the surfaces of contact lenses compared with patients who simply rinsed and stored their lenses.[1]

In the era of silicone hydrogel (SiHy) lenses, it has been well established that SiHy lenses have very different deposition characteristic profiles than their hydrogel predecessors.[2]

Hydrogels tend to deposit more proteins than SiHys, and SiHys tend to deposit more lipids than hydrogels.[3]

Certain care systems are better designed to remove lipids effectively from the surfaces of lenses.[4]

It is incumbent upon ECPs to recommend strongly the solutions we want our patients to use and to reinforce proper use of the solutions, including correctly rubbing the lens.

Continues on page 46 : ***5 steps***

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In Brief

New technology

TRANSITIONS LAUNCHES NEW ADAPTIVE LENSES

PINELLAS PARK, FL :: **TRANSITIONS OPTICAL HAS ANNOUNCED** the launch of its new adaptive lenses, the Transitions Signature VII lenses with Chromea7 technology.

Available Jan. 7, 2014, the new lenses will replace the Transitions VI lenses in the Transitions family of products as the optimal lenses for maximum indoor clarity and responsiveness to UV outdoors, the company said.

Through its product development model—Life360—the company developed the new lenses to be more responsive in more situations, testing them in more than 200 conditions representing real-life lighting situations, including various temperatures, weather conditions, and geographies.

"There is a real opportunity for eye-care professionals to convert clear-lens wearers into Transitions lens wearers," said Brian Hauser, general manager, United States and Canada, Transitions Optical. "(The older) lenses have been in the market for 6 years. This is the longest we've gone without a generational change, so the new technology will create a lot of excitement.

(Photo courtesy of Transitions Optical)

"For the first time, we will be bringing attention to our new product technology by calling out both the newness of (the lenses) and the . . . technology by name in our consumer campaign," he said. "Eye-care professionals can recommend this new choice in adaptive lenses with more confidence than ever." ■

5 STEPS

(Continued from page 45)

2 IDENTIFY ALLERGY SUFFERERS

Patients who suffer from allergies tend to produce excessive mucous and discharge while their allergies are active.[5] Allergy patients are more likely to be symptomatic of contact lens discomfort. This is a concern particularly because the prevalence of allergies tends to be between 20% to 40% of the population.[6] Also, 70% of those who have systemic allergies will also have ocular symptoms.[7]

Although some of our patients will come in when symptomatic or let us know of allergy symptoms at other times of the year, many of our patients won't tell us of ocular symptoms, even when questioned, leading to under-diagnosing the condition.[8]

Patients, at times, will minimize certain symptoms during contact lens checkups because those patients may think that our recommendation would be to discontinue contact lens wear. These patients will, unfortunately, attempt to self-treat with over-the-counter options or temporally limiting lens wear.

Not identifying these patients during yearly visits is a concern. That's why we have patients bring in any contact lens-care products to appointments. This will give us an accurate view of what our patients are actually using, including using drops for discomfort during allergy season.

Fortunately, we have effective options to help patients with allergies, but it ultimately depends on us to identify these patients. Prescribing an effective mast-cell stabilizer/anti-histamine combination will help allergy patients by reducing symptoms and the amount of discharge.

Also, recommending a peroxide care system works well for these patients by providing maximum disinfection with a high level of cleaning efficacy.

3 BE VIGILANT ABOUT COMPLIANCE

It may sound surprising, but daily disposable contact lenses (DDCLs) should be replaced daily, 2-week lenses should be replaced every 2 weeks, and monthly lenses on a monthly basis. The compliance rate of each of the lens modalities varies significantly. DDCLs win the compliance battle because 88% of patients replace them as scheduled. Two-week lenses have a 48% compliance rate, while monthly lens wearers replace lenses with 72% compliance.

In fact, 2-week lens wearers wear their lenses on average for 27 days (2.6× the manufacturers' recommended replacement frequency (MRRF) and 1-month wearers wear theirs for 47 days on average (1.5× the MRRF).[9,10]

Manufacture s set these replacement schedules based on their impressions of what will provide the patient with the optimal lens-wearing experience. So, it is essential for both doctors and patients to follow this replacement schedule.

Some patients may need to replace lenses on a more frequent basis, but exceeding the recommended replacement schedule may put the patient at risk for suboptimal lens experiences, including deposit buildup.

Although it seems obvious that replacing lenses is better for patients, researchers discovered that patients achieved better end-of-day comfort, better vision, better end-of-day comfort at the close of the lens wearing cycle (2-week or 1-month), and better vision at the close of the lens wearing cycle (2-week or 1-month).[11]

4 UNDERSTAND CONTACT LENS SOLUTIONS CAN IMPROVE SURFACE QUALITIES

Contact lens solutions are a vital part of patients' contact lens-wearing experience. When a patient doesn't replace his or her lenses on a daily basis, it is crucial that he or she use a solution that is compatible with the lens.

Many of our patients are wearing SiHy lenses, and as such, the solution that patients use should reflect the technology.

Many of the soft lenses that we prescribe have a hydrophobic (water-repelling) backbone.

However, when patients initially place them on their eyes, the lenses have hydrophilic (water-loving) sites on the lens surface. As the tear surface becomes unstable throughout the day and begins to break up, the hydrophilic groups will migrate into the lens that produces a hydrophobic surface.[12]

One study, looking at the capabilities of a newer contact lens solution, found that the solution's unique wetting agent would embed itself into the hydrophobic areas, which recreates the hydrophilic nature of the lens.[12]

Older technology solutions, such as private label and generic, do not have the wetting capabilities designed specifically for SiHy lenses because they were invented prior to SiHy lenses hitting the market.

Ensure that each patient is using the lens solution that you recommended during the annual exam. Be sure to explain to patients the rationale of why you are prescribing it. By making certain that patients are using updated solutions, you can help to keep the surface of their lenses clear so that deposits don't have a chance to become embedded on the lens surface.

5 CONSIDER DDCLS FOR PATIENTS WHO CONTINUE TO HAVE PROBLEMS

DDCLs provide us with a viable option to help reduce deposition on the surface of lenses. With the lens being replaced every day, the previous day's wear is never a factor.

There are a number of options with DDCLs.

A variety of prescriptions and parameters are available in hydrogel materials. Vistakon and Alcon currently have SiHy daily disposable lenses on the U.S. market. ■

References

1. Cho P, Cheng SY, Chan WY, Yip WK. Soft contact lens cleaning: rub or no-rub? *Ophthalmic Physiol Opt.* 2009;29:49-57.
2. Nichols JJ. Deposition on silicone hydrogel lenses. *Eye Contact Lens.* 2013;39:20-23.
3. Cheung SW, Cho P, Chan B, Choy C, Ng V. A comparative study of biweekly disposable contact lenses: silicone hydrogel versus hydrogel. *Clin Exp Optom.* 2007;90:124-131.
4. M. Senchyna, P. Stauffer, J. Davis,et al. Characterization of a multi-purpose lens solution designed for silicone hydrogel materials. Poster presented at the Association for Research in Vision and Ophthalmology, May 2-7, 2010, Fort Lauderdale, FL.
5. Lemp MA. Contact lenses and associated anterior segment disorders: dry eye, blepharitis, and allergy. *Ophthalmol Clin North Am.* 2003;16:463-469.
6. Saban DR, Calder V, Kuo CH, et al. New twists to an old story: Novel concepts in the pathogenesis of allergic eye disease. *Curr Eye Res.* 2013;38:317-330.
7. Katelaris CH, Bielory L. Evidence-based study design in ocular allergy trials. *Curr Opin Allergy Clin Immunol.* 2008;8:484-488.
8. Abelson M. *Allergic Diseases of the Eye.* Philadelphia, PA: W.B. Saunders Co; 2000.
9. Dumbleton K, Woods C, Jones L, et al. Patient and practitioner compliance with silicone hydrogel and daily disposable lens replacement in the United States. *Eye & Contact Lens.* 2009;35:164-171.
10. Dumbleton K, Woods C, Jones L, Fonn D. The relationship between compliance with lens replacement and contact lens-related problems in silicone hydrogel wearers. *Cont Lens Anterior Eye.* 2011;34:216-222.
11. Dumbleton K, Woods C, Jones L, et al. Comfort and Vision with Silicone Hydrogel Lenses: Effect of Compliance. *Optom Vis Sci.* 2010;87:421-425.
12. Epstein A, Stone R. Surface and polymer chemistry: the quest for comfort. *Rev Cornea Contact Lens.* 2010;247:15-19.

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MILE BRUJIC, OD, FAAO

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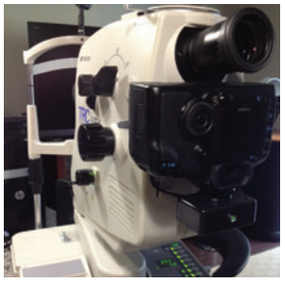

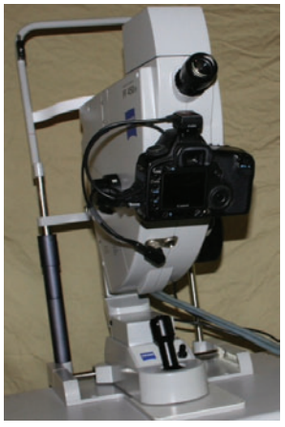

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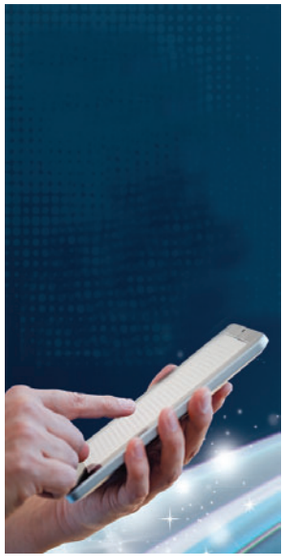

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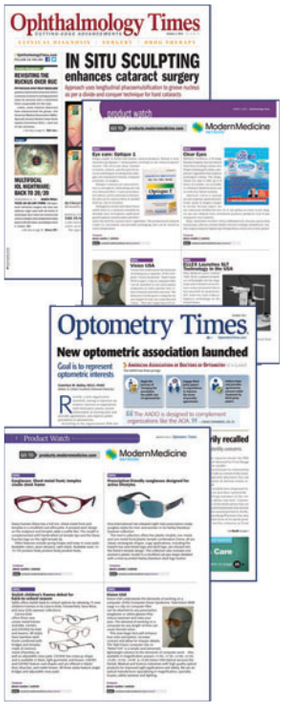

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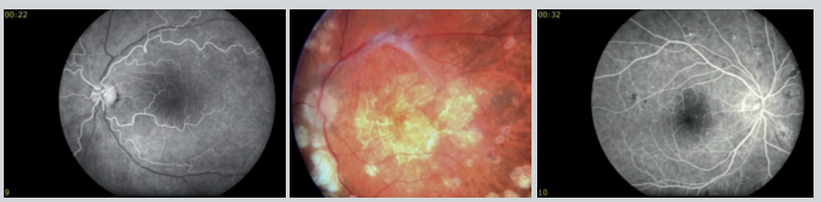

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Proptosis and vision loss

Male presents with left-sided, painful proptosis, decreased vision: What is diagnosis?

By Courtney Y. Kauh, MD, MS; Cesar A. Briceno, MD; Victor M. Elner, MD, PhD; Christine C. Nelson, MD, FACS

A 69-year-old African American male was transferred from an outside hospital, having been brought in from his nursing home for worsening left orbital proptosis of unknown duration.

The patient had developed dementia over the course of 1 year and was largely uncommunicative and hard of hearing. However, he was able to report painful swelling of his left eye for about 3 months.

His past medical history confirmed his 3-month history of left ocular proptosis and was significant for microscopic hematuria and end-stage renal disease of unknown etiology. Other diseases listed were cerebrovascular accident, lymphoma, hypertension, diabetes, thyroid disease, arthritis, and vocal cord granuloma.

His ocular history was significant for cataracts, bilateral uveitis, and elevated left IOP. Medications included warfarin and several drugs for kidney disease and hypertension, as well as brimonidine in the left eye.

EXAMINATION

His visual acuity was 20/100, right and no light perception, left. He had a left afferent pupillary defect. IOPs were 17 mm Hg, right and averaged 34 mm Hg, left.

There was 6 mm of relative left ocular proptosis with increased resistance to retropulsion. Sensation was intact and symmetric over the cranial nerve V1-V3 distributions, bilaterally. The soft, boggy left upper eyelid was easily elevated manually. Right ocular ductions were normal, but ductions of the left hypotropic and exotropic eye were absent (Figures 1 and 2).

The patient was afebrile and hypertensive; laboratory studies showed hypokalemia, hypercalcemia, azotemia, and elevated creatinine, and he had a normal white blood cell count.

The computed tomography (CT) scan from the referring hospital revealed a mass occupying most of the left orbit, extending into the orbital apex. The mass caused displacement and distortion of the globe and optic nerve.

His paranasal sinuses appeared well pneumatized, but there was complete bilateral opacification of the mastoid sinuses and middle ear cavities (Figures 3 and 4).

The differential diagnosis for his unilateral proptosis included: acute etiologies such as infectious (cellulitis), hemorrhagic (retrobulbar hemorrhage), and vascular (cavernous sinus thrombophlebitis) causes, as well as chronic etiologies such as inflammatory (Graves' disease, sarcoidosis, ANCA-associated vasculitides, idiopathic orbital inflammatory pseudotumor), and malignant (lymphoma, lacrimal gland tumor) causes.

Given the patient's history and clinical presentation, a chronic process was suspected. Because of his history of lymphoma and concern that the orbital mass represented a recurrence, orbital biopsy was performed through a lid crease approach to obtain a tissue diagnosis.

Histopathologic findings were diagnostic of Wegener's granulomatosis.

Further evaluation of the patient revealed elevated erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP), as well as positive C-ANCA levels all of which confirmed the diagnosis. A CT scan of the chest was negative for pulmonary involvement.

One month after promptly beginning cyclophosphamide and prednisone treatment, his orbital proptosis was found to be improved.

However, 4 months later, the proptosis worsened and the patient was switched from cyclophosphamide to rituximab, which he is currently continuing.

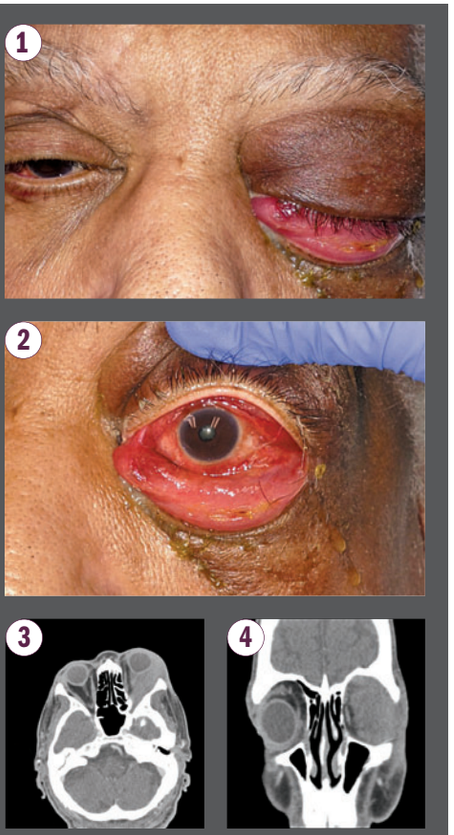
DISCUSSION AND DIAGNOSIS

Wegener's granulomatosis is an idiopathic, systemic inflammatory autoimmune disease that is characterized by a classical clinical triad of: granulomatous inflammation of the respiratory tract, necrotizing vasculitis, and glomerulonephritis. Peak incidence is in the fourth to fifth decade of life, affecting the sexes equally. It is more common among Caucasians and rare in African Americans.[1]

Immunofluorescence staining for this disease is positive for cytoplasmic antinuclear cytoplasmic antibodies (c-ANCA) in 80-90% of patients.[2] These antibodies are directed against enzymes in granules of neutrophils and monocytes, namely serine proteinase 3 (PR3) or myeloperoxidase (MPO).

Eye symptoms and signs are the first manifestation of Wegener's granulomatosis in 15% of patients, while an additional 35% to 45% develop eye involvement during the course of their disease.[1,3] Inflammation can occur in different parts of the eyes and may result in conjunctivitis, episcleritis, keratitis, scleritis, uveitis as well as vasculitis of the retina.[2]

Orbital involvement has been reported in 15% of patients.[4] These patients may present



1 **Patient with left-sided proptosis.**

2 **Patient's left eye with manual elevation of upper eyelid.** *(Figures 1 and 2 courtesy of Courtney Y. Kauh, MD, MS)*

3 **Axial computed tomography (CT) scan demonstrating left-sided proptosis caused by large orbital apex mass.**

4 **Coronal CT further demonstrating large orbital apex mass.** *(Figures 3 and 4 courtesy of Courtney Y. Kauh, MD, MS; Cesar A. Briceno, MD; Victor M. Elner, MD, PhD; and Christine C. Nelson, MD, FACS)*

with proptosis, diplopia, and lacrimal drainage system obstruction, as well as lid erythema, orbital pain, bony erosion, or compressive optic neuropathy.

Disease involving the orbit most commonly presents as subacute painful proptosis. Typically, it starts with gradually but progressively increasing pain and proptosis over 1 to 2 months, followed by rapid deterioration with exacerbated pain, inflammation, optic nerve compression, and visual loss.[5]

HOW DISORDER PRESENTS

The classic features of Wegener's granulomatosis are vasculitis, glomerulonephritis, and granulomas of the upper and lower respiratory tract. However, it can affect almost any organ system and often presents with nonspecific symptoms and signs, resulting in misdiagnosis or delay in diagnosis.

In 90% of patients, upper respiratory disease is often the initial presentation,[1] but it may be unrecognized for several months until other manifestations of Wegener's granulomatosis arise. When the respiratory system is affected, nasal obstruction, nasal crusting, frequent nosebleeds, chronic sinusitis, and subglottic stenosis can occur. Also, pulmonary nodular disease and necrotizing granulomatous inflammation can occur and cause nonspecific symptoms, such as cough, dyspnea, hemoptysis, and post-obstructive infection.

Renal involvement is common with about 80% of patients affected.[2] Inflammation occurring in the kidneys can lead to proteinuria and hematuria and if it is not treated aggressively, kidney failure may occur.

When the musculoskeletal system is involved, ill-defined myalgia and arthralgia or arthritis may be present.

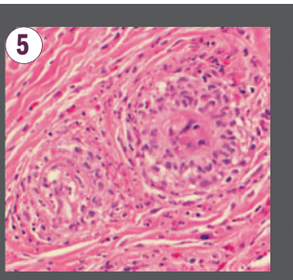
Many kinds of skin rashes may occur, the most common form appearing as small purple or red dots on the lower extremities, known as palpable purpura.

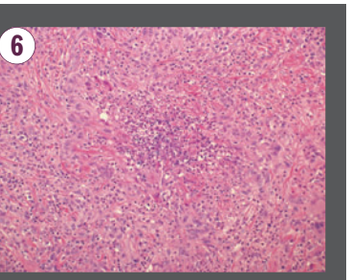
About 21% to 45% of patients with generalized disease can have some degree of neurological involvement that can manifest as stroke, seizures, multiple cranial neuropathies, polyneuritis, and peripheral neuropathy.[6] Inflammation can also lead to blockage of eustachian tubes and cause chronic middle ear infections or directly result in hearing loss. A limited form of the disease affecting fewer and less vital tissues with non-life threatening inflammation also exists.[7]

Laboratory studies usually reveal elevated ESR and CRP. In patients with renal involvement, urinalysis may show microscopic hematuria and proteinuria that are manifestations of underlying glomerulonephritis.

Results of serological testing for c-ANCA are positive in the majority of patients with systemic involvement and are positively correlated with disease activity. In limited disease, a negative c-ANCA result is more common. A negative result does not exclude the diagnosis of either form of the disease.

The gold standard for diagnosis of Wegener's granulomatosis is a tissue biopsy, which demonstrates a constellation of microabscesses, granulomatous inflammation, and necrotizing vasculitis and often causing parenchymal necrosis. The inflammatory infiltrate may also include scattered neutrophils, giant cells, lymphocytes, plasma cells, and eosinophils. Focal areas of necrosis are often associated with obliteration of normal fat[8] (Figures 5 and 6).





5 **Patient's orbital mass biopsy demonstrating vasculitis with infiltration by neutrophils and eosinophils.**

6 **Patient's orbital mass biopsy demonstrating microabscesses with surrounding granulomatous inflammation.** *(Figures 5 and 6 courtesy of Victor M. Elner, MD, PhD)*

The aim of therapy is to induce and maintain disease remission. Early effective treatment is important because it can significantly reduce morbidity and mortality.

Current treatment recommendations depend on the severity and activity of disease, with most cases treated using a combination of corticosteroids and a cytotoxic or biologic agent. Typical agents are cyclophosphamide and rituximab for initial treatment of active, severe disease followed by better-tolerated agents, including methotrexate or azathioprine for maintenance therapy.[9,10]

If left untreated, the disease is often fatal. Historically about 90% of patients died within 2 years. Improved treatment regimens have resulted in improved survival and reduced morbidity with most studies now reporting a 5-year survival of 70% to 80%.[11] About one-third of patients relapse usually within 18 months of stopping treatment, but recurrence can occur at any time.[12]

Our patient presented with unilateral ocular involvement that led to a delayed diagnosis of Wegener's granulomatosis. His medical history revealed end-stage renal disease, stroke, hearing loss, arthritis, and vocal cord granuloma, most or all of which were probably manifestations of the disease.

Wegener's granulomatosis is a multisystem vasculitis that often presents with non-specific generalized symptoms and signs affecting various tissues. Because of this, delay in diagnosis is common. However, early effective treatment significantly improves morbidity and mortality.

Ophthalmologic involvement is common and other systemic manifestations should be sought. It is important for ophthalmologists to keep this disease in their differential diagnosis when evaluating eye disease, because early recognition may significantly improve outcomes of this highly morbid disease. ■

References

1. Hoffman GS, Kerr GS, Leavitt RY, et al. Wegener granulomatosis: an analysis of 158 patients. *Ann Intern Med.* 1992;116:488–498.
2. Tarabishy AB, Schulte M, Papaliodis GN, Hoffman GS. Wegener's granulomatosis: clinical manifestations, differential diagnosis, and management of ocular and systemic disease. *Surv Ophthalmol.* 2010;55:429–444. doi:10.1016/j.survophthal.2009.12.003.
3. Pakrou N, Selva D, Leibovitch I. Wegener's granulomatosis: ophthalmic manifestations and management. *Semin Arthritis Rheum.* 2006;35:284–292. doi:10.1016/j.semarthrit.2005.12.003.
4. Sadiq SA, Jennings CR, Jones NS, Downes RN. Wegener's granulomatosis: The ocular manifestations revisited. *Orbit.* 2000;19:253–261.
5. Santiago YM, Fay A. Wegener's granulomatosis of the orbit: a review of clinical features and updates in diagnosis and treatment. *Semin Ophthalmol.* 2011;26:349–355. doi:10.3109/08820538.2011.588662.
6. Almouhawis HA, Leao JC, Fedele S, Porter SR. Wegener's granulomatosis: a review of clinical features and an update in diagnosis and treatment. J *Oral Pathol Med.* 2013;42:507–516. doi:10.1111/jop.12030.
7. Carrington CB, Liebow A. Limited forms of angiitis and granulomatosis of Wegener's type. *Am J Med.* 1966;41:497–527.
8. Fechner FP, Faquin WC, Pilch BZ. Wegener's granulomatosis of the orbit: a clinicopathological study of 15 patients. *Laryngoscope.* 2002;112:1945–1950. doi:10.1097/00005537-200211000-00007.
9. Langford CA. Update on the treatment of granulomatosis with polyangiitis (Wegener's). *Curr Treat Options Cardiovasc Med.* 2012;14:164–176. doi:10.1007/s11936-012-0165-x.
10. Geetha D, Seo P. Advances in therapy for ANCA-associated vasculitis. *Curr Rheumatol Rep.* 2012;14:509–515. doi:10.1007/s11926-012-0284-0.
11. Semple D, Keogh J, Forni L, Venn R. Clinical review: Vasculitis on the intensive care unit–part 2: treatment and prognosis. *Crit Care.* 2005;9:193–197. doi:10.1186/cc2937.
12. Nachman PH, Hogan SL, Jennette JC, Falk RJ. Treatment response and relapse in antineutrophil cytoplasmic autoantibody-associated microscopic polyangiitis and glomerulonephritis. *J Am Soc Nephrol.* 1996;7:33–39.

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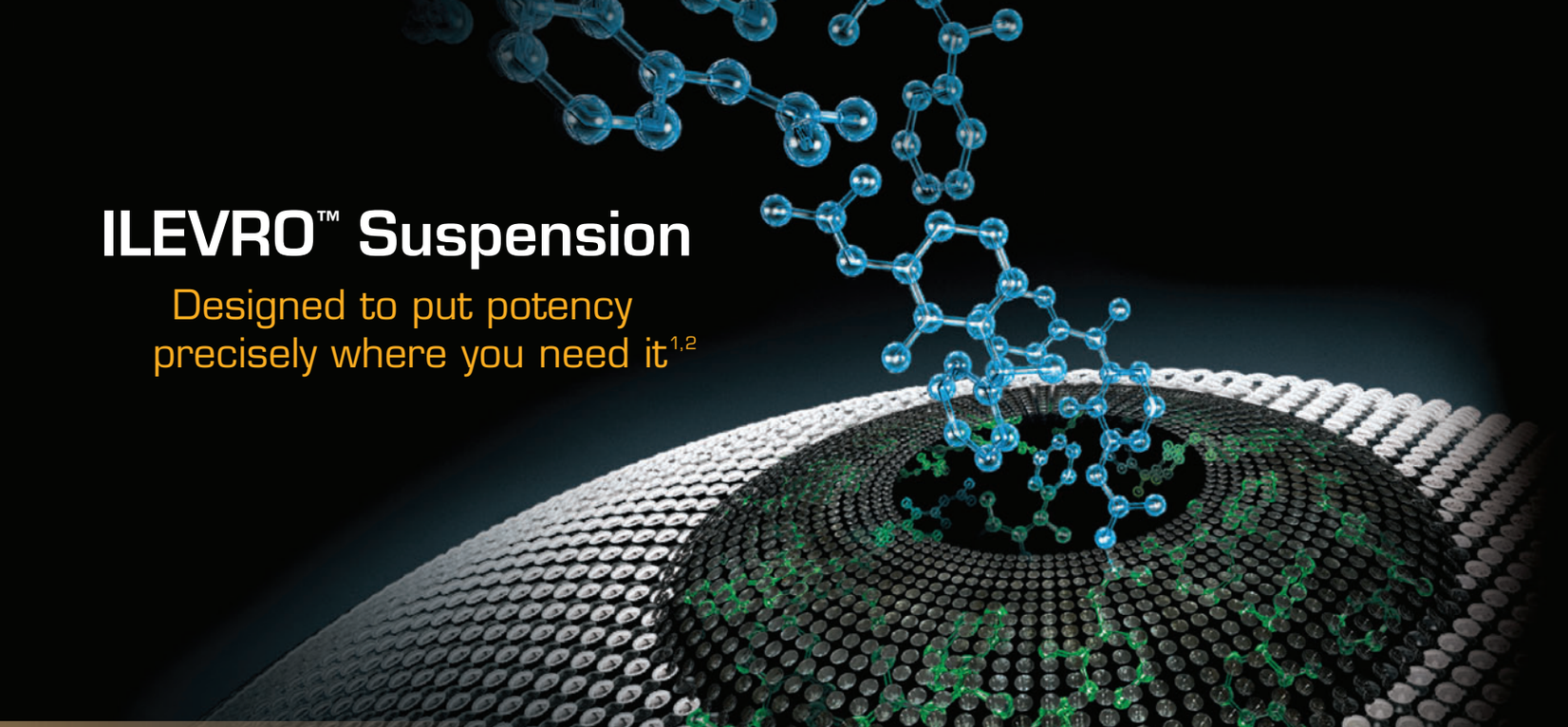

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- Increased Bleeding Time – With some nonsteroidal anti-inflammatory drugs including ILEVRO™ Suspension there exists the potential for increased bleeding time. Ocularly applied nonsteroidal anti-inflammatory drugs may cause increased bleeding of ocular tissues (including hyphema) in conjunction with ocular surgery.
- Delayed Healing – Topical nonsteroidal anti-inflammatory drugs (NSAIDs) including ILEVRO™ Suspension may slow or delay healing. Concomitant use of topical NSAIDs and topical steroids may increase the potential for healing problems.
- Corneal Effects – Use of topical NSAIDs may result in keratitis. In some patients, continued use of topical NSAIDs may result in epithelial breakdown, corneal thinning, corneal erosion, corneal ulceration or corneal perforation. These events may be sight threatening. Patients with evidence of corneal epithelial breakdown should immediately discontinue use.

  Patients with complicated ocular surgeries, corneal denervation, corneal epithelial defects, diabetes mellitus, ocular surface diseases (e.g., dry eye syndrome), rheumatoid arthritis, or repeat ocular surgeries within a short period of time may be at increased risk for corneal adverse events which may become sight threatening. Topical NSAIDs should be used with caution in these patients.

  Use more than 1 day prior to surgery or use beyond 14 days post-surgery may increase patient risk and severity of corneal adverse events.
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For additional information about ILEVRO™ Suspension, please refer to the brief summary of prescribing information on adjacent page.

References: 1. Ke T-L, Graff G, Spellman JM, Yanni JM. Nepafenac, a unique nonsteroidal prodrug with potential utility in the treatment of trauma-induced ocular inflammation, II: In vitro bioactivation and permeation of external ocular barriers. *Inflammation*. 2000;24(4):371-384. **2.** Data on file. **3.** ILEVRO™ Suspension package insert.

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