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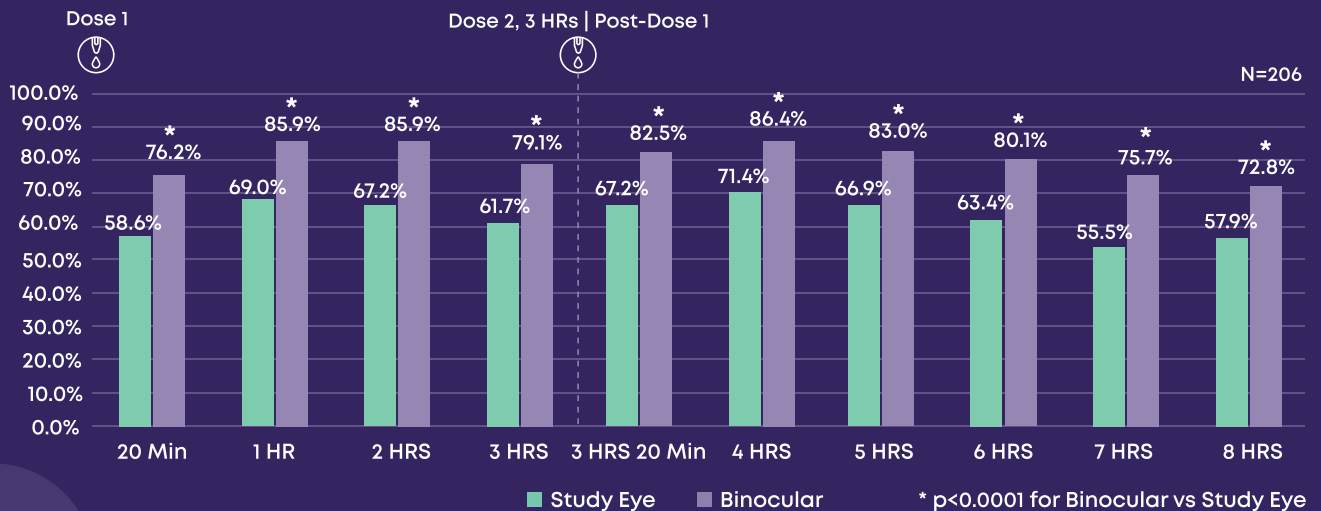


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References

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Randomized Trial Compares Two Glaucoma Approaches

Researchers from Sweden and Iceland have found a difference in outcomes between intensive initial therapy for glaucoma and standard medical therapy for certain patient presentations, and published their results in a recent issue of the *American Journal of Ophthalmology*.¹

The randomized, controlled Glaucoma Intensive Treatment Study (GITS) consisted of 242 patients with newly detected and previously untreated open-angle glaucoma. They were randomized to either a conventional stepwise escalating strategy, starting with a single IOP-lowering medication, or to intensive treatment with IOP-lowering eye drops from three medication classes followed by 360-degree laser trabeculoplasty one week after the start of the drug. The subjects were followed for five years. The patients receiving mono-treatment were prescribed a prostaglandin (81 percent) or a β -blocker (19 percent). The researchers say that participants randomized to multi-treatment were prescribed any available type of combination drop plus a drop from a third drug class. They say that typical prescriptions were bimatoprost/timolol or travatan/timolol fixed combinations plus brinzolamide or dorzolamide as the third substance. One week after initiation of the drops in multi-treatment participants, a full 360-degree LTP was performed. The laser procedure was performed with selective laser trabeculoplasty in 82 percent and argon laser trabeculoplasty in 18 percent of participants.



Selective laser trabeculoplasty was one of the procedures combined with medication and then compared to medication alone in the randomized study.

The primary outcome was the predicted remaining visual field, as measured by the visual field index at projected end of the patient's life. Among the exclusion criteria were eyes with worse than moderate stage visual field loss, less than 65 percent of a full field as defined by the summary VFI. The researchers say the reason for this exclusion was to reduce the risk of reaching the practical limits for use of VFI rates of progression.

Boel Bengtsson, PhD, an associate professor of ophthalmology at the Department of Clinical Sciences at Lund University in Sweden, describes how they projected what the patients' visual fields would likely be at the end of life. "The speed of progression (rate of progression in percentage point per year) was calculated by linear regression analysis of the visual field summery index over time," she explains. "The VFI

expresses the remaining visual field in percent of a full field. The projected VFI at end-of-life was estimated by extrapolation of rate of progression slope until the time for the individual predicted residual life expectancy, in other words, the time for the age-corrected life expectancy."

In terms of results, the researchers report that the median untreated intraocular pressure was 24 mmHg in both treatment groups. During follow-up, median and mode IOP were 17 mmHg in the mono- and 14 mmHg in the multi-treatment group. In the mono-treatment group, the median VFI at projected end of life was 79.3 percent and in the multi-treatment group 87.1 percent ($p=0.15$). The annual rate of progression of visual field damage was faster in mono-treatment than in multi-treatment patients; median losses per year were 0.65 and 0.25 percentage

units, respectively ($p=0.09$). Progression events occurred in 21 percent of the mono- and in 11 percent of the multi-treatment participants ($p=0.03$). Adverse events, mostly mild, were reported in 25 percent of the mono- and in 36 percent of the multi-treatment participants. “Differences in visual field outcomes between treatment groups were more pronounced in participants having higher baseline IOP, defined by median split of untreated IOP values,” the researchers note. After five years, more than five times as many eyes with higher baseline IOP had progressed in the mono-treatment group than in the multi-treatment group. There was no difference between treatment groups in patients with lower untreated IOPs.

“The main results weren’t surprising,” says Dr. Bengtsson. “We expected lower IOP in participants randomized to immediate multi-treatment than in participants randomized to initial mono-

treatment. Neither was it surprising that the visual field development was more favorable in the multi-treated group, especially in eyes with higher untreated baseline IOP as defined by median split of the untreated IOP, and in eyes with pseudoexfoliation glaucoma. The latter were quite few, however, with 33 participants in each treatment arm. The difference between mono- and multi-treated eyes was significantly smaller and was non-existent in the event analysis.

“When it comes to adverse events,” Dr. Bengtsson continues, “possibly or probably caused by the glaucoma medication, more such events were reported in the multi- than in the mono-treated group. That result was also expected, but the difference was perhaps smaller than guessed considering the intensity of treatment: two drops containing medication of three different classes plus 360-degree laser trabeculoplasty.”

For surgeons looking for a take-home

message from the study, Dr. Bengtsson offers some pearls. “Consider starting at diagnosis with intensive treatment to reach an immediate IOP in the lower range between 10 and 20 mmHg in glaucoma patients having high untreated IOP on repeated measurements,” she says. “Glaucoma patients with lower untreated intraocular pressure don’t seem to benefit from initial intensive treatment. We defined higher and lower IOP by a simple median split of the untreated baseline IOP based on three measurements most often obtained within a few days. We can’t present a certain limit for higher untreated IOP for which eyes will profit of initial intensive treatment. That would require a much larger sample.”

1. Bengtsson B, Heijl A, Aspberg J, et al. The Glaucoma Intensive Treatment Study (GITS): A randomized controlled trial comparing intensive and standard treatment on 5 years visual field development. *Am J Ophthalmol* 2024;266:274-288.

Long-term DMEK Visual Outcomes Appear Positive

Corneal surgeons have shifted from penetrating keratoplasty to various lamellar procedures for very many diseases requiring a graft, and Descemet membrane endothelial keratoplasty (DMEK) has become a workhorse for conditions like Fuchs’ dystrophy and bullous keratopathy. Still, questions remain about long-term results; most published studies go out to about five years postoperatively. To better understand the durability of this treatment, researchers from Germany recently conducted a 10-year follow up study.¹

“Our results show that the final visual acuity outcome after DMEK can be estimated at six months after surgery and remains stable for up

to 10 years at around 0.1 logMAR, considering all eyes, including those with retinal comorbidity,” stated the researchers in a paper published in *Cornea*.

The researchers assessed 54 eyes (38 DMEKs and 16 triple-DMEKs) five years after surgery, the minimum follow-up period needed to meet the criteria for this long-term study. Only 37 eyes (69 percent) were available for follow-up between years eight and 10. The mean age for patients at the beginning of the study was 68.9 years. All eyes began with a mean baseline best-corrected visual acuity of 0.6 \pm 0.3 logMAR, or approximately 20/80 Snellen. They were able to achieve 0.1

\pm 0.2 logMAR at six months postoperatively, or approximately 20/25, which was maintained throughout the one-, five- and 10-year follow-up periods.

When analyzing each patient’s endothelial cell density, the researchers discovered a 26.9 percent loss in the first year and a 4 percent average annual loss thereafter, for a final result of 61 percent loss as the end of the 10-year period. However, there was no correlation between this finding and best-corrected visual acuity scores.

Other measurements analyzed included central corneal thickness, graft survival rate and the incidence of open-angle glaucoma. “This study shows that BCVA is still excellent 10 years after DMEK, although endothelial cell density decreases steadily, and central corneal thickness consecutively increases and reaches preoperative values,” mentioned the researchers in their paper. “The graft survival rate was excellent over 10 years. DMEK and Triple-DMEK didn’t induce

(Continued on p. 12)

CORRECTIONS

In the November article, “Managing Cross-linking Complications,” Peter Hersh, MD, was incorrectly identified as medical director for Glaukos. He is actually a principal investigator for the company’s clinical trials. In November’s Editorial, the work of Paul




Hahn, MD, was cited. He is no longer the chair of the ASRS Research and Safety in Therapeutics Committee, however, as was stated. He is currently the chair of ASRS’ Council on Education.

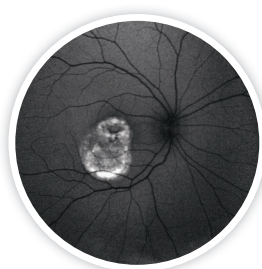
Review of Ophthalmology regrets the errors.



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References:

1. Data on File. DOF2023CT4023
2. Data on File. 2024DOF4003
3. Data on File. 2024DOF4005

4. Data on File. DOF2023CT4007
5. Data on File. 2024DOF4033

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2024 YEAR IN REVIEW

As practicing ophthalmologists, our readers have numerous demands on their time: patient exams; surgery; postop visits; and practice management duties, just to name a few. With so much going on, it's tough for busy physicians to keep up with every article we publish, or even to remember in which issue an interesting article appeared.

That's where our 2024 Year in Review issue comes in. This digital-only 13th edition will include articles that run the gamut of ophthalmology topics, ranging from practical, how-to cataract surgery articles and tips for dry-eye management to expert takes on glaucoma, retina, pediatrics and oculoplastics. After perusing our Year in Review, ophthalmologists can feel confident that they didn't miss out on anything important from 2024.



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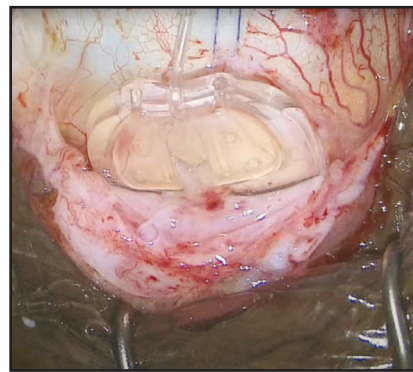
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WILLS EYE RESIDENT CASE SERIES

A patient presents with a swollen eyelid and ptosis.

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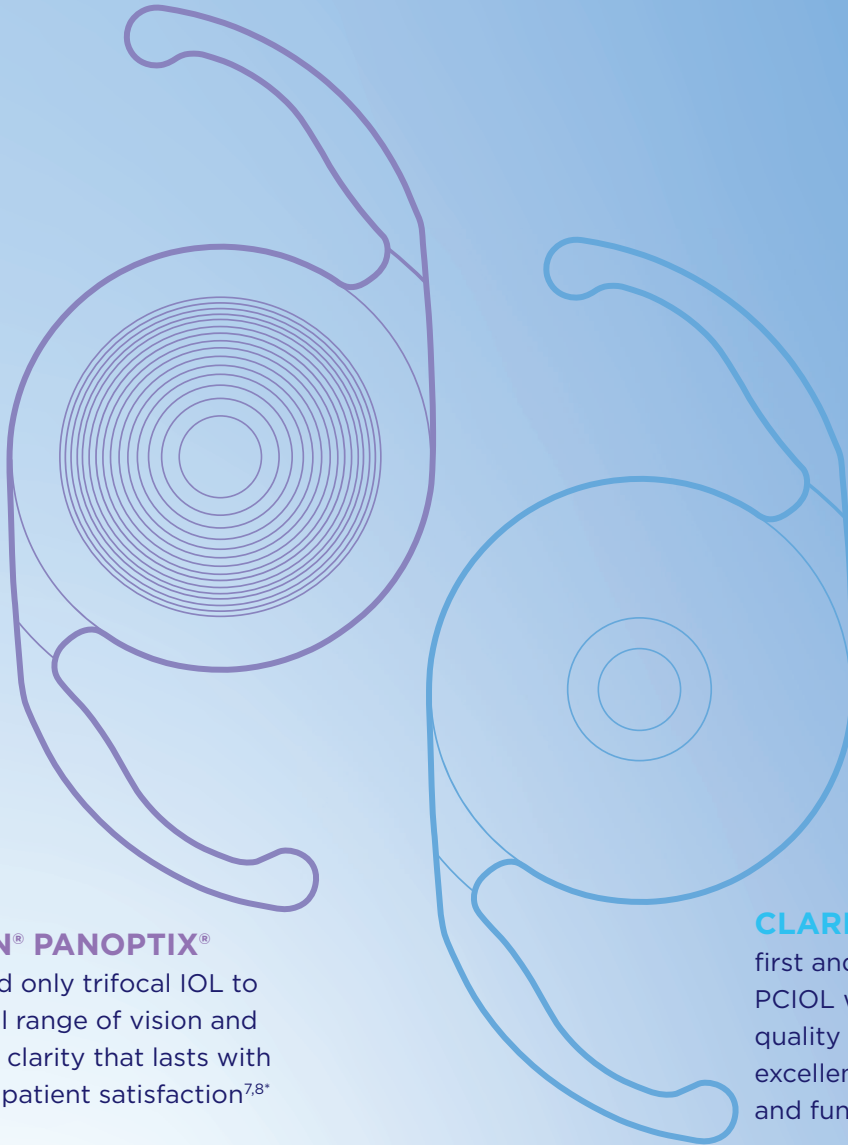
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* Defined as modified Miyata grade 0, <25mv/mm² over 3 years (n=138), and over 9 years (n=20), respectively. PCIOL=Presbyopia Correcting IOL.

† Results from a prospective, randomized, parallel group, subject- and assessor-masked, multisite trial of 107 subjects bilaterally implanted with the AcrySof® IQ Vivity® Extended Vision IOL and 113 with the AcrySof® IQ IOL with 6 months follow-up.

‡ Snellen VA was converted from logMAR VA. A Snellen notation of 20/20-2 or better indicates a logMAR VA of 0.04 or better, which means 3 or more of the 5 ETDRS chart letters in the line were identified correctly.

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For the **Clareon® PanOptix® IOL**, some visual effects may be expected due to the superposition of focused and unfocused multiple images. These may include some perceptions of halos or starbursts, as well as other visual symptoms. As with other multifocal IOLs, there is a possibility that visual symptoms may be significant enough that the patient will request explant of the multifocal IOL. A reduction in contrast sensitivity as compared to a monofocal IOL may be experienced by some patients and may be more prevalent in low lighting conditions. Therefore, patients implanted with multifocal IOLs should exercise caution when driving at night or in poor visibility conditions. Patients should be advised that unexpected outcomes could lead to continued spectacle dependence or the need for secondary surgical intervention (e.g., intraocular lens replacement or repositioning). As with other multifocal IOLs, patients may need glasses when reading small print or looking at small objects. Posterior capsule opacification (PCO), may significantly affect the vision of patients with multifocal IOLs sooner in its progression than patients with monofocal IOLs.

For the **Clareon® Vivivity® IOL**, most patients implanted with the **Vivivity® IOL** are likely to experience significant loss of contrast sensitivity as compared to a monofocal IOL. Therefore, it is essential that prospective patients be fully informed of this risk before giving their consent for implantation of the **Clareon® Vivivity® IOL**. In addition, patients should be warned that they will need to exercise caution when engaging in activities that require good vision in dimly lit environments, such as driving at night or in poor visibility conditions, especially in the presence of oncoming traffic. It is possible to experience very bothersome visual disturbances, significant enough that the patient could request explant of the IOL. In the parent AcrySof® IQ Vivivity® IOL clinical study, 1% to 2% of AcrySof® IQ Vivivity® IOL patients reported very bothersome starbursts, halos, blurred vision, or dark area visual disturbances; however, no explants were reported.

Prior to surgery, physicians should provide prospective patients with a copy of the Patient Information Brochure available from Alcon informing them of possible risks and benefits associated with these IOLs.

ATTENTION: Reference the Directions for Use labeling for each IOL for a complete listing of indications, warnings and precautions.

REFERENCES: 1. Market Scope 2023 Premium Cataract Surgery. 2 Alcon, Data on File, 2022. 3. Alcon, Data on file 2024. 4. Oshika T, Fujita Y, Inamura M, Miyata K. Mid-term and long-term clinical assessments of a new 1-piece hydrophobic acrylic IOL with hydroxyethyl methacrylate. *J Cataract Refract Surg.* 2020 May;46(5):682-687. 5. Maxwell A, Suryakumar R. Long-term effectiveness and safety of a three-piece acrylic hydrophobic intraocular lens modified with hydroxyethyl-methacrylate: an open-label, 3-year follow-up study. *Clin Ophthalmol.* 2018;12:2031-2037. 6. Clareon® Vivivity® Extended Vision Hydrophobic IOL (CNWETO) Directions for Use – US. 7. Clareon® PanOptix® Trifocal Hydrophobic Acrylic IOL Model: CNWTT0 DFU. 8. Lehmann R, Maxwell A, Lubeck DM, Fong R, Walters TR, Fakadej A. Effectiveness and Safety of the Clareon® Monofocal Intraocular Lenses: Outcomes from a 12-Month Single-Arm Clinical Study in a Large Sample. *Clin Ophthalmol.* 2021;15:1647-1657. Published 2021 Apr 20.

REVIEW NEWS

DMEK Outcomes

(Continued from page 6)

chamber angle synechiae. The significant increase in open-angle glaucoma over the long follow-up most likely reflects the risk of developing glaucoma with aging.”

1. Teubert S, Borgardt K, Steindor F, et al. Ten-year follow-up after Descemet membrane endothelial keratoplasty. *Cornea.* October 29, 2024. [Epub ahead of print].

Predicting the Success of Macular Hole Surgery

A study from 2023 identified a qualitative metric to assess photoreceptor loss in patients with full-thickness macular holes (FTMH), which may help clinicians estimate postoperative visual recovery. The author characterized border hole morphology into two subtypes: smooth and bumpy. The latter subtype was found to be associated with photoreceptor disruption that negatively influenced functional and anatomical recovery.

While that investigation focused on the number of photoreceptor cells lost, researchers of a new study hypothesized that “a deeper insight into the macular hole potential recovery after surgery could be done by focusing on residual photoreceptor cells on the hole hedge.”¹ The team used en face OCT to quantify these photoreceptor remnants and calculate the photoreceptor integrity index (PIIN) to determine whether the novel metric can predict FTMH postoperative recovery.

In the new study, photoreceptor integrity correlated to functional and anatomical visual outcomes of full-thickness macular hole. Once validated in further studies, the quantitative metric may help clinicians better predict post-op visual recovery and set realistic expectations for patients, the researchers say. Images from the study of an illustration and an en face OCT scan (p. 16), show densely packed photoreceptors at the border of the hole, with disrupted ones that fall off the border and lie over the RPE as remnants. Considering the oxygen’s role in photoreceptors nutrition through choroid, at the maximum height of neurosensory detachment and by focusing at the end of the external limiting membrane, the hypoxic phenomenon may be exacerbated due to the distance from the first oxygen and nutrients source, the researchers explain in their paper.

“The PIIN, calculated as the ratio of photoreceptor area to lumen hole area measured at customized segmentation, was correlated with the minimum and base diameters of the hole, positive change in BCVA, preoperative ellipsoid zone defect, preoperative external limiting membrane (ELM) defect and changes in ellipsoid zone and ELM over the six-month follow-up period,” the researchers explained in their paper.

Thirty-eight eyes of 38 patients with FTMH were enrolled in the study and imaged before and after surgery. The results showcased that a higher PIIN correlated positively with better postoperative recovery over six months, marked by significant improvements in BCVA. A secondary analysis confirmed the use of PIIN as a clinically significant predictor of postoperative

(Continued on p. 16)

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Health Insurers Are In the DOGE House

One of the plans of the incoming Trump Administration is the establishment of the Department of Government Efficiency, which aims to drastically cut spending and waste. Well, Walt Bethke, DOGE Agent, Junior Grade, reporting for duty.

We've all heard that there's going to be a 2.83-percent cut to Medicare's physician reimbursement amount in 2025. Using past Medicare budget data, this would ostensibly save around \$187,326,190 on cataract surgery payments.

However, by rooting out potential waste in the system, the cut might not even be necessary. And one of these potential sources of waste, per a recent article in the *Wall Street Journal*, is the suspicious denial of claims by Medicare Advantage plans for patients who are near the end of their lives. These denials cause the patients to drop out of the plans and enroll in Medicare, which then foots the bill.

The article states: "People in the final year of their lives left Medicare Advantage for traditional Medicare at double the rate of other enrollees from 2016 to 2022 ... Those private-plan dropouts—300,075 during that time span—often had long hospital and nursing-home stays after they left, running up large bills that taxpayers, not their former insurers, had to pay.

"They cost the federal government an average of \$218 a day during that period. That is more than seven times the cost of a typical Medicare recipient ...

"Medicare Advantage insurers collectively avoided \$10 billion in medical costs incurred by the dropouts during that period ... If those beneficiaries had stayed in their plans, the government would have paid the insurers

about \$3.5 billion in premiums, meaning the companies netted more than \$6 billion in savings during that period."¹

So the \$6.5 billion cost was shifted over to Medicare which, during that period, consistently cut physician reimbursement in order to keep its budget balanced to offset the significantly high spending for things such as this.

However, if Medicare could have somehow intervened in these denials to justifiably prevent these desperate patients from dropping Medicare Advantage and getting into Medicare—since the MA plans purportedly use Medicare criteria for approval/denial of claims—this would have saved Medicare more than \$1 billion per year during that period! That would go far in decreasing the need to cut physician reimbursement by ever increasing amounts.

Some might argue that not all of those dropouts were due to unfair claim denials, since patients may drop out for other reasons. Fair enough. Let's say half of them were legitimate dropouts rather than suspicious denials of care. That would still make the savings \$3.25 billion dollars over that period, which still equals a savings to Medicare of around \$541,666,666 per year.

Rather than going after the "little guy," how about Medicare goes after the big fish for once and really save money for doctors and their fellow taxpayers?

— *Walter Bethke*
Editor in Chief

1. Mathews AW, Weaver C, McGinty T. The sickest patients are fleeing private medicare plans—Costing taxpayers billions. *Wall Street Journal*. November 11, 2024 (online article).

2025

BIANNUAL OPHTHALMIC PRODUCT GUIDE

REVIEW of OPHTHALMOLOGY

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OPHTHALMIC Product Guide

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SightChek®
Digital Phoropter
Designed for maximum efficiency.

ClearChart® 4
Digital Acuity Systems
Digital acuity systems for portable use.

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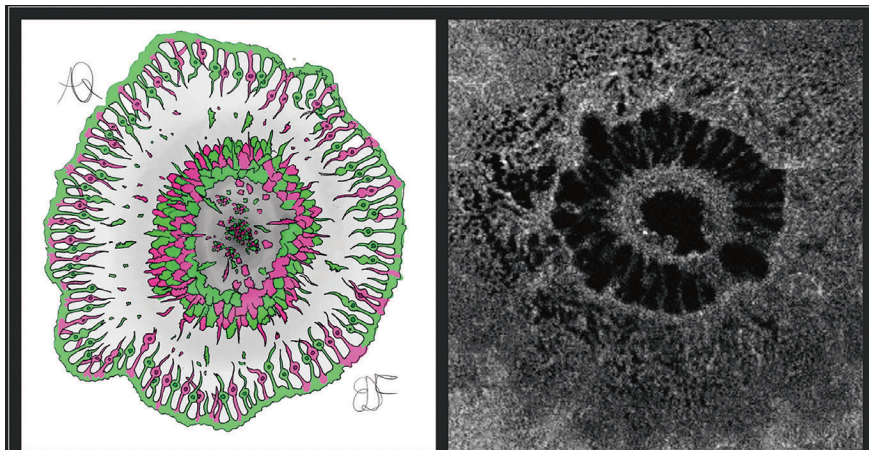
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Macular Hole

(Continued from pg. 12)



In a new study, photoreceptor integrity correlated to functional and anatomical visual outcomes of full-thickness macular hole. (Photo: Quarta A, et al. *Graefes Arch Clin Exp Ophthalmol* 2024;262:86-101)

visual outcomes.

“As the distance of the macular hole borders from the RPE increases due to alterations of the vitreoretinal interface,

there may be a decrease in the oxygen supply to the photoreceptors and a reduction in the availability of nutrients,” the researchers explained in their

paper. “Moreover, compared to the base of the hole, the retina at the macular hole’s edge is likely more prone to increased wall shear stress supported by vitreous dynamics from eye movement. The PIIN considers the photoreceptors at the highest edge of the hole, i.e. the highest point of ELM, where the oxygen deprivation is more severe.”

By correlating photoreceptor preservation with recovery metrics, such as PIIN, physicians may be able to better predict the efficacy of surgical interventions and set more realistic expectations for recovery times and outcomes. The authors caution, however, that larger studies are needed before PIIN can be relied upon in clinical practice.

1. Quarta A, Govetto A, Porreca A, et al. Development and preliminary evaluation of a novel preoperative index for quantitative analysis of photoreceptor loss in full-thickness macular holes. *Graefes Arch Clin Exp Ophthalmol* 2024;262:86-101.

Semaglutide Doesn’t Increase NAION Risk, Study Finds

A study published over the summer revealed a link between semaglutide—a popular glucagon-like peptide 1 receptor agonist (GLP-1RA) used to treat type 2 diabetes and obesity—and an increased risk of non-arteritic anterior ischemic optic neuropathy (NAION).¹ Since that analysis recruited participants from a single neuro-ophthalmology practice (Massachusetts Eye and Ear in Boston), a separate team of researchers questioned whether these findings apply to broader populations. To investigate, they conducted a population-based real-world study on data from 200 million people across 21 countries within the TriNetX global network to assess whether semaglutide users possess a higher risk of NAION.²

The final analysis included Caucasian individuals older than 18 with type 2 diabetes mellitus (T2DM) or obesity, who were further divided into one of three groups for comparison: T2DM-only (n=37,245), obesity-only

(n=138,391) and T2DM with obesity (n=64,989). Baseline characteristics, such as age, sex, BMI, hemoglobin A1c, comorbid conditions and medications, were balanced between groups. The researchers then compared the effects of semaglutide with those of various non-GLP-1RA glucose-lowering or weight-loss medications.

The results demonstrated that semaglutide use did not increase the risk of NAION development among the general population compared with non-GLP-1RA drugs. This finding was consistent among the T2DM-only group, the obesity-only group and the T2DM with obesity group at one, two and three years of follow-up.

“Our findings contrast with those of Hathaway et al. probably because of the differences in the study populations and designs,” the study authors explained in their paper for *Ophthalmology*. They noted that while the prior study “involved patients referred to a single major medical center in a city

with a high degree of medical sophistication, our study included individuals from a more general clinical setting.” Additionally, they pointed out that “differences in population characteristics and drug prescription preferences between single institutions and global databases may contribute to varying results,” as can differences in healthcare systems across regions and countries.

Considering these findings observed across a large, real-world cohort, the researchers concluded that “avoidance of semaglutide based solely on concerns regarding the risk of NAION may not be warranted, as its potential benefits for blood glucose control and cardiovascular health likely outweigh its potential risks.” ◀

1. Hathaway JT, Shah MP, Hathaway DB, et al. Risk of nonarteritic anterior ischemic optic neuropathy in patients prescribed semaglutide. *JAMA Ophthalmol*. July 3, 2024. [Epub ahead of print].

2. Chou CC, Pan SY, Sheen YJ, et al. Association between semaglutide and non-arteritic anterior ischemic optic neuropathy: a multinational population-based real-world study. *Ophthalmology*. November 2, 2024. [Epub ahead of print].



Hello, Darkness

Musings on life, medicine and the practice of ophthalmology.

MARK H. BLECHER
CHIEF MEDICAL EDITOR

As the days get shorter, it's tough to be a perky upbeat soul. While many actually like winter, I don't think anybody enjoys the darkness.

Humans are not a nocturnal species. We put up with it, we can adapt to it, but physiologically we suffer without the sunlight. Psychologically as well. It's depressing, more to some than others.

We're all familiar with Seasonal Affective Disorder, and 'tis the season. Layer that on top of your intrinsic personality and you may have an even bigger problem. Depression can not only be seasonal, it's situational, it's contextual and even partly genetic. Seems like there's no way to avoid it. Yet many people do.

Many approach the day with an upbeat attitude, and view events around them with a positive spin even if on the surface they don't seem terribly positive. We all know some of those people. I admire them and am jealous. I wonder how I can be like that instead of seeing the downside of events. I frequently say, expect the worst and when less than that happens, you're happily surprised. Well, for a moment anyway. It's a very functional, but not very optimistic way to live.

So, what is it that makes people depressed and keeps them depressed? I'm not going to speak about depression the illness but more about situational depression. In thinking about depression in everyday life, I've come to think about responses to disappointment. Not



Getty

getting what you want tends to generate negative feelings. How do you avoid turning that into feeling depressed? And I think the answer—an answer anyway—is to move beyond the disappointment. Move forward. Lemonade from lemons. It's not the lemonade that helps, it's the act of making lemonade. Of doing something. Think about the future, the next steps in your life. Many therapists and philosophers will tell you not to dwell on the past. And the moment something bad happens, some-

thing you're disappointed in happens, it's in the past. It's done. Linger on that event changes nothing about it, and it leads to frustration and then depression since you can't change it. Being forward-looking is an active process. It requires positive energy and thought. It presumes that the next moments can be better, more positive. Or at least possibly not as bad. It's a forward-thinking state of mind. Having something to do, planning something to do is a positive concept. It's positive no matter how dark and depressing your current position is.

And right at this moment, and this time of year, there's a lot that has the potential to be depressing. But we should take comfort from the fact that tomorrow has the potential to be better. Starting any day now, the days will get longer, there'll be more light. The opportunity for improvement is always there, if not just around the corner. And therein lies the challenge: You have to want to see it, to believe things can be better. When everything around you seems to reinforce the negativity, how can you move beyond? I wish I had the answers. I struggle as well. I'm certainly no therapist

but for me finding something to do that I can work toward tends to pull me away from the darkness.

It's tough to do this alone, it's easier if you have help. Encouragement. Support. Distraction. Getting beyond the voice in your head that just wants to curl up and disappear. Instead you need to stand up and get moving. Get back in the flow to the future where the possibilities are endless. I like the sound of that, if only I could keep that top of mind. Maybe I'll have it printed on a pillow. Then I will have done something positive. ◀



Complex Cataract Strategies for Success

Tools and techniques to get you through challenging cases.

LIZ HUNTER
SENIOR EDITOR

From an Interview with Brandon D. Ayres, MD

A routine, uncomplicated cataract surgery can sometimes take an unexpected turn, requiring surgeons to think on their feet about the strategies that could get them through the case safely and efficiently. Sometimes the solutions will include instruments they don't typically reach for, such as a dye, stain, ring or hooks. The more useful the tool or technique, the more it becomes a go-to when faced with complicating factors such as zonulopathy or scarring.

We spoke with Wills Eye Hospital's Brandon D. Ayres, MD, about

the devices and tactics he uses when complications arise. Here are some of his top tips.

Flexible Iris Retractors for Iris Retropulsion Syndrome

Iris Retropulsion Syndrome is typically seen in patients who are high myopes, have undergone vitrectomy, or have had a penetrating keratoplasty. In such cases, when performing cataract surgery, the fluidics of the anterior chamber are altered. When you activate the irrigation on a phacoemulsification unit, the fluid pushes the iris backward, preventing equalization of pressures in the anterior and posterior chambers. This results in a hyper-

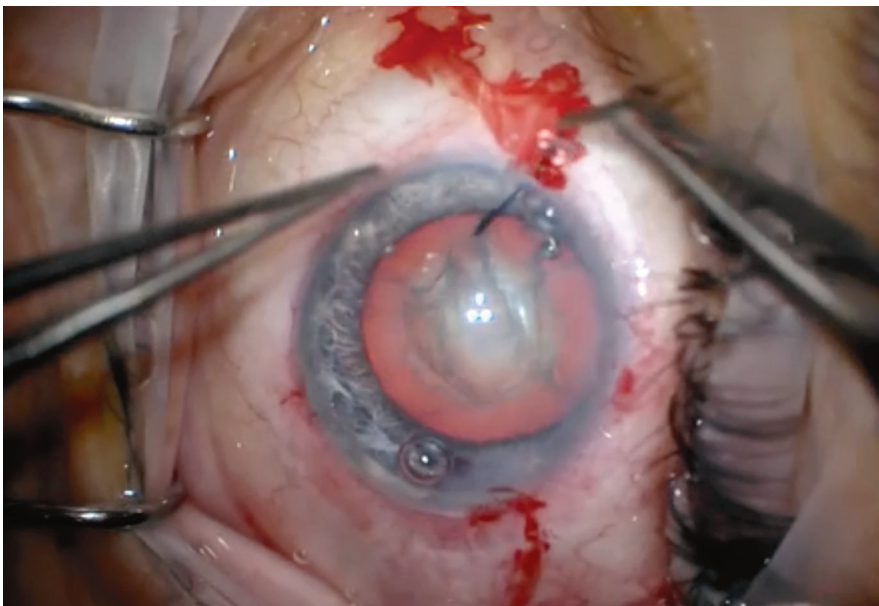
deep anterior chamber. As a result, the surgeon needs to constantly focus back and forth during surgery, which can be very challenging. The condition also can be felt by patients, potentially causing patient movement, adding to the challenge.

By using a flexible iris retractor, you elevate the iris off the anterior capsule allowing proper fluid flow and equalization of pressures (*Figure 1*). Although flexible iris retractors are commonly thought of as devices to dilate a small pupil, they can be extremely helpful in managing Iris Retropulsion Syndrome. In these cases, the iris is already dilated, but by placing a single hook to lift the iris, fluid can flow properly in the anterior segment and you don't get the excessive deepening of the anterior chamber. Patients no longer experience the discomfort caused by the retropulsion. It takes what could have been a very challenging, painful and somewhat frustrating surgery and turns it right back into a routine case. It's a tip that most surgeons might not think of, but it's an innovative way to use this tool to help manage cases.

Where to Place Iris Hooks

When using flexible iris retractors for a patient with a small pupil, you typically place between four and five hooks to dilate the pupil. These retractors not only pull the iris peripherally to widen the pupil but also pull the iris anteriorly. If the incision architecture isn't properly planned, you're going to pull the iris anteriorly and right into your way (*Figure 2*). This anterior iris position complicates placement of instruments into the anterior chamber as they may "bump into" the iris.

To avoid this, it's recommended to make your incisions steep, meaning at an angle that's not in the iris plane.



All images courtesy of Brandon D. Ayres, MD

Figure 1. Flexible iris retractor.

This article has no commercial sponsorship.

Dr. Chayet is considered a pioneer in refractive and cataract surgery, and is the medical director of the Codet Vision Institute in Tijuana, Mexico. He is a clinical investigator for RxSight, LensGen and ForSight Vision6.

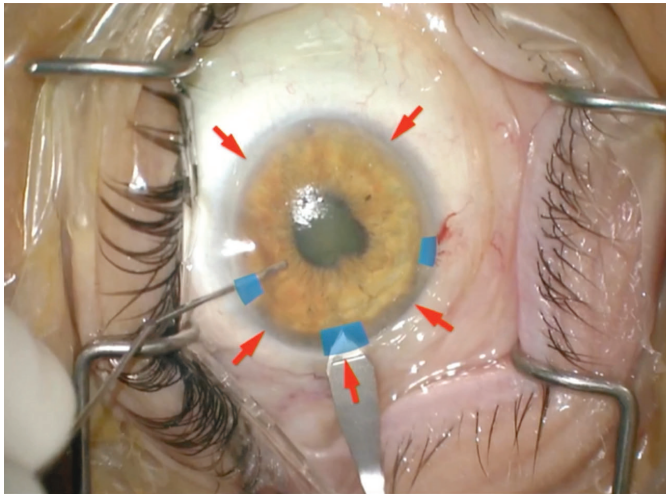


Figure 2. Mapping out iris hook placement.

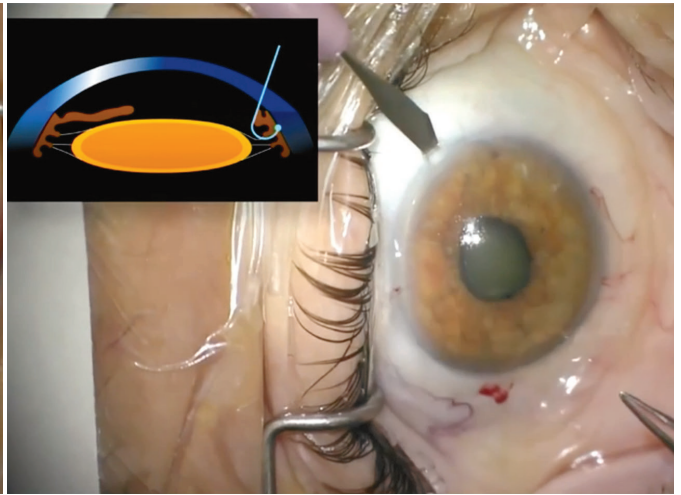


Figure 3. Insert hooks peripherally and steep.

You want to direct the keratome blade down and make the incision very peripheral (*Figure 3*). This changes the position of the flexible iris retractor so that as you pull the iris back; not only does it dilate the iris, but it pulls it down and out of the way. Now you have easier access for your phaco, your IA or your second instrument in and out of the eye without traumatizing the iris.

In some cases, the iris hooks can also be placed subincisionally. By placing them directly beneath your cataract wound or second instrument, you can further pull the iris out of the way—it actually pulls it under the incision—keeping it clear of instruments as they move in and out of the eye.

Using a Second Instrument To Help Stabilize the Lens

Here, the complexity increases a little bit. In patients with severe zonulopathy, the lens can become unstable and shift excessively, making the capsulorhexis challenging. In such cases, it's helpful to use two hands during the procedure. Once you begin the capsulorhexis, you can use an atraumatic microforceps to hold the capsule and stabilize the lens (*Figure 4*). This allows you to continue tearing the rhexis with your second hand. This is a good technique if you don't have a capsule stabilizing hook. The microforceps act as a stabilizing device to help you complete the capsulorhexis.

When to Add Capsular Support Hooks or a Capsular Tension Ring

One of the most common questions asked about cataract surgery is when to put in capsule support hooks or a capsular tension ring. Basically, as soon as you notice signs of zonulopathy, I recommend placing a capsular support hook early in the case. Many surgeons try to muscle through the surgery, but this can exacerbate zonulopathy and worsen the lens instability. By adding support hooks early on, you can stabilize the lens and complete the cataract extraction more smoothly without causing further damage to the zonules (*Figure 5*).

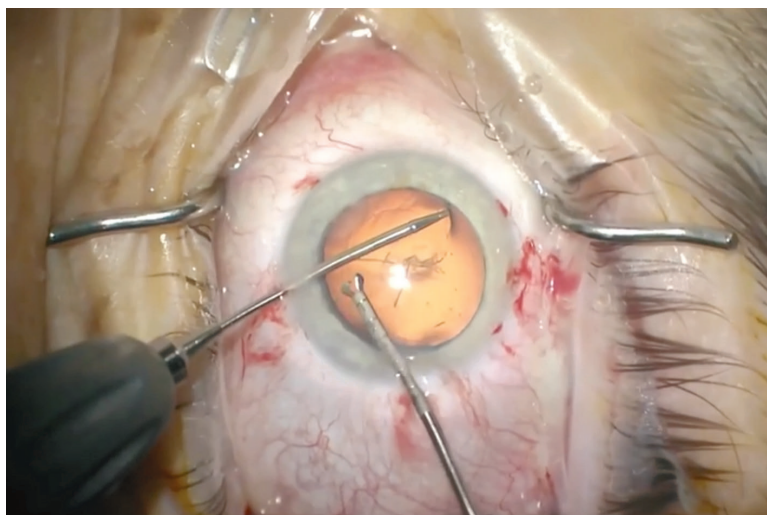


Figure 4. Using a second instrument.

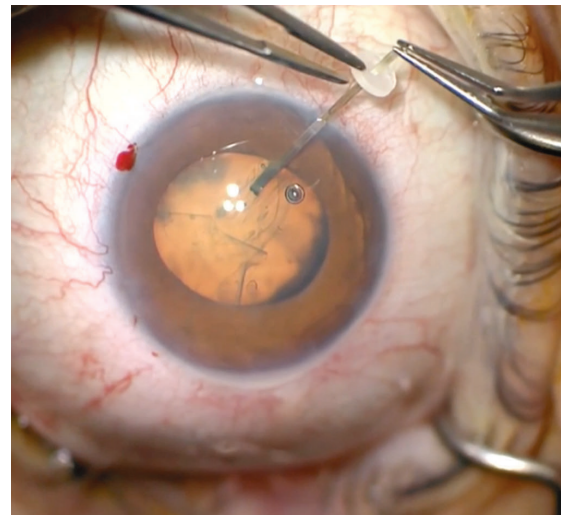


Figure 5. Adding capsular support hooks.

ADVANCED RETINAL IMAGING OFFERS RAPID FINDINGS IN THE OFFICE

A New York City practice has iCare EIDON Ultra-Widefield results available in every exam lane



By K. Bailey Freund, MD

As a retinal specialist at Vitreous Retina Macula Consultants of New York and clinical professor in the Department of Ophthalmology at NYU Grossman School of Medicine, I limit my daily schedule to no more than about 30 patients per day. Because of the complexity of the cases I see, I want to be sure to spend adequate time looking at imaging and discussing the findings with my patients.

Supporting me in this effort is the iCare EIDON Ultra-Widefield imaging system. Our upgrade to iCare EIDON UWF has offered us the ability to better uncover pathology outside of the macula. There are often important changes happening beyond the vascular arcades, nasal to the optic nerve, particularly with retinal vascular diseases such as

diabetic retinopathy, retinal vein occlusion, and pathologies manifesting peripheral vascular leakage such as Coats disease. The iCare EIDON UWF is particularly useful for detecting the onset or regression of retinal neovascularization, exudates and hemorrhages, degenerative throughout the fundus, and alterations of the vitreoretinal interface.

USING UWF IMAGING FOR EVERY EVALUATION

Because iCare EIDON imaging systems use white LED illumination and display the full visible spectrum, I have found the resulting images to be similar to what is seen with ophthalmoscopy. The TrueColor Confocal Technology suppresses scattered light outside the focal plane and re-

CASE #1: CENTRAL SEROUS CHORIORETINOPATHY

FIGURE 1

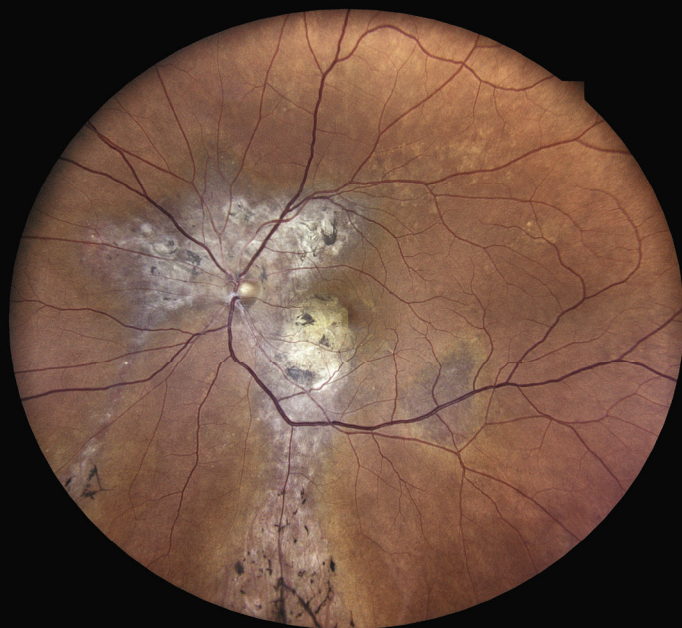


Figure 1. Without the proper contrast and resolution offered by our iCare EIDON UWF, we might have missed the descending tracks of pigmentary alterations indicating chronic leakage. At the margin of the streaks, the fundus appearance becomes more yellow, probably due to the loss of photopigment in the rods and cones, resulting in hyperautofluorescence.

Active central serous chorioretinopathy (CSC) can be of recent onset, “acute,” or “chronic,” meaning subretinal fluid persisting for six months or longer. The clinical findings of CSC can further be classified as “simple” or “complex” depending on the severity of associated imaging findings. This patient had chronic CSC in the past and manifests multiple areas of change in the retina and retinal pigment epithelium extending well beyond the vascular arcades, as evidenced by this iCare EIDON UWF image that represent the “complex” CSC phenotype (Figure 1).

CSC can exhibit fluid leakage extending to the inferior fundus and, in this image, two descending tracks of pigmentary alterations indicating chronic leakage can clearly be seen. Other visible changes include the central area of atrophy, hyperpigmentation, and subretinal fibrosis. The subtle yellow fundus appearance at the margin of the streaks relates to the loss of photopigment in the rods and cones which results in hyperautofluorescence. The iCare EIDON UWF enabled me to quickly identify and then monitor these peripheral changes.

moves artifacts, yielding exceptionally sharp images. When I magnify the iCare EIDON UWF images, I see minimal loss of detail, which is unusual for digital imaging.

I am a huge fan of the “flicker” feature enabling comparison of images over time. This feature overlays two images utilizing a precise vessel registration. This allows my eye to catch subtle changes much earlier than when viewing the images side by side. Detecting subtle growth of geographic atrophy in age-related macular degeneration and the onset or progression of lacquer cracks in myopic degeneration are just two important uses of this feature. I think it’s an excellent way to compare and track disease over time. Also, since the iCare EIDON UWF is largely automated, most images can be captured without manual focusing and with minimal skill. That’s very efficient because, in probably less than an hour of training, someone should be able to produce images equal to those of an experienced photographer. You just push a button, and the system focuses and aligns, saving time to acquire images.

iCare EIDON Ultra-Widefield images are a part of every patient evaluation at my practice. Before I even speak to the patient, my staff has already pulled up the patient’s images since their last visit in flicker mode or side by side on my review station. I can often see what might be relevant to that day’s visit and whether anything has changed since the last visit. We have computer stations for reviewing imaging in every lane of the office so physicians don’t have to move to another room to evaluate findings. I also find that I save time with the iCare EIDON UWF since the images allow me to review relevant retinal findings while waiting for the full effect of dilating drops. The exceptional image quality and efficiencies delivered by the iCare EIDON UWF, along with the ability to track subtle imaging biomarkers are both reasons why this imaging system has provided our practice with an outstanding return on investment.

K. Bailey Freund, MD, a retinal specialist at Vitreous Retina Macula Consultants of New York, is not a paid consultant of iCare.

CASE #2: PSEUDOXANTHOMA ELASTICUM

FIGURE 2



Figure 2. This iCare EIDON Ultra-Widefield image revealed the classic peau d’orange appearance as well as angioid streaks and comet lesions, pointing to a diagnosis of pseudoxanthoma elasticum (PXE). Findings of a secondary inflammation, including widening and hyperpigmentation involving the nasal angioid streaks, are highly suggestive of prior episodes of a recently described secondary punctate inner choroidopathy reaction that can occur in PXE eyes.

Pseudoxanthoma elasticum (PXE) is a disease I’ve studied my entire career. The amount of detail in terms of the wide range of characteristic retinal findings related to tissue calcification occurring in this disease can be seen very well on this iCare EIDON UWF image (Figure 2). In the temporal area, the classic peau d’orange appearance reminiscent of the skin of an orange, as well as angioid streaks and comet lesions show up extremely well. Since PXE has systemic implications, it’s important to make the diagnosis early, although unfortunately I’ve seen many patients for whom the diagnosis of PXE was missed. This case features findings of a recently identified inflammatory reaction occurring in some eyes of patients with PXE that is described as a secondary punctate inner choroidopathy (PIC) reaction. This reaction can produce widening and hyperpigmentation of the angioid streaks, as seen in this eye nasal to the optic nerve. PXE has a high risk of choroidal neovascularization, which can lead to vision loss. However, findings can be subtle if no bleeding is occurring, so images like these from the iCare EIDON UWF help us identify and monitor PXE patients for potentially treatable macular disease.

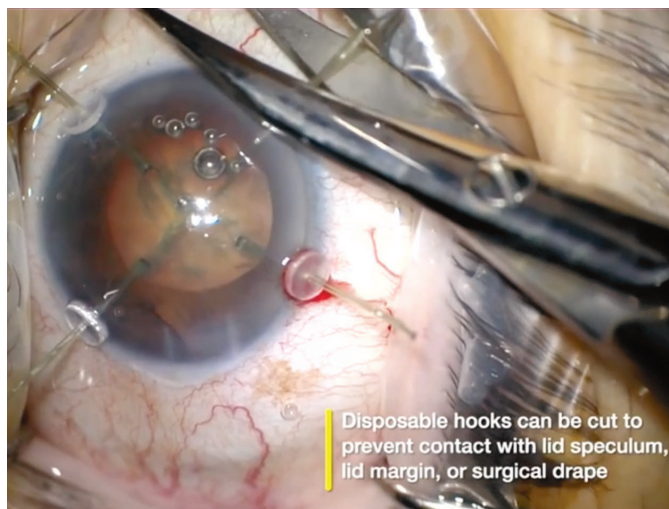


Figure 6. Use sharp scissors to cut hooks.

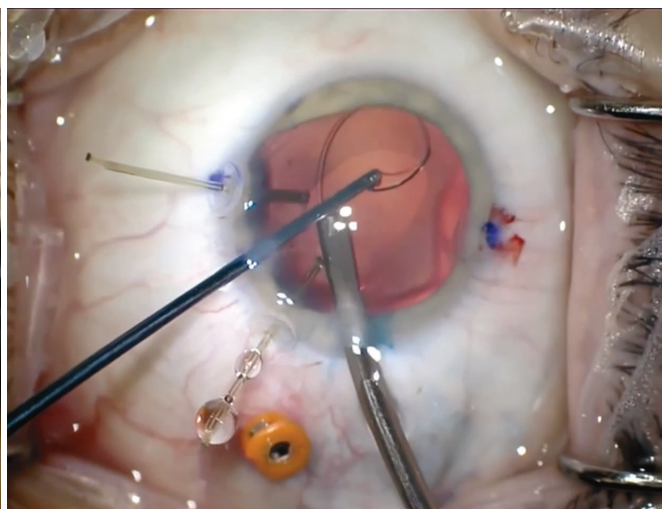


Figure 7. Inserting a capsular tension ring.

Cutting Support Hooks

Many of the capsular support hooks are now disposable. The hooks made by Microsurgical Technology, for example, have edges that extend outside the eye. I often describe them as little spider legs. The hook is inside the eye and the legs stick outside the eye. As you move the eye, the external part of the hook can bump into the eyelid, speculum, or I've even had them stick to the drape. Not only are they in the way, but they're also causing the patient discomfort.

In these situations, you can use a sharp scissor to trim the external portion of the hook (*Figure 6*). This will prevent it from bumping into the lid and simplify the procedure. Although the hooks weren't made to be cut, they

do cut easily, and just by thinking a little outside the box, it can greatly simplify your case. Most importantly, make sure the scissors being used are sharp or they won't cut properly.

When to Have a Capsular Tension Ring on Hand

My rule of thumb is that if you need to use a capsule support hook to safely complete a cataract extraction, you should also plan to use a capsular tension ring. It's always a good idea to have one ready in case you encounter unnoticed zonulopathy. If you're already using capsule support hooks or employing a bi-manual technique for your rhexis, you will definitely need a CTR to provide additional support to the lens (*Figure 7*). There are differ-

ent techniques for inserting a CTR, but the most important thing is to be comfortable with the procedure, as there's no single method that's universally better than the others.

When to Use a Suture-Fixed Ring or a Segment

When dealing with cases of zonulopathy involving significant areas of weakness—such as two, three or four clock hours of zonulopathy—the remaining zonules are healthy and using a CTR helps recruit those other zonules to fix the area where the zonulopathy is. Once you put the CTR in the lens, it stays nice and centered.

However, sometimes the entire capsular bag is loose and you may need more than just a CTR. In these situations, the bag might be subluxed or dislocated, such as in a patient with Marfan syndrome, and you not only need a CTR to hold the entire capsule open evenly, you also need to reposition and re-suture the capsule. This is where suturable segments like the Ahmed segment or a Malyugin ring come into play (*Figure 8*). These devices can be sutured into place to stabilize the bag and reposition a decentered lens, ensuring it stays centered in the capsule. ◀

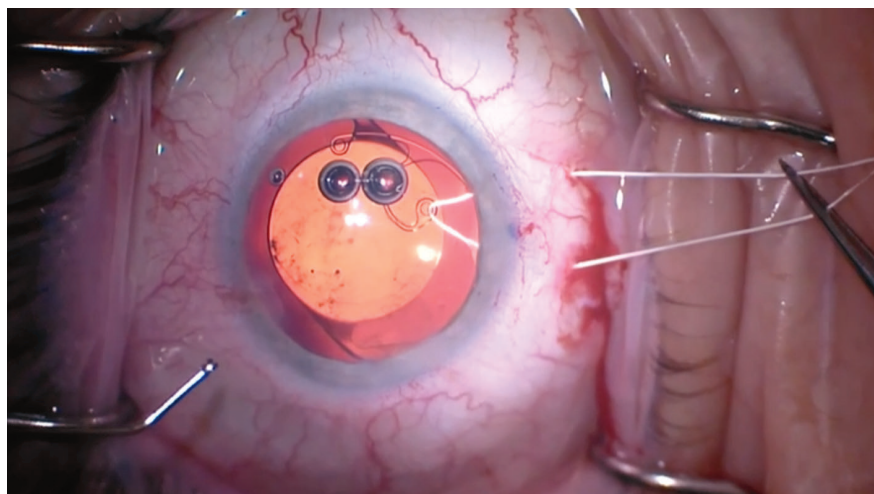


Figure 8. Using an Ahmed segment.

DISCLOSURES

Dr. Ayres is a consultant for Alcon, Bausch + Lomb, Microsurgical Technology, and Carl Zeiss Meditech.



EDITED BY MICHAEL COLVARD,
MD AND STEVE CHARLES, MD

TECHNOLOGY UPDATE

There's a Podcast for That: A Guide

Here's a guide to independent podcasts hosted by ophthalmology experts.

ANDREW BEERS
ASSOCIATE EDITOR

The popularity of podcasting grew exponentially over the COVID-19 pandemic. Now, it's become even easier to start podcasting with the number of services available online to record, edit and publish episodes. Anyone—even an ophthalmologist—can become a podcaster as long as they have the right technology and an internet connection.

Ophthalmology podcasts have been around since the early days of podcasting, but the vast number of

podcasts are fairly new to the media space. Many organizations and media outlets began producing their own podcast content to garner more viewership and promote informational resources, but independent ophthalmic podcasts have created their own communities in podcasting. Independent podcasting allows hosts to have freedom to discuss topics at their leisure, foster a community of individuals passionate about the podcast subjects, and pivot towards different areas in ophthalmology that excite them.

In this article, we'll review informative podcasts hosted independently by



experts in ophthalmology. Whether they focus on subspecialties, procedural preparation and execution, journal articles or the ophthalmology life, these podcasts offer something beneficial to all their listeners.

What Makes a Good Podcast?

Jessica Randolph, MD, a practicing ophthalmologist in Richmond, Virginia, has a wealth of knowledge on podcasting in ophthalmology. She has written articles on the subject as a way to promote the medium during the COVID-19 pandemic and was featured as a guest on multiple health-care podcasts, including *Sight for Sore Eyes*, which is listed in the next section below.

“I think that having a very specific audience with a specific goal in mind [makes for a popular podcast],” says Dr. Randolph. “So, some sort of focus, agenda or curriculum for the podcast that helps people decide whether it would be a good fit for them and their interest and that keeps them engaged is important because listeners know they're going to get the same content every single time. Especially now with the number of different podcasts about so many things, having a shtick that establishes what the podcast is and what you're going to learn can really help find new listeners and engage with people.

“The other thing that I think helps make a podcast popular is having a charismatic host,” she adds. “Having somebody who's engaging and asks interesting questions. I think having that kind of host that can bring everything down at an oddly asynchronous virtual level, but still be entertaining and engaging and draw you in really helps to make a popular podcast.”

Dr. Randolph notes that it's impor-

This article has no commercial sponsorship.

Dr. Colvard is a surgeon at the Colvard-Kandavel Eye Center in Los Angeles and a clinical professor of ophthalmology at the Keck School of Medicine of the University of Southern California. **Dr. Charles** is the founder of the Charles Retina Institute in Germantown, Tennessee.

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Indication

Tyrvaya[®] (varenicline solution) nasal spray is indicated for the treatment of the signs and symptoms of dry eye disease.

Important Safety Information

The most common adverse reaction reported in 82% of patients was sneezing. Events that were reported in 5-16% of patients were cough, throat irritation, and instillation-site (nose) irritation.

Please see Brief Summary of Prescribing Information on the next page and the full Prescribing Information at Tyrvaya-pro.com.

Reference: 1. Tyrvaya. Prescribing Information. Oyster Point Pharma.

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BRIEF SUMMARY: Consult the full Prescribing Information for complete product information available at www.tyrvaya-pro.com.

INDICATIONS AND USAGE

TYRVAYA® (varenicline solution) nasal spray is a cholinergic agonist indicated for the treatment of the signs and symptoms of dry eye disease.

ADVERSE REACTIONS

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

In three clinical trials of dry eye disease conducted with varenicline solution nasal spray, 349 patients received at least 1 dose of TYRVAYA. The majority of patients had 31 days of treatment exposure, with a maximum exposure of 105 days.

The most common adverse reactions reported in 82% of TYRVAYA treated patients was sneezing. Other common adverse reactions that were reported in >5% of patients include cough (16%), throat irritation (13%), and instillation-site (nose) irritation (8%).

USE IN SPECIFIC POPULATIONS

Pregnancy: Risk Summary: There are no available data on TYRVAYA use in pregnant women to inform any drug associated risks. In animal reproduction studies, varenicline did not produce malformations at clinically relevant doses.

All pregnancies have a risk of birth defect, loss, or other adverse outcomes. In the US general population, the estimated background risk of

major birth defects and miscarriage in clinically recognized pregnancies is 2% to 4% and 15% to 20%, respectively.

Data: Animal Data: Pregnant rats and rabbits received varenicline succinate during organogenesis at oral doses up to 15 and 30 mg/kg/day, respectively. While no fetal structural abnormalities occurred in either species, maternal toxicity, characterized by reduced body weight gain, and reduced fetal weights occurred in rabbits at the highest dose (4864 times the MRHD on a mg/m² basis).

In a pre- and postnatal development study, pregnant rats received up to 15 mg/kg/day of oral varenicline succinate from organogenesis through lactation. Maternal toxicity, characterized by a decrease in body weight gain, was observed at 15 mg/kg/day (1216 times the MRHD on a mg/m² basis). Decreased fertility and increased auditory startle response occurred in offspring at the highest maternal dose of 15 mg/kg/day.

Lactation: Risk summary: There are no data on the presence of varenicline in human milk, the effects on the breastfed infant, or the effects on milk production. In animal studies varenicline was present in milk of lactating rats. However, due to species-specific differences in lactation physiology, animal data may not reliably predict drug levels in human milk.

The lack of clinical data during lactation precludes a clear determination of the risk of TYRVAYA to an infant during lactation; however, the developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for TYRVAYA and any potential adverse effects on the breastfed child from TYRVAYA.

Pediatric Use: Safety and efficacy of TYRVAYA in pediatric patients have not been established.

Geriatric Use: No overall differences in safety or effectiveness have been observed between elderly and younger adult patients.

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tant to remember that ophthalmology podcasts aren't meant to be alternatives to diagnosis or medical information. They're informal discussions about cases, studies and advancements in the field. It's important to decipher what's fact and what's opinion. Avoid the misinformation and disinformation and take podcast content with a grain of salt.

"There are a lot of opinion-based podcasts where the host is talking about what's important to them and their views on a subject, and that may not have the objectivity that some other podcasts have where they function more as a journal club," shares Dr. Randolph. "And so, podcasts that discuss scientific terminology, review references and even CME-based information are going to provide much better medical advice for a resident, a patient, an attending surgeon or anyone else, versus those that are simply chatting about a topic and discussing personal beliefs that aren't focused on medical data. I think it can be really hard for patients sometimes to parse out exactly what the important things are, and I think you've seen that with the COVID pandemic and all of the misinformation that came out of there."

Dr. Randolph says that the easiest way to avoid misinformation is by listening to podcasts produced by major ophthalmic societies. But there are many other podcasts out there and every listener has a different taste. If there's a podcast that seems untrustworthy, then there are ways to check the validity of the content.

"You have to do a little bit of digging and potentially go to the podcast's website and see if there are references at the end of a podcast episode or in an additional webpage to show where they're getting that information from," Dr. Randolph says, "because it can be really hard to differentiate and to find that information especially since certain opinions can carry more weight and seem like facts."

Ophthalmology Podcasts

The following list of podcasts are listed in alphabetical order. These podcasts aren't sponsored by any ophthalmic organization or media outlet. They're solely independent programs with the intent to inform and discuss topics within the ophthalmic space.

• **Cataract Coach Podcast.** Uday Devgan, MD, is an ophthalmologist specializing in cataract and refractive surgery at his clinic, Devgan Eye Surgery in Los Angeles, but that's only the tip of the iceberg. On the internet, he's known in the ophthalmic community as the Cataract Coach, offering a free online space where he publishes educational content on various treatments and procedures. In addition to surgical videos and articles, he also hosts a podcast under the same name.

The *Cataract Coach Podcast* features interviews with renowned surgeons and innovators. Dr. Devgan sits down with physicians to discuss topics that have an impact on the lives and careers of ophthalmologists. Some episodes are straightforward and aligned with Dr. Devgan's video content on his website, such as a talk on managing cataract complications or IOL implantation. Other episodes dive deep into how surgeons can follow their dreams and establish a business or ways in which physicians can educate their staff.

The *Cataract Coach Podcast* is available on Apple Podcasts and Spotify. Full length videos of the interviews can be viewed on YouTube under Dr. Devgan's channel as well as his website: <https://cataractcoach.com/category/podcast/>.

• **Eyes for Ears.** Hosted by Ben Young, MD, and Andrew Pouw, MD, *Eyes for Ears* is a podcast for trainees. Navigating OKAPs and board presentations can be daunting as a young medical student, but Drs. Young and Pouw try their best to help. They cover topics for multiple different subspecialties, including neuro-ophthalmology, in which they sit down with Neuro-Ophthalmology Section

Co-Host, Amanda Redfern, MD, a neuro-ophthalmologist at OSU Casey Eye Institute in Oregon.

Drs. Young, Pouw and Redfern were all members of the Yale ophthalmology residency program. The creators of *Eyes for Ears*, Drs. Young and Pouw, felt that their journey towards clinical practice was much easier with someone to discuss ideas with. They created the podcast with this in mind and have established a catalogue of podcast episodes that can benefit any trainee learning about in-depth subjects and ideas.

The *Eyes for Ears* podcast is available on Apple Podcasts and Spotify as well as the Eyes for Ears website: <https://eyesforears.net/>.

• **Headlight in the Fog: The Uveitis Podcast.** Looking for discussions centered around uveitis? Here's a podcast that puts the disease under the spotlight and tries to understand the many facets that make up ocular inflammatory diseases.

Hosted by Akshay Thomas, MD, and Laura Kopplin, MD, *Headlight in the Fog: The Uveitis Podcast* features informal discussions with uveitis and ocular-inflammation experts. The podcast includes a wide range of topics instead of just focusing on the management of uveitis. Typically, the hosts ask their guests about their opinions on niche subject areas within the specialty. For example, their first episode with guests Karen Armbrust, MD, PhD, and Sapna Gangaputra MD, MPH, offered views on how to approach pediatric patients with uveitis. Also, in an interview with Lynn Hassman, MD, PhD, and Wendy Smith, MD, the podcast panel discussed how to set up and maintain a successful university-based uveitis practice.

The *Headlight in the Fog: The Uveitis Podcast* is available on Apple Podcasts, Spotify and Amazon Music. Its host streaming platform is the free Buzzsprout podcasting service, and all episodes can be accessed on the platform's website: <https://www.uveitispodcast.com/1733598>.

• **Honestly Bilal.** Bilal Ahmed, MD, set out to create a podcast that was geared towards anyone on their journey to becoming an ophthalmologist.

Honestly Bilal podcast episodes are unique in the sense that they don't focus on case studies, treatment options or specific diseases. Instead, Dr. Ahmed talks with everyone from medical students to university department leaders about their entry into medicine.

Most episodes are quick to digest, with run times ranging from 15 to 30 minutes. Although Dr. Ahmed only published one episode in 2024, his podcast's catalogue is filled with dozens of stories from all walks of life in the ophthalmic community.

The *Honestly Bilal* podcast can be accessed on Apple Podcasts, Spotify, YouTube and the podcast streaming platform Podchaser. This podcast doesn't have a home webpage.

• **It's Good to See You.** Rupa Wong, MD, is a pediatric ophthalmologist at the Honolulu Eye Clinic and an ophthalmology social media influencer. Her media influence is seen on many platforms, including YouTube, TikTok and Instagram, where she's amassed more than 100,000 followers. As a mother, most of her content revolves around her expertise in pediatric health and how families can stay on top of eye care.

Dr. Wong's podcast, *It's Good to See You*, provides the same content she procures for her other social media platforms, but she dives into deeper conversations on pediatric subjects. Through interviews, Q&As and segmented episodes, she uses her knowledge and experiences to emphasize the importance of eye care for children. These discussions are meant to be seen as casual conversations and shouldn't be taken as formal medical information, but the tips Dr. Wong provides can be helpful to parents figuring out how to care for their children's ophthalmic needs.

The *It's Good to See You* podcast is available on Apple Podcasts, Spotify and Podchaser. Also, episodes can

be accessed on Dr. Wong's website: <https://www.drrupawong.com/podcast>.

• **Mind Body MD.** In the United States, ophthalmologists tend to adhere more to Western medicinal practices. While the advances in modern Western medicine have been revolutionary at times, proponents of holistic options say they can provide a more natural approach to treatment.

Tara McCannel, MD, the Director of the Ophthalmic Oncology Center at the UCLA Stein Eye Institute and the co-founder of Seyhart Wellness in Santa Monica, California, hosts the *Mind Body MD* podcast to share her insight on holistic approaches to medicine. She sits down with physicians who share their opinions on how surgeons can incorporate holistic methods to their practices, how to live a peaceful and balanced life as a doctor, and the pros and cons of holistic treatments. Not all interviews are with ophthalmologists but can also be with physicians in other fields, which provides a unique viewpoint on how to approach tasks holistically as a doctor.

"[*Mind Body MD*]' is an interesting take on ophthalmology because she's talking about a lot of these Eastern holistic alternatives through a Western medicine lens which may be frowned upon by a lot of people because they're not based in Western medicine," shares Dr. Randolph.

The *Mind Body MD* podcast is available on Apple Podcasts and Spotify. Additionally, further information about Dr. McCannel's podcast and clinical work can be found on her podcast's website: <https://www.mindbodymdpodcast.com/>.

• **The Retina Channel Podcast.** For retina specialists looking for a podcast about their subspecialty, *The Retina Channel Podcast* covers the latest news. Hosted by Keyvan Koushan, MD, a retina surgeon at the Toronto Retina Institute, this podcast centers around an ophthalmology journal club.

Journal clubs tend to be featured in health-care podcasts regularly as they're a way to discuss articles within

a small subgroup while promoting the subject to influence educational discourse within a larger community.

The Retina Channel Podcast focuses on the most recent advancements in the retina space and holds discussions with leading experts. On their website, they state, "Our mission is to facilitate transmission of knowledge from researchers to their target audience." Each episode features an informal discussion with a guest along with information about the discussed article, what major publication accepted it and how to access it.

The Retina Channel Podcast is available on Apple Podcasts, Spotify and YouTube. This podcast is supported by the streaming platform Libsyn, and episodes can be accessed on the channel's website: <https://theretinachannel.libsyn.com/>.

• **Straight from the Cutter's Mouth: A Retina Podcast.** Every week, Jay Sridhar, MD, the host of *Straight from the Cutter's Mouth: A Retina Podcast*, posts a new podcast episode about topics in the retina space. Since his first episode in 2016, he has partnered with and interviewed many doctors to bring the podcast to light.

"[Dr. Sridhar] does an amazing job with his content and interviews, and he covers everything from hard-hitting, data-driven journal articles to meetings and even daily issues like parenting, wellness and medical education," says Dr. Randolph. "It's very well-rounded and it talks about the things that are affecting us in a more global sense than just the medical part of our lives."

According to the *Straight from the Cutter's Mouth* webpage, Dr. Sridhar began podcasting when he completed his fellowship. Upon entering the workforce, he understood that he'd have to endure a burden of commuting as a retina specialist. While traveling, he hoped to find an ophthalmology podcast that could be a useful retina resource on the go. Unfortunately, he never found such a podcast. That's when he was inspired to create *Straight from the Cutter's Mouth*.

With a catalogue of nearly 450 episodes, Dr. Sridhar’s podcast has covered topics from unique case presentations of retinal disease to international approaches in retina surgery. One of *Straight from the Cutter’s Mouth’s* latest episodes features a recurring segment titled “Masterpiece Retina.” Here, retina specialists review studies that had an impact on the retina specialty. For example, in the “Masterpiece Retina” episode featuring guests Ajay Kuriyan, MD, and Will Parke, MD, they analyzed a study published in a 1990 edition of *Ophthalmology* by Joseph Simone, MD, and Marc Whitacre, MD, on the effect of intraocular gas and fluid volumes on intraocular pressures. Dr. Sridhar additionally hosts a “Journal Club” segment where he sits down with other retina specialists to discuss the recent articles published in major ophthalmic journals.

The *Straight from the Cutter’s Mouth: A Retina Podcast* is available on Apple Podcasts and Spotify. Episodes can also be accessed on the podcast’s website: <https://www.retinapodcast.com/>.

• **The Lens Pod.** Medical students can look to *The Lens Pod* for insight on key concepts in ophthalmology. Here’s some backstory: *The Lens* was a newsletter that began during the COVID-19 pandemic as a way to make articles on ophthalmological studies more accessible and easier to digest for medical students. David Portney, MD, Dena Ballouz, MD, and Ajay Kolli, MD, founded the newsletter when they were medical students and have continued to branch out to other forms of media to help other students. One way the founders reached their demographic was through podcasting.

The Lens Pod is essentially The Lens newsletter in an audio format. Similar to other journal club podcasts, the episodes for *The Lens Pod* summarize published studies as a way to inform listeners about the recent advancements in ophthalmology. There’s more to the podcast though. Led by a team

OPHTHALMOLOGY PODCAST GUIDE

Podcast	Host(s)	Latest Episode (as of Nov. 20, 2024)
Cataract Coach Podcast	Uday Devgan, MD	“Podcast 86: Ramesh Ayyala, MD” – Host talks with Dr. Ayyala about critical life lessons he learned in the field.
Eyes for Ears	Ben Young, MD, Andrew Pouw, MD, and Amanda Redfern, MD (neuro-ophthalmology co-host)	“Toxocara” – Hosts review toxocariasis and the importance of it.
Headlight in the Fog: The Uveitis Podcast	Akshay Thomas, MD, and Laura Kopplin, MD	“Episode 35: Management of Uveitis in Pregnancy” – Hosts talk with Drs. Lyndell Lim and Kelly Kuo about pregnant patients with uveitis.
Honestly Bilal	Ahmed Bilal, MD	“The Resident Journey: Transitions to Senior Resident + Retinal Imaging with Dr. Ian Han” – Host talks with Dr. Han about tips for residents becoming leaders in their program.
It’s Good to See You	Rupa Wong, MD	“Debunking LASIK Myths with Refractive Surgeon Dr. Kathryn Hatch” – Host talks with Dr. Hatch to address common misconceptions about LASIK.
Mind Body MD	Tara McCannel, MD, PhD	“Finding Fulfillment in a Career in Oncology – Dr. Bartosz Chmielowski” – Host talks with Dr. Chmielowski about his journey in ocular oncology.
The Retina Channel Podcast	Keyvan Koushan, MD	“E82-Effect of Perfluorocarbon on Distortion after Repair of Retinal Detachment- Prof. Maher Saleh” – Host talks with Prof. Saleh about his group’s findings.
Straight from the Cutter’s Mouth: A Retina Podcast	Jay Sridhar, MD	“Episode 448: Masterpiece Retina Part Four with Drs. Will Parke and Ajay Kuriyan” – Host talks with doctors about historical retina articles from major journals.
The Lens Pod	Various contributors	“The Lens Newsletter” – Host reads journal article summaries from the latest newsletter.
Sight for Sore Eyes	Ore-ofe Adesina, MD	“What an Ophthalmologist Looks Like – Dr. Benjeil Edghill – Part 2” – Host talks with Dr. Edghill about his experiences as a Black ophthalmologist and his journey in medicine.

of medical students, the podcast publishes episodes where they interview specialists in ophthalmology about how students can prepare for the field and what doctors are doing to help the next generation of practicing physicians.

The Lens Pod is available on Apple Podcasts and Spotify. Also, episodes are available for listening on *The Lens* website: <https://lensophthalmology.com/the-lens-pod>.

• **Sight for Sore Eyes.** Why should all podcasts discuss journal articles and cases? What about other aspects of ophthalmology and owning a business? *Sight for Sore Eyes* by Ore-ofe Adesina, MD, a neuro-ophthalmologist at the Robert Cizik Eye Clinic in Houston, offers a twist on how to approach an ophthalmology podcast.

“[Dr. Adesina] uses ‘[*Sight for Sore Eyes*]’ to spotlight Black and under-represented positions in a minority

perspective in ophthalmology,” Dr. Randolph says, “and he talks about the disparities in the field and how Black surgeons are underrepresented. [His podcast] showcases our stories and why DEI is important.” For his podcasts, Dr. Adesina sits down with ophthalmologists who are making an impact for minority groups in the field. Topics included the history of the African-American experience in ophthalmology, the next generation of surgeons and disparities in eye care.

The *Sight for Sore Eyes* podcast is available on Apple Podcasts, Spotify and Amazon Music. Its host streaming platform is the free Buzzsprout podcasting service, and all episodes can be accessed on the platform’s website: <https://sightforsoreeyes.buzzsprout.com/2128103>. ◀

DISCLOSURES

Dr. Randolph has no relevant financial disclosures.



2ND YEAR OPHTHALMOLOGY RESIDENT

PROGRAMS AND WET LABS

Dear Resident Program Director and Coordinator,

We would like to invite you to review the upcoming 2nd-Year Ophthalmology Resident Wet Lab Programs for the 2024–2025 Residency Year in Fort Worth. These programs offer a unique educational opportunity for second-year residents. To better familiarize beginning ophthalmologists with cataract surgery, these programs will consist of both didactic lectures and a state-of-the-art, hands-on wet lab experience. Technology and technique will be explained and demonstrated and surgeons will leave better prepared to optimize outcomes and manage complications when they arise. The programs also serve as an opportunity for your residents to network with residents from other programs.

After reviewing the material, it is our hope that you will select and encourage your 2nd Year residents to attend one of these educational activities, which are CME accredited to ensure fair balance.

Best regards,

Derek DeMonte, MD, Kourtney Houser, MD, and Jonathan Rubenstein, MD

DECEMBER 7–8, 2024
FORT WORTH, TX

Jonathan Rubenstein, MD
Course Director

FEBRUARY 8–9, 2025
FORT WORTH, TX

Derek DeMonte, MD
Course Director

FEBRUARY 22–23, 2025
FORT WORTH, TX

Kourtney Houser, MD
Course Director



Registration Open: www.ReviewEdu.com/CSE2ndYr2024-25

For more information visit the registration site above by scanning the QR code, call Denette Holmes at 866-627-0714, or email dholmes@postgradhealthed.com.

CME courses are restricted to 2nd-year residents enrolled in an ophthalmology residency program at the time of the course. There is no registration fee for this activity. Air, ground transportation in Fort Worth, hotel accommodations, and modest meals will be provided through an educational scholarship for qualified participants.

Joint Accreditation Statement

In support of improving patient care, this activity has been planned and implemented by Amedco LLC and Review Education Group, LLC. Amedco LLC is jointly accredited by the Accreditation Council for Continuing Medical Education (ACCME), the Accreditation Council for Pharmacy Education (ACPE), and the American Nurses Credentialing Center (ANCC), to provide continuing education for the healthcare team. Amedco Joint Accreditation #4008163



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LIFE AFTER THE LENS: INSIGHTS ON RETIREMENT

The stories and words of wisdom from those who've reached this milestone.

CHRISTINE YUE LEONARD
SENIOR ASSOCIATE EDITOR

As surgeons approach retirement, the decision to scale back their duties often becomes a complex and deeply personal journey. Factors such as age, health and the desire for a slower-paced lifestyle play key roles in this transition. Whether driven by a need to reduce stress, changes in their practice environment or the realization that their skills can serve them in other areas, ophthalmologists must carefully navigate the path between dedicated patient care and a well-earned retirement. Ultimately, the choice to step back isn't just about leaving the operating room but a way of redefining their identity.

We spoke with several ophthalmologists about their retirement transition experiences. Here, they share how they put down the knife and the activities they're engaged in today.

Tapering the Surgical Case Load

As thoughts of retirement loom large, many ophthalmologists plan their transition in a stepwise fashion, often beginning with a reduction in their

surgical case load. Several years before he retired, glaucoma specialist Thomas Harbin, MD, MBA, formerly of Eye Consultants of Atlanta and the author of several books on ethics and business in medicine, made the decision to stop doing glaucoma and cataract surgery. "I continued doing lasers in the office, but I stopped going to the operating room," he says. "I was just getting older and thinking about slowing down."

Similarly, as he approached his seventieth year, Richard Packard, MD, senior consultant and former director of Arnott Eye Associates in London decided to give up his consultancy after nearly 46 years of work in the National Health Service. "I got to the stage where I was fed up doing all the complex cases," he says. "I was shortly going to be 70, and I had planned to stop doing surgery at 70 anyway. So, this was a good opportunity.

"As far as the private sector was concerned, I went on doing surgery until later on that year, when by chance I discovered that when I covered my left eye, my right eye wasn't seeing very well," he continues. "I soon learned that I had a problem with that eye, so I stopped doing surgery six months

earlier than I would've stopped doing surgery at age 70. What I didn't want to happen was for somebody to tap me on the shoulder and say, 'You know what, I think it's time.' And so, I made the decision. My surgery was still fine at 69, but I didn't want that to happen. I'd done plenty of surgery in my time, and I stopped. But I've been carrying on. I haven't really retired, just stopped seeing patients."

In his tenure as chair of the Department of Ophthalmology and Visual Sciences at Vanderbilt University and as chief medical officer of Vanderbilt Medical Group, Paul Sternberg Jr., MD, has seen many ophthalmologists in various stages of retirement. He's also had to have some of those challenging conversations about scaling back responsibilities.

"Whether you're the head of a private practice or an academic department, part of your job is going to be to help your associates, your colleagues, your friends, work through these retirement transitions in a way that's respectful to them and protects patients," explains Dr. Sternberg. "There were a number of occasions where these discussions occurred. Sometimes

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it was initiated by other physicians in the practice who were concerned, sometimes by patient complaints. Sometimes it was initiated by the OR, tactfully noting that a certain surgeon's cases were taking longer or there were more complications. I've been very fortunate that in my 20 years as chair and 15 as CMO, every time I've had to have conversations with physicians about reducing their clinical activity or moving toward retirement, we were able to have those conversations in a very respectful manner."

Dr. Sternberg prefaces that his approach may not work in every instance. If he hears a physician's cases are taking longer or there's been an increase in complications, he speaks with the physician and raises the concerns. "I say, 'You know, it's been brought to my attention that your surgical duration is longer' or 'your complications rate is up a little bit. Do you still enjoy operating? Do you still get up in the morning on your surgery days and are excited to go to the OR, or are you starting to feel a little apprehension? Have you noticed that you just don't have the same joy in going to the OR that you did in the past?'"

"In most cases, if you present it in a non-threatening manner, you can have a collegial conversation," he continues. "You'll hear, 'You know, yeah,' and then it'll be, 'Have you thought about stopping operating?' Because, you don't have to continue operating. In medical ophthalmology, you can continue seeing patients and maintain those special relationships. It can continue to be very gratifying, and in many cases, you actually can maintain the same level of revenue and compensation."

"So, in those circumstances, we've been able to move towards a mutually agreeable decision to transition without there being any significant issues with me having to force someone out or the physician suing or feeling insulted or belittled by the tone or the direction the conversation was going," he says.

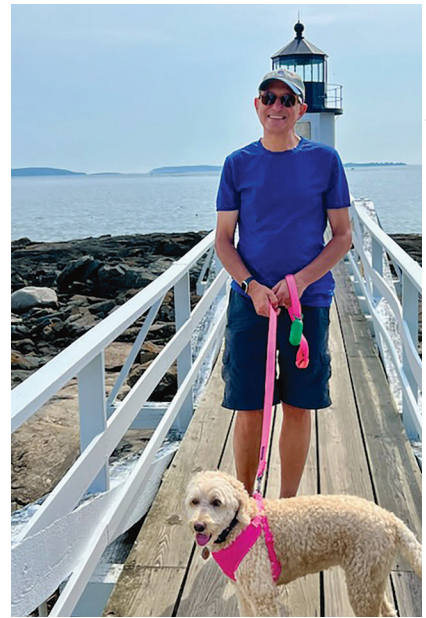
When having these conversations, Dr. Sternberg emphasizes the need to

be respectful, no matter what data is in front of you. "This is someone who's had a long and successful career, who's a physician, who has pride in who they are and what they've accomplished, and you don't want to take that away from them," he says. "So, your goal really needs to be to allow them to feel good about who they are and what they've accomplished, and to help them come to the decision that this is a direction that will allow them to leave the profession on top, and not move in a direction where they feel forced out or belittled. Again, I've been fortunate that I've been able to get to that place without rancor. That's not always the case, I'm sure. And sometimes it takes more than one conversation."

The decision to stop performing surgery doesn't necessarily mean a surgeon has to stop all at once. A period of transition can help the surgeon and their colleagues prepare for the adjustment. "If you're having the conversation in April, don't say, 'How about you stop operating by May 1?'" Ask them how they feel," advises Dr. Sternberg. "What's a good, comfortable time frame for you? Is it September? Is it the end of the calendar year? What I've found is that once we arrive on a date—let's say we're having the conversation in April, and they decide on September—by July they've stopped operating. Once the decision is made, they often start turning cases over to their associates; they start to move forward."

Hanging Up the White Coat

Retirement journeys look different for every physician. For John Stechschulte, MD, of Columbus, Ohio, the right decision was a full stop. "I went from being a busy surgeon in December of 2019 to being fully retired from the office and OR by mid-January 2020," he says. "Many of my colleagues in ophthalmology choose to discontinue or drop back their surgical work a few years before they stop providing clinical care. I'm probably in the minority in that I decided to take a full stop. I



Paul Sternberg Jr., MD

Paul Sternberg Jr., MD, with his labradoodle, Sydney, in front of the Marshall Point Lighthouse in Maine.

still stay involved in ophthalmology in many different ways, just not in the OR or in the clinic."

One of the driving forces behind his decision was his family. With his children living in North Carolina and in Colorado, and with his parents in Florida, he and his wife decided to spend more time traveling to visit everyone. He adds that "2020 was a year in which I could retire, because at that point, we had a few new doctors in our group, and I could see that the younger doctors could help take over the care of my patients. It worked out well both personally and for my practice. I had thought about semi-retiring in 2015, but at that point our practice wasn't quite large enough, and it would have been difficult to cut back on my surgeries and still maintain the practice financially with one less surgeon. So, I kept working, though I would have liked to have worked part time starting in 2015."

Retina specialist Pauline Merrill, MD, formerly of Illinois Retina Associates and Rush University Medical Center in Chicago, also retired full stop—for a time. "For me, the push to retire came during the pandemic," she says. "I was already

feeling burned out at that point. I was doing surgical retina, medical retina and uveitis. I was in a private practice and also teaching residents at Rush and doing research and presenting at meetings. The summer of 2020 during the pandemic wasn't a great time to be in Chicago. My husband and I had always planned to retire to the mountains of North Carolina, and we'd recently finished building our home there. I had already told my partners I planned to stop doing surgery, but then with the burnout and the pandemic, I decided to just retire and move to North Carolina."

After a few years in retirement, Dr. Merrill joined a practice in Greenville, South Carolina, where she works part time doing medical retina. "It's a nice balance between retirement and keeping my hand in ophthalmology," she says. "I'm doing medical retina and uveitis—no surgery and no call. Though, there is quite a bit of uveitis here, with occasional complicated uveitis patients leading to some long days."

For Richard Grostern, MD, director of Ophthalmic Pathology and former director of comprehensive ophthalmology at Rush University Medical Center, the choice to retire was taken out of his hands when he experienced health issues in 2019 at age 50. "My transition was sudden and strange, and I wasn't ready for it," he says. "At the time, I was practicing comprehensive ophthalmology, cataract surgery and refractive surgery, and I was also managing partner of a moderate-sized practice. And one day it ended. It was a very difficult time. Since then, I've kept up on the administrative side of things. I'm still a managing partner of the practice, and I continue to do ocular pathology."

Adjusting Duties in the Practice

For those who scaled back on work-related responsibilities as part of their transition, that often meant scaling up in other areas. Some physicians see more patients than when they were performing surgery in the time leading

up to retirement; others increase the amount of time they spend on research and publishing or devote more time to hobbies and traveling. For many, reducing the number of days spent at the office is a common theme.

Over time, Dr. Harbin says he began taking more time off and slowing down in terms of the days of the office. "Later on, I recruited somebody to come take over my practice," he says. "After they came, and we had a period



"Do a lot of thinking and be sure you're ready to go."

—Thomas Harbin, MD, MBA



of transition, I stopped going."

"In 2017 as part of my succession management, I sold my practice in London to a company called Optegra," says Dr. Packard. "I did the fee earn-out in order to get the value of the practice paid to me. Then COVID came along and messed things up. Optegra decided they didn't want to have comprehensive ophthalmology anymore. They just wanted to do NHS cataract surgery, or private refractive surgery and cataract surgery, which I wasn't doing anymore. I set up some appointments so I could see some old patients to say goodbye. And then I decided that enough was enough, and I stopped seeing patients."

In his quest to reduce his workload, Kenneth J. Hoffer, MD, of Santa Monica, California, switched up his clinic hours instead of taking days off. "I was seeing 40 patients a day, four days a week, and operating on 10 cataracts on Wednesday," he says. "That was my routine for most of those years. As the years went by, I was trying to look at ways to reduce my workload because it was really hectic. However, I didn't really like the idea of taking a day off.

"I realized that lunch was something I wasn't eating, and I didn't eat breakfast," he continues. "The only meal I eat in a day is around 9:30 when I cook dinner for my wife and me. And so, I said to myself, 'Why am I sitting around in my office for an hour, playing with papers and then going home at five o'clock in the winter when it's dark?' I decided to eliminate my lunch break and work straight through from nine to three and see patients continuously. I had 11 people working for me then. I had six of them go to lunch at noon, and the other five go to lunch at one. That worked out well. I was out of there at three o'clock. I could go to the coffee shop, get on my computer and do my research work and so forth.

"I came into financial stability in the mid-80s; in 1982, I was able to buy my building and have my own outpatient surgery center," he recounts. "I could have retired in 1983, but I had no interest in doing that—I loved what I was doing. But I wanted to slow my practice down a bit more."

After speaking with a number of people from around the country, Dr. Hoffer took a chance and made the decision to sign out of Medicare in 1999. "I was as busy as could be," he says. "Everybody that advised me it was a good idea was dead wrong, because the patients were able to get free care anywhere down the street. But for me, they had to pay out of their pocket to have their cataract removed. I guess they decided, 'I don't care how good he is, I don't care how famous he is. I can't afford it, or I don't want to pay that.' Things are different today; people are paying left and right for premium intraocular lenses and femto capsulotomies. Now, people are used to paying, but back then, they weren't, so my practice gradually slowed down. I could have been unhappy about that, but I found I had more time to do research and publishing and to work in areas to improve things that I really enjoyed. However, I could afford to do that."

In the early 2000s, Dr. Hoffer sold his building and began renting space

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Nilson, Robert 10.18.2024

PROVIDER

"Good morning Bob, how can I help you today?"

PATIENT

"I'm having trouble with my vision, and I've noticed some floaters and flashes of light in my eyes."



in other doctors' offices. "I did that for probably 15 years," he says. "I'd see patients on certain days. I had a nurse that was taking the calls and setting up the appointments, and the patients paid cash to see me, and I paid cash to rent the office for the time I was there. I was seeing patients up until the pandemic in January 2020. After things started opening up again after a couple of years, I figured most of those patients had found another doctor by now."

When making the transition to retirement and scaling back responsibilities, it's important to loop in your colleagues so everyone is on the same page, says Dr. Sternberg. "For the first half of my career, I was a clinician/scientist/educator, and in 2003 when I relocated to Vanderbilt, I became department chair and subsequently became associate chief medical officer," he says. "A very high percentage of my professional arc was administration and executive leadership. I made the decision when I turned 65 that at 70, which would be 20 years as department chair and 15 years as chief medical officer, I would step back from my administrative roles.

"During that period of time, whether I was talking to potential faculty candidates or resident applicants, I made my timeline very clear," he continues. "I didn't want either my current faculty or potential faculty to have any misunderstanding; I didn't want incoming faculty or residents to feel that there had been a 'bait and switch.' I also didn't want anyone to feel that retirement or stepping back was something to be afraid of. I feel strongly that retirement is something that you should plan for and be excited about.

"On June 30, 2023, I stepped back from my leadership roles at the medical center," he says. "Over that five-year period, I had a number of discussions, both with my wife and with the CEO/dean about what my life was going to look like after that. At the same time, my good friend and colleague who was the health system chief of staff was

also stepping back, and he had made the decision that he was going to make a complete clean break: stop seeing patients, no administrative roles and full retirement.

"After reflection and having those conversations, I decided I wasn't ready for that; I felt like I still wanted to be involved at some level," continues Dr. Sternberg. "The conversations centered on topics such as, 'What do I love doing? What would give me joy during this period of time, this next chapter?' It turned out that I really loved seeing patients and working with the trainees. So, I now continue to see patients, and am actually even a little bit busier clinically. I also work with the CEO/dean on special projects and specifically help with fundraising, so they created a position called the Medical Director of the Development Office."

Current Activities

Many physicians maintain a connection to medicine after they retire. Here's what these ophthalmologists are doing now in their semi-retirement and post-retirement eras.

"I still have my pinky finger in ophthalmology," says Dr. Harbin. "There's a nonprofit called The Good Samaritan Clinic, and I go there every month and see patients there. Most of them just need an exam and they're done for another couple of years. But if I see somebody who needs glaucoma treatment or has diabetic retinopathy and needs help from a retina doctor, I get them out to a member of my group.

"I also review fundus photographs that are taken by another nonprofit called Prevent Blindness Georgia," he continues. "So, every week or so, I'll get a series of photographs to review. It keeps me somewhat engaged in ophthalmology."

When he's not volunteering his time, Dr. Harbin keeps active in other ways. "I work out with weights and do cardio every other day, and walk on the days I'm not working out," he says. "I read and I do some mind games like Wordle, trying to keep my brain stimulated. My wife and I do some

traveling. We go out with friends and have lunch with them every now and then. I sit around and read the paper now. I didn't used to do that when I was very busy."

Dr. Hoffer says he may be busier in his "retirement" than when he was in the clinic and the OR full time. "I'm immensely busy in everything ophthalmological: doing research, publishing papers, editing papers, reviewing journal articles, writing book chapters, lecturing, teaching, etc.," he says. "I just got through publishing and editing a 72-chapter textbook on intraocular lens calculations, of which I wrote eight chapters. I'm also a consultant for Medennium, a company that's trying to get their phakic IOL (called the PRL, now the MPL) back. And I've been doing my run every day—a half-hour run. I've been doing it now for 31 years, and I've never missed a day.

"About a year ago, my son asked me why I keep spending all this time reviewing journal articles when I don't get paid to do it," he continues. "I've found that research and teaching and publishing has kept my brain going. I think it's a good plan because it seems to be working. And I feel a lot of responsibility for the field and the quality of scientific information put out there."



Pauline Merrill, MD

Pauline Merrill, MD, hiking in the woods of North Carolina.

"I'm still very much involved with teaching," Dr. Packard says. "I also sit on the Education Committee of ESCRS, and I'm the chief judge of the ESCRS video competition. I'm an examiner for the Federation of the European Board of Ophthalmology—the specialist exam in cataract/refractive surgery. I'm also working with a number of different companies on interesting inventions of theirs, so it keeps me fairly occupied."

Dr. Merrill took up golf again during her retirement. "I played with a ladies league in the summer, but after a while I realized I needed to do something less stressful than playing golf, so I went back into practice three days a week. I still enjoy hiking in the mountains and kayaking on the lake."

Dr. Sternberg also works three days a week, two of which are devoted to seeing patients for half the day while the other time is spent in meetings related to development and other projects. He's also been spending more time in Maine during his retirement transition.

"Over the years, my wife and I have been coming to Maine over the summers, and we fell in love with it," he says. "We decided that we wanted to spend more time up here. So, we now spend the summers in Maine. I'll come back to Vanderbilt every five or six weeks to see patients and have some meetings. Upon reflection, I suppose my retirement transition is in kind of an intermediate stage. As an administrator, I didn't work a 40-hour week. The hours and days weren't conventional. I wasn't cutting back from 100 percent to 50 percent, but from, say, 150 percent to 50 percent, so this has really felt like a dramatic cutback for me. It's been very liberating and enjoyable. My friends refer to it as 'retired-ish.'"

Staying mentally engaged is a common theme for many physicians in retirement. Dr. Stechschulte and his wife audit courses at the Ohio State University. "There's a program called Program 60, where if you're beyond the age of 60, and you can figure out how to register as a student and enroll for a

university course of your choice while getting permission from the professor, you're able to join in and be a student again. Typically, the professors don't expect us to do the tests or final exams, but they enjoy having us in the class to participate by telling the students about the experiences we've had. I've taken about one course per semester, in all different fields and areas of interest, even in some things in which I wasn't particularly interested but had heard really good things about the professor. I still stay involved in our state medical association and attend our Ohio and local eye meetings."

Reflections on Retirement

"Do a lot of thinking and be sure you're ready to go," says Dr. Harbin. "I was in my early 70s when I retired. Some people are in their mid 60s. But you need to be sure you're ready, and to the best of your ability, have something to do during the week when you retire, so you're not just sitting at home twiddling your thumbs."

Dr. Packard advocates for a gradual transition. "I think the important thing is not to stop suddenly, because you'll feel lost," he says. "You've devoted your life to your profession, and [after retiring] you'll lose out on many of the connections through your job. You won't see those people as often as before and your social life will change."

"I think you have to scale back in a planned, strategic way, so at the same time you're giving up ophthalmology, you're taking up other things like charitable work, golf, fishing or whatever," he continues. "But you have to make sure that your day isn't just going to be a question of getting up in the morning and going, 'What am I going to do today?'"

Dr. Stechschulte agrees, pointing out that the hardest part of retirement isn't usually the financial part but deciding what to do with yourself upon retiring. "A purposeful retirement, finding happiness in what you're doing and the things you want to pursue is so important," he says. "I miss the people in my practice—the doctors, the staff, and I

do miss the patients. I miss the personal interactions with patients. I liked the routine of knowing I was going to be at work Monday through Friday, and sometimes go in for emergencies on the weekend. But now, I'm certainly enjoying my freedom doing whatever I want, on whatever days I want."

"I think doctors should find books about retirement that focus on the non-financial matters," he advises. "These matters are so much more difficult to decide upon. Friends have told me how surprised they are at the amount of introspection and soul searching they were doing in preparation for their retirement. It's hard for most doctors to go through this, so I think many tend to just keep working and waiting to see what the next year brings."

"Remember that retirement isn't a bad word," says Dr. Sternberg. "Along with your decision to move towards retirement, you also need to partner that with preparation—succession planning. That's something that most of us don't do very well. Helping your practice or your department move forward without you is a really important thing. If you're afraid of sharing your decision with them, then it's going to be much harder on them when you do share your decision. Knowing what's going to happen, and then having them work with you to a transition is really important. I'm a firm believer that this needs to be something that's out in the open, that's discussed, that's not kept as a harmful secret."

"What's less commonly talked about, and what people are hesitant to talk about, is the change in identity and the way others identify you," Dr. Grostern points out. "Being a doctor isn't just a job; it's who you are. Losing that core part of yourself is hard, whether it's suddenly or through a gradual, planned process. It took me a while to realize that that loss of identity was what was gnawing at me. My advice to retiring physicians is to not only plan what you're going to do, but to also think about who you are to others and to yourself." ◀

FUCHS': WHEN IS IT TIME FOR A TRANSPLANT?

Corneal specialists describe how to use diagnostic cues and imaging technology to determine when a patient with Fuchs' dystrophy needs transplantation.

CATLIN NALLEY
CONTRIBUTING EDITOR

While Fuchs' dystrophy often progresses slowly, advanced cases may call for corneal transplantation, specifically, Descemet's stripping endothelial keratoplasty or Descemet's membrane endothelial keratoplasty. However, the decision to pursue surgical intervention is complex and relies on multiple diagnostic factors. With advanced imaging technologies and a better understanding of the disease's natural course, ophthalmologists are equipped with more precise tools to assess disease progression and determine the optimal timing for surgical intervention.

In this article, we'll explore how to best decide when corneal transplant should be considered for a patient with Fuchs' dystrophy. We'll also review the role of imaging modalities in evaluating endothelial cell loss, corneal thickness and structural changes. Additionally, we'll highlight other key clinical signs and symptoms that influence treatment decisions. Also, leading corneal specialists will

provide practical tips and guidance to help ophthalmologists better manage patients with Fuchs' dystrophy and optimize outcomes.

Clinical Tips & Best Practices

As with any patient, a thorough patient history and symptom assessment is the first step. Michael Sulewski, MD, assistant professor of ophthalmology at Johns Hopkins, and a cornea and cataract specialist at the Wilmer Eye Institute, notes, "I assess the patient's symptoms, notably for the presence of AM blurriness as a way of distinguishing visual symptoms of Fuchs' edema from other comorbidities, such as cataract."

Dr. Sulewski's next step is a slit lamp exam to correlate symptoms and visual acuity with key findings of edema, such as epithelial bullae or posterior stromal folds. "If a patient has diurnal variation, decreased acuity and clinical findings of edema, I feel confident offering endothelial keratoplasty as an intervention," he says.

What becomes a more challenging decision is when cataract surgery is indicated but the symptoms and slit lamp exam for Fuchs' is rather

equivocal, according to Dr. Sulewski. "Although the cornea may be relatively well-compensated at that instant, cataract surgery alone can precipitate its decompensation, and many patients would prefer to have a combined procedure rather than a staged approach if disease progression is imminent."

When assessing disease severity and corneal edema, corneal pachymetry is one piece of the puzzle. Kathryn Colby, MD, PhD, the Elisabeth J. Cohen, MD, Professor and Chair in the NYU Langone Department of Ophthalmology, checks the corneal thickness of any Fuchs' dystrophy patient she sees; however, she also emphasizes that for this measurement to be useful you need to have a long-term history with the patient.

"Everyone has some variability in how thick their cornea is to begin with," Dr. Colby says. "There's a normal range, but when I see someone for the first time and their cornea is 550 microns, I don't necessarily know if that's elevated or just normal for them." During the examination of the cornea, she also "very carefully looks at the distribution of the

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corneal guttae—a hallmark of Fuchs' dystrophy.”

Imaging plays an important role in the diagnosis and management of Fuchs' dystrophy. For Sinthu Ranjan, MD, clinical assistant professor of ophthalmology, University of North Carolina at Chapel Hill Department of Ophthalmology, specular microscopy and corneal topography/tomography are two of the most valuable modalities.

Specular microscopy allows for direct visualization of the corneal endothelium, helping to assess cell density and morphology, Dr. Ranjan explains. “This

imaging technique can identify critical changes, such as irregular cell sizes or shapes,” she says. “It'll also give you a percentage of hexagonality. Generally, if you're over 60 percent for a Fuchs' patient, you're doing okay; however, once that starts to drop, or sometimes the specular can't even really give you a good percentage, then you may be heading towards transplant.”

Dr. Ranjan also uses imaging to support patient education and counseling. “Showing patients what their cells look like can be helpful when explaining their condition and management options,” she says. “You can visualize the guttata and, oftentimes, it's a way to help patients become comfortable with the idea that surgical intervention may one day be necessary.”

Corneal topography/tomography, Dr. Ranjan notes, provides a full corneal pachymetry map, showing thickness at multiple points across the cornea. “In comparison, handheld pachymeters provide thickness measurements at a single point and these results can vary based on the pressure applied or the exact measurement location, introducing potential variability,” she says.

“With the help of corneal topography/tomography you can track thick-

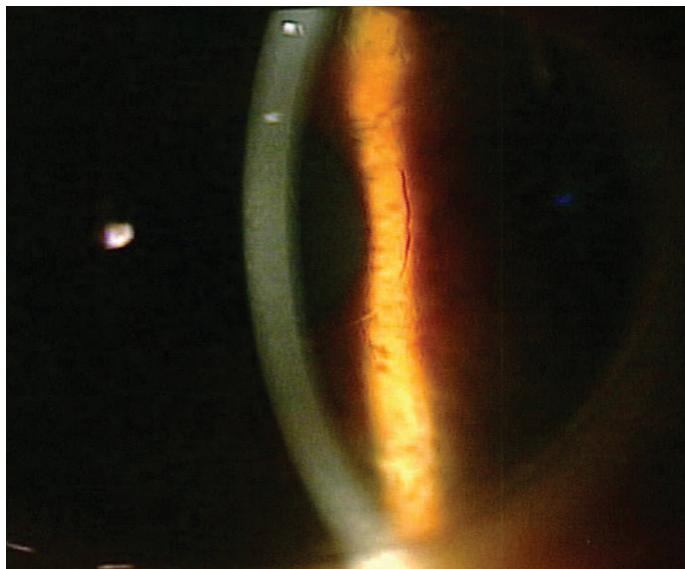


Figure 1. A Fuchs' patient who underwent Descemet's stripping only, showing the edge of Descemet's stripping and a clear cornea.

ness more objectively,” Dr. Ranjan adds, while noting that normal central corneal thickness averages around 540 μm . “Thickness above 640 microns is a threshold where patients are more likely to experience corneal decompensation and develop edema.”

In cases when cataract surgery is indicated but the edema is borderline or subclinical, Dr. Sulewski uses Scheimpflug tomography as the tiebreaker. “An insightful paper from Mayo clinic in 2020 outlined three Scheimpflug imaging findings conferring high risk of requiring transplant soon: irregular isopachs (deviation from concentric circles on the pachymetry map); displacement of the thinnest (from the center); and focal posterior depression on the back surface of cornea,” he says. “When I identify these imaging findings, I tend to offer DMEK along with cataract surgery to patients.”

When imaging the endothelial cells, Dr. Colby not only images the center, but also the paracentral region as well. “Following a comprehensive exam, including everything we discussed above, I am able to communicate the severity of a patient's disease as well as what the intervention might be,” she says.

For patients who have a cataract

and their Fuchs' dystrophy isn't very advanced the best intervention could be observation, Dr. Colby suggests. Cataract surgery alone might be the best option for patients without significant corneal involvement.

“For patients who are pseudophakic and they have corneal guttae that are confined centrally, and the peripheral endothelial mosaic is intact, Descemet stripping only [DSO] could be my recommendation,” she notes. “If a patient has advanced Fuchs' dystrophy where guttae are all across the cornea I'd proceed with DMEK.”

Dr. Ranjan considers herself a relatively conservative surgeon and doesn't immediately jump to a transplant for every patient. “You have to take the whole person into consideration when deciding if surgery is the appropriate next step,” she advises. “While clinical findings are paramount, it's also important to think about other factors as well.

“For example, how old is the patient? An 85-year-old patient who's otherwise functioning is probably not someone I'd consider for transplant, even if they develop some mild corneal edema. If they aren't bothered by it and their quality of life isn't impaired, I would likely wait because surgery comes with its own host of challenges.”

With a full picture, you can determine the best course of action, according to cornea specialists. Ongoing monitoring and close collaboration with patients to assess symptom burden and visual function remain essential in managing Fuchs' endothelial corneal dystrophy and determining the appropriate timing for corneal transplantation, if necessary, surgeons say.

Patient Communication

Empowering patients with clear, em-

All images: Kathryn Colby, MD, PhD

pathetic education is essential when helping them navigate their diagnosis, manage symptoms and understand potential treatment pathways, including corneal transplantation. Effective patient counseling not only fosters trust but also ensures patients feel informed about their options and possible outcomes.

Dr. Colby begins educating patients from the very first visit. This includes discussions on the disease, what it is and, depending on the specific needs of the patient, next steps and the potential treatment options that may be considered in the future. “I try to use patient-friendly analogies to help them understand,” she says. “Ongoing communication is important so that your patients aren’t surprised when their disease progresses, and further intervention is necessary.”

When moving forward with transplant, educating patients on the details on their procedure and what to expect is critical, say physicians. “For patients undergoing DMEK, I counsel that supine positioning is required for the first couple days after surgery. Since partial detachments are common in the first couple weeks, I also always prepare patients for the possibility of performing a rebubble in the office,” explains Dr. Sulewski. “It’s better to prepare for such a common contingency than have the patient worried that something awful and unusual has occurred.

“For DMEK, I counsel that many patients achieve excellent vision within the first couple of weeks (often 20/20); however, this may be delayed if a rebubble is performed,” he continues. “I mention that steroids are required for transplant for months to years which confer a risk of glaucoma that requires ongoing pressure monitoring. We also discuss that although rare with DMEK, rejection remains a possibility and that patients need to monitor symptoms and present urgently.”

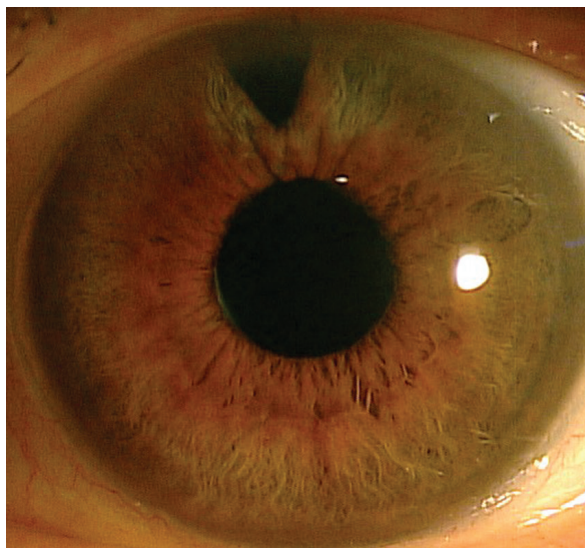


Figure 2. Slit lamp photo of the patient who underwent the Descemet’s stripping only procedure from Fig. 1, more than four years after surgery.

It’s also important to tailor discussions about transplants to the individual needs and readiness of the patient, according to Dr. Ranjan. “Assessing a patient’s interest in transplant is number one,” she says, while emphasizing that you never want to pressure a patient into a procedure they don’t want, even if surgery is the best course of action. “Take the time over multiple visits to educate and build trust.”

For elderly or physically limited patients, ophthalmologists must also consider potential challenges, such as positioning requirements after surgery, availability of support, and frequent follow-ups. “Open and honest communication with your patients is key to help them not only understand all that transplant entails, but also to ensure this is the right approach from both a medical and lifestyle perspective,” says Dr. Ranjan.

Alternatives and Advances

While corneal transplantation remains the time-tested surgery for advanced Fuchs’ dystrophy, not all patients require or are ready for this intervention. Advances in our understanding of the disease and innovative techniques have expanded the range of treatment options, allowing for personalized approaches based on disease severity,

patient preferences and the presence of comorbid conditions.

One example is the procedure known as Descemet’s stripping only. Pioneered by Dr. Colby in the United States and Dr. Gregory Moloney in Australia starting in 2014, this approach involves removing the central portion of the cornea’s endothelial layer and utilizing a ROCK inhibitor to promote cell migration and regeneration. “This approach offers another avenue of treatment for certain patients with Fuchs’ dystrophy,” Dr. Colby notes.

“Although transplant is an excellent option for speedy recovery, Descemet’s stripping only is a reasonable and growing

alternative for the right patients,” says Dr. Sulewski. “This procedure has the advantages of technical simplicity, no long-term steroids or possibility of rejection, and no positioning requirement. The drawbacks are a slower visual recovery or non-clearing of edema, requiring rescue with DMEK. Therefore, I would still only offer this procedure to a patient open to the possibility of a transplant, in case rescue is needed.”

Dr. Sulewski also highlights injectable endothelial cell culture therapies as another promising advancement that are already in trial phases and “may become the future of endothelial cell transplant.”

When it comes to managing patients with Fuchs’ corneal endothelial dystrophy, Dr. Colby emphasizes the importance of a “less is more” approach and staying current on the latest advancements.

“There’s a lot of activity in the field and so you have to be aware of what is going on and what might be available to you and your patients,” she advises, while highlighting the value of working with your patients. “Engage in a partnership with your patients so that they can help make the decisions on what’s best for their overall health and well-being.” ◀

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REVIEW
of OPTHALMOLOGY

AVOIDING AND MANAGING TRAB COMPLICATIONS

Complications aren't uncommon with this procedure, but with great skill, this treatment can be far more effective than other glaucoma surgeries.

ANDREW BEERS
ASSOCIATE EDITOR

Some surgeons and patients may wonder: Why risk the chance of complications with trabeculectomy when there are safer surgical options like MIGS? Yes, trabeculectomy is known for laborious postoperative care, risk of infection, intraocular pressure spikes and bleb issues, but this procedure offers a lot of utility even after all these years. In this article, glaucoma specialists share their advice on how to mitigate and manage trabeculectomy complications using proper techniques and solutions.

Choosing the Right Candidate

It's imperative to take into consideration the lifestyles and medical histories of each glaucoma patient before moving forward with trabeculectomy. There isn't a standard procedure for glaucoma, and different options may be more beneficial than others in certain cases. In other cases, treatment options may have contraindications that won't allow for the patient to be a candidate. It all depends on the patient.

"Since we've had so many more options available in the last several years, I would differentiate between contraindications versus 'patients in which I'd prefer to start with other procedures,'" says Thomas Johnson III, MD, a glaucoma specialist at the Johns Hopkins Hospital in Baltimore. "However, regarding contraindications for trabeculectomy, I think they mainly have to do with the suitability of the conjunctiva and the ocular state. Studies have shown that trabeculectomy is much less likely to succeed in the long term in patients that have neovascular glaucoma or uveitic glaucoma, especially if they have active inflammation at the time of surgery. So, I almost never do a trabeculectomy in that subset of patients."

James Tsai, MD, glaucoma specialist at Mount Sinai in New York, agrees that trabeculectomy wouldn't be the ideal option for patients with neovascular or uveitic glaucoma. He finds that if the patient's glaucoma is difficult to control, then moving forward with another treatment option would be appropriate in this case.

"The candidates that aren't good for trabeculectomy are ones who can't

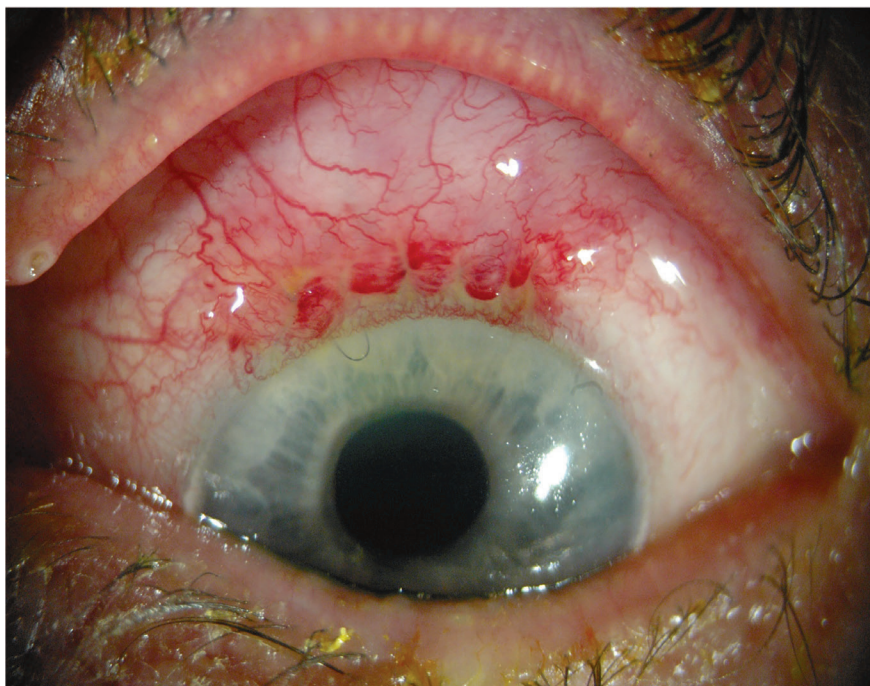
come back for regular follow-up, whether they're in a nursing home or they live very far away," Dr. Tsai adds. This is something that another doctor, Brian Francis, MD, a glaucoma specialist at the Doheny Eye Center in Pasadena, California, takes into account when he meets with his patients. Both surgeons note that this is a labor-intensive surgery and postop care is imperative.

"The patient's lifestyle plays into it, so things like hygiene, access to medical care, if they're active—open water swimmers or scuba divers—then they're probably not ideal patients," adds Dr. Francis. Obviously, patients aren't going to sit around all day. They want to walk around, work and take care of their health. But it's important that the patient sits still and relaxes during the postoperative management period to ensure the bleb wound heals at a steady rate, say surgeons.

"Here's what I ask of my patients," says Dr. Tsai, "after I take the patch off postop day one, I want my patients to essentially have as little eye movement as possible because we don't want hyphema or irritation. I'd rather have patients look straight ahead and just

This article has no commercial sponsorship.

Drs. Johnson, Tsai, and Francis have no relevant financial interest to disclose for this article.



A corneal releasable suture for a fornix-based flap closed conjunctiva to conjunctiva. The releasable suture isn't exposed, which is usually the case. Instead, only the suture loop is visible to release it, which would allow for filtration of aqueous at the site of the bleb, reducing IOP.

have their eyelids blink. The easiest way to do that is for them to watch TV or a movie, because when you're looking that far away, guess what? You're just blinking. You're looking straight ahead. You're not moving your eyes.

"I don't want patients to read," continues Dr. Tsai. "Reading is one of the most challenging things for someone because their eyes are moving back and forth. I also want them to take it really easy in terms of activity. I tell them not to bend, lift or strain anything. They can walk, but not run or jog." If a patient can't adhere to these management conditions, then they'll increase their chance of further postoperative complications.

"Younger patients are more likely to scar a trabeculectomy leading to surgical failure," says Dr. Johnson. "I also tend to, if I need filtering surgery, do a tube shunt in juvenile onset open-angle glaucoma in people that are relatively young, like under 50. But I've done trabeculectomy in those cohorts of people for various reasons, and it can work.

"When people have had other complicated surgery before, if they've had a vitrectomy and they've got a scleral buckle, they have a lot of conjunctival scarring in the area that you would want to work superiorly, and it's often not feasible to do a trabeculectomy," he continues. "For patients with significant dry eye and ocular surface disease with medicamentosa from years of drops, and their conjunctiva is either extremely friable or inflamed, I tend to stay away from it in them as well."

Also, Dr. Johnson notes that patients with conditions where their sclera is too thin wouldn't be candidates for trabeculectomy. If a patient has a rheumatic disease or a collagen associated disease such as Ehlers-Danlos or Marfan, then they wouldn't have reasonably thick sclera, therefore making the flap during the procedure quite difficult to create and suture. Surgeons say that ensuring a perfect scleral flap that's not too thin or not too thick decreases the risk of complications.

Surgical Techniques

There are different schools of thought

on how to cut the scleral flap and suture afterwards. Everyone's going to employ the technique that makes them the most confident and comfortable to move forward with trabeculectomy and lead to positive outcomes. What physicians need to keep in mind is that the scleral flap thickness makes or breaks the outcome of the procedure. Dr. Johnson shares his pearls on flap thickness.

"When making the flap, I think the two issues that arise are whether the surgeon creates a flap too deep or too shallow," says Dr. Johnson, "and for me, I think it's usually more of a problem if they're too shallow in making the flap.

"If you outline your flap too deeply on the posterior edge, it will cause you to lose the counter traction that you need in order to get the flap in the right plane as you move anteriorly," Dr. Johnson continues. "So, I start the flap at the posterior edge. I use a crescent blade and then slowly, with one hand, hold the flap up and provide gentle traction anteriorly. Then, the base of the flap that's still attached to the sclera provides posterior counter traction so that you have a really clear zone of scleral tissue that you're dissecting in.

"If you go too deep and the posterior edge of the flap is full thickness, then as you pull the flap anteriorly, the sclera underneath the flap will move anteriorly with the flap that you're trying to dissect," Dr. Johnson continues. "And so, it makes that dissection a little bit trickier. Essentially, you try not to go full thickness. If you do, you can kind of keep the eye inflated by re-injecting BSS as needed or add Healon if you have to, but I think having too thick of a flap is something that just makes the surgery take a little bit longer. It's not ideal, but it's not as big of a problem as if your flap is too thin.

"I think the biggest worry is amputating the flap completely or even partially, because when that occurs anteriorly, it's very challenging to get it to be watertight or to hold enough

resistance to aqueous outflow,” continues Dr. Johnson. “I think there are two things that can play into that. One is simply being a little bit too thin on the flap as you’re dissecting it anteriorly and coming up shallowly as you move towards the limbus. The other thing that sometimes throws trainees off is if they end up with a little bit of episcleral tissue or a little bit of Tenon’s stuck onto the surface of the flap. That can often lead people to misgauge how thick the flap truly is.”

“It’s really critical to get, ideally, half thickness of the scleral flap, which isn’t too thick or too thin,” adds Dr. Tsai. “Kind of like Goldilocks. You want it just right.” In order to achieve this result, he chooses to create a rectangular flap for easier control during trabeculectomy. There are different ways physicians can shape the flap, and there’s no wrong way to do it, they say; it’s all based on preference and experience.

“I tend to make rectangular flaps, but surgeons have made it triangular, surgeons have made it semi-circular,” says Dr. Tsai. “I don’t think it really matters the shape of the flap. For me, I tend to make my rectangular flap about 3 millimeters wide, ideally 2.5 millimeters deep. However, it varies a little bit, but I like the rectangular flap because I’m able to make straight lines as opposed to semi-circular where you’ve got to trace it. I find with the triangular flaps I can’t make it as thick as I want it to be, and I couldn’t make as consistent of a flap as I would with a rectangular flap.”

In addition to the shape of his flap, Dr. Tsai chooses to create a fornix-based flap rather than a limbal-based. “I do a fornix-based flap, but I don’t make my fornix-based flap right at the limbus,” he says. “I make my fornix-based flap incision about 1 millimeter posterior to the limbus and therefore, I’m able to suture the flap conjunctiva to conjunctiva. I believe that gives me a better watertight closure and that I get much better conjunctival healing because I’m suturing conjunctiva to the conjunctival tissue as opposed to

when people make it at the limbus. In my thinking, [suturing to the limbus] doesn’t allow the incision to heal as nicely.”

Suturing the flap is one of the final steps leading into postoperative management for trabeculectomy. Physicians can choose between an interrupted or a releasable suture for their patient. It all depends on their preference and the tools available to them.

“When I suture the flap, I usually put one corneal releasable suture,” says Dr. Tsai. “My concern with interrupted sutures is that early on in the postoperative phase, I don’t want to be reliant on having a working laser or the inability to see the suture because there’s subconjunctival hemorrhage.

“I started using releasable sutures decades ago when I had a patient where I did the interrupted sutures, brought her to a satellite location, and unfortunately the laser wasn’t working that day,” Dr. Tsai shares. “What did we do? We had to have her come back another day to another office where the laser was working, but that wasn’t ideal because I felt that I should have cut the suture then and there and I lost some time where the body’s healing response accelerated even more. Now, with the corneal releasable suture, I can pull the first suture and not have to worry about having a working laser or having subconjunctival hemorrhage which obscures the suture from laser suture lysis.”

Managing Postoperative Concerns

Complications aren’t uncommon with trabeculectomy. After creating the scleral flap and suturing it, maintaining the bleb becomes the main focus during postoperative management. The bleb can overfilter causing hypotony, it can leak, and sometimes ptosis can arise.

“If I have somebody with an overfiltering bleb who has functional hypotony, I think there’s a few things you can do,” says Dr. Johnson. “I’ve tried putting large bandage contact lenses

over it to see if that could temporarily restrict flow and maybe get some adhesions to form that would reduce the size of the bleb. I haven’t had much success with that. I’ve placed barrier sutures before and that can work pretty well actually. I used a 10-0 nylon that I would run in a long mattress. So, a short pass parallel to the limbus, and then another pass parallel to the limbus but several millimeters posterior, and then you tie it and bury the knot. And so, you have sort of a very long rectangle that you place on either side of the bleb itself, and that can kind of wall off the extent of the bleb dispersing in the lateral direction and reduce the overall surface area for drainage. That works reasonably well in cases where the bleb is very diffuse from a lateral perspective.

“The most definitive thing for an overfiltering bleb, of course, is to revise the bleb and do a peritomy and then either re-suture the flap or patch over the flap depending on the state of the flap,” Dr. Johnson continues. “When I do that, I’ll do a peritomy just like I would for a primary trabeculectomy and then try to re-suture the flap and refill the eye and see if it’s able to hold pressure. In relatively recent trabeculectomies or in cases where not too much mitomycin was used, that’s often successful. And then you can close it, and, in some ways, it behaves like a primary trabeculectomy, and you manage it in much the same way afterwards.”

Dr. Johnson doesn’t see bleb leaks as an issue as long as they don’t lead to infection. “If there’s just a leak and the patient is otherwise relatively stable, you have a little bit of time to see what you can do about it but it’s not something that you would put off for too long,” says Dr. Johnson. “Typically, when I see a bleb leak, I’ll place a bandage contact lens on the surface. A large one like a Kontur lens that has a diameter of 16 or 18 millimeters, which will help protect the bleb and the epithelial cells from the eyelid’s movements and hopefully give them a more favorable environment to re-



An ideal functioning filtering bleb. Notice that it's not avascular. This would be a sign of ischemic conjunctival tissue. In these cases, the avascular nature of the bleb would result in a bleb leak, surgeons say.

epithelialize and fill the hole.”

Dr. Johnson stays away from prophylactic antibiotic drops for bleb leak, although he finds that some physicians choose to prescribe these for their patients. He feels that these antibiotics aren't effective since they can damage epithelial cells at higher concentrations, which would lower the chance of the sealing the leak.

If the bleb somehow leads to significant ptosis in a patient, then referring them to an oculoplastic surgeon for treatment would be the way to go, suggests Dr. Johnson. “Ptosis is not uncommon,” he says. “I don't do anything with the bleb for ptosis. I think a lot of times ptosis after glaucoma surgery is transient and even if it doesn't completely go away, it gets better over the course of three to six months, so I try to counsel my patients to wait at least six months to see where the eyelid is going to end up. But then in cases where it's still unacceptably drooping, I'll refer them to oculoplastic specialists for surgery to have the lid lifted.”

Overfiltering blebs leading to hypotony, bleb leaks and ptosis are complications that, when addressed

early, aren't visually threatening problems. It's when a patient's condition progresses beyond those complications that physicians should be worried. Suprachoroidal hemorrhage and infection at the site of the bleb will reduce the effectiveness of the treatment and lead to severe ocular issues.

“Suprachoroidal hemorrhage is usually from hypotony after the surgery or after a laser suture lysis, so sudden decrease in IOP will cause a suprachoroidal hemorrhage,” says Dr. Francis. “You don't want to open the sutures immediately after the bleeding period, because the bleeding has to basically tamponade and stop. Then, the blood has to lyse, and then liquefy before you can drain it. So, typically you want to keep the patient on maximum medications, including oral carbonic anhydrase inhibitors like Diamox, and then you want to plan the choroidal drainage. So, usually after five to seven days, the clot has liquefied in the suprachoroidal space, and you can go in there and drain the blood.”

Bleb leak can pose its own challenges and lead to blebitis, shares Dr. Tsai. The surgical techniques he employs are meant to reduce the chance of

bleb leak occurring to ensure infection doesn't arise, but it's a possibility.

“One of the reasons I went to conjunctiva-to-conjunctiva closure is so I can do a fornix-based flap and minimize bleb leak early on,” says Dr. Tsai. “But if there's blebitis around the area of leak, then I look for any debris, mucus strands or infiltrates. That's when I'll treat very aggressively with topical antibiotics, every hour to every two hours. And, I'll certainly see them daily, if not twice a day, to make sure they don't get worse.”

Trabeculectomy has its own nuances when it comes to complications, but, like every glaucoma procedure, the chance of IOP spiking can occur. Here's where releasable sutures come in handy, physicians say.

“I think the most common reason for high pressure after trabeculectomy is that some scarring is taking place and fluid flow, either through the flap or dispersion in the subconjunctival sub-Tenon's space into the bleb, is being undermined,” says Dr. Johnson. “It's not uncommon for the patient to come in with a pressure that was significantly higher than it was at post-op day one in the week or two weeks after surgery. That's why we commonly do releasable sutures or laser suture lysis so that we can open up the flap and allow more flow to overcome any kind of scarring response that's initially encountered.

“In somebody that goes from a low pressure and then suddenly spikes to very high pressure, it could be due to scarring within the bleb, but it also could be due to an occlusion of the ostium itself,” Dr. Johnson continues. “It's always important to remember to do gonioscopy and make sure the ostium is clear before one starts to cut sutures on the flap, because you don't want to cut all your flap sutures, end up with continuous high eye pressure, and then when that blood clot dissolves, the pressure is much lower than you wanted because you ended up cutting a lot more sutures than you felt was necessary.

“The iris can plug the ostium some-

times, usually if you do an adequate iridectomy at the time of the trabeculectomy,” adds Dr. Johnson. “Depending on how much iris is going through that ostium, sometimes a YAG laser through a gonioscopy can help free that up and restore patency to the system. But, if there’s a lot of posterior pressure and a lot of iris going up through that ostium, it may require the need for the patient to go back to the operating room to pull that out.”

Glaucoma isn’t the only condition physicians need to worry about. Although patients may appear with glaucoma alone, some may have an underlying cataract or form a cataract after the trabeculectomy.

“If a cataract forms after trabeculectomy, usually I’ll try to give the trabeculectomy time to heal and to establish itself and then come back later and to do phaco after some time,” says Dr. Francis. “You don’t want to go in too soon after trabeculectomy because then you’re going to get failure of the bleb.”

If a cataract occurs, some glaucoma specialists may opt to refer their patient. Dr. Tsai once managed these cases, but due to his schedule, he’s been focusing exclusively on glaucoma cases. Whether the patient is referred to another physician or treated by their initial surgeon, surgeons say it’s important to remember that these patients want to move forward in their eye-care journey with the ability to maintain or improve visual acuity and continue their lifestyles.

Postop Care

After trabeculectomy, postoperative management becomes key on the path to success. Following up with patients regularly can ensure that they don’t progress any further towards worsening symptoms.

“I tend to tell my patients that I’ll see them on the first day after the operation and, at the minimum, I’ll see them weekly for the first several weeks after trabeculectomy,” says Dr. Tsai. “Then, depending on how they’re doing, we can go to every other week.

But I’m not going to see them on postop day one and tell them they’re doing great and say, ‘I’ll see you back in two or three weeks.’ I want them to be in for a minimum of once a week for the first several weeks until I get a sense of where their eye pressure is at in regard to the target level and that it won’t go higher.”

If a patient is on glaucoma medications, they may need to stop for a short period of time depending on how tight the suture is made during the procedure. “I typically stop glaucoma drops when my patients have surgery, because I’m trying to get flow immediately,” says Dr. Francis. “I won’t leave the OR unless I have flow, and I have a bleb. So, I’ll typically take the patient off the medications. If you’re one of those doctors that does very tight sutures and tight scleral flaps, then, yeah, I would recommend keeping the patient on all their meds, at least until postop day one.”

Have the patient take Tylenol for pain and place them on topical steroids to reduce inflammation. Dr. Tsai finds that this helps with the healing process, and, in addition, he takes into account the use of blood thinners. If a patient is on blood thinners, then he suggests that they should continue the medication, but he tries not to tighten the suture too much in order to reduce the risk of hemorrhage. Talk to patients prior to surgery about the medications they’re currently on, since it will affect the outcome of postoperative results.

“What my patients do during postoperative management is wear an eye shield for a couple of weeks afterwards,” adds Dr. Tsai. “So, during the day, I have them try not to rub their eyes. If they’re light sensitive, then they wear a pair of sunglasses. I tell them their vision may be a little blurred after the procedure. I try to have them wear their glasses and go about their work. Also, patients will need lots of hydration.”

Remember to explain to patients what they’re going to expect from trabeculectomy, say surgeons. They note

that this isn’t a MIGS procedure, nor is it similar to a refractive or cataract surgery where the goal is to achieve the best corrected visual acuity—it’s its own unique treatment with lots of factors that need to be taken into account.

“When I sit down to talk with my patients, I’m trying to get them to understand why we’re doing the trabeculectomy,” says Dr. Tsai. “Often they’ll say, ‘Well, what about MIGS instead?’ So, I use the analogy of baseball to explain to them how it works. I say, ‘If you’re going to have a tube shunt, you’ll probably get a double. You’ll get your pressure lowered; you’ll still have to be on a couple of medications.’ With trabeculectomy with mitomycin, you can either get a strikeout or a home run. What’s a home run? A home run is when we get pressures in the high single digits, maybe a target pressure, and patients are off all glaucoma medications, their vision hasn’t changed, and we halt progression. That’s a home run. What’s a strikeout? Endophthalmitis. You have an infection or suprachoroidal hemorrhage where you lose your vision totally.

“If you’ve got severe glaucoma, it’s almost like being behind a lot of runs,” Dr. Tsai continues. “A double may not help you as much as trying to go for that home run. You’re going to have to take a little bit more risk to get a greater reward. Patients start understanding that while trabeculectomy can be a very safe and effective surgery, it has a potentially greater risk than some other surgeries.”

Yes, trabeculectomy is a safe and effective procedure when done right, but it’s not simple. Surgeons need to be careful and figure out what techniques work in their case to provide their patients with the best results, experts note.

“Trabeculectomy really requires the surgeon to be very attentive to details,” comments Dr. Tsai. “I hope it won’t become a lost art with all these new gadgets and technologies coming out. Let’s keep this in our armamentarium.” ◀

THE PSYCHOLOGY OF PATIENT EXPECTATIONS

How cataract surgeons navigate patient personalities and set realistic goals to ensure both parties are happy with the outcome.

LIZ HUNTER
SENIOR EDITOR

Throughout the course of a cataract surgeon's medical education and training they'll learn how to manage multiple types of patient presentations with techniques taught and practiced repeatedly until every step in the process is mastered. With more advanced technology at their disposal than their predecessors, whether it's optical coherence tomography and epithelial mapping or the growing list of IOL choices, cataract surgeons can gather an extensive amount of information about a patient before making even one incision. One might confidently consider themselves an expert in these elements because they're passive, but ultimately the outcome of the surgery hinges on one unpredictable component: the patient.

Understanding all of the things that make a person 'tick' as they say, isn't so easily taught in medical school. But real-world experience proves how patient expectations are undeniably linked to their personality. Are they discerning? Are they easygoing? Are they anxious? These questions aren't always answered

honestly, and for cataract surgeons who are entrusted with their patients' vision, these answers could make the difference in a happy outcome.

This is something that researchers have attempted to quantify. A study published in 2019 evaluated how patient personality related to their dissatisfaction after receiving a multifocal IOL.¹ Participants were given the Five Factor Inventory scale, created by American psychologist Lew Goldberg to assess personality traits. It included a set of 25-item bipolar adjective scales with five items per each personality dimension: extraversion; conscientiousness; agreeableness; neuroticism; and openness to experience. Participants rated each item, which gave the researchers their dominant personality trait.

They ultimately established that patients with neuroticism (defined as being prone to negative emotions and likely to be anxious, hostile and irritable) as the dominant personality trait least happy with the postoperative outcomes. Perhaps not unsurprisingly, patients with conscientiousness and agreeableness as dominant personality traits demonstrated the highest satis-

faction with outcomes.

Steven Dell, MD, of Dell Laser Consultants in Austin, Texas, has spoken at several ophthalmology conferences on this topic of psychometrics. "Psychometrics is really just the study of how individuals react to different stimuli," he says. "Some people are very reactionary, while others are super laid back. It's hard to assess these personality traits during a brief ophthalmologic examination."

While a thorough psychological examination may be beneficial in order to ensure patient satisfaction, it's unlikely to be a reality in today's busy cataract practices. But that doesn't mean it should be overlooked completely.

"We spend a lot of time on biometrics, measuring all the different parameters of the eyeball, but we really don't spend enough time understanding who these eyeballs are attached to," Dr. Dell says. "We often have precious little time to spend with patients, and sometimes, despite our passion for them, we don't know them very well. This could set us up for problems, particularly with services like premium implants."

This article has no commercial sponsorship.

Dr. Dell consults for Zeiss, Johnson & Johnson Vision, RxSight, Atia Vision, LENZ Therapeutics, Optical Express and Lumenis. Dr. LaBorwit is a consultant/lecturer for Alcon and lectures for RxSight. Dr. Wong has no related financial disclosures.

We spoke with cataract surgeons to find out how they deal with patient expectations realistically. Read on to hear their first-hand experience and advice.

Setting Expectations

Surgeons say that premium IOLs have made it somewhat more difficult to set realistic expectations with patients. “We have to constantly remind ourselves and our patients that there’s no such thing as a perfect lens, despite what marketing might suggest,” says Shannon Wong, MD, CEO and medical director at Austin Eye in Texas.

“I think this has become challenging because expectations have risen along with technological advances in what we can deliver with these lenses,” says Dr. Dell. “While lenses have improved, I don’t believe they’ll ever fully catch up to the expectations of perfection. We have the ability with laser vision correction, for example, to achieve close to 100 percent of patients reaching their visual goals, setting that as a benchmark. If we can’t meet it, some percentage of our patients will feel dissatisfied. Particularly with multifocal intraocular lenses, which require some degree of sacrifice in visual quality for greater visual quantity, it’s essential for physicians to determine how amenable a patient might be to these compromises.”

Maryland-based Scott LaBorwit, MD, chair of the medical advisory board for Vision Innovation Partners Group and an assistant professor at the Wilmer Eye Institute at Johns Hopkins, says he doesn’t beat around the bush with patients. “At least 10 percent of patients who come in for a consultation aren’t candidates for premium lenses, either due to cornea or retina findings or because their expectations are unrealistic,” he says. “There are certain personalities that, frankly, will make things difficult if I place a premium lens in their eye. Some patients may have unrealistic expectations, such as seeking complete spectacle freedom when I know I won’t be able to deliver that. In some cases, I have to make the decision for them, even if I go over the

lens options. I may spend more time discussing why the premium lens may not work as well in their eye due to specific concerns or reasons, such as a poor tear film, in hopes of steering them towards a monofocal lens or at least best managing their expectations.”

Not only can this approach help them make a better decision, it helps fight misinformation. “One of the biggest risks is misinformation—whether from the internet or from their friends at a card game,” Dr. LaBorwit says. “It’s amazing how many people discuss cataract surgery, often based on one person’s experience, but that experience may not be applicable to others. Their eyes could be very different. It’s important to customize the conversation during your consultation to the patient’s eyes and expectations. While results might be similar, I explain that not everyone will have the same outcome, and I make it clear what they can realistically expect.”

It’s the classic mantra of under-promise and over-deliver. “One point I always make to patients is that I can’t give them the eyes of a 20-year-old,” Dr. LaBorwit continues. “I can’t promise that they’ll never need glasses again. What I’m doing is replacing their natural lens with a fixed piece of plastic that doesn’t move. I talk about the technology and how it can offer more than a standard monofocal lens, but I try to reset their expectations.



Scott LaBorwit, MD, and refractive educator Henry Shea have developed strategies to educate patients about refractive cataract surgery options, ensuring the information is accessible and engaging. Dr. LaBorwit tailors his approach depending on if the patient is a visual learner or prefers other methods. He says this prioritizes clarity and comfort and avoids overwhelming patients while empowering them to make informed decisions about their care.

We’re putting a lens in their eye, and here are the options available. I explain what each technology is capable of, and I generally find that I can get patients out of glasses 90 to 95 percent of the day.”

Gathering Information and Patient Education

Information collected by surgeons about their patients should include ways in which they use their vision—near and distance activities—and insight into their personality traits, but patients are also expecting to gather information of their own.

Surveys are one method for surgeons to gather these details. Dr. Dell has shared publicly and freely a survey he’s been using in his practice for about 20 years, which has undergone some

modifications as lenses have changed. The survey helps define the patient's goals, and includes questions about their habitual near working distance, how critical night vision is to them, if they're open to visual compromise and if they're easygoing or a perfectionist, among others.

Sometimes a patient will be quite self-aware and admit they're a perfectionist, Dr. Dell says, indicating that they would be dissatisfied with anything less than perfection. "Other clues can be helpful; for instance, if a patient frequently needs their glasses remade or uses multiple pairs of glasses for different tasks. Another clue can be if a spouse seems to disagree with the patient's self-assessment. Maybe they think of themselves as laid back and easygoing, but their spouse is chuckling in the corner of the exam room—that can provide further insight into their true nature," he says.

Knowing a patient's previous occupation can be useful, too. "If a retired patient appears relaxed but was an optical engineer or architect, you can rest assured that their personality didn't retire the same time they did," says Dr. Dell.

"Another useful indicator I learned from Gary Foster, MD, in Colorado,

who uses the analogy of "The Princess and the Pea," he continues. "When a patient with a tiny cataract believes it's ruining their life, that signals a different mindset than someone with a significant cataract who finds it only mildly annoying. The speed at which they seek cataract surgery can indicate their flexibility in terms of personality, which can be very useful."

Although Dr. Dell says the questionnaire has become less critical for determining patient goals, it remains extremely useful for altering patient expectations. "By the time they finish filling it out, they start to realize that visual compromises are necessary," he says. "This survey is just one of many data points we use to assess a patient's personality, serving as a useful adjunct to our overall understanding of the individual."

Dr. Wong says surveys once had a place in his information gathering process, but he no longer uses them. "Instead, I assume that everyone wants it all—far, mid and near vision without glasses," he says. "I make this assumption when making my recommendations. If patients express a preference otherwise, I will adjust my approach. But generally, I assume that they want it all."

Dr. LaBorwit tries to gather as much information as possible when sitting face to face with the patient. "The most important thing is to really listen to your patients," he says, asking them about their daily activities and what they hope to get out of cataract surgery, beyond just clearer vision.

Leaning on their past is the best way to look to the future, he continues. "I also ask about their glasses expectations. Have they had LASIK, and did they like being free from glasses? Are they looking for freedom from glasses? I'll also ask if they've ever tried contacts, and whether they had issues with monovision or multifocal lenses, or if they struggled with progressives. I get patients talking about what they love and hate about glasses pretty quickly, and that gives me valuable insight. I spend more time listening and it helps me pull information about what would be a good fit for their lifestyle."

One of the best sources of information about patients is the staff. "Your staff likely spends more time with patients and can gain insights into their personalities," Dr. Dell says. "If they hint that our practice might not be able to make a particular patient happy, I take that very seriously. Sometimes, when patients are in front of the surgeon, they might put on a facade and be less willing to show their true colors. They often feel more comfortable letting their guard down with staff members. As surgeons, we've all experienced patients being rude to our staff but polite to us."

Dr. LaBorwit actively solicits feedback from them, and makes sure his staff knows it's an open, collaborative process. "Often, patients are on their best behavior when I walk into the room, which is fortunate, but also sometimes unfortunate," he says. "It's important that I know their thoughts before I go in. It's not a top-down structure; it's a team effort."

On the other side of this exchange of information is the patient, who needs some education about cataract surgery itself and how their vision will change (for the better) after surgery.



Although not formally trained in psychology, cataract surgeons must carefully navigate different personality traits within their patient population. The best approach, according to surgeons, is to keep expectations realistic for a better chance of a happy outcome for both parties.

Because people absorb information differently, surgeons may consider altering the way they dispense it. “It’s important to deliver the information in different formats,” Dr. LaBorwit says. “Some patients are visual learners, so I’ll actually show them the anatomy of the eye and show how we remove the lens and implant the lens. Other people like to hear examples, such as how one lens might help them perform a certain activity differently. You have to cater the education to the ways they’ll grasp it.”

He makes sure patients are really listening. “Sometimes, patients ask the next question before you’ve even finished answering the first one,” says Dr. LaBorwit. “Once you put the lens in, you’re committed to it. If they haven’t fully understood the realities of the procedure, you’re stuck, and they may have unrealistic expectations. I test them a little by watching how they react to the information I provide. It’s a big commitment on both sides—by the patient and by the provider.

“I also make sure that I document key pieces in the chart, as part of informed consent,” he continues. “For example, I’ll tell them that I can’t guarantee they’ll never wear glasses again. If I’m using a multifocal lens, I let them know they might see rings at night, but these usually won’t bother them after a month or two and in 99 percent of cases patients often would choose the same lens if given the choice again. I don’t routinely tell patients that there’s a 1 percent chance they won’t tolerate the lens, but I might bring it up if I’m concerned. It’s important to make sure they’re fully informed, because if they don’t understand the realities, we could both end up unhappy.”

The Role of Psychology

The common thread running throughout the expectation-management process is psychology. While not a component of a cataract surgeon’s formal education, developing the skills to successfully read a patient’s demeanor and knowing how to handle the more challenging personalities is crucial for success.

“There are intangibles that contribute to a patient’s experience and mood,” says Dr. Wong, “such as how the office is run. If the office has good leadership, everything is done in greater detail, thoroughly, and efficiently. Patients pick up on that, and it builds trust and confidence. On the other hand, if the office doesn’t have great leadership or if the staff isn’t well-organized, patients may feel more anxious throughout the process.”

Hiring really good people who know how to read the doctor and the patient is essential, he continues. “Mastering both surgical and interpersonal skills is critical,” Dr. Wong says. “The more emotional intelligence, or what I call ‘pattern recognition’ of personality types, a doctor and their staff have, the better they can identify patients with unrealistic expectations or personalities that might lead to problems within the practice.

“However, it’s unrealistic to think that you can perfectly screen out patients who might be problematic,” he continues. “You can only do your best, and even then, it becomes a process of managing different personalities. For example, if a patient is upset and aggressive, we’ve learned to de-escalate those situations. Realistically, if you perform enough surgeries, you’ll encounter some unhappy patients at varying levels. It could be something as mild as a negative online review, or as serious as being reported to the medical board or even sued. There’s no perfect system, but the more you can read the room and pick up on non-verbal cues, the better.”

It’s something you learn by interacting with patients you maybe shouldn’t have operated on or by saying things you shouldn’t have said, explains Dr. Wong. “That’s part of emotional intelligence: learning from your mistakes and taking ownership of them. You have to develop the ability to recognize personality types and communicate effectively with each individual,” he says. “Some people lack that ‘chip’ to learn how to read the room, but it’s an intangible quality that can be refined with

experience. It’s a very valuable skill, even though I never studied psychology formally.”

Some patients can even test you to the point where you might even decline taking them on as a patient. “That can be a tricky situation,” Dr. Dell says. “My experience has shown that when you express concerns about meeting a patient’s expectations, they often respond with gratitude, or they may seek help elsewhere and later return, acknowledging that their previous solution didn’t work and ask us to fix it.”

“I use a line from an old movie, ‘Magnum Force,’ where the main character, Dirty Harry, says, ‘A man’s got to know his limitations,’” Dr. Wong says. “You can’t be all things to all people. If a patient is outside your comfort zone, it’s better to refer them to someone else. Otherwise, it’s a case of paying now or paying later.

“Ultimately, we’re dealing with humanity, and some people simply won’t be happy, no matter what we do,” he continues. “While that’s not an excuse, it’s a reality.”

Parting Advice

For those who aren’t as well-versed in psychometrics or personality assessments, Dr. LaBorwit says to keep it simple and deliver to the best of your ability.

“If I were to offer advice to someone just starting out in this field, I’d say: Listen and learn from other providers, but find your own voice in how you deliver information to your patients,” he says. “You have to be comfortable with what you’re saying and recommending, and your delivery has to come across as natural. Spend enough time researching, shadowing others and figuring out what works best for you before you start interacting with patients. This is a field that requires a personalized approach, and being authentic and knowledgeable will help you gain your patients’ trust.” ◀

1. Rudalevicius P, Lekaviciene R, Auffarth GU, Liutkeviciene R, Jasinskas V. Relations between patient personality and patients’ dissatisfaction after multifocal intraocular lens implantation: Clinical study based on the five factor inventory personality evaluation. *Eye (Lond)* 2020;34:4:717-724.



EDITED BY KULDEV SINGH, MD, MPH,
AND PETER A. NETLAND, MD, PhD

GLAUCOMA MANAGEMENT

Getting From A to B: Tube Exchange

Tube shunt exchange pearls, and how to switch out an Ahmed for a Baerveldt.

MARY QIU, MD
CLEVELAND

Patients with glaucoma frequently require a tube shunt if they have severe or refractory glaucoma. The Ahmed glaucoma valve is often the preferred choice for initial tube placement, especially when preoperative intraocular pressure is significantly elevated, as it allows for immediate functionality without the need for ligation. However, studies like the ABC study and AVB study indicate that Ahmed valves, when compared to Baerveldts, don't achieve equally favorable long-term pressure-lowering results. Often, we encounter patients with one prior failed Ahmed, usually in the superotemporal quadrant, which is the optimal site for a patient with a single tube.

In such cases, we must consider our next steps. Options include placing a second tube, often in the inferonasal quadrant, or considering cyclophotocoagulation as a less invasive alternative. However, neither of these strategies is particularly appealing to most surgeons or patients. Here, I'll describe a technique for same-quadrant tube exchange.

Tube Exchange Rationale

Exchanging an Ahmed for a non-

valved tube presents several advantages worth considering. The tube exchange technique, which I learned during my fellowship at the Cleveland Clinic's Cole Eye Institute from Anna Singh, MD, involves removing the failed Ahmed from the superotemporal quadrant and

replacing it with a non-valved tube, such as a Baerveldt 350, Baerveldt 250, ClearPath or Molteno. The exchange may tend to provide better long-term outcomes, and by using the same quadrant, we reduce the overall amount of hardware in the eye. Having two tubes can increase the risk of complications such as tube-associated infections, erosions and endophthalmitis, as well as the potential for corneal decompensation, which might necessitate a corneal transplant.

Additionally, if the original Ahmed was positioned in the anterior chamber, exchanging it for a non-valved tube in the same quadrant allows us to reposition the tube

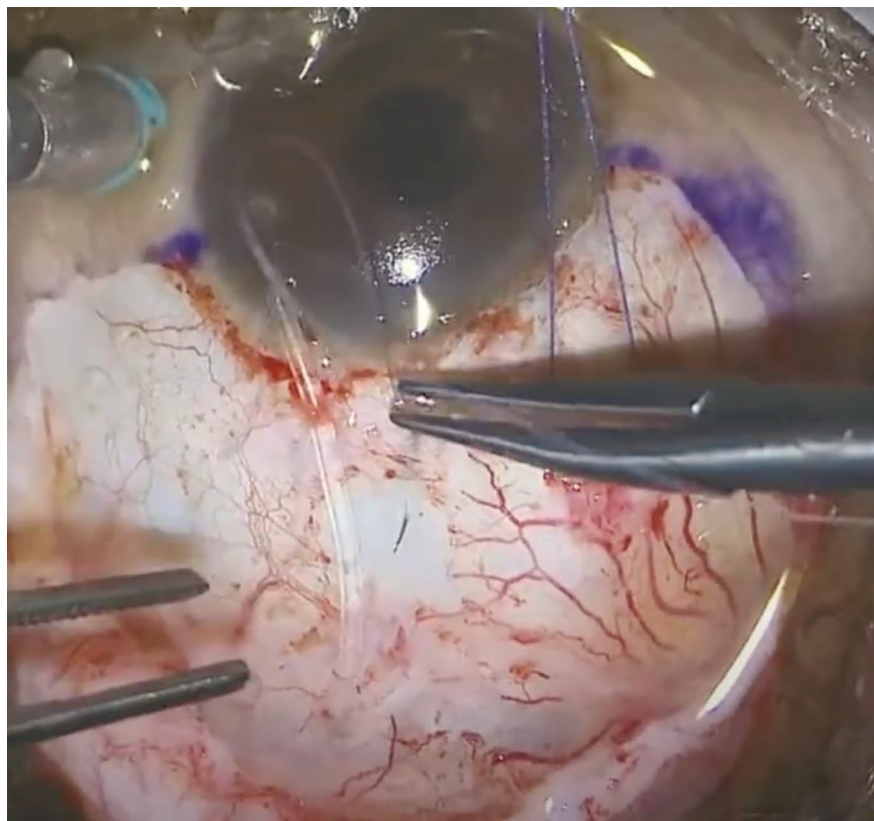


Figure 1. Removing the prior tube and securing the tract.

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Dr. Singh is a professor of ophthalmology and chief of the Glaucoma Division at Stanford University School of Medicine. He is a consultant to Alcon, Allergan, Santen, Sight Sciences, Glaukos and Ivantis. Dr. Netland is Vernah Scott Moyston Professor and Chair at the University of Virginia in Charlottesville.

tip to the ciliary sulcus or pars plana, if indicated. There's an ongoing trial, the DECLARE trial led by Dr. Ying Han at UCSF, investigating whether sulcus placement is more beneficial for corneal health compared to anterior chamber placement.

Considerations for Exchange Procedures

One key consideration when performing a same-quadrant tube exchange from a valved tube to a non-valved tube is that non-valved tubes must be ligated initially to allow the body time to form a fibrous capsule around the endplate. For the first six weeks, a dissolvable ligature suture is placed around the non-valved tube, preventing fluid flow and resulting in no immediate reduction in intraocular pressure during that period.

To address early pressure lowering before the ligature dissolves, several strategies can be employed. According to a survey of AGS members,¹ the most common approach is to fenestrate the tube without additional maneuvers, such as using wicks. This technique typically involves using a needle to create multiple small holes in the tube between the point where it enters the eye and the ligature, allowing fluid to escape and providing some early pressure reduction prior to the ligature's dissolution. This fenestration can be performed at the time of the exchange to enhance the effectiveness of the non-valved tube before the ligature opens.

Other strategies include adding an additional wick to the tube, either instead of or in conjunction with fenestration. Additionally, I've developed a technique^{2,3} that incorporates a concurrent goniotomy during non-valved tube placement, provided the eye has an open angle and there are no specific contraindications to goniotomy such as the use of blood thinners. A goniotomy can facilitate early pressure reduction before the ligature on the non-valved tube dissolves.

Other methods for managing

REMOVING NON-VALVED TUBES

Tube exchanges aren't limited to a valved to non-valved exchange. Any tube can be exchanged for any other tube. You might want to replace a Baerveldt 250 with a Baerveldt 350⁵ or remove a Baerveldt and replace it with an Ahmed.

When exchanging a larger non-valved tube, such as a Baerveldt, there are special considerations that make this process more challenging compared to removing an Ahmed and replacing it with a Baerveldt. The difficulties arise primarily from safely removing a larger non-valved tube, regardless of whether you're replacing it with something else or simply discarding it.

Removing a larger non-valved tube, like a Baerveldt 350, requires careful dissection. You start by opening the conjunctiva, then separating it from Tenon's, and separating Tenon's from the capsule. You need to incise the capsule to access the plate and cut all the anchoring stalks that extend through the holes. Baerveldt tubes have four anchoring stalks—two in the front and two in the back—while Ahmed tubes have three.

The two back stalks of Baerveldts are located in the middle of the plate, between the rectus muscles. These stalks can be cut easily, but the other two are at the wings of the plate and are typically tucked under the muscle. Strumming the stalks before cutting is an effective technique, but care is needed since you might not always see them under the muscle.

If you can't successfully cut the anchoring stalks, you won't be able to remove the plate. Opening your scissors wider allows you to cut the whole stalk in a single snip, as opposed to cutting halfway. I've seen cases where a Baerveldt was left hanging by a single stalk because it wasn't fully severed during removal attempts.

For any tube exchange, but particularly with a larger Baerveldt 350, using a scleral traction suture instead of a corneal traction suture is advantageous. The typical corneal traction suture is placed near the limbus to help rotate the eye for exposure. However, when removing a tube, you need more posterior exposure to access the plate and stalks, as well as possibly peeling away the capsule.

To achieve this, place the traction suture through the sclera after opening the conjunctiva. Make a partial-thickness wide scleral pass through the sclera as posteriorly as possible. This allows for greater eye rotation than a limbal traction suture. Adding an additional scleral traction suture several millimeters behind the limbus near the tube-plate junction will further enhance your ability to rotate the eye, providing better exposure to the quadrant you're working in. This will enable you to see everything needed to successfully remove the old tube—whether it's an Ahmed, a Baerveldt, or any other type—ensuring a smooth exchange process.

aqueous production, such as cyclophotocoagulation, endoscopic cyclophotocoagulation or micro-pulse CPC, can also be employed to reduce aqueous production, buying time until the non-valved tube becomes fully operational.

Same-quadrant Challenges

There are several challenges associated with performing a same-quadrant tube exchange. In a primary tube placement in a quadrant that hasn't been previously operated on, the conjunctiva is typically mobile, and

Tenon's capsule behaves normally. In such cases, you can simply open the conjunctiva, dissect through Tenon's, create your space and suture directly to the bare sclera, proceeding with the procedure as usual.

However, during a same-quadrant tube exchange, you must remove the entire previous tube in that quadrant before you can implant the new one. This requires careful dissection. You need to open the conjunctiva meticulously and separate it from the Tenon's, then separate Tenon's from the tube and the tube capsule. Next, you must incise the tube capsule and sever all the anchoring stalks that grow through the anchoring holes in the front and the additional holes in the plate. If these stalks aren't cut, the old tube won't be removable.

Once the old tube hardware is removed, you may also need to excise some of the capsule on the deep aspect of the tube, located between the tube plate and the sclera. While this may not be critical, it's helpful to

remove some of the deep capsule to allow better suturing of the new tube to the bare sclera. Occasionally, the tube capsule can be adherent to the rectus muscles, necessitating extra care to separate the capsule from the adjacent muscles. This allows you to isolate the muscles and hook them with a muscle hook so that the new tube can be tucked underneath.

For a Baerveldt 350 or ClearPath 350, the wings of the new tube need to go under the muscle. If this isn't feasible, the new tube can be placed on top of the muscle, which will still allow it to function. This adjustment can be made if successful hooking of the muscles isn't possible.

Another option is to place the new tube in the sub-Tenon's space instead of suturing it directly to the bare sclera. George Tanaka, MD, from San Francisco has developed a technique where he places the new tube more superficially under the conjunctiva, but above Tenon's. This variation is possible if suturing the new tube

to the bare sclera isn't feasible.

The Technique

The technique I'll describe below is now my standard practice when encountering an eye with a failed Ahmed. I do everything I can to perform a same-quadrant tube exchange to a non-valved tube rather than moving on to a second tube. If the eye is extremely sick with very poor visual potential, sometimes I'll move on to a CPC. I believe having less hardware in the eye is better overall and in the long term, and having less hardware in the anterior chamber is certainly better for the cornea. When possible, I move the new tube to the sulcus. If the eye is phakic and cataract surgery is indicated, I'd do the cataract surgery to facilitate the new tube going into the ciliary sulcus.

I recommend general anesthesia for more complex tube removal or exchange procedures to minimize patient discomfort, which can hinder your ability to visualize the surgical

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field adequately. This can also be performed under monitored anesthesia care with a block if preferred.

1. Open the conjunctiva. When performing an Ahmed to Baerveldt exchange, the first step is to open the conjunctiva. I recommend opening the conjunctiva as widely as possible. This approach helps maintain the conjunctiva as a continuous sheet and makes it easier to reposition everything afterward. Although it may be tempting to keep your incisions small, I advise against that. It's counterintuitive, but a larger incision facilitates the overall process of closure. I also advise against opening at the tube plate junction. While this can provide immediate access to the plate, it creates a cut area that may complicate closure and increase the risk of dehiscence in the future.

First, I open the conjunctiva at the limbus and make relaxing incisions, as I would for a primary tube. I often overshoot a little bit. For example, if I'm working superotemporally, rather than opening from 12 to 3 o'clock, I might open from 11 to 4 o'clock. Make your relaxing incisions generous so you're able to pull the conjunctiva back and see what's going on in the quadrant you're working in. Next, I use a combination of blunt and sharp dissection to separate the conjunctiva from the underlying Tenon's. This helps to mobilize the conjunctiva and to close everything back up. One effective method for opening the conjunctiva and Tenon's is to use BSS or lidocaine in a cannula and inject it into the subconjunctival space. This technique "poofs up" the Tenon's, providing additional space to work with and preventing a shrink-wrapped conjunctiva. This trick is very helpful for safely opening the conjunctiva and Tenon's.

2. Remove the old patch graft. Identify the area at which the previous tube shunt was inserted into the eye. You'll most likely encounter the previous corneal or scleral patch graft covering the tube. Peel this off with a combination of blunt and

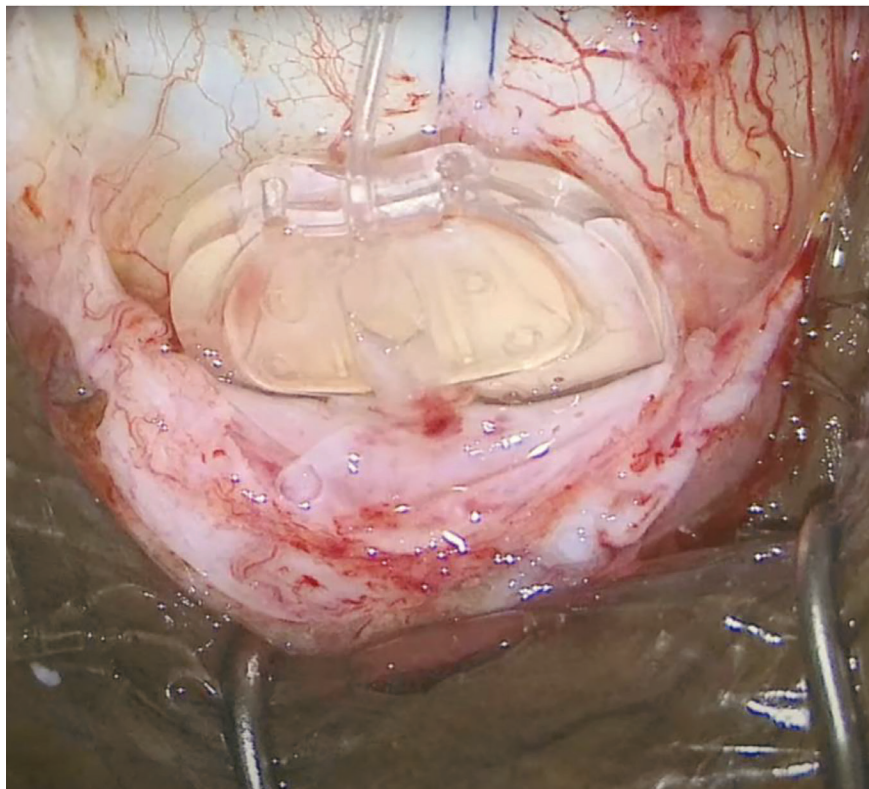


Figure 2. Removing the prior Ahmed.

sharp dissection. Occasionally, the patch graft will stick to the underside of Tenon's. If that's the case, you can leave it there and may even be able to reuse that same patch graft for the new tube, if positioning is ideal.

3. Remove the old tube. Next, you want to unplug the old tube from where it's inserted into the eye. It will most likely be in the anterior chamber, but it's possible that the previous tube was in the ciliary sulcus or pars plana. Since the tube is plugged into the eye, a capsule will have developed around it. You'll encounter a thin film, or a flimsy layer of capsule material that fully engulfs the tube. This must be incised to access the tube itself for removal.

I prefer to use a blade to gently scratch the capsule at the most posterior aspect, where the tube lies on the sclera. You can run your blade from the most anterior to the most posterior portion of the tube, making a very light scratch and almost

sneaking your blade under the tube, between the tube and the sclera. This will incise the capsule and free the tube.

You can also grasp the capsule with a 0.12 and use scissors, but I find that using a blade, or even a 23-gauge needle—as if performing bleb needling—to scrape the tube works well. The capsule is very flimsy, so anything slightly sharp will easily incise it, liberating the tube from the engulfing capsule, allowing you to unplug the tube from the eye.

4. Secure the tract. I recommend making a paracentesis and filling the anterior chamber with Healon before pulling the tube out of the eye. This maintains eye pressure during the exchange. I don't advise leaving the eye filled only with aqueous, as the chamber will shallow, fluid may leak from the sclerotomy site, and this increases the risk of choroidal effusions while the tube is being removed. However, it's possible to leave the eye filled with aqueous and quickly

suture the tube tract or plug it with a piece of Tutoplast. There's a technique, developed by Keith Barton, MD, from the United Kingdom, that involves using a piece of dehydrated Tutoplast cut into a triangular shape to quickly plug into the tube tract. It's then glued down. This may be faster than suturing.

If suturing is necessary, I use an 8-0 Vicryl on a BV needle. I prefer the BV needle because it's tapered and doesn't cut, minimizing the width of the tract as it passes through the sclera to create a more watertight closure. Sometimes, it's quite impossible to suture the tract shut because it's very short and anterior and may be right at the limbus. If the tract is very short and anterior, achieving a watertight closure with suture may be impossible. Short, anterior tracts, or short tracts in general, are more conducive to plugging with something like a piece of Tutoplast, using Tutoplast and glue or Tutoplast sutured down.

5. Dissect the capsule. Once you've removed the tube from the eye and secured the tract, you'll want to access the plate and fully dissect it from its capsule. You'll encounter the plate capsule, which you want to incise. I like to incise along the anterior edge of the plate. For an Ahmed, I incise the capsule with my scissors pointing vertically and cut along the capsule with one tine in the capsule and one tine out to make an incision along the front edge. Then, I cut the two anchoring stalks in the front.

If I'm removing a Baerveldt, I cut along the ridge at the front part. I sever the two anchoring stalks at the front where those sutures were initially placed; there may still be some remnants of suture from the original surgery that can be cut.

Then, I cut into the capsule more posteriorly. For Ahmeds, I like to cut a square along the superficial aspect of the capsule. I make a radial cut down one edge of the capsule on one edge of the plate, and then a radial cut down the edge of the capsule

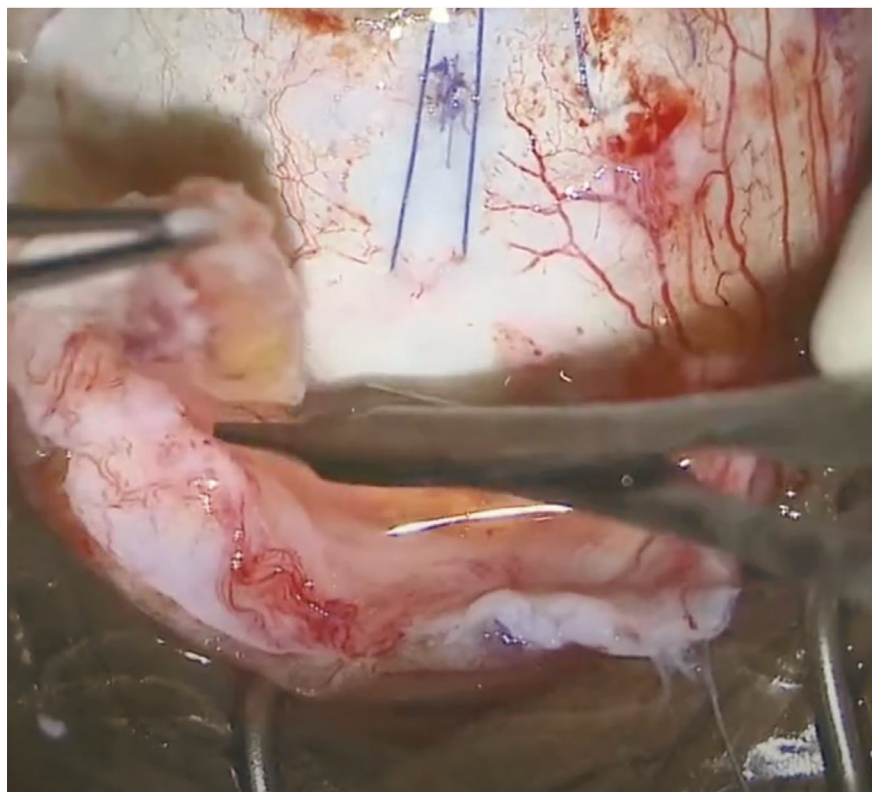


Figure 3. Removing the prior Ahmed's capsule.

on the other edge of the plate. It's almost as if I've made a horizontal line at the top, and then two vertical radial cuts along the sides, which I can then connect at the back to form a square. Again, you have to sever the anchoring stalks that are growing through the tube plates—Ahmeds have three, and Baerveldts have four.

Once you've done that, you now have a free-floating piece of capsule. I save this piece of capsule as a possible capsular autograft. I often do this for tube exchange cases because this capsule material is autologous, slightly vascularized and integrates well into surrounding tissues. It's cosmetically more favorable compared to sclera. When I excise this piece of capsule, I save it in a cup of BSS to keep it hydrated.

6. Remove the plate. Once the capsule is harvested, you're now at the plate. After cutting through all the anchoring stalks, you can remove the plate. I don't usually send it for culture unless there's a suspected infection; if the reason for the surgery

is due to infection, I would send the plate for culture. Otherwise, I just discard it.

7. Remove the deep aspect of the capsule. Next, remove the deep aspect of the capsule, the part that's between the plate and the sclera. If this is an Ahmed, there's no deep capsule below the muscles. However, if this is a Baerveldt, the capsule does extend under the muscles, and I usually work only on the part that isn't peripheral, focusing on the area between the two muscles. The radial incisions should be just at the edge of the muscle and not beyond where the muscle starts.

Peel the posterior part of the capsule off the bare sclera. This is sometimes easier than you might think because there's a tissue plane. You can grip the capsule material with a 0.12 or 0.5 and then used a small blunt Wescott or a larger blunt Wescott scissors to strum at the adhesions between the capsule and the bare sclera. Sometimes, gentle strumming allows you to get through

all of that without needing to cut anything. Other times, the adhesions are thicker and denser, requiring a bit of sharp dissection. Overall, I've often found the capsule peels off the sclera more easily than expected.

As I mentioned before, sometimes the capsule is adherent to the edge of the muscle, and you have to actually peel it off the muscle. Other times, you can leave some remnants of the capsule still stuck to the muscle to avoid getting too close. One technique borrowed from general surgery that's useful for peeling it off the muscle is to use a dry Weck-Cel sponge to bluntly push the capsule off the muscle. You can then take your scissors to both bluntly and sharply dissect it off. Instead of strumming with metal scissors at the start, pushing with a dry Weck-Cel is a useful way to dissect one soft tissue off another, as the dry Weck-Cel has some friction, allowing it to stick to the capsule while you push it off the muscle, whereas scissors are metallic and slippery, providing no friction between the scissors and the capsule.

8. Proceed as if implanting a primary tube. Once the capsule has been removed, you're down to bare sclera, and you can trim off any remaining capsule material or Tenon's material to create a clean scleral bed. At this point, it feels as if nothing had ever been there. You can hook the two muscles, which are mobile, and then proceed with your Baerveldt implantation as you would with a primary Baerveldt. The rest of the case proceeds just like it would with a primary tube.

After implanting your new tube, place a patch graft—either the patch graft from the previous tube, which might still be intact and can be recycled, or the capsule autograft harvested from the capsule of your old tube, which is conveniently available, autologous and integrates well into the surrounding tissues. Occasionally, you might need to open a new patch graft if the old one has melted away or if you didn't obtain a good dissec-

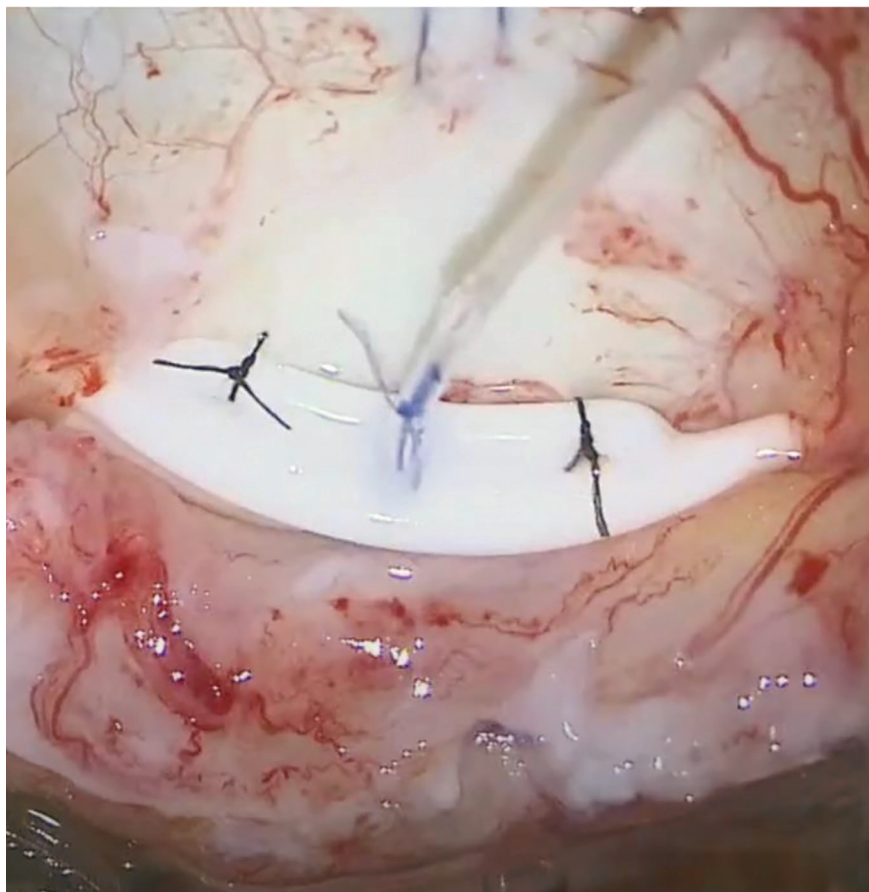


Figure 4. Implanting the new Baerveldt.

tion or a nice chunk of tissue for the capsule autograft.

9. Close the conjunctiva. The closure can sometimes be tricky. As I mentioned before, the more you can keep the conjunctiva in one continuous sheet, the easier it is to put everything back. Despite your best efforts, though, there can be a lot of tension, or new tears or breaks may have occurred in the conjunctiva during the procedure, making it difficult for the conjunctiva to return to its original position.

There are several tricks you can employ at this point to close things up, as the closure for a tube exchange will be more challenging than for a primary tube. If there are areas that you feel cannot be covered with conjunctiva, it's actually okay to leave Tenon's uncovered because the conjunctiva will grow over it. One option is to create a Tenon's graft, which can sometimes be rotated or

transposed from one area to another, or advanced posterior to anterior. To advance the Tenon's, separate the conjunctiva from the Tenon's and pull the Tenon's forward to get it closer to the limbus, even if the conjunctiva may not reach.

One trick to help advance the Tenon's farther is to make circumferential snips high up in the fornix, which allows the Tenon's to stretch and advance anteriorly. However, sometimes the clock hour you need to cover isn't where you have available Tenon's. In this case, you would need to rotate or transpose Tenon's from another location.⁴ For example, if you're trying to cover superotemporally but have more superior or superonasal Tenon's, you can create a transposition graft. Separate the conjunctiva from the Tenon's, then take your sheet of Tenon's from the superior or superonasal area. Make a

(Continued on pg. 62)



Update on Macular Telangiectasia Type-2 (MacTel)

An in-depth review of the pathophysiology and diagnostic clues, as well as potential therapies on the horizon.

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Macular telangiectasia Type-2 can often present with mild problems with visual acuity as well as retinal changes that can mimic other conditions, making diagnosis challenging. Once the diagnosis is made, however, treatment options are limited, though things can be done to help treat the disease's sequelae. Here, we'll provide diagnostic tips to help catch the disease and monitor its progression, and we'll take a look at treatment options both currently available as well as those on the horizon.

MacTel Background

Macular telangiectasia Type-2 is a bilateral—though sometimes asymmetrical—neuroglial degeneration with characteristic alterations of the capillary network that affects a localized area of the macula.¹ For unknown reasons, the affected area is an oval area centered on the fovea, with a horizontal diameter not exceeding the distance between

the temporal optic disc margin and foveal center, and the vertical diameter not exceeding approximately 0.8 times this distance (the “MacTel area”).²

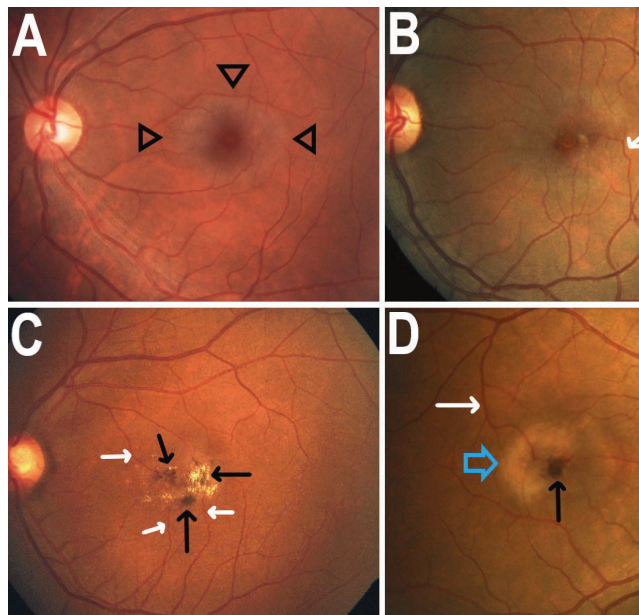


Figure 1. Clinical staging of macular telangiectasia type-2 as proposed by Donald Gass, MD, and Barbara Blodi, MD showing the different stages as follows: Stage 2 (A), characterized by parafoveal loss of retinal transparency (black arrowheads); Stage 3 (B), characterized by right-angle vessel (RAV, white arrow); Stage 4 (C), characterized by pigment clumps (black arrows) (at termination of the RAV, white arrows); Stage 5 (D), characterized by neovascular membrane (blue arrowhead); note the central pigment (black arrow) and RAV (white arrow) dipping into it.

The primary pathology is the loss of macular Müller cells that can progress to central vision loss due to related loss of photoreceptors.³

The average age of patients affected by this condition is 50 to 60 with no gender or racial predilection.^{4,5} However, there are sparse data on this condition from Asia or on ethnic minority groups. The incidence and prevalence data are limited and the true figures are probably underestimated.⁶

MacTel was initially described as an acquired condition. Recently, genome wide association studies (GWAS) identified three genetic susceptibility loci for MacTel. These loci are associated with serine/glycine metabolism.⁷

Functional variants in phosphoglycerate dehydrogenase (PHGDH), the rate limiting serine biosynthetic enzyme, account for 3.2 percent of MacTel cases.⁸ By conducting studies using a combination of genetic analyses, metabolomics, animal studies, and in vitro testing of stem cells, the MacTel research group determined that insufficient serine leads to the formation of toxic deoxysphingolipids in the retina.^{9,10}

The clinical characteristics of MacTel identified by Donald Gass, MD, and Barbara Blodi, MD, were based on vascular changes temporal to the fovea seen on ophthalmoscopy and fundus fluorescein angiography and these changes were classified into five stages (Figure 1).⁴ However, the availability of multi-modal imaging, optical

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coherence tomography, complemented by confocal blue reflectance; fundus autofluorescence and OCT-angiography have revealed many features that provide a better correlation to the degree of vision loss.

The early changes in MacTel are intriguing. The parafoveal reduction or loss of retinal transparency is postulated to represent the area of Müller cell dysfunction.⁶ The overall MacTel area involvement often exceeds the angiographically visible vascular alterations, and probably precedes them too. Blue light reflectance reveals a pathognomonic hyper-reflective area which correlates to parafoveal loss of retinal transparency on fundus photographs (initially apparent in the temporal sectors) (Figure 2) and to loss of macular pigment on dual-wavelength autofluorescence. BLR is increasingly being used as

the diagnostic tool of choice for early detection of MacTel. Increased BLR may be due to the decreased absorption of the wavelength around 488 nm by the reduction in macular pigment in this condition, thereby resulting in increased reflection of blue light.

Since structural alterations in MacTel occur at different retinal levels, the increased light scatter that occurs due to abnormalities in the neurosensory retina may also lead to increase in BLR (although in a minor role when using a confocal imaging system). As increased blue light fundus autofluorescence in the fovea precedes clinical and angiographic finding, it's also one of the earliest changes in MacTel.¹¹ These changes may also be due to the abnormal distribution of macular pigment in this area,¹² and/or alterations in the composition of lipofuscin and

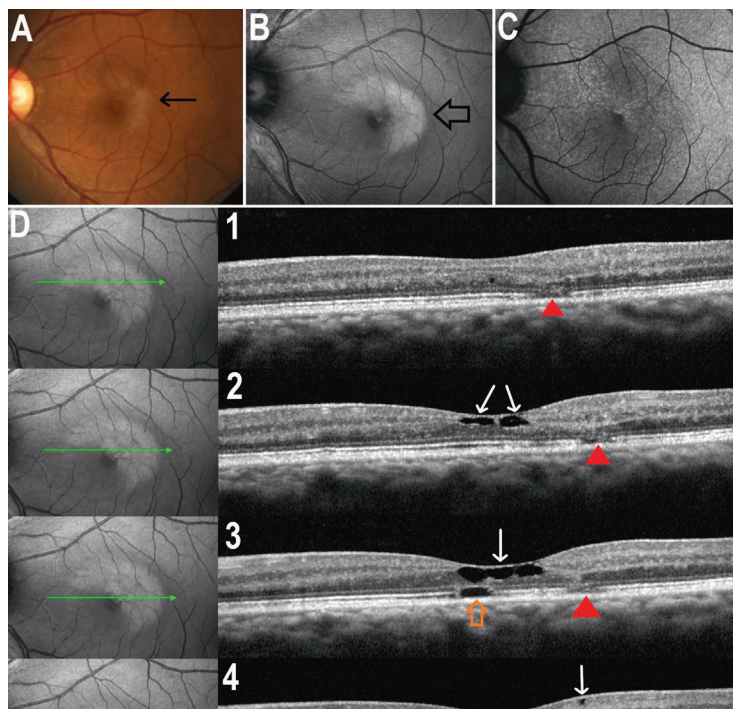


Figure 2. Color fundus photograph shows parafoveal loss of retinal transparency temporal to fovea (black arrow), suggestive of stage 2 macular telangiectasia type-2 (MacTel) (A). Confocal blue reflectance demonstrates hyper-reflectance predominantly involving the temporal parafoveal region (black arrowhead, B). On fundus auto-fluorescence, ill-defined areas of hyperautofluorescence can be seen at the macula (C) (extent not so clearly defined as in CBR). Multiple optical coherence tomography sections (numbered 1-4) at the macula showing inner retinal cavitation (white arrows) and outer retinal cavitations (orange open arrow) at the fovea with ellipsoid zone loss temporal to the fovea (red arrowhead), thereby suggesting that changes in early MacTel are more prominent at the temporal parafovea (D).

melanin within the retinal pigment epithelium. Whilst mild FAF changes may occur despite intact retinal structure and function, areas of significantly increased or decreased FAF correlate with disrupted retinal structure and decreased function.

A focally decreased fundus AF signal is usually due to blockage (i.e., strong absorption) of the excitation light by advanced structural alterations, such as pigment hyperplasia (Figure 3) or neovascular complexes. The earliest vascular changes in MacTel occur temporal to the fovea in the deep capillary network, apparent on OCTA as reduced vascular density and telangiectatic vessels in the deep vascular plexus (Figure 4). The abnormalities in the deep plexus may be identified on the OCTA, very early in the disease even when the OCT is within normal

limits.¹³ These observations suggest that the microvasculature may be affected early in the disease too. Progressively, the superficial vascular plexuses is involved and these findings correlate well with corresponding abnormalities on FFA.¹⁴

Progression

We've also acquired significant information on progression of MacTel from OCT. Figure 5 (A-D) illustrates the natural course of progression in early MacTel. The earliest subtle changes on OCT imaging may include temporal enlargement of the foveal pit or foveal asymmetry postulated to be due to the changes in the outer nuclear/Henle's fiber layer thickness or hyper-reflective dots above the external limiting membrane (ELM).¹⁵ A subset of eyes in MacTel have been seen to have

only outer foveal defect characterized predominantly by foveal loss of ellipsoid and interdigitation zone with relative preservation of the overlying ELM (Figure 5C).¹⁶

With time, hyporeflective cavities may develop within the inner retina, which are usually located in the foveal pit with a predilection for the temporal slope (Figure 5). The reflectivity of these hyporeflective spaces in MacTel is different from exudative macular cysts, suggesting they're a manifestation of atrophy rather than exudation/leakage.¹⁷ The morphology and location of the features of inner retinal cavitation (IRC) on OCT images are consistent with the histological location of the Müller cell cone (MCC), and it's suggested that these cavities might represent MCC damage. Considering the MCC location

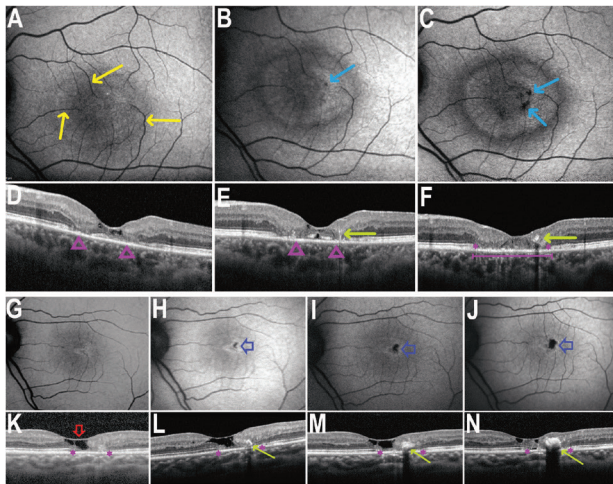


Figure 3. Disease progression captured using fundus autofluorescence imaging in two different cases of macular telangiectasia type-2 (MacTel). Case 1 (four-year follow-up) shows multiple right-angle vessels (RAV, yellow arrows) with parafoveal ring of hyper-autofluorescence at presentation (A). At one year follow-up, a small hypo-AF jet black lesion (blue arrow) corresponding to pigment is visible temporal to fovea (B). Final follow-up at four years shows increase in hypo-AF lesions (blue arrows, C). The corresponding optical coherence tomography sections show inner retinal cavitation (IRC) at the fovea with parafoveal ellipsoid zone loss (sparing the foveola) and collapse sign at presentation (D), hyper-reflective outer retinal lesion corresponding to the small pigment (green arrow) at one year (E), and pigment clumping and migration with large extent of continuous EZ loss involving the center (purple line between asterisks, F) at four years. Case 2 (10 year follow-up) shows RAV temporally (presentation, G) with progressive increase in size of pigmentation at two (H), five (I) and 10 (J) years from presentation. The corresponding OCT sections show the extent of EZ loss (between purple asterisks) as well as increase in pigment clumping and migration (green arrow, L-N). Note the change (collapse) in IRC as the disease progresses.

and their plug-like function, which is important in maintaining the foveal concavity,^{18,19} the development of the IRC, foveal flattening, and the internal limiting membrane drape are thought to be caused by MCC degeneration rather than the z-shape Müller cell in the parafoveal area that's present across the whole retina.²⁰ As the disease progresses, IRC may change (Figure 5 [E-H]), possibly due to loss of supporting structures, surrounding atrophy and decreasing leakage. The cavities may disappear and later reappear over time.

Recently, a seven-grade OCT classification using visual acuity as an outcome measure showed that as the disease progressed, vision loss correlates to disruption of the photoreceptor inner segment-outer segment border (EZ).²¹

The loss of EZ usually begins temporal to fovea, but disease progresses towards the fovea. This can be seen in Figure 5 (E-H) where the disease progresses from the onset of EZ loss. The amount of EZ loss on OCT corresponds with deficits in microperimetry and may be used as a diagnostic feature and outcome measure.^{22,23} The EZ loss occurs progressively albeit in a non-linear fashion and the rate of EZ loss is dependent on the size of the area of EZ loss at baseline.²⁴

The MacTel Natural History Observation Study of 56 eyes of 31 participants followed-up for 4.5 ± 1.2 years demonstrated progressive loss of EZ of $0.08 \text{ mm}^2/\text{year}$ that explains the functional vision loss over time.²⁵ Eyes with EZ loss that involved the foveal center had a significantly higher rate of visual loss of 1.40 letters per year.²⁶

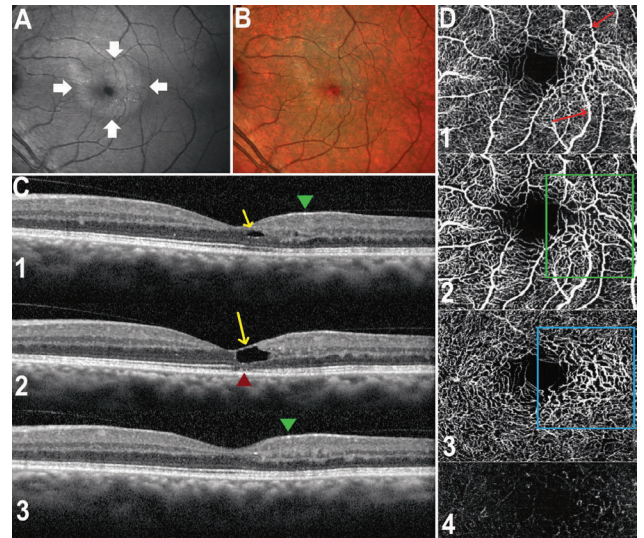


Figure 4. The different slabs of optical coherence tomography angiography in macular telangiectasia type-2. Confocal blue reflectance shows parafoveal circumferential hyper-reflectance (white arrowheads) with glistening hyper-reflectance of crystals (seen well on multicolor also, B). OCT shows inner retinal cavitation along foveal slope (yellow arrow), subfoveal ellipsoid zone loss (red arrowhead) and hyper-reflective dots at the nerve fiber layer (green arrowhead, corresponding to crystals). The OCT-angiography slabs shown include the whole retina slab (D), superficial vascular complex (SVC, E), deep capillary plexus (DCP, F) and outer-retina choriocapillaris slab (OR-CC, G). While the whole retina slab depicts the amalgamation of changes of the different slabs of OCTA with good visualization of right-angle vessel (red arrows), telangiectasia can be seen on SVC (green box) and DCP (blue box), while the OR-CC slab is normal.

The loss of EZ usually begins temporal to fovea, but disease progresses towards the fovea. This can be seen

Interestingly, longitudinal studies have also reported reductions in size of EZ loss (i.e., EZ recovery) in some eyes.²⁷⁻²⁹

Eyes with disorganized inner retinal layers, collapsed outer retinal layers and disrupted outer retinal hyper-reflective bands have significantly worse visual acuity.³⁰ Increased reflectivity in various layers may be seen due to pigment hyperplasia (Figure 3) or outer retinal hyper-reflectivity (Figures 5 [G,H] and 6). Increasing photoreceptor loss and disease severity have been shown to be associated with the presence of ORHR material.^{31,32} Figure 5 (E-H) shows that with progression of EZ loss, there's pigment hyperplasia and ORHR forming in the natural course of the disease. The former appears in outer retina within areas of photoreceptor atrophy before migrating into the inner retinal layers with back-shadowing. ORHR either appears as linear or oval, fusiform hyper-reflective lesion in the

outer retina as bright as the RPE layer, extending internally from the RPE. They're commonly located temporal to the fovea, which may explain why vision isn't affected to the degree seen with central pigment and atrophy. The oval hyper-reflective mound above the RPE with associated intraretinal edema and/or subretinal fluid or exudation is indicative of SRNVM (Figure 6). Intraretinal thickening temporal to the fovea compared to the nasal fovea, without any retinal fluid, may indicate early SRNVM. Atrophy of the outer retina involving the photoreceptor layer as well as scarring are the most common causes of vision loss in MacTel.

Treatment

Currently, MacTel is an untreatable disease and treatment is reserved for complications or sequelae of the disease, such as intra- or subretinal neovascularization or rarely, macular holes. Anti-VEGF agents may be used cautiously to treat the exudation due to neovascularisation bearing in mind the underlying neurodegenerative pathology. Surgical closure outcomes of macular holes in MacTel may be less successful than with idiopathic macular holes because of the absence of abnormalities of the vitreomacular interface and also due to tissue loss/atrophy in cavitations.

Antioxidant supplementation with oral lutein, meso-zeaxanthin, and zeaxanthin have been tried given the loss of central macular pigment in MacTel. Although pigment was seen to accumulate outside the diseased area, no re-accumulation of pigment was observed in the deficient areas after treatment.³³⁻³⁵ Visual acuity gains have been mild and not statistically significant with no beneficial effect on the progression of photoreceptor loss.

The shift of focus from MacTel being a vascular disease to a primary neuroglial degenerative disease paved the way to investigating the role of neuroprotection as a potential treatment.⁶ Ciliary neurotrophic factor (CNTF) has been shown to reduce photoreceptor loss in animal models.³⁶ As a result, a first-in-class Encapsulated Cell Therapy that con-

tains NTC-201-6A allogenic cells with unique capability of expressing CNTF (NT-501) has been developed to evaluate safety and efficacy in MacTel. An open-label, Phase I study on seven eyes demonstrated that the eyes tolerated the procedure of implantation of NT-501 into the vitreous and anchored to sclera and the drug appeared active with good safety profile.³⁷

Subsequently, a Phase II, randomized, sham-controlled clinical trial demonstrated the efficacy of this surgical encapsulated cell-based delivery implant that released CNTF into the vitreous cavity compared to sham. Interestingly, this is also the first study that evaluated change in baseline area of EZ loss on en-face SD-OCT as a primary outcome measure. The study showed that in addition to significantly less loss of area of EZ loss, the intervention also preserved retinal sensitivity on microperimetry and reading speed, providing evidence that CNTF slowed the progression of retinal neuronal degeneration.³⁸ Long-term follow-up to 36 months showed sustained beneficial effects. Based on

promising Phase II data, two parallel identical Phase III studies, NTMT-03-A and NTMT-03-B were conducted across 47 sites globally. Revakinagene Taroretcel (Neurotech) is the registered name for NT-501 CNTF. This intervention was compared to sham across 24 months in patients with MacTel, with EZ area loss of 0.16 to 2 mm², but maintaining good visual acuity of at least 54 ETDRS letters (equivalent to Snellen 20/80 or better). In these trials, the primary outcome of rate of change in EZ area loss from baseline in the intervention arms in both trials showed significant reduction compared to sham, reinforcing the ability of CNTF to preserve photoreceptors. On average, the reading speed deteriorated in all arms but the worsening was significantly less in the CNTF arms in both trials. The change in aggregated sensitivity within the area of EZ loss was only found to be significant in NTMT-03-A but not NTMT-03-B. The intervention was well tolerated. Delayed dark adaptation and miosis were observed in 17 to 24 percent of patients in the CNTF arms

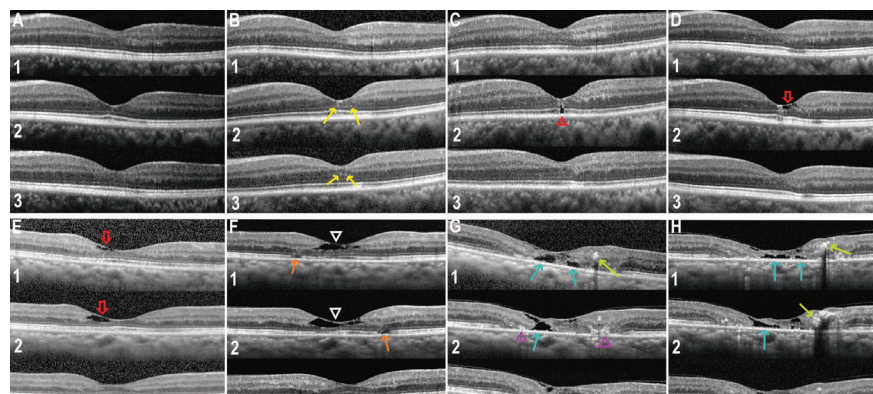


Figure 5. The natural course of findings on optical coherence tomography of two different cases followed up over a five-year period. Multiple sections (labeled 1 to 3) are taken at each visit and the same region is followed-up to show the progression of findings. The first case (labelled A to D) demonstrates no OCT abnormalities at presentation (A), hyper-reflective dots overlying the external limiting membrane (yellow arrow) at one year follow-up (B), ellipsoid zone loss subfoveally (red arrowhead) at three years (C), and inner retinal cavitation (IRC) along temporal foveal slope (red open arrow) with restoration of subfoveal EZ at the final follow-up (D). In the second case (labeled E to H), at presentation, only IRC along temporal foveal slope is seen (E, red open arrow). At two years, there is increase in the size of the IRC with formation of an internal limiting membrane drape (white arrowhead) along with EZ loss temporally (orange arrow) (F). Follow-up at four and five years shows progression of MacTel on OCT with large central EZ loss, outer retinal cavitation (blue arrow), collapse of inner into outer retina, pigment clumping and migration (green arrow), accompanied by progressive foveal thinning and collapse of IRC. Outer retinal hyper-reflectivity (purple arrowheads, G and H,) become more prominent with disease progression.

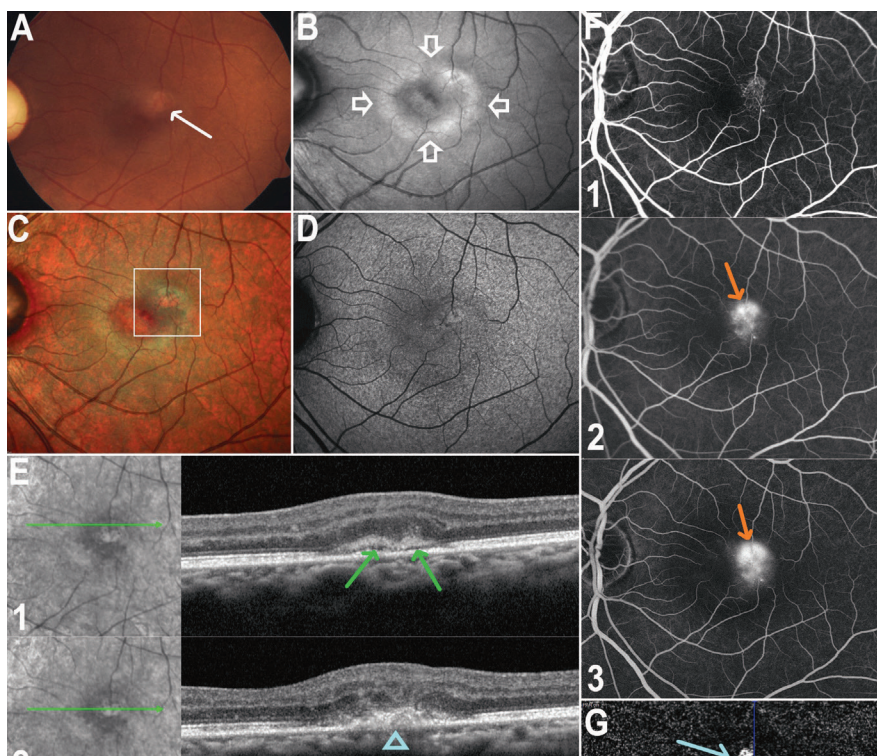


Figure 6. Color fundus photograph showing parafoveal loss of retinal transparency and a greyish-yellow membrane at macula (white arrow), suggesting stage 5 macular telangiectasia type-2 (MacTel) (A). Confocal blue reflectance demonstrates the entire extent of MacTel involvement as seen from the parafoveal circumferential hyper-reflectant ring (white arrowheads, B). On multicolor photo, the region of neovascular membrane is depicted by the greenish-orange color shift (temporal to fovea, white box) (C). Fundus autofluorescence demonstrates predominantly hyper-autofluorescence at the macula with small patches of hypo-AF (D). Optical coherence tomography shows subretinal fluid (green arrows, section 1), outer retinal hyper-reflective (ORHR) mound overlying the retinal pigment epithelium (blue arrowhead) and intraretinal thickening (section 2), and inner retinal cavitation along foveal slope (section 3) (E). Fundus fluorescein angiography shows hyper-fluorescence temporal to the fovea in the early phase (along the termination of right angle vessel, numbered 1) which starts leaking in the mid phase (numbered 2, orange arrow), with more profuse leak seen superiorly in the late phase (numbered 3, orange arrow) (F). Note the overall extent of MacTel involvement on CBR is greater than that seen on FFA. OCT angiography depicting a well-defined circular network with flow signals corresponding to the ORHR (blue arrow, G).

(Emily Chew, MD, AAO Retina Sub-specialty Day, 2024). Overall, the results are very encouraging.

As the serine-glycine metabolism is dysregulated in MacTel, patients may have low serine levels and abnormal lipids.^{10,39} A Phase IIa trial is evaluating the effects of the drugs, serine and fenofibrate on serine and/or deoxy sphingolipid levels in six cohorts of patients from the MacTel Natural History Observation and Registry. The intervention in the six cohorts include serine 200 mg/kg/day, serine 400 mg/kg/day, fenofibrate 160 mg/day, both

serine 200 mg/kg/day and fenofibrate 160 mg/day, both serine 400 mg/kg/day and fenofibrate 160 mg/day, or no treatment. The results of this 10-week trial are awaited (NCT04907084).

In conclusion, the research on MacTel is a perfect example of a long-standing collaboration of philanthropy (Lowy Medical Research Institute), industry, researchers and patients that has spanned nearly 20 years from studying the natural history of the disease, identifying the role of neuroprotection, developing the appropriate intervention and clinical endpoints for clinical trials to comple-

tion of Phase I to III trials. The trials highlight a beneficial treatment for an untreatable disease that would otherwise progress slowly to central vision loss and poor quality of life. ◀

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Infection Risk With Secondary IOL Surgeries

Scientists assessed postoperative endophthalmitis (POE) rates and risk factors after secondary intraocular lens implantation for preoperative aphakia and IOL exchange combined with or without vitrectomy, in Medicare fee-for-service beneficiaries in the United States.

The retrospective study included Medicare FFS beneficiaries who underwent IOL exchange or secondary IOL implantation for preoperative aphakia between January 1, 2011, and November 19, 2022. POE rates were calculated overall and separately for each surgical category—secondary IOL for aphakia vs. IOL exchange, with subsets for concurrent anterior or posterior vitrectomy. Multivariate analysis of potential risk factors was implemented.

A total of 97,152 patients were included. Here are some of the findings:

- The 42-day POE rates for secondary IOL implantation for aphakia and for IOL exchange were, respectively, 0.35 and 0.28 percent overall, 0.31 and 0.30 percent when combined with posterior vitrectomy, and 0.84 and 0.42 percent with anterior vitrectomy.

- The risk of POE increased when secondary IOL surgery was combined with anterior vitrectomy compared to no vitrectomy (adjusted odds ratio [aOR] 1.849; $p < 0.001$) and with higher Charlson comorbidity indexes compared to zero: one to two (aOR 1.495; $p = 0.01$), three to four (aOR 1.591; $p = 0.01$), five to six (aOR 1.617; $p = 0.046$), \geq seven (aOR 3.290; $p < 0.001$).

- Risk was decreased for IOL exchange compared to secondary IOL

implantation for preoperative aphakia (aOR 0.783; $p = 0.04$).

Scientists wrote the overall postoperative endophthalmitis rate for all secondary intraocular lens surgeries was 0.31 percent during the 11-year period. They hypothesized that the absence of the posterior capsular barrier explained the higher postoperative endophthalmitis rates compared with cataract surgery, especially if a concurrent vitrectomy was performed with the secondary intraocular lens procedure.

J Cataract Refract Surg 2024; Oct 9. [Epub ahead of print].
Kerrison CH, Chang DF, Dun C, et al.

IOL Calcs in Endothelial Dystrophy without Edema

Scientists evaluated the accuracy of several intraocular lens formulas for patients with endothelial dystrophy (ED) without edema, treated with cataract surgery alone, at an academic tertiary referral center, as part of a comparative retrospective cohort study.

Scientists assessed the predicted refractive results of ED patients who underwent cataract surgery and compared them to a matched control group. The accuracy of five different IOL formulas Haigis, Holladay 1, Barrett Universal II, SRK/T and Kane was evaluated and compared between the groups. The standard deviations of the prediction error of all formulas were compared.

The study included 221 eyes: 50 (23 percent) eyes of patients with ED and 171 (77 percent) control eyes.

- No significant difference was found between the two groups in clinical and demographical characteristics ($p > 0.05$).

- The postoperative spherical equivalent was -0.37 D in the ED and -0.30 D in the control group ($p = 0.8$).

- Overall, both groups had a comparable standard deviation of the prediction error (PE) and absolute PE (APE) in all formulas ($p > 0.05$).

- In the ED group, APE was 0.34 D for Haigis, 0.32 D for Holladay1, 0.32 D for Barrett Universal II, 0.38 D for SRK/T and 0.32 D for Kane.

- No statistically significant difference between formulas was found.

Scientists found the prediction accuracy of intraocular lens power calculation in patients with endothelial dystrophy was comparable between formulas and with healthy controls. They noted the finding suggests that in patients with guttae without edema intraocular lens power calculations are as effective and accurate as in healthy eyes.

J Cataract Refract Surg 2024; Nov 6. [Epub ahead of print].
Shemer A, Fradkin M, Dubinsky-Pertsov B, et al.

Gabapentin and Pregabalin for Post-Refractive Surgery Pain

Gabapentin and pregabalin were evaluated in this systematic review and meta-analysis to help patients manage pain after refractive surgery.

A search of databases including PubMed, Embase, Cochrane Library and CINAHL was performed until March 2024. Inclusion criteria were randomized controlled trials assessing pregabalin and/or gabapentin's effectiveness in treating pain post-PRK, LASIK and LASEK surgeries.

Six studies met inclusion criteria, comprising a total of 391 patients undergoing various corneal surgeries. Here are some of the findings:

- The meta-analysis revealed that pregabalin was significantly more effective than placebo in reducing pain on the first and second postoperative days (SMD day one: -0.32 ; CI -0.54 to

(Continued on p. 66)

“Don’t Miss Your Monthly Dose”

RETINA[®] SPECIALIST MONTHLY

Timely reports on retina research and professional news, from the editors of *Review of Ophthalmology and Retina Specialist*.

Medical Editor: Philip Rosenfeld, MD, PhD.

(Continued from pg. 54)

relaxing incision opposite to where you want the Tenon’s to end up. For instance, if you want the Tenon’s to move temporally, you’d make a relaxing incision nasally. This would be a circumferential incision on the nasal side of the Tenon’s. Once you make that snip, you can rotate or transpose the Tenon’s to the desired clock hour while still keeping it pedicled, or attached to itself at the side closest to where you want to move it. So, in this example, you’d make a snip nasally but keep it attached temporally, then drag the whole thing temporally.

There’s actually quite a lot of stretch in the Tenon’s. I’ve successfully used these transposition grafts to borrow Tenon’s from one area to cover another. Once you get the Tenon’s down, it’s okay for that Tenon’s to remain uncovered by conjunctiva. This gives you much more flexibility in terms of conjunctival closure, even if you can’t get it to reach the limbus or fully close the relaxing incisions. As long as you have Tenon’s over bare sclera and on top of the tube and patch graft, you’re in good shape.

If, despite your best efforts, you just can’t get the conjunctiva to close, there are other techniques you can employ, such as using an amniotic membrane graft to bridge any gaps in the conjunctiva. Additionally, you can consider other types of patch graft material. For example, a pericardial Tutoplast is larger than sclera, and on rare occasions, I’ve opened a pericardial Tutoplast when I needed a bit more coverage for my new tube and the available tissues were insufficient.

A video of this Ahmed to Baerveldt tube exchange technique can be viewed here: <https://youtu.be/3ISXoOVLhXU>.

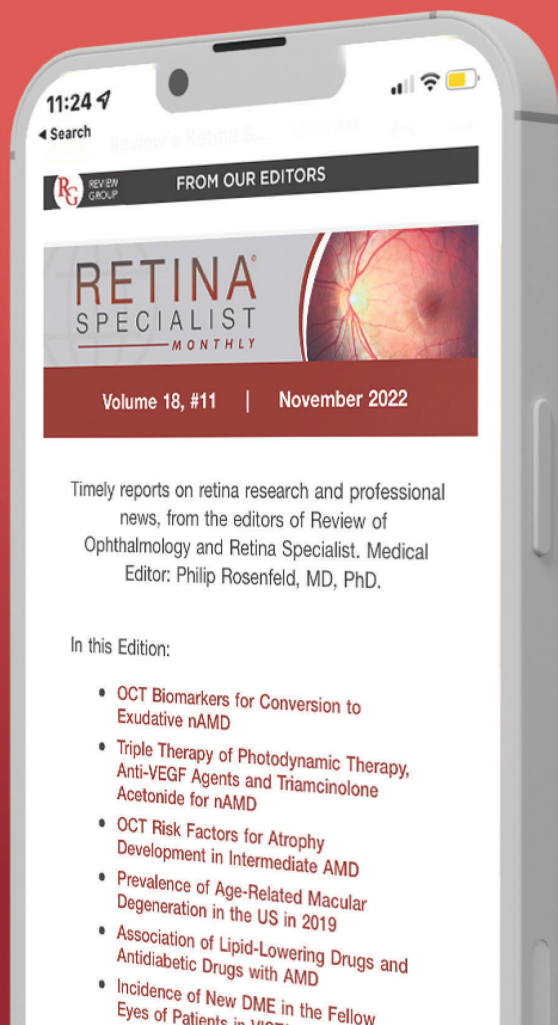
I’d encourage all glaucoma surgeons who take care of patients with one prior failed tube to consider trying a same-quadrant tube exchange because it may yield a better long-term outcome for the patient, despite the fact that it’s a slightly lengthier procedure than putting in a second tube shunt. ◀

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Timely reports on retina research and professional news, from the editors of *Review of Ophthalmology and Retina Specialist*. Medical Editor: Philip Rosenfeld, MD, PhD.

In this Edition:

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- Triple Therapy of Photodynamic Therapy, Anti-VEGF Agents and Triamcinolone Acetonide for nAMD
- OCT Risk Factors for Atrophy Development in Intermediate AMD
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EDITED BY ERIK MASZENIO, MD

WILLS EYE RESIDENT CASE REPORT

A patient presents with a swollen eyelid and ptosis.

SAMANTHA S. MASZENIO, MD, TATYANA MILMAN, MD, AND JACQUELINE R. CARRASCO, MD
PHILADELPHIA

Presentation

A 71-year-old woman presents with left upper eyelid swelling and ptosis that has progressively worsened over four weeks. She has no associated pain or vision changes. Her symptoms haven't improved with oral antibiotics prescribed by her primary care provider. She's referred for evaluation by an ophthalmologist.

History

Ocular history is notable for primary open angle glaucoma for which she is on brinzolamide, netarsudil and bimatoprost in both eyes. Medical history is notable for hyperlipidemia and hypertension, for which she is taking rosuvastatin and amlodipine, respectively. She's never had any surgeries. Social history is notable for no tobacco, alcohol or other substance use; she works as a teacher. Review of systems notable for no fevers, chills, night sweats, weight loss or any other recent illness.

Examination

Ophthalmic examination revealed complete ptosis of the left eye and inability to spontaneously open the eyelid (*Figure 1A*). There was also a mild supraduction deficit of the left eye (*Figure 1B*). Pupils were equal, round and reactive to light with no relative afferent pupillary defect. Visual acuity was 20/20 in the right and 20/25 in the left eye. Intraocular pressure was 16 mmHg in both eyes. Color plates were 8/8 in both eyes and confrontation visual fields were full. The slit lamp examination was otherwise unremarkable. Fundus examination was notable for cup-to-disc ratios of 0.9 in each eye which was consistent with her known history of primary open angle glaucoma.



Figure 1. External photograph of the patient at presentation (A showing complete ptosis of the left eye; and B showing mild supraduction deficit of the affected eye) and most recently after treatment (C).

What's your diagnosis? What management would you pursue? The case continues on the next page.

Work-up, Diagnosis and Treatment

At this point, the differential diagnosis included neoplasms, such as lymphoma, lymphoproliferative disease, lacrimal gland tumor, and metastasis; infectious, including bacteria dacryoadenitis from mycobacteria, Lyme disease or *Staphylococcus* species; vascular, including arteriovenous malformation and orbital venous varix; and inflammatory, including orbital sarcoidosis, idiopathic orbital inflammation, Wegener's granulomatosis with polyangiitis, and other autoimmune etiologies.

Laboratory work-up for broad infectious and inflammatory etiologies of the patient's symptoms revealed mildly elevated rheumatoid factor of 21 (normal <14) and mildly elevated lactate dehydrogenase of 242 (normal <240). Normal laboratory tests included angiotensin converting enzyme (ACE), antineutrophil cytoplasmic antibodies (ANCA), antinuclear antibody, QuantiFERON-TB Gold, syphilis, cascade, and thyroid labs (thyroid stimulating hormone, thyroid peroxidase antibody, and thyroid stimulating immunoglobulin). Overall, the laboratory findings were nonspecific for any causative etiology.

Chest radiograph was within normal limits and without evidence of hilar adenopathy.

Computed tomography imaging (*Figure 2*) with contrast of the orbits revealed soft tissue thickening involving the left lacrimal gland with no discrete fluid collection, as well as mild soft tissue thickening over the medial canthus which is nonspecific but may be seen in inflammatory processes. The findings favored left dacryoadenitis.

The patient underwent left orbitotomy with biopsy. Pathology examination (*Figure 3*) revealed fibroadipose tissue with numerous discrete non-necrotizing granulomas, composed predominantly of epithelioid histiocytes and multinucleated giant cells with a narrow rim of lymphocytes. The differential diagnosis included sarcoidosis. Correlation with clinical findings to exclude rheumatologic, paraneoplastic and medication-induced etiologies of sarcoidal-type reaction was recommended.

Given the presumed diagnosis of sarcoidosis, the patient was referred to rheumatology for systemic workup, which was negative for involvement of other organ systems at the time of presentation. She was treated with oral steroids and steroid injections of the

involved orbital area with the oculoplastic surgery service, as well as methotrexate with rheumatology. She had good resolution of the orbital mass over the course of one year; however, the ptosis remained severe. She underwent a frontalis sling procedure to correct the ptosis with good cosmetic result (*Figure 1C*).



Figure 2. Computed tomography images showing left lacrimal gland soft tissue thickening in coronal (left), axial (top right) and sagittal (bottom right) views.

Discussion

Sarcoidosis is a multisystem chronic granulomatous disease of unknown cause. It's thought that affected individuals have a genetic predisposition combined with environmental factors that trigger granuloma formation.¹ Most cases (approximately 70 percent) present in adults between 25 to 40 years of age, although there's a second peak of incidence in women over 50 years of age.¹ There's a 2:1 female predominance.¹ In the United States, sarcoidosis is seen more commonly in African Americans (age-adjusted annual incidence of 35.5 per 100,000) than in Caucasians (10.9 per 100,000).²

The systemic manifestations of sarcoidosis are wide-ranging.¹ Pulmonary findings include hilar adenopathy and interstitial lung disease. Musculoskeletal findings include

arthritis, dactylitis and myopathy. Cardiac findings include cardiac granulomas which may lead to heart block. Dermatologic findings include erythema nodosum—tender, erythematous nodules often on the shins—although cutaneous involvement can have a wide range of appearances. Neurologic findings include brain parenchymal or meningeal involvement or cranial nerve palsies, classically a facial nerve palsy. Patients can also have nonspecific symptoms such as fever, fatigue or weight loss. Because of its various presentations, sarcoidosis is often termed one of the “great masqueraders” of medicine.

Some of the screening tools for sarcoidosis include chest radiography and serum ACE level; however, both are imper-

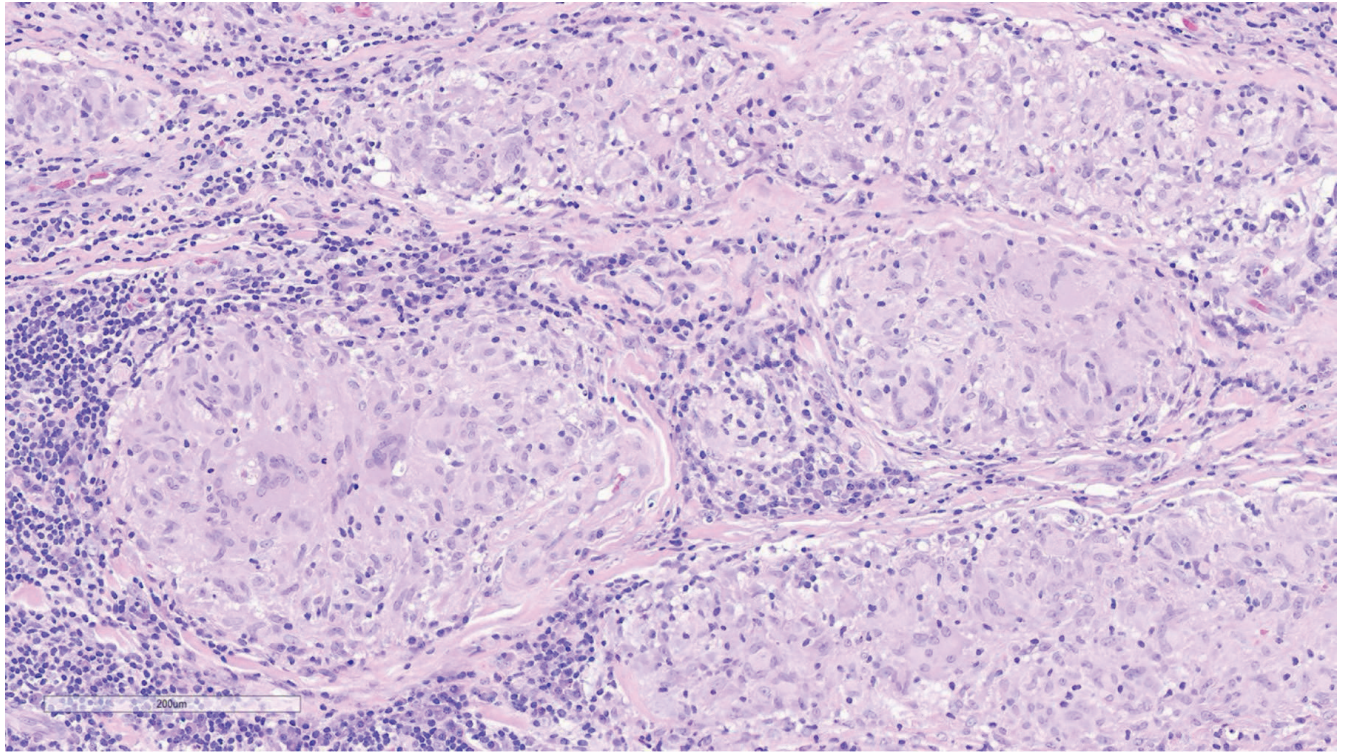


Figure 3. Hematoxylin and eosin-stained slide from the excisional biopsy showing non-necrotizing granulomas.

fect. Chest radiography shows hilar adenopathy in 50 to 80 percent of cases.³ ACE level is positive in 30 to 80 percent of cases.⁴ As a case in point, our patient's chest radiograph and ACE level were both normal.

Ophthalmic involvement is seen in 25 to 60 percent of patients with sarcoidosis.⁵ Uveitis, dry eye and conjunctival nodules are the most common manifestations.⁵ Sarcoid-associated uveitis can include granulomatous anterior chamber inflammation, intermediate uveitis, choroidal granulomas or perivascular sheathing (termed “candle-wax drippings”).⁶ This list is by no means exhaustive, and sarcoidosis can affect all parts of the eye and orbit.

Our patient specifically had orbital sarcoidosis. This is a rare manifestation of sarcoidosis, appearing in only 1 percent or less of patients with ocular sarcoidosis.⁷ When the orbit is affected, the lacrimal gland is most commonly involved, as seen in our patient, although it can also involve the orbital soft tissue, optic nerve sheath, dura or extraocular muscles.⁸ Presenting findings include having a palpable mass, proptosis, ptosis, discomfort, diplopia and decreased vision. Treatment includes steroids, surgical debulking and methotrexate; observation may be appropriate if the patient is asymptomatic.⁷ In one study by Ioannis Mavrikakis, MD, PhD, and Jack Rootman, MD, at the University of British Columbia, half of patients developed systemic sarcoidosis.⁸ No specific clinical feature has been found to be predictive of patients with orbital sarcoidosis developing systemic sarcoidosis.⁹

In conclusion, this case of a patient presenting with slowly progressive ptosis and periorbital swelling demonstrates the often-nonspecific presentation of orbital sarcoidosis. Screening tools such as chest radiograph and angiotensin converting enzyme serum level are imperfect and can be normal in a patient who has sarcoidosis. Sarcoidosis is a “great masquerader” that can affect every organ system and every part of the eye. ◀

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(Continued from p. 61)

-0.09; SMD day two: -0.55; CI -0.85 to -0.25), while gabapentin showed significant pain reduction on the second day only (SMD day two: -0.42; CI -0.71 to -0.13).

- Combined analysis for both medications showed significant pain reduction on the first and second days post-surgery.
- No increase in adverse events was associated with either drug.
- Publication bias was minimal except for a slight asymmetry noted on day-one effectiveness.

Scientists found that pregabalin and gabapentin were effective in reducing postoperative pain following refractive surgeries, with pregabalin showing a greater effect. They noted that both medications were found to be safe, with no significant increase in adverse events. Scientists added that further research with standardized methodologies and long-term follow-up is recommended to optimize postoperative pain management in ocular surgeries.

Int Ophthalmol 2024; Oct 24;44:1:409.
Chen KY, Chan HC, Wei LY, et al.

Fluid Resolution in Wet AMD Studied

Researchers investigated the incidence and factors associated with subretinal fluid resolution during SRF-tolerating treatment in patients with neovascular age-related macular degeneration.

This retrospective study included patients diagnosed with neovascular AMD who exhibited fovea-involving residual SRF persisting for at least six months during aflibercept treatment. Patients who showed SRF resolution despite maintaining the injection intervals were included in the resolution group, while those who exhibited persisting SRF throughout the study period were included in the non-resolution group. The incidence and associated factors of SRF resolution without reducing the injection interval were evaluated.

In total, 65 patients with neovascular AMD were included (32 and 33 in the resolution and non-resolution groups, respectively). Here are some of the findings:

- When compared to the non-resolution group, the resolution group showed a lower mean height of SRF (67.7 ±33.4 vs. 109.9 ±44.9 μm; $p < 0.001$) and a lower maximum height of SRF (138.3 ±88.6 vs. 176.2 ±76.9 μm; $p = 0.034$).
- In multivariate analysis, the mean SRF height ($p = 0.001$), maximum SRF height ($p = 0.006$) and interval of anti-vascular endothelial growth factor injections ($p = 0.023$) were significantly associated with the resolution of SRF.
- In the resolution group, 14 patients (43.8 percent) successfully expanded the injection interval.

Researchers wrote, during SRF-tolerating treatment for neovascular age-related macular degeneration, a substantial proportion of patients exhibited resolution of fluid without shortening the injection interval. Researchers concluded, following subretinal fluid resolution, injection intervals can be extended in more than 40 percent of patients. ◀

Retina 2024; Oct 16. [Epub ahead of print].
Lee JH, Park SM, Kim JH.

XDEMYV® (lotilaner ophthalmic solution) 0.25%, for topical ophthalmic use

BRIEF SUMMARY OF PRESCRIBING INFORMATION
Please see the XDEMYV® package insert for full Prescribing Information.

INDICATIONS AND USAGE
XDEMYV is indicated for the treatment of *Demodex* blepharitis.

CONTRAINDICATIONS
None.

WARNINGS AND PRECAUTIONS
Risk of Contamination Do not allow the tip of the dispensing container to contact the eye, surrounding structures, fingers, or any other surface in order to minimize contamination of the solution. Serious damage to the eye and subsequent loss of vision may result from using contaminated solutions.

Use with Contact Lenses Contact lenses should be removed prior to instillation of XDEMYV and may be reinserted 15 minutes following its administration.

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

XDEMYV was evaluated in 833 patients with *Demodex* blepharitis in two randomized, double-masked, vehicle-controlled studies (Saturn-1 and Saturn-2) with 42 days of treatment. The most common ocular adverse reaction observed in controlled clinical studies with XDEMYV was instillation site stinging and burning which was reported in 10% of patients. Other ocular adverse reactions reported in less than 2% of patients were chalazion/hordeolum and punctate keratitis.

USE IN SPECIFIC POPULATIONS

Pregnancy: Risk Summary There are no available data on XDEMYV use in pregnant women to inform any drug associated risk; however, systemic exposure to lotilaner from ocular administration is low. In animal reproduction studies, lotilaner did not produce malformations at clinically relevant doses.

Data Animal Data In an oral embryofetal developmental study in pregnant rats dosed during organogenesis from gestation days 6-19, increased post-implantation loss, reduced fetal pup weight, and incomplete skeletal ossification were observed at 50 mg/kg/day (approximately 1390 times the recommended human ophthalmic dose (RHOD) on a body surface area basis) in the presence of maternal toxicity (i.e., decreased body weight and food consumption). A rare malformation of situs inversus of the thoracic and abdominal viscera occurred in 1 fetus from a pregnant rat receiving 50 mg/kg/day; whether this finding was treatment-related could not be excluded. No maternal or embryofetal toxicity was observed at 18 mg/kg/day (approximately 501 times the RHOD on a body surface area basis). In an oral embryofetal development study in pregnant rabbits dosed during organogenesis from gestation days 7-19, no embryofetal toxicity or teratogenic findings were observed at 20 mg/kg/day (approximately 580-times the RHOD on an AUC basis), even in the presence of maternal toxicity (i.e., decreased food consumption and body weight).

In an oral two-generation reproductive toxicity study, F0 male and female rats were administered lotilaner at doses up to 40 mg/kg/day for 10 weeks before pairing and during the 2-week pairing period (3 weeks for males). Dosing for F0 females continued through lactation day 22. F1 male and female rats were administered lotilaner at 1 and 5 mg/kg/day post-weaning from day 23 for 10 weeks before pairing and during the 2-week pairing period (3 weeks for males). Dosing for F1 parental females continued through lactation day 22. There were no clear adverse effects on the F1 generation, and a slightly lower mean body weight during lactation was noted for F2 pups at 5 mg/kg/day. The no observed adverse effect level (NOAEL) was determined to be 5 mg/kg/day

(approximately 139 times the RHOD on a body surface area basis).

Lactation: Risk Summary There are no data on the presence of XDEMYV in human milk, the effects on the breastfed infant, or the effects on milk production. However, systemic exposure to lotilaner following 6 weeks of topical ocular administration is low and is <99% plasma protein bound, thus it is not known whether measurable levels of lotilaner would be present in maternal milk following topical ocular administration. The developmental and health benefits of breastfeeding should be considered along with the mother's clinical need for XDEMYV and any potential adverse effects on the breast-fed child from XDEMYV.

Pediatric Use: Safety and effectiveness in pediatric patients below the age of 18 years have not been established.

Geriatric Use: No overall differences in safety or effectiveness have been observed between elderly and other adult patients.

NONCLINICAL TOXICOLOGY
Carcinogenesis, Mutagenesis, Impairment of Fertility

Carcinogenesis Long-term studies in animals have not been performed to evaluate the carcinogenic potential of lotilaner.

Mutagenesis Lotilaner was not genotoxic in the following assays: Ames assay for bacterial gene mutation, *in vitro* chromosomal aberration assay in cultured human peripheral blood lymphocytes, and *in vivo* rat micronucleus test.

Impairment of fertility In a two-generation study of reproductive performance in rats, F0 male and female rats were administered lotilaner at oral doses of 40 mg/kg/day for 80 days reduced to 20 mg/kg/day for 47-50 supplementary days. Reduced pregnancy rates and decreased implantation rates were observed in F0 females at doses 20 mg/kg/day (approximately 556 times the RHOD on a body surface area basis), which were also associated with maternal toxicity (i.e., decreased body weight and food consumption). No effects on fertility were observed in F0 females at the dose of 5 mg/kg/day (approximately 139 times the MRHOD on a body surface area basis). No effects on fertility were observed in F0 males at the oral dose of 20 mg/kg/day (approximately 556 times the RHOD on a body surface area basis), and no effects on fertility were observed in F1 males and females at the oral dose of 5 mg/kg/day (approximately 139 times the RHOD on a body surface area basis).

PATIENT COUNSELING INFORMATION

Handling the Container Instruct patients to avoid allowing the tip of the dispensing container to contact the eye, surrounding structures, fingers, or any other surface in order to minimize contamination of the solution. Serious damage to the eye and subsequent loss of vision may result from using contaminated solutions.

When to Seek Physician Advice Advise patients that if they develop an intercurrent ocular condition (e.g., trauma or infection), have ocular surgery, or develop any ocular reactions, particularly conjunctivitis and eyelid reactions, they should immediately seek their physician's advice concerning the continued use of XDEMYV.

Use with Contact Lenses Advise patients that XDEMYV contains potassium sorbate, which may discolor soft contact lenses. Contact lenses should be removed prior to instillation of XDEMYV and may be reinserted 15 minutes following its administration.

Use with Other Ophthalmic Drugs Advise patients that if more than one topical ophthalmic drug is being used, the drugs should be administered at least 5 minutes between applications.

Missed Dose Advise patients that if one dose is missed, treatment should continue with the next dose.

RX only

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¹ Comparison between New Perimetry Device (IMOVifa®) and Humphrey Field Analyzer™ M Eslani, T Nishida, S Moghimi, JM Arias, C Vasile, V Mohammadzadeh, RN Weinreb; Invest. Ophthalmol. Vis. Sci. 2022;63(7):1272 - A0412.



xdemvy®
(lotilaner ophthalmic
solution) 0.25%

This is not the actual product. It is a depiction of the product for dramatic purposes.



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Abby, real patient with Demodex blepharitis (DB). Results after 6 full weeks of treatment. Results may vary.



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44% and 55% of patients taking XDEMZY in SATURN-1 (N=209) and SATURN-2 (N=193), respectively, achieved a significant improvement in their eyelids (reduction of collarettes to no more than 2 collarettes per upper lid) at Day 43 vs 7% (N=204) and 12% (N=200) of patients taking vehicle (P<0.01 in each trial).*

INDICATIONS AND USAGE

XDEMZY (lotilaner ophthalmic solution) 0.25% is indicated for the treatment of *Demodex* blepharitis.

IMPORTANT SAFETY INFORMATION:

WARNINGS AND PRECAUTIONS

Risk of Contamination: Do not allow the tip of the dispensing container to contact the eye, surrounding structures, fingers, or any other surface in order to minimize contamination of the solution. Serious damage to the eye and subsequent loss of vision may result from using contaminated solutions.

Use with Contact Lenses: XDEMZY contains potassium sorbate, which may discolor soft contact lenses. Contact lenses should be removed prior to instillation of XDEMZY and may be reinserted 15 minutes following its administration.

ADVERSE REACTIONS: The most common adverse reaction with XDEMZY was instillation site stinging and burning which was reported in 10% of patients. Other ocular adverse reactions reported in less than 2% of patients were chalazion/hordeolum and punctate keratitis.

Please see next page for a Brief Summary of the full Prescribing Information.

*The safety and efficacy of XDEMZY for the treatment of DB were evaluated in a total of 833 patients (415 of whom received XDEMZY) in two 6-week, randomized, multicenter, double-masked, vehicle-controlled studies (SATURN-1 and SATURN-2). Patients were randomized to either XDEMZY or vehicle at a 1:1 ratio, dosed twice daily in each eye for 6 weeks. All patients enrolled were diagnosed with DB. The primary efficacy endpoint was defined as the proportion of patients with collarette reduction to no more than 2 collarettes per upper eyelid at Day 43.

Reference: XDEMZY [prescribing information]. Tarsus Pharmaceuticals, Inc; 2023.

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