THE CASE OF THE CREEPING PARACENTRAL VISUAL FIELD DEFECT

What are options when a patient and her family prefer to avoid surgery?

BY STEVEN R. SARKISIAN JR, MD; AUSTIN BELL, MD; SYLVIA GROTH, MD; AND REGINE PAPPAS, MD

CASE PRESENTATION

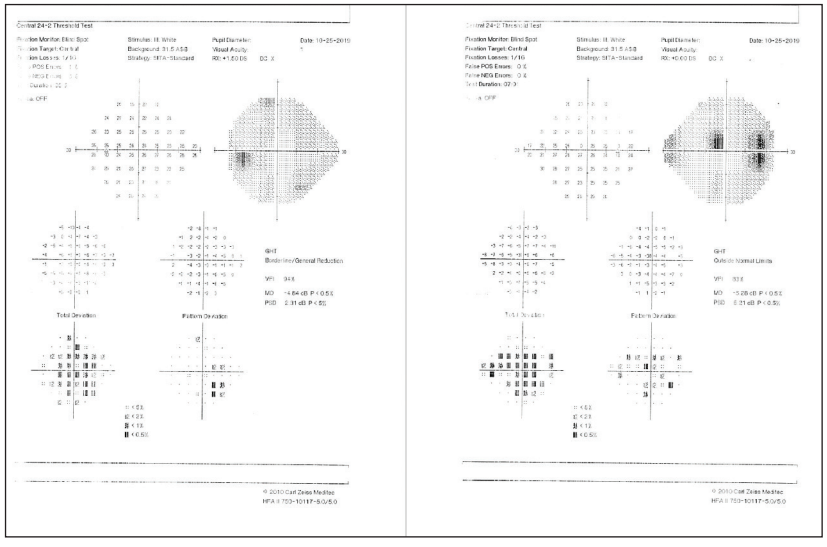

Figure 1. Visual field testing reveals a paracentral defect in the right eye.

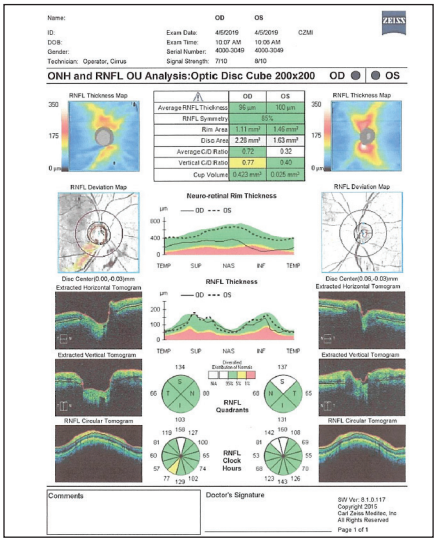

Figure 2. OCT imaging shows significant inferotemporal thinning consistent with visual field findings.

A 75-year-old white woman presents with a rapidly progressing visual field defect in her right eye. This paracentral scotoma has deepened during the past 6 months (Figures 1 and 2). At every visit, IOP has measured less than 15 mm Hg. At the current visit, IOP is 13 mm Hg OD and 11 mm Hg OS. The patient underwent selective laser trabeculoplasty (SLT) on her right eye last year, but the procedure had no effect on IOP. She is using brinzolamide and latanoprost. She is allergic to brimonidine. Timolol lowered her heart rate, so this drug was discontinued.

A posterior chamber IOL is present in each eye. Optic nerve cupping is worse in the right eye. The examination findings are not significant otherwise.

Upon receiving a recommendation of filtration surgery, the patient asks that her son, an optometrist in another state, be consulted. He says that he would prefer his mother not have surgery and asks if there are other options.

How would you proceed?

—Case prepared by Steven R. Sarkisian Jr, MD

AUSTIN BELL, MD

This patient likely has normal-tension glaucoma (NTG), given the characteristic focal paracentral defect on visual field testing and the disease progression despite IOPs in the low teens. My first step would be to address any modifiable factors that can contribute to progressive optic neuropathy. These include nocturnal hypotension, migraine, vascular dysregulation, sleep apnea, and other medical problems. Regardless, I would target a 30% reduction in IOP to reduce the risk of further disease progression.[1] While assessing the patient for modifiable risk factors, I would simultaneously maximize medical therapy. Switching her to

"MOST IMPORTANT IN THIS CASE ARE TO THOROUGHLY COUNSEL THE PATIENT AND HER FAMILY ON THE RISK OF IRREVERSIBLE VISION LOSS IF HER IOP IS NOT ADEQUATELY CONTROLLED AND TO ADDRESS ANY PRECONCEPTIONS OR CONCERNS THEY HAVE ABOUT EYE SURGERY."

—AUSTIN BELL, MD

a fixed combination containing a prostaglandin analogue (netarsudil 0.02%/latanoprost 0.005%, Rocklatan, Aerie Pharmaceuticals) or to latanoprostene bunod 0.024% (Vyzulta, Bausch + Lomb) may decrease IOP more than therapy with latanoprost alone[2] and may be particularly effective in the setting of NTG.

Because the patient is currently using only one aqueous suppressant (brinzolamide), cyclophotocoagulation could be an effective option. Transscleral cyclophotocoagulation (TSCPC) using the MicroPulse P3 Glaucoma Device (Iridex) can be performed in the office with or without a retrobulbar block. I prefer to perform this procedure in the OR with a block to maximize patients' comfort.

Most important in this case are to thoroughly counsel the patient and her family on the risk of irreversible vision loss if her IOP is not adequately controlled and to address any preconceptions or concerns they have about eye surgery. Based on her presentation, I believe filtration surgery offers the best chance of achieving a significant and consistent IOP reduction. My preference would be to implant an Ex-Press Glaucoma Filtration Device (Alcon) to achieve an IOP in the single digits if possible.

SYLVIA GROTH, MD

This case presents diagnostic, treatment, and ethical dilemmas. The optic nerve asymmetry is severe, both in terms of observed cupping (much more significant on the right) and disc area (right nerve much larger). Surprisingly, OCT imaging shows a well-preserved retinal nerve fiber layer in all quadrants apart from a sliver of thinning at 7 o'clock. Automated perimetry, however, demonstrates a diffuse depression with deep paracentral loss corresponding to the area of OCT thinning. The observed dissociation between functional and structural measurements demonstrates the utility and importance of both tests for evaluating and managing patients with suspected glaucomatous optic neuropathy.

Based on the patient's history of low IOP, I would inquire about risk factors for sleep apnea and, if any were present, pursue evaluation and treatment. Focal thinning on the optic disc suggests possible optic nerve head ischemia, necessitating blood pressure checks and prevention of nocturnal hypotension.

One option is to add netarsudil ophthalmic solution 0.02% (Rhopressa, Aerie Pharmaceuticals) to the patient's medical regimen. Considering her propensity for allergies, she may not tolerate this Rho kinase inhibitor. I would not recommend SLT because the IOP is low and SLT failed in the past. Instead, I would recommend that she undergo TSCPC with the MicroPulse P3 Glaucoma Device, which can be an effective, conservative treatment that can be repeated, if needed.

I would repeat automated perimetry within 3 months to look for further disease progression. Patients who wish to avoid incisional surgery, whatever the reason, require counseling on the progressive nature of glaucoma. Despite our best efforts—even with incisional surgery—we physicians are sometimes unable to stop or substantially slow vision loss. Proceeding conservatively is reasonable in this case, especially when all parties understand the natural course of the disease.

REGINE PAPPAS, MD

This patient's risk factors for progression include advanced age and extreme cup-to-disc asymmetry. Treatment options are limited because of her pseudophakic status, her brimonidine allergy, and the side effects she experienced with timolol combined with her son's reluctance to have her undergo surgical intervention.

I would start by offering the patient an alternative therapeutic agent such as the fixed combination of netarsudil and latanoprost, which would

(Continued on page 36)

(Case Files, continued from page 30)

not alter her current drop frequency. If insurance coverage were problematic, I would instead consider adding netarsudil to the current drop regimen. I would target an IOP in the single digits. This topical therapy may be more effective in patients with normal tension,[3] as was noted by Wang et al to be the case in a study in monkeys.[4]

I would repeat automated perimetry and OCT imaging in 3 months. If further progression were evident in the right eye, I would have a long discussion with the patient and her son regarding three treatment options. First, I would recommend TSCPC on her right eye. The MicroPulse P3 Glaucoma Device has been used successfully in eyes with good central vision and minimal inflammation. In some studies, a 20% decrease in IOP was noted to last for at least a year.[5-7] The procedure is also repeatable. If this approach were not successful, I would recommend placement of a Xen Gel Stent (Allergan) with adjunctive mitomycin C because she is at lower risk of scarring than a younger nonwhite, more pigmented patient would be. If neither of these interventions worked, I would again broach the subject of filtration surgery, either using an Ex-Press Glaucoma Filtration Device or traditional trabeculectomy.

WHAT I DID: STEVEN R. SARKISIAN JR, MD

I saw this patient 1 month after latanoprostene bunod became available. In the Jupiter Study, this therapeutic agent showed significant efficacy in patients with NTG.[2] I was concerned about availability of the drug because it had just been released and was not stocked by most pharmacies. I was also concerned about insurance coverage for this new medication. The patient and her son, however, were highly motivated to avoid surgery. She therefore began therapy with latanoprostene bunod. At a follow-up visit 1 month later, IOP was 9 mm Hg OD. The IOP, appearance of the optic nerve, and visual field status have remained stable for more than a year since she began medical therapy with latanoprostene bunod. ■

1. The effectiveness of intraocular pressure reduction in the treatment of normal-tension glaucoma. Collaborative Normal-Tension Glaucoma Study Group. *Am J Ophthalmol*. 1998;126(4):498-505.
2. Kawase K, Vittitow JL, Weinreb RN, Araie M; Jupiter Study Group. Long-term safety and efficacy of latanoprostene bunod 0.024% in Japanese subjects with open-angle glaucoma or ocular hypertension: The Jupiter Study. *Adv Ther*. 2016;33(9):1612-1627.
3. Levy B, Ramirez N, Novack GD, Kopczynski C. Ocular hypotensive safety and systemic absorption of AR-13324 ophthalmic solution in normal volunteers. *Am J Ophthalmol*. 2015;159(5):980-985.e1.
4. Wang RF, Williamson JE, Kopczynski C, Serle JB. Effect of 0.04% AR-13324, a ROCK, and norepinephrine transporter inhibitor, on aqueous humor dynamics in normotensive monkey eyes. *J Glaucoma*. 2015;24(1):51-54.
5. Zaarour K, Abdelmassih Y, Arej N, Cherfan G, Tomey KF, Khoueir Z. Outcomes of micropulse transscleral cyclophotocoagulation in uncontrolled glaucoma patients. *J Glaucoma*. 2019;28(3):270-275.
6. Varikuti VNV, Shah P, Oshin R, et al. Outcomes of micropulse transscleral cyclophotocoagulation in eyes with good central vision. *J Glaucoma*. 2019;28(10):901-905.
7. Shah P, Bhakta A, Vanner EA, Kishor KS, Greenfield DS, Maharaj ASR. Safety and efficacy of diode laser transscleral cyclophotocoagulation in eyes with good visual acuity. *J Glaucoma*. 2018;27(10):874-879.

STEVEN R. SARKISIAN JR, MD
SECTION EDITOR
- Founder and CEO, Oklahoma Eye Surgeons, Oklahoma City, Oklahoma
- Member, *GT* Editorial Advisory Board
- khilborn@okeyesurgeons.com
- Financial disclosure: Consultant (Alcon, Allergan, Bausch + Lomb, BVI, Glaukos, Katena, Ocular Science, Omeros, Santen, Sight Sciences); Equity owner (Sight Sciences); Grant support (Alcon, Glaukos, Sight Sciences); Lecture fees (Alcon, Allergan, Bausch + Lomb)

AUSTIN BELL, MD
- Glaucoma and Cataract Surgeon, Boozman Hof Regional Eye Center, Rogers, Arkansas
- aupbell@gmail.com
- Financial disclosure: Research (Glaukos); Speaker fees (Ellex, Ivantis)

SYLVIA GROTH, MD
- Assistant Professor of Ophthalmology, Vanderbilt Eye Institute, Nashville, Tennessee
- sylvia.groth@vumc.org
- Financial disclosure: None

REGINE PAPPAS, MD
- Pinnacle Eye Center, Melbourne, Florida
- rmpappas@aol.com
- Financial disclosure: Speaker fees (Aerie Pharmaceuticals)