

CUTTING-EDGE OPTIONS WANTED

What's the best course of action when IOP rises after years of control in a patient who reports a remote history of traumatic glaucoma?

BY JACOB BRUBAKER, MD; MICHELLE BUTLER, MD; AND AMY ZHANG, MD

CASE PRESENTATION

A 27-year-old woman requests a second opinion regarding her surgical options. The patient reports being treated 11 years ago for glaucoma induced by blunt force trauma to the left eye. At that time, she presented with an IOP of 36 mm Hg OS. She subsequently underwent a trabeculectomy and did well for many years until her IOP rose despite maximal medical therapy.

On examination, BCVA is 20/20 OU with a manifest refraction of -7.25 D OD and -8.00 D OS. IOP is 22 mm Hg OD and 20 mm Hg OS. A slit-lamp examination reveals a low, scarred, superonasal bleb and a surgical peripheral iridotomy in the left eye. The anterior chamber is otherwise unremarkable, and the crystalline lens is clear. On gonioscopy, the angle in the left eye is open to grade 4 with 2+ pigment, occasional iris processes, no visible angle recession, and a sclerotomy through the trabecular meshwork in the superonasal quadrant. Severe cupping of the optic nerve is evident. Perimetry (Humphrey Field Analyzer, Carl Zeiss Meditec) and OCT imaging show severe glaucoma in the left eye (Figures 1 and 2).

The patient is using several medications to manage her glaucoma—brimonidine, a fixed combination of dorzolamide HCl and timolol maleate, and netarsudil ophthalmic solution 0.02% (Rhopressa, Aerie Pharmaceuticals) in her left eye only, and latanoprostene bunod ophthalmic solution 0.024% (Vyzulta, Bausch + Lomb) in both eyes.

The patient discussed several surgical procedures with her treating doctor but is interested in hearing about more cutting-edge options. How would you proceed?

—Case prepared by Jacob Brubaker, MD

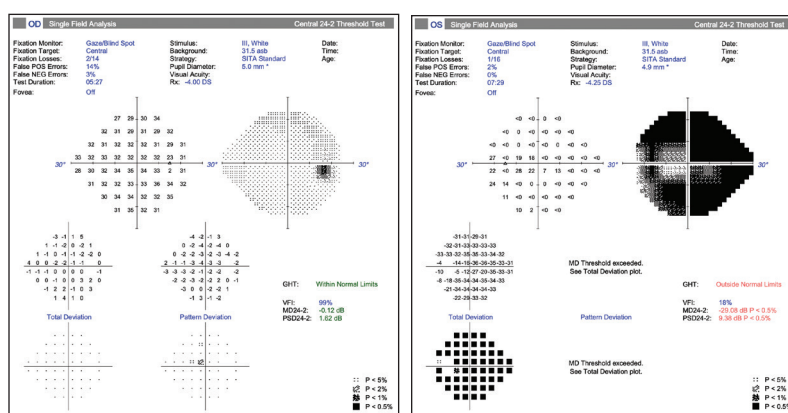


Figure 1. Visual field testing for the right and left eyes.

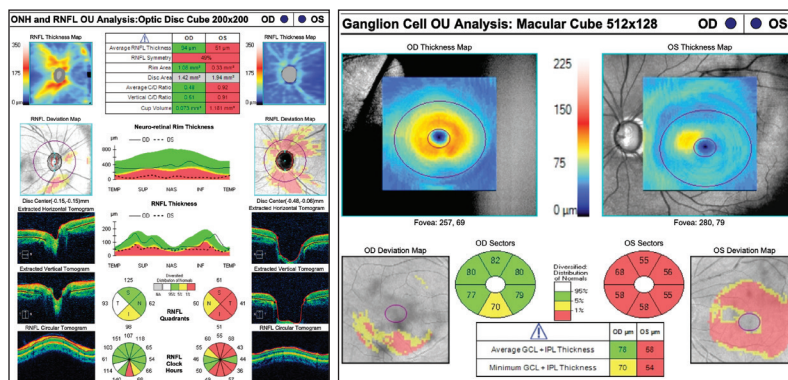


Figure 2. OCT analyses of both eyes.



MICHELLE BUTLER, MD

This case presents interesting challenges concerning the surgical

management of traumatic glaucoma in a young woman with myopia and a failed trabeculectomy. Despite an intense regimen of topical drops, the IOP is still above the target. Broadly speaking, the options include improving physiologic conventional drainage, resurrecting the trabeculectomy, creating another subconjunctival

outflow pathway, and either decreasing the production of aqueous or improving aqueous outflow facility.

Because the trabeculectomy worked initially, I would attempt an ab interno bleb revision using a flat Grover Fellman sclerostomy spatula (Epsilon USA).¹ In this procedure, the spatula is inserted through a paracentesis

and then passed across the anterior chamber and through the sclerostomy under gonioscopic guidance. Gentle dissection posteriorly underneath the flap may reestablish flow. Mitomycin C (MMC) can be administered to prevent scarring.

If this procedure failed to reestablish aqueous flow on the operating table, I would perform a gonioscopy-assisted transluminal trabeculotomy (GATT), which can successfully treat traumatic glaucoma and is an option after filtering surgery.² In this procedure, a 5-0 polypropylene suture (Prolene, Ethicon) is blunted with low-temperature cautery, inserted through a goniotomy, and fed around Schlemm canal before both ends are retrieved, cleaving the meshwork. Caution is warranted based on published 24-month data showing that, at least for primary open-angle glaucoma, the rate of failure was higher when a visual field defect of at least -15 dB was present. In the same study, however, younger patients and those with secondary glaucoma (traumatic, pseudoexfoliative, pigmentary, uveitic) did better on average than patients with primary open-angle glaucoma after GATT.²

I hope this patient derives comfort from the fact that there are many different ways to manage her glaucoma both now and in the future.



AMY ZHANG, MD

This patient clearly has optic nerve pathology in the left eye and very asymmetric cupping. Visual field testing shows advanced loss, with only a small central island of vision remaining in the left eye that correlates with severe thinning of the optic nerve evident on the OCT scan. The trabeculectomy kept the IOP well controlled, but the examination shows scarring which is

contributing to the increase in IOP.

I would offer this patient an ab interno trabeculotomy (Trabectome, MicroSurgical Technology) combined with ab interno needling of the scarred superonasal bleb and an injection of MMC. It is interesting that, despite the history of blunt trauma, there is no visible angle recession. The pigment that is present should respond nicely to the ab interno trabeculotomy. In young individuals with visible pigment and a history of trauma, I have performed an ab interno trabeculotomy alone and achieved a 20% to 30% reduction in IOP. Given the advanced cupping and visual field changes in this eye, however, an ab interno trabeculotomy alone will not reduce IOP sufficiently, so I would recommend concurrent needling of the bleb with a spatula via an ab interno approach through the same temporal wound. Given the patient's age, myopic status, clear lens, and open angle, I would not remove the lens at the time of surgery.



WHAT I DID: JACOB BRUBAKER, MD

This patient clearly had severe glaucoma in the left eye that was likely to progress without intervention, and medical therapy had been exhausted. She and I discussed two surgical options, bleb revision with adjunctive MMC and GATT. I explained that a 360° GATT was likely impossible because of the sclerotomy. After further conversation, I began to doubt the diagnosis of traumatic glaucoma because the injury appeared to be quite mild. I suspected she instead had juvenile open-angle glaucoma.

The patient wished to continue wearing contact lenses and decided to proceed with a GATT procedure. I elected to use an iTrack 250 (Ellex) to allow illuminated tracking. I initiated

the catheter entry site through the trabecular meshwork in the nasal angle 1 clock hour inferior to the sclerotomy. The illuminated catheter traveled about 270° before being impeded by the sclerotomy. Using a pullback technique, I successfully completed a 270° goniotomy despite the impasse.

One day after surgery, her IOP was 7 mm Hg with a microhyphema. The patient was weaned from all topical glaucoma drops over the subsequent month. Two years after surgery, IOP is 13 mm Hg without glaucoma medication. Unfortunately, IOP in her right eye subsequently rose into the mid-40s on maximal medical therapy. A similarly excellent surgical result was achieved in this eye as well; her unmedicated IOP was in the low teens.

This case highlights the importance of obtaining a detailed history from and having an open discussion with patients. I was not sure GATT would be effective in this case, given the patient's previous trabeculectomy, but she was willing to give GATT a try. After undergoing the procedure in both eyes, she is happy, IOP control is excellent, and her prognosis is much improved. ■

1. Grover, DS, Fellman RL. Outcomes for ab interno bleb revision with a novel translimbal sclerostomy spatula. *J Glaucoma*. 2017;26(7):633-637.
2. Grover DS, Fellman RL, Godfrey DG, et al. Gonioscopy-assisted transluminal trabeculotomy: an ab interno circumferential trabeculotomy. 24 months follow up. *J Glaucoma*. 2018;27(5):393-401.

JACOB BRUBAKER, MD | SECTION EDITOR

- Glaucoma and Anterior Segment Surgeon, Sacramento Eye Consultants, Sacramento, California
- Member, *Glaucoma Today* Editorial Advisory Board
- jbrubaker@saceye.com
- Financial disclosure: None

MICHELLE BUTLER, MD

- Attending Surgeon and Clinician, Glaucoma Associates of Texas, Dallas
- mbutlerjones@gmail.com
- Financial disclosure: None

AMY ZHANG, MD

- Clinical Assistant Professor, Kellogg Eye Center, University of Michigan, Ann Arbor, Michigan
- amydz@med.umich.edu
- Financial disclosure: None