GLAUCOMATOUS PROGRESSION IN A YOUNG PATIENT

What are the options for this patient who is intolerant of all but one medication?

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CASE PRESENTATION

A 64-year-old woman with a history of moderate open-angle glaucoma presents for a consultation. IOP is 29 mm Hg OD and 12 mm Hg OS. The target IOP for the right eye is in the low to middle teens. UCVA is 20/20 OU, and the patient has clear crystalline lenses with no cataract formation.

She states that she is “allergic to all eye drops” and says that she has tried every brand and class of medication, including all of the prostaglandin analogues, carbonic anhydrase inhibitors, and alpha-agonists. Recently, she began using netarsudil ophthalmic solution 0.02% (Rhopressa, Aerie Pharmaceuticals) but stopped this therapy because of hyperemia and ocular irritation. The patient can tolerate only preservative-free timolol, which she is currently using. Figures 1 and 2 show the results of visual field testing and OCT imaging.

What options would you consider for this patient, and how would you proceed?

—Case prepared by Steven R. Sarkisian Jr, MD

Figure 1. Visual field testing shows moderate changes in the right eye, whereas the visual field of the left eye is essentially full.

Figure 2. OCT demonstrates glaucomatous changes to the retinal nerve fiber layer that are worse in the right eye.

This is a delicate situation: The patient is young and has no cataract but has advancing glaucoma and no topical medication options left available. With an IOP of 29 mm Hg and a target in the middle to low teens, close to a 50% reduction is required. I would normally consider selective laser trabeculoplasty, but, given her history and the target IOP, I do not believe that this procedure will achieve the goal. I therefore think surgical intervention is necessary.

I prefer microinvasive glaucoma surgery (MIGS) for patients such as
This young woman has severe glaucoma based on visual field criteria (damage to both hemifields) in her right eye. Medical therapy has maxed out at one drop, and a profound IOP reduction (roughly 50%) is required. This goal will be difficult to achieve with a single surgery. Any discussion about surgical intervention must cover standard surgical risks, a possible need for multiple interventions (needling), and an explanation that patients typically require medications to reach the target IOP even after most “successful” surgical interventions.

The three surgical options that I would consider for this patient are trabeculectomy, placement of a nonvalved tube shunt such as the Ahmed ClearPath 250 (New World Medical) or Baerveldt glaucoma implant (Johnson & Johnson Vision), and implantation of a Xen 45 Gel Stent (Allergan). Although I do not perform trabeculectomy when targeting a low IOP without drops, the option should be discussed.

In the Primary Tube Versus Trabeculectomy (PTVT) study, patients who received a nonvalved tube shunt required a mean of 2.1 ±1.4 medications, whereas trabeculectomy patients required just 0.9 ±1.4 medications (P < .001). Because this patient can tolerate only one medication, placing a tube shunt may not be sufficient, and the procedure cannot be enhanced.

The Xen performed well in a 12-month study, with patients using an average of 1.7 medications. Although roughly one-third of patients required a needling intervention, the procedure showed exceptional safety. The Xen procedure also has the advantage of offering an immediate reduction in IOP.

If this patient is able to tolerate the risk of needling and prioritizes safety, I would nudge her to choose the Xen Gel Stent but also offer a tube shunt.

The complexity of treating hyperallergic patients cannot be overstated. Whether the allergies are legitimate or psychosomatic, these patients still present the same problem: reducing IOP with limited options.

When confronted with patients such as this one, I consider four options:

• No. 1: gonioscopy-assisted transluminal trabeculotomy (GATT)
• No. 2: goniotomy with a Kahook Dual Blade (KDB, New World Medical)
• No. 3: micropulse transscleral cyclophotocoagulation (TSCPC)
• No. 4: acetazolamide (Diamox, Wyeth Pharmaceuticals)

In this case, I would recommend GATT. This procedure is minimally invasive, targets the source of the pathology, and treats the trabecular meshwork for 360°. In patients with primary open-angle glaucoma, the 2-year efficacy of GATT has been shown to be excellent, with a mean IOP reduction of 40% and an equally impressive 44% decrease in medication burden.

For surgeons who are less comfortable with the microgymnastics of GATT, a KDB goniotomy is a more straightforward method of unroofing a portion of Schlemm canal. Although the treatment area is only about 120°, a standalone KDB goniotomy was reported to decrease IOP by 31% and reduce medication burden by 26% at 1 year. The impressive IOP reduction despite less angle treatment with KDB goniotomy was likely due to complete removal of the trabecular meshwork, which decreases the risk of cleft closure.

Micropulse TSCPC is another effective strategy for lowering IOP; it combines a time-tested diode cyclophotocoagulation unit with new micropulse treatment parameters. Egbert et al established that cyclophotocoagulation can be an effective primary treatment for glaucoma and has a favorable risk profile. Noecker et al reported that micropulse TSCPC decreased IOP by 30% and reduced medication burden by 50% in patients with mild to moderate glaucoma.

Finally, the option of prescribing acetazolamide to treat patients who are intolerant of topical glaucoma medical therapy should not be dismissed. For those who can tolerate its side effects, acetazolamide has been shown to lower IOP by 30% to 40.6%.
Both the patient and I were reluctant to pursue further surgical intervention. Several well-certified and highly regulated compounding pharmacies recently began manufacturing fixed combinations of glaucoma drugs that are free of preservatives or nearly so. I started the patient on a fixed combination of preservative-free dorzolamide and brimonidine dosed twice daily in her right eye, and the IOP had decreased to 14 mm Hg at her 3-week follow-up visit.