THREE REAL-WORLD SCENARIOS IN WHICH A *MINIMALLY INVASIVE APPROACH PREVAILED*

In these cases, MIGS was a safer, effective alternative to traditional incisional surgery.

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During the past decade, MIGS has evolved into an essential component of the modern glaucoma treatment algorithm. Although trabeculectomy and tube shunt surgery remain indispensable options for managing advanced and refractory disease, MIGS can offer a safer, effective, and strategically sound alternative in numerous real-world situations. This article highlights three case scenarios in which MIGS meaningfully lowered the patient's IOP, reduced their medication burden, and preserved their future surgical options.

SCENARIO NO. 1

A 68-year-old White man presented with an IOP of 39 mm Hg OD. An examination revealed pseudophakia, pseudoexfoliative material in the pupillary margin, and dense (3+ to 4+) trabecular meshwork pigmentation on gonioscopy. OCT demonstrated glaucomatous retinal nerve fiber layer thinning, whereas the visual field was full on standard automated perimetry.

Treatment with latanoprost and a fixed combination of dorzolamide and timolol reduced the IOP to 25 mm Hg OD. Although filtering surgery was an option, the full visual field supported a less-invasive approach. I therefore performed 180° viscodilation followed by trabeculotomy using the Omni Surgical System (Sight Sciences). My decision was guided by evidence that trabecular meshwork–stripping procedures may be particularly effective for the management of secondary glaucomas.[1] At 18 months postoperatively, the IOP was 16 mm Hg OD on timolol monotherapy.

This case illustrates how standalone trabecular meshwork–based MIGS can meaningfully reduce IOP in eyes with secondary glaucoma and preserve future surgical options while offering a markedly better safety profile compared with trabeculectomy and tube shunt surgery. MIGS procedures may delay or obviate the need for more invasive incisional surgery. Importantly, the role of standalone trabecular MIGS in refractory disease has increasing support in the peer-reviewed literature.[2,3]

SCENARIO NO. 2

A 66-year-old Black man with moderate to advanced primary open-angle glaucoma was receiving treatment with latanoprost and a fixed combination of dorzolamide and timolol. The patient had demonstrated an intolerance of brimonidine and netarsudil. His BCVA was 20/20 with 2+ nuclear sclerosis in each eye. Central corneal thickness measured 510 µm bilaterally. His IOP was approximately 22 mm Hg OU on medication (peak IOP, 29 mm Hg). Visual field testing revealed superior arcuate defects in both eyes, with an early inferior nasal step defect in the left eye. Guided Progression Analysis software (Carl Zeiss Meditec) suggested increased visual field loss during the past 2 years in both eyes.

Trabeculectomy was an option to lower the IOP but at the risk of prolonged postoperative care, bleb-related complications, and accelerated cataract progression. Additionally, higher rates of bleb fibrosis and surgical failure have been reported in patients of African descent.[4]

Further evaluation revealed a symptomatic cataract, with worsening glare and reduced visual performance on brightness acuity testing. Given the asymmetry in disease severity, a tailored surgical approach was selected: Cataract extraction was combined with implantation of a Hydrus Microstent (Alcon) in the right eye, and cataract extraction was paired with trabeculotomy using the Omni Surgical System in the left eye. The goal was to achieve a greater IOP reduction in the eye with more advanced glaucoma.

In the HORIZON trial, cataract extraction plus trabecular meshwork stenting reduced IOP significantly and decreased the medication burden in patients with mild to moderate glaucoma. Compared with those who underwent cataract surgery alone, patients treated with the combined procedure were less likely to require additional glaucoma surgery through 5 years, suggesting that trabecular meshwork stenting may improve long-term disease control.[5] Emerging evidence also supports the safety and efficacy of MIGS in eyes with more advanced disease when the intervention is combined with cataract surgery.[6,7]

Two years after undergoing the planned procedures in both eyes, the patient's IOP remained stable at approximately 16 mm Hg OU on a fixed combination of dorzolamide and timolol. Repeat visual field testing demonstrated no further disease progression.

SCENARIO NO. 3

A 69-year-old pseudophakic patient presented with an IOP that varied from 14 to 16 mm Hg OU on a fixed combination of netarsudil and latanoprost (Rocklatan, Alcon) and a fixed combination of brimonidine and timolol. An examination showed 1+ to 2+ conjunctival injection with a mild follicular reaction, and the patient reported significant ocular surface irritation. Visual field testing demonstrated arcuate defects consistent with moderate glaucoma, with stable testing over several years.

Well-controlled IOP and ocular surface toxicity are a common clinical scenario. Patients often endure chronically red, irritated eyes to avoid incisional glaucoma surgery. Similarly, surgeons may defer intervention to avoid the risks associated with filtering procedures.

In this setting, MIGS can reduce a patient's medication burden while maintaining IOP control. Multiple studies have demonstrated that, in eyes with controlled IOP, MIGS procedures can maintain target pressures while reducing the topical medication burden.[2,3] Standalone trabecular meshwork–based procedures, including trabeculotomy with the Omni Surgical System and trabecular bypass with devices such as the iStent Infinite (Glaukos), have demonstrated favorable safety profiles and reductions in IOP and/or medication use.

This patient underwent standalone iStent implantation combined with placement of a travoprost intracameral implant (iDose TR, Glaukos) for sustained prostaglandin delivery. At 6 months, the IOP was 16 mm Hg on timolol monotherapy, and the conjunctival injection had resolved. The patient reported a marked improvement in their comfort and cosmesis.

CONCLUSION

MIGS is not a replacement for traditional glaucoma surgery, but it has become an essential component of modern glaucoma care. As illustrated by these cases, MIGS can be used to safely and effectively lower IOP, reduce the medication burden, and delay—or even avoid—the need for more invasive incisional procedures. MIGS can preserve future surgical options and allow earlier, more tailored intervention across a range of disease stages. ■

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