

THE ROLE OF SURGERY

A blueprint for treatment.

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Treatment of glaucoma is targeted at reducing IOP. Owing to the risk of potential complications, incisional surgery was traditionally reserved for advanced cases that were refractory to conservative management. Recent advances

in surgical technique have changed the role of surgical intervention in the management of glaucoma.

CATARACT SURGERY

Patients with the most common forms of chronic glaucoma tend to be of similar demographics as those requiring cataract surgery. Determining the appropriate surgery to perform in a patient with glaucoma and significant cataracts can be a challenge. Phacoemulsification has been shown to yield significantly better outcomes in acute and chronic angle-closure glaucoma than previously believed,¹ but the risk of postoperative IOP spikes remains a concern even after uneventful phacoemulsification. If the goal is attaining a modest reduction in IOP or maintaining the current medical regimen, phacoemulsification alone may be appropriate for patients with very mild open-angle glaucoma or in eyes with preexisting functional blebs. In patients with angle-closure glaucoma, the need for additional medications or further incisional surgery for IOP control after phacoemulsification is low but needs to be discussed with them. Thus, with the exception of eyes with moderate or advanced glaucoma, performing phacoemulsification as a standalone procedure is reasonable in these cases.¹

AB INTERNO GLAUCOMA PROCEDURES

Ab interno glaucoma procedures have recently gained significant popularity, because they have the ability to lower IOP while preserving the conjunctiva. Similar to classic glaucoma procedures, they either increase the outflow of aqueous or decrease its production. Numerous devices and techniques in this area have been developed, the details of which are discussed elsewhere in this issue. In general, endoscopic cyclophotocoagulation and smaller implants that bypass a small region of the trabecular meshwork are usually combined with phacoemulsification and are reserved for mild to moderate disease with the goal of reducing reliance on antiglaucoma medications. Reductions in medication could have a profound impact on a patient's quality of life. Years may pass before



“The goal is reducing patients' reliance on antiglaucoma medications, which can profoundly improve their quality of life.”

increased therapy is needed, translating to years of extra vision with minimal risk.

In eyes with moderate to advanced glaucoma that require more significant drops in IOP, procedures that result in the bypass of a larger region of the trabecular meshwork can be considered. This includes the Trabectome (NeoMedix), Kahook Dual Blade (New World Medical), gonioscopy-assisted transluminal trabeculotomy, and Trab360 (Sight Sciences). These procedures are capable of unroofing large areas of trabecular meshwork, yielding significant pressure reductions in eyes that may otherwise require traditional surgery. Since most of these procedures do not produce an external reservoir, there is no concern about bleb-related complications. Patients are not precluded from wearing contact lenses after these procedures, making them ideal for individuals who are heavily reliant on them. These procedures' ability to produce significant IOP reductions could delay or even prevent the need for classic filtering surgery while preserving full conjunctival real estate.

FILTERING PROCEDURES

Filtering or shunting procedures continue to be used in advanced disease that requires significant IOP lowering. Ample literature exists to demonstrate their long-term efficacy. Their downside, however, is the potential for bleb-related



AT A GLANCE

- The classic teaching in glaucoma has been to reserve surgical procedures for advanced cases. With recent developments, the role of surgical intervention has increased drastically. If the goal is attaining a modest reduction in IOP or maintaining the current medical regimen, phacoemulsification alone may be appropriate for patients with very mild open-angle glaucoma or in eyes with preexisting functional blebs.
- Ab interno glaucoma procedures have recently gained significant popularity, because they have the ability to lower IOP while preserving the conjunctiva. In general, endoscopic cyclophotocoagulation and smaller implants that bypass a small region of the trabecular meshwork are usually combined with phacoemulsification and are reserved for mild to moderate cases with the goal of reducing reliance on antiglaucoma medications.
- With the development of the micropulse diode laser, transscleral cyclophotocoagulation now has an expanded role in the treatment of glaucoma. The risks are lower, and the treatment is gentler, allowing the procedure to be used in a wider range of disease states.

complications and the need for activity restrictions. Because the treatment of glaucoma is focused on stabilizing the optic nerve and visual field, trabeculectomy with an antimetabolite is a reasonable first-line filtering procedure in most circumstances. The recent development of the Xen45 Gel Stent (Allergan) also allows this procedure to be performed through an ab interno approach, though long-term data on the Xen remain limited. (For more on this device, see the piece by Erik Mertens, MD, FEBO, on p. 38).

Placement of a glaucoma drainage device (GDD) can be performed as a primary or a subsequent procedure. While tube placement can be performed primarily, superotemporal placement precludes future filtering surgery. Despite favorable results with GDD implantation in the Tube Versus Trabeculectomy (TVT) study,² primary tube implantation could translate to significant complications. Therefore, therapy should be tailored to the individual, especially in patients with specific circumstances like neovascular glaucoma or poor tissue quality.

CYCLODESTRUCTIVE PROCEDURES

Transscleral cyclophotocoagulation is generally reserved for eyes with end-stage glaucoma and poor visual prognosis due to the risks. With the development of the micropulse transscleral cyclophotocoagulation (MP-TSCPC) diode laser, there is a trend to perform MP-TSCPC in eyes with earlier disease states. Alternative mechanisms of IOP reduction have been proposed for MP-TSCPC, including increased uveoscleral

outflow³ and increased trabecular outflow⁴ by enlargement of extracellular matrix spaces, rather than true cyclodestruction. It is important to note that MP-TSCPC is not without complications and that lighter settings are recommended for use in earlier disease to reduce the risk of problems such as phthisis. (For more on this subject, see the pieces by James Fox, MD, and Jacob Brubaker, MD, on pp. 54-55.)

PUTTING IT TOGETHER

The most common forms of glaucoma are chronic diseases that currently cannot be cured. Treatment is aimed at delaying the onset of blindness and maintaining a patient's quality of life. The classic teaching in glaucoma has been to reserve surgical procedures for advanced cases. With the recent development of ab interno procedures, the role of surgical intervention has increased drastically, working in synergy alongside medications for a wide range of disease severity.

In mild to moderate cases, phacoemulsification can be safely performed as a standalone procedure in both open-angle and angle-closure glaucoma. In open-angle glaucoma, ab interno procedures can be performed routinely alongside cataract surgery or as a standalone procedure in moderate cases, with the choice of intervention depending on the level of IOP reduction needed.

Filtering procedures, such as trabeculectomy or GDD placement should continue to be reserved for more advanced cases. Traditional transscleral cyclodestructive procedures should be used after failure of surgery, with consideration of MP-TSCPC on lighter settings for eyes with earlier glaucoma. In a disease without a known cure, having such a treatment algorithm optimizes the amount of time patients can maintain vision. ■

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