What's New in Glaucoma Surgery?

The indications and surgical options as well as the expanding role of the crystalline lens.

BY THOMAS W. SAMUELSON, MD

Virtually every aspect of glaucoma surgery is currently being reconsidered, perhaps as any procedure should from time to time. The indications for surgery are changing, new procedures are being performed, and what used to be a "one-size-fits-all" approach is now becoming individualized to a much greater extent. Indeed, we surgeons are matching the glaucoma procedure to the patient's needs far more than we did even a few years ago; we are using newer and less invasive strategies for early disease and retaining some of the time-tested, traditional procedures for more advanced disease.

INDICATIONS FOR INCISIONAL GLAUCOMA SURGERY

The indications for glaucoma surgery have changed for many ophthalmologists. We have safer and less invasive procedures such as ab interno approaches to Schlemm's canal (eg, Trabectome [NeoMedix Corporation, Tustin, CA], iStent [Glaukos Corporation, Laguna Hills, CA; not available in the United States]) and ab externo approaches to Schlemm's canal (eg, canaloplasty [iScience Interventional, Menlo Park, CA]) as well as an expanding role for more targeted cyclophotocoagulation (endoscopic cyclophotocoagulation [Endo Optiks, Little Silver, NJ]). Such procedures seem to be associated with less intraoperative and perioperative risk and may be offered earlier in the course of the disease. Perhaps more importantly, these procedures do not subject patients to lifelong risk, as does trabeculectomy, which requires a perilimbal filtering bleb to lower pressure. Because of the risks of leaks, hypotony, and bleb-related infection—early or late in the postoperative course—many surgeons are reserving traditional interventions such as trabeculectomy for later in the disease process.

Nevertheless, many patients with advanced glaucoma still require more definitive pressure-lowering procedures such as trabeculectomy or the placement of an aqueous drainage device. Transscleral outflow procedures are therefore still frequently employed and are not likely to disappear any time soon. Fortunately, several strategies have been developed to refine guarded filtration surgery. They include improved conjunctival management to facilitate a more posterior bleb, as popularized by Peng Khaw, FRCS, FRCOphth, in London and the Ex-Press mini glaucoma shunt (Alcon Laboratories, Inc., Fort Worth, TX), which many believe yields a more controlled and standardized procedure.

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THE ROLE OF THE CRYSTALLINE LENS

The crystalline lens is playing an increasingly important role in my own decisions regarding the surgical management of glaucoma. Mounting evidence suggests that cataract extraction is beneficial to the management of most glaucoma patients. The majority of patients' eyes enjoy a lower IOP following cataract surgery, and it generally reduces the medication burden.[1-3]

Although the mechanism of IOP reduction following cataract surgery is uncertain, it seems less logical to perform a simultaneous transscleral outflow procedure that bypasses the trabecular meshwork and may negate this beneficial effect on trabecular outflow. I believe that cataract surgery should be considered a distinct step in the management of glaucoma. Just as I would rarely perform filtering surgery on a patient without trying a prostaglandin analogue, I am also reluctant to perform a transscleral outflow procedure, such as trabeculectomy, on phakic eyes. One notable exception pertains to patients with far-advanced dis-

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ease, because they may not have enough of the optic nerve head or visual field in reserve to allow for further disease progression. Rather, these individuals often require the most definitive procedure with a maximal decrease in IOP. Unfortunately, I see such patients far too often. With earlier detection, more efficacious drugs, and more effective procedures for earlier in the disease spectrum, I hope to see fewer patients who require a trabeculectomy.

FEWER COMBINED PROCEDURES

Early in my career, perhaps in the early to mid-1990s, combined phacoemulsification and trabeculectomy was my favorite and perhaps most commonly performed operation. It seemed like a win-win situation by offering a chance to improve patients' vision and the control of their IOP. However, over the ensuing 10 to 15 years, cataract surgery has improved dramatically, but trabeculectomy has improved only incrementally.

Similarly, I am reluctant to perform filtering surgery on a patient without first trying cataract surgery. Fortunately, pharmacologic agents have improved such that many patients' glaucoma may be managed medically until cataract formation justifies the crystalline lens' removal. Whether or not the presence of glaucoma alone becomes an indication for lensectomy remains to be seen. Suffice it to say that one can make a strong case for earlier as opposed to later cataract surgery in patients with glaucoma. This is especially true in patients with somewhat crowded anterior chamber angles, but it may apply to other forms of glaucoma as well, including open-angle glaucoma. Though not yet completely understood, the term *phacomorphic glaucoma* may apply even when the angle is not occludable or the iris is not mechanically impeding outflow. That is, simple forward rotation of the scleral spur by the enlarging crystalline lens may adversely affect outflow, even in the absence of direct mechanical impediments by the iris at the level of the trabecular meshwork.

More research is needed to elucidate the influence of cataract surgery on physiological outflow pathways. For now, I tend to reserve transscleral outflow procedures for pseudophakic patients or for phakic patients that have particularly severe field loss. In the meantime, it seems to make more sense to use procedures that enhance physiological outflow, such as canaloplasty or Trabectome surgery, in phakic eyes.

CONCLUSION

I tend to subdivide patients. For those who have early-to-moderate disease, I might perform a less-invasive procedure to improve physiological outflow or reduce inflow without giving up the conventional outflow pathway (Trabectome, canaloplasty, endoscopic cyclophotocoagulation). When patients have severe disease, however, I continue to employ trabeculectomy and aqueous drainage devices/tube shunts. Finally, I prefer not to give up the trabecular meshwork in phakic eyes, because cataract surgery often lowers IOP. It seems reasonable first to perform phacoemulsification, arguably the best operation in medicine, and then reassess the patient. Such an approach takes nothing off the table and keeps all options available. Despite significant advances in less-invasive glaucoma surgery, for the small percentage of patients with very aggressive and far advanced disease, trabeculectomy remains an excellent approach. ■

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