

Combined Phacoemulsification and Trabeculectomy:

Practical Considerations and Approaches

Surgeons should perform their best trabeculectomy and cataract surgery and not modify their technique significantly.

BY LOUIS B. CANTOR, MD

Cataract surgery in the glaucoma patient can present many challenges, and multiple factors are important to consider in the preoperative assessment. Perhaps first among all of the other considerations is the degree of optic nerve damage and visual field loss related to glaucoma.

Additional issues include the number of glaucoma medications required to control the IOP preoperatively and how well the patient tolerates those medications. The preoperative IOP and the target IOP are also important considerations. In addition, physicians must identify the type of glaucoma. The presence of pseudoexfoliation is important and can influence the surgical procedure. Complications during cataract surgery can affect the success of filtering surgery if a combined procedure is being considered. The presence of other secondary glaucomas may also influence the type of surgical glaucoma procedure that might be necessary.

PICK AN APPROACH

One of the early decisions to be made is whether a staged approach would be appropriate. A staged approach may involve glaucoma surgery first followed by subsequent cataract surgery or cataract surgery first with glaucoma surgery performed on another date if indicated. Glaucoma surgery first without cataract surgery, even if the cataract is visually significant, may be appropriate when the IOP is severely out of control or the glaucomatous damage is very advanced. This approach might achieve the best possible result from the glaucoma surgery, and then visual rehabilitation through cataract surgery could be considered as a second step.

Alternatively, cataract surgery alone may be an option for patients with a visually significant cataract and glaucoma that is well controlled or for those who have not sustained a great deal of glaucomatous damage to the optic nerve or visual field loss. It has been well documented that, in many glaucoma patients, cataract surgery alone can reduce the IOP, often by an amount that equals one medication.

COMBINED SURGERY

Many patients are candidates for combined cataract and glaucoma surgery. The indications for a combined procedure include a visually significant cataract, poorly controlled IOP on multiple medications, IOP that is controlled on poorly tolerated medications, advanced glaucomatous damage and either controlled or uncontrolled IOP, and a desire to minimize operative and anesthetic risk by performing one procedure instead of two.

Increasing evidence suggests that lens extraction in eyes with angle-closure glaucoma may help prevent progressive angle closure.¹ Therefore, if one is considering glaucoma surgery on an eye with chronic or even acute angle closure, there may be a long-term benefit to lens extraction and an IOL's implantation in terms of IOP.

OPTIONS

Many glaucoma procedures may be combined with cataract surgery, including nonpenetrating deep sclerectomy, canaloplasty (iScience Interventional, Menlo Park, CA), Trabectome surgery (NeoMedix Corporation, Tustin, CA), endoscopic cyclophotocoagulation (Endo Optiks, Little Silver, NJ), and the placement of an Ex-Press mini

glaucoma shunt (Alcon Laboratories, Inc., Fort Worth, TX). Several other new procedures are in development or awaiting FDA approval such as the iStent (Glaukos Corporation, Laguna Hills, CA). The techniques described herein involve approaches to and considerations for combining trabeculectomy with cataract surgery.

In general, the surgeon should perform his or her best trabeculectomy and cataract procedure rather than significantly modify his or her technique to complete a combined procedure. Because most ophthalmologists prefer clear corneal cataract surgery, they should use this approach when combining glaucoma and cataract surgery. The creation of a fornix- or limbus-based conjunctival flap depends upon the surgeon's preference. A limbal incision may have a higher incidence of wound leaks along the limbus postoperatively but, depending upon the surgeon's technique, may result in a more diffuse bleb. Limbus-based conjunctival flaps tend to be more secure and predictable in terms of postoperative leakage. In general, studies have not found differences in the long-term IOP control utilizing either approach. Ophthalmologists who prefer a scleral corneal tunnel can perform cataract surgery through the tunnel, which can be converted into a trabeculectomy flap after cataract surgery is complete.

MY TECHNIQUE

Today, most surgeons will initially perform clear corneal cataract surgery temporally and then readjust the microscope to create a superiorly placed trabeculectomy. My preference is to sit at the patient's head for all of my procedures and to create a limbus-based conjunctival flap, apply an antimetabolite, and then develop the superficial scleral trabeculectomy flap. I next perform clear corneal cataract surgery while staying at the patient's head and complete phacoemulsification through a clear corneal temporal incision, with my right hand for the right eye and my left hand for the left eye.

At the conclusion of the cataract surgery, the trabeculectomy block is removed from beneath the superficial scleral flap, and in most cases, I perform an iridectomy. I reposition the scleral flap and suture it at its two posterior corners with two 10-0 nylon sutures. I often apply light cautery to the anterior edges of the scleral flap to allow for adequate leakage, which I test by injecting balanced salt solution into the anterior chamber through the paracentesis tract. Once I determine that leakage is adequate, I deepen the chamber with a high-molecular-weight viscoelastic (Healon GV; Abbott Medical Optics Inc., Santa Clara, CA) and then close the conjunctiva and Tenon's capsule in the superior fornix in a two-layered fashion with a running 8-0 Vicryl suture (Ethicon, Inc., Somerville, NJ).

Mitomycin C (MMC) has proven to be a useful adjunct for enhancing the bleb's survival in glaucoma procedures, including combined glaucoma and cataract surgeries. I have not noted a benefit from 5-fluorouracil in combined procedures. My usual dose of MMC is 0.2 mg/mL applied for 2 minutes, followed by irrigation of the surgical site with balanced salt solution. I will occasionally increase the MMC dose to 0.4 mg/mL if the patient has risk factors for bleb failure such as a previous failed bleb, young age, or African American ancestry.

OUTCOMES

The visual acuity outcomes of combined glaucoma and cataract surgery are generally excellent. However, patients should be cautioned that the visual recovery after a combined procedure is not the same as after cataract surgery alone. The patient's vision will often be at least blurred if not frankly poor for the first 1 to 2 weeks while the eye recovers from possible hypotony, overfiltration, or any other early postoperatively complications that can occur in association with glaucoma surgery (among them are a leaking wound, hypotony, a shallow anterior chamber, choroidal effusions, hyphema, hypotony maculopathy, and aqueous misdirection).

It is also important to discuss with patients the goals of the glaucoma procedure in advance of surgery. For patients with advanced glaucoma, it may be enough if the glaucoma procedure protects the eye from having an IOP spike after cataract surgery, which could snuff out his or her remaining central island of vision. Certainly, it would be advantageous if the filtering procedure continued to provide good long-term IOP control.

CONCLUSION

The appropriate selection of patients and procedures, good surgical technique, and careful postoperative management allow most patients undergoing combined glaucoma and cataract surgery to enjoy improved vision, adequate control of their IOP, and a reduction in or elimination of their need for glaucoma medications. ■

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1. Tham CC, Kwong YY, Leung DY, et al. Phacoemulsification vs phacotrabeculectomy in chronic angle-closure glaucoma with cataract complications. *Arch Ophthalmol*. 2010;128(3):303-311.