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Combined Cataract Extraction and Glaucoma Surgery

Indications for Trabeculectomy, Tube Shunt, and Minimally Invasive Glaucoma Surgery

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Keywords

• Minimally invasive glaucoma surgery • Cataract surgery • Trabeculectomy
• Tube shunt

Key points

- Standalone cataract surgery may provide sufficient pressure reduction in certain patients with primary angle-closure glaucoma.
- Cataract surgery combined with minimally invasive glaucoma surgery is indicated in patients with mild to moderate open-angle glaucoma.
- Cataract surgery with trabeculectomy or tube shunt implantation is indicated in patients with a visually significant cataract who also require optimal control of intraocular pressure.
- Several new procedures may also be appropriate to use in patients with more advanced glaucoma. Additional studies are required to determine which of these offers the best safety profile and efficacy in combination with cataract surgery.

INTRODUCTION

Patients with a visually significant cataract and coexistent glaucoma pose special challenges to the ophthalmic surgeon. Historically, a "wait and watch" approach was taken for patients with mild glaucoma, in which cataract surgery was performed first followed by glaucoma surgery as needed. For patients with advanced glaucoma or those with uncontrolled intraocular pressure (IOP), a

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trabeculectomy was typically performed first. This procedure would be followed by cataract extraction once the IOP was well-controlled.

Although this approach may still be indicated in some scenarios, improved phacoemulsification techniques have made 1-time cataract extraction in combination with trabeculectomy or tube shunt a more convenient option for most patients. Additionally, several minimally invasive glaucoma surgeries (MIGS) are in development or have been introduced into practice recently. Several of these devices have evidence of providing moderate improvements in IOP control and are indicated in patients with mild to moderate open-angle glaucoma at the time of cataract extraction. In select patients, more robust IOP reduction may also be obtained with the XEN gel stent (AqueSys Inc., Aliso Viejo, CA), InnFocus microshunt (InnFocus Inc, Miami, FL) and gonio-assisted transluminal trabeculotomy (GATT). These procedures show promise for patients with advanced or uncontrolled glaucoma who may have traditionally required a filtration procedure at the time of cataract surgery.

Because they target angle-based outflow pathways, most MIGS are indicated for use in the open-angle glaucomas. Although fewer surgical options are available for primary angle-closure glaucoma (PACG), several recent clinical trials have clarified the indications for standalone cataract extraction versus combined surgery in these patients for whom the mechanism of angle closure is related to the anatomic size or position of their lens.

This review summarizes the indications for combined cataract and glaucoma surgery as dictated by the mechanism of the glaucoma, its severity, and the level of IOP control. We also review the current literature regarding the relative efficacy and safety profile of the various surgical options, as well as patient factors that need to be considered when choosing a surgical approach.

SIGNIFICANCE

Open-angle glaucoma

Cataract extraction

It has long been recognized that cataract surgery results in reduced IOP. A recent metaanalysis of patients with primary open-angle glaucoma (POAG) found that cataract surgery alone resulted in a 13% decrease in IOP with a 12% reduction in medications through 16 months of follow-up. This effect seems to be more pronounced in patients with pseudoexfoliation glaucoma, for whom long-term reduction in IOP was 20% with a 35% reduction in number of medications through 34 months of follow-up [1].

Despite a mean decrease in IOP after cataract extraction, however, a significant minority of patients do not experience this benefit. Long-term studies have demonstrated that 14% to 26% of POAG patients actually have a higher IOP in the 5 years after cataract extraction, and up to 26% require additional medications [2]. The most important determinant of this effect seem to be the level of preoperative IOP [3]. Thus, patients with low to normal preoperative IOP are least likely to benefit from cataract surgery, and in 1 recent study