

COVER STORY

A New Option in Nonpenetrating Glaucoma Surgery: Two US Perspectives

Simple, Safe Approach

By Robert J. Noecker, MD, MBA



Since the late 1960s when trabeculectomy was described,¹ ophthalmologists have been looking for alternatives. Filtration surgery produces significant and sustained drops in intraocular pressure (IOP), but the associated risks make it probably one of the most dangerous surgical procedures in ophthalmology. The modern concept on nonpenetrating glaucoma surgery (NPGS) was brought forward in the mid-1980s,² and numerous scientists and companies have attempted to advance the concept.

Most published reports agree that NPGS has a significantly lower rate of complications compared with conventional trabeculectomy, as well as generally having less negative impact on visual acuity. Deep sclerectomy, viscocanalostomy, canaloplasty, and other procedures each became fairly popular at one point in the preceding decade in the search for an effective glaucoma procedure with an improved safety profile. However, NPGS procedures have not really taken hold in the United States. I would generalize that, among my colleagues, the impression is that they increase surgical complexity without providing the efficacy needed to replace standard filtration surgery.

This may be related in part to technique. Canaloplasty in particular increases the complexity of

surgery, and this is likely a strong deterrent to its adoption among lower-volume glaucoma surgeons and comprehensive ophthalmologists. In addition, NPGS can require close to an hour in the operating room, whereas other glaucoma procedures average about 20 minutes. In a country where many surgeons operate in outpatient surgical centers that accommodate 10-minute cataract procedures and high-volume turnover, an hour in a surgical suite does not integrate well economically or for optimum patient flow.

CO₂ laser-assisted sclerectomy surgery (CLASS), a new NPGS option using the IOPTiMate system (IOPTima), may alleviate some of these concerns. In this procedure, following conjunctival peritomy and superficial scleral flap dissection, scleral tissue directly above Schlemm canal is ablated using the IOPTiMate CO₂

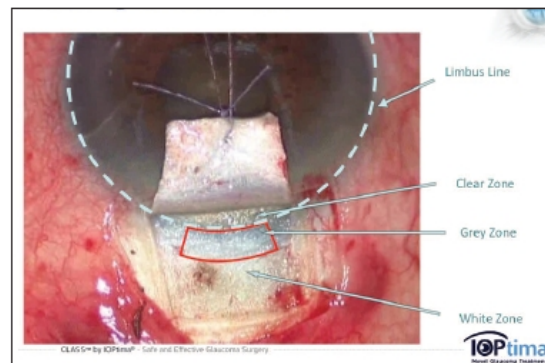


Figure 1. Optimal positioning of the ablation.



Figure 2. A standard scleral flap is created.



Figure 3. The laser beam scans rapidly in a preselected ablation pattern and repeatedly ablates thin layers of sclera, exposing and unroofing Schlemm canal.



Figure 4. The laser ablation is aimed at Schlemm canal.



Figure 5. The scleral flap is closed and sutured.

laser (Figure 1). Once sufficient scleral tissue is ablated to allow aqueous humor to percolate through the thin membrane, the scleral flap is replaced and sutured, as is the conjunctiva (Figures 2-5).

The concept of NPGS makes a lot of sense, but the available options to date have been tedious procedures. CLASS is efficient, effective, safe (with a low postoperative complication rate), and simple enough for even residents and fellows to perform. Additional large studies are needed to continue to evaluate the procedure, but I think there is a lot to be excited about.

Robert J. Noecker, MD, MBA, is in private practice at Ophthalmic Consultants of Connecticut in Fairfield, Connecticut and is an assistant clinical professor of ophthalmology at the Yale School of Medicine. He acknowledged no financial interest in the product or company mentioned herein. Dr. Noecker may be reached at noeckerrj@gmail.com.

Overcoming Limitations of Other Approaches

By Alan L. Robin, MD



The Collaborative Initial Glaucoma Treatment Study (CIGTS) found that both surgical and medical therapy had equal success in preventing glaucoma progression.³ Regrettably, each of these therapeutic approaches has major limitations. Eye drop administration is limited by patient adherence, and even compliant patients may find drops difficult to use. Surgery has immediate complications such as failure, cataract, hypotony, and endophthalmitis, as well as long-term risks of bleb-related infection and failure.

If patients do not take their medications daily, eye care providers need to be in control and be able to

deliver safe and long-lasting therapies that are not dependent upon daily administration. What is needed are procedures to prevent glaucoma progression that have a short learning curve, are easy to use, and require only minimal training, so that almost any surgeon can perform them. CO₂ laser-assisted sclerectomy surgery (CLASS) has the potential to be such an option. The IOptiMate system (IOptima) performs exactly the ablation specified, once the surgeon programs the desired shape and dimension. Intraoperative and postoperative risks are significantly reduced by not penetrating the globe.

In a study of 37 patients with primary and pseudoexfoliative open-angle glaucoma who underwent CLASS, deep scleral ablation and aqueous percolation were repeatedly achieved.⁴ The baseline IOP of 26.3 ± 7.8 mm Hg dropped to 14.4 ± 3.4 mm Hg at 6 months, and this reduction was sustained through 12 months (n = 30). In addition, complications were mild and transitory with no sequelae.

The data so far are incomplete, and well-controlled studies looking at both the learning curve and the long-term success compared to conventional glaucoma surgery must be done. However, the results to date are hopeful, and CLASS could potentially be a first-line therapy to help eliminate needless blindness. ■

Alan L. Robin, MD, is an associate professor of ophthalmology at the Wilmer Eye Institute and an associate professor of international health at the Bloomberg School of Public Health, both at Johns Hopkins University in Baltimore. He acknowledged no financial interest in the product or company mentioned herein. Dr. Robin may be reached at (410) 377-2422; arobin@glaucomaexpert.com.

1. Cairns JE. Trabeculectomy. Preliminary report of a new method. *Am J Ophthalmol.* 1968;66(4):673-679.
2. Zimmerman TJ, Koener KS, Ford VJ, et al. Trabeculectomy vs. nonpenetrating trabeculectomy: a retrospective study of two procedures in phakic patients with glaucoma. *Ophthalmic Surg.* 1984; 15(9):734-740.
3. Wahl J. Results of the Collaborative Initial Glaucoma Treatment Study (CIGTS). *Ophthalmology.* 2005;112(3):222-226.
4. Geffen N, et al. CO₂ laser-assisted sclerectomy surgery for open-angle glaucoma. *European Ophthalmic Review.* 2012;6(1):12-16.