

Office-Based TSCPC With the IRIDEX G-Probe

This noninvasive procedure offers similar IOP-lowering efficacy as traditional glaucoma surgeries with an improved safety profile.

BY EMERY JAFFE, MD

Advanced glaucoma patients often face significant changes in lifestyle due to a loss of vision and visual field. These threats to patients' sight require aggressive treatments, like trabeculectomy and tube shunts, which unfortunately may affect quality of life. After 5 years of follow-up in the Tube Versus Trabeculectomy (TVT) Study,¹ early postoperative complications occurred in 21% of patients in the tube group and 37% in the trabeculectomy group, while late complications occurred in 34% and 36%, respectively. Reoperation due to complications occurred in 22% of patients in the tube group and in 18% in the trabeculectomy group. Transscleral cyclophotocoagulation (TSCPC) may be a viable treatment for these eyes. Two recent small studies have shown TSCPC to be at least comparable to the TVT results in terms of IOP reduction and risk of vision loss.^{2,3}

TRANSCLERAL CYCLOPHOTOCOAGULATION

The types of eyes being treated influences the risk of complications after any glaucoma procedure. Older studies that showed TSCPC to have a high rate of devastating complications were treating some of the most severe refractory glaucomas, such as aphakic and rubeotic glaucoma.

In my experience, patients on maximally tolerated medicines who require high degrees of IOP lowering may be good candidates for TSCPC with the G-Probe (IRIDEX). The handpiece is a 600-μm diameter quartz glass fiber with a protruding, polished, hemispheric tip that precisely delivers laser energy to the treatment location. This procedure can yield a 30% to 50% reduction in IOP⁴ and, in my experience, eliminate the need for some medications. The patients I have treated so far with this procedure are often on three to four drugs and are still not achieving their target IOPs. The only true contraindication may be eyes with total obstruction of aqueous outflow; these eyes would likely require heavier treatment that would affect the safety of the procedure. In addition, I choose not to treat eyes with uveitic, aphakic, or rubeotic glaucoma because of the higher risk of complications.

IMMEDIATE OFFICE-BASED TREATMENT

TSCPC with the G-Probe is an office-based procedure, so there is no need to gain medical clearance or wait for OR availability. I use a retrobulbar block with lidocaine, and I aim treatment at the ciliary body band, which is usually about 1.5 to 2.0 mm behind the limbus. I follow the protocol described by Douglas E. Gaasterland, MD, whenever possible, which calls for using lower power settings with longer exposure times (Table). This approach delivers sufficient overall energy with improved safety.⁵

I have recently begun avoiding areas of both the temporal and nasal limbus to avoid the branches of the anterior ciliary arteries and the posterior ciliary nerves. I am treating between two-thirds and three-quarters of the clock hours. I apply all of my treatments to the pigment band of the ciliary body, which I identify with limbal transillumination.⁶ Previously, I had a technician shine an LED penlight at the opposite limbus to show where the pigment of the ciliary body starts; now, I shine the light to find where the treatment should be, and I proceed around the globe, keeping the same distance posterior to the limbus. This and the use of difluprednate ophthalmic emulsion (Durezol; Alcon Laboratories, Inc.) before the procedure and again after with a nonsteroidal keeps inflammation under control and decreases the pain and inflammation typically associated with TSCPC.

Transillumination by Dr. Steven Vold



SAFETY PROFILE

Certain less invasive glaucoma treatments are more appropriate for earlier cases of glaucoma or for patients who are closer to their goal IOP. As with all surgical procedures, diode laser TSCPC is not without the potential for complications. I am cautious not to induce hypotony, so I tend to undertreat. If more pressure reduction is required postoperatively, TSCPC is a repeatable procedure.

Earlier protocols for performing TSCPC called for the surgeon to raise the power on the laser until audible pops were heard, and then to reduce the power. This method

TABLE. SUGGESTED G-PROBE TREATMENT PARAMETERS BY DOUGLAS E. GAASTERLAND, MD^a

Iris Color	Power	Duration	Energy Per Application
Dark Brown	1,250 mW	4,000 ms	5.00 joules
All other	1,500 mW	3,500 ms	5.25 joules

^aIn 1991, Dr. Gaasterland was the principal investigator in the Diode Laser Ciliary Ablation Study Group to conduct an FDA-approved IDE, multi-center study to determine the efficacy of the G-Probe for TSCPC of medically uncontrolled, high surgical risk glaucoma in patients with no previous ciliary ablation. Dr. Gaasterland's slow coagulation technique is an update on the treatment parameters used in the study.

has become passé, and it is now recommended to avoid the iris base, which helps to reduce audible pops, eliminate peaked pupils, and minimize the risk of cystoid macular edema (CME). The use of a topical steroid and nonsteroidal is complementary in avoiding CME.

The main reported complications of diode TSCPC have been hypotony, CME, and the progression of cataracts. The conservative treatment of patients with good vision has a high chance of reducing postoperative hypotony. Using transillumination to locate the pigment band for more accurate treatment has decreased pain and inflammation in my patients. This, coupled with using appropriate anti-inflammatory drops, will make CME and cataract progression less likely. If hypotony and CME become rare complications of TSCPC, the procedure will be even more impressive, with IOP lowering similar to incisional procedures without the complications of surgery.

CASE EXAMPLE

The successful use of TSCPC is demonstrated in the case of an 81-year-old Hispanic man with a 20-year history of primary open-angle glaucoma treated by me with multiple drops since 2006. His initial Humphrey visual fields (Carl Zeiss Meditec, Inc.) showed split fixation OD and major scotomas in all quadrants OS. Patient history included aggressive medical management, cataract surgery OU, and an ExPress mini glaucoma shunt (Alcon Laboratories, Inc.) with mitomycin OS. His IOPs were in the mid-to-high teens until an increase to 19 mm Hg OD and 27 mm Hg OS in September 2012. Medicines were reviewed, and when pressures were rechecked in October, they were 20 mm Hg OD and 46 mm Hg OS. Diode laser TSCPC was offered for OS.

A retrobulbar block with 4 cc of lidocaine with epinephrine was given followed by 24 shots at 1.25 watts for 4 s each. The temporal limbal clock hours were avoided. Durezol was given pre- and postoperatively. Bromfenac sodium ophthalmic solution 0.09% (Bromday; Bausch + Lomb) and atropine 1% were also given postoperatively. The patient was patched and asked to continue all of his glaucoma drops except for echothiophate iodide (phospholine iodide) OS. Durezol was prescribed qid for a week, bid for 4 days, and qd for 4 days. Bromday was used qd. The patient reported taking one acetaminophen with codeine (Tylenol No. 3; Ortho-McNeil Pharmaceutical, Inc.) for pain

the first night only. Three weeks after treatment, IOP was 14 mm Hg OS; 3 months after treatment IOP measured 18 mm Hg. His pressure OD is now in the mid 20s. He is planning to return for the laser procedure in his better eye over the next few weeks.

CONCLUSION

TSCPC is an office-based, noninvasive outpatient procedure appropriate for addressing several types of glaucoma that might otherwise be managed with incisional surgeries. An added benefit is that it saves expenses to the patient and to the health care system in terms of facility fees. The procedure reduces aqueous production by closing capillaries and ablating ciliary epithelium, but it does not affect the ciliary body itself. There is little-to-no effect on the conjunctiva or ocular surface, making TSCPC both titratable and repeatable. Because of this, performing TSCPC also does not limit future surgical options should they be necessary. ■

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FOR MORE INFORMATION

"Reconsidering Transscleral Cyclophotocoagulation", is an expanded discussion on the safety profile and benefits of the G-Probe in practice and is available by the following link or by using your smartphone to scan the QR code.



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