**Avoiding complicated filtering surgery**

# Revisiting TSCPC as an option

## Procedure has ability to lower IOP, preserve vision similar to trabeculectomy and tube shunts

**By Ike K. Ahmed, MD**
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A variety of procedures are available for the treatment of open-angle glaucoma, catering to different degrees of severity. Micro-invasive glaucoma surgery is a relatively new category aimed at mild-to-moderate glaucoma, and includes the trabecular micro-bypass (iStent, Glaukos) and Trabectome (NeoMedix). These procedures use a clear-corneal micro-incision, spare the conjunctiva, and present only a minimal disruption of the normal anatomy and physiology of the eye. Their modest efficacy is combined with an extremely high safety profile.

Blebless ab externo glaucoma surgeries, which include canaloplasty and deep sclerectomy, are successful at lowering high IOP while still maintaining a good safety profile. Filtering surgeries, such as trabeculectomy, EX-PRESS shunt (Alcon Laboratories), and tubes, are the go-to options when a patient requires an IOP lower than 10 to 12 mm Hg.

### Take-Home Message

Transscleral cyclophotocoagulation is not the same as cryotherapy of the past; it has the ability to lower IOP and preserve vision similar to trabeculectomy and tube shunts, while avoiding a complicated filtering surgery.

Transscleral cyclophotocoagulation (TSCPC) has typically been reserved for patients with little hope of maintaining their vision. The American Academy of Ophthalmology Ophthalmic Technology Assessment Committee stated, "Cyclophotocoagulation is indicated for patients with refractory glaucoma who have failed trabeculectomy or tube shunt procedures, patients with minimal useful vision and elevated IOP, patients who have no visual potential and need pain relief, and patients with complicated glaucoma and conjunctival scarring from previous surgery."[1]

A few changes in technique combined with a re-evaluation of the data merit a new attitude toward this treatment option, however. Cyclodestruction and later cryotherapy were techniques associated with serious complications including: substantial post-treatment visual loss, sympathetic ophthalmia, and phthisis. Cryotherapy has largely been replaced by TSCPC, which has a vastly improved safety profile.

New techniques, such as the slow coagulation method by Doug Gaasterland, are making TSCPC safer. This approach uses a lower amount of energy over a longer duration of time, leaving the eyes quieter, and it reduces some of the complications, such as inflammation, uveitis, and cystoid macular edema.

On the cusp of development is a MicroPulse CPC procedure, which is believed will further enhance safety and allow more comfort in using the procedure earlier in the treatment paradigm. In addition, the use of steroids and non-steroidal anti-inflammatory drugs perioperatively has helped mitigate some of the complications.

A glaucoma device (G-Probe, Iridex) is designed to direct infrared energy toward the ciliary body, and I tend to err on the side of posterior placement as well. In highly myopic eyes, I often use transillumination to identify the exact location of the ciliary body. This technique is effective any time extra confidence is needed with where to direct the laser, and more precise targeting of the ciliary processes can reduce pain and inflammation after the procedure.

### TSCPC in eyes with good visual acuity

Analyzing the data on TSCPC will show that it has historically been used in very sick eyes with minimal visual acuity, contributing to the idea that loss of visual acuity is linked to TSCPC. However, more recent studies of eyes with better visual potential have shown that this may not be fully accurate. Rotchford and colleagues studied TSCPC in 49 eyes with a median pre-treatment visual acuity of 20/60, and after 5 years of follow-up, the median visual acuity remained 20/60.[2] A loss of two or more lines was recorded in 30.6% of eyes, a number similar to other procedures.

The 3-year follow-up for the Tube Versus Trabeculectomy Study showed an average decrease in IOP of 48% for both randomized groups, with surgical complications related to re-operation or visual acuity loss of greater than 2 Snellen lines in 22% of the tube group and 27% of the trabeculectomy group.[3] This is similar to the results of 74 eyes that underwent TSCPC and were followed for 12 months.[4] The mean reduction in IOP was 43% and mean visual acuity was preserved in subgroups with good vision, whereas 13% of patients lost vision due to a progressive cataract or glaucoma.

In another study comparing TSCPC with a glaucoma valve (Ahmed Glaucoma Valve, New World Medical), there was a 57% decrease in IOP in the TSCPC group and a 47% decrease in IOP in the Ahmed group.[5] Both groups had an incidence of decreased vision of about 25%, and predominantly in patients with neovascular glaucoma who are difficult to treat.

In my practice, I use TSCPC in patients whose disease is often advanced in nature, who may have had previous glaucoma surgery, and who need IOP lowered to the low teens or less. I expect that patients will be taking one to two medications after the procedure.

Patients for whom trabeculectomy or tube shunts would present a significant risk are often excellent TSCPC candidates. This includes patients with a previous failed subconjunctival procedure or who have had a previous incisional surgery, whether or not they have good vision.

An example of a TSCPC patient in my clinic is a 60-year-old male who has high myopia, has split fixation, and vision around 20/25 with a small tunnel of vision of 3° to 4°. His IOP is low 20s mm Hg with maximum medical therapy, which is too high for the optic nerve. This patient is at very high risk for immediate snuff

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**HANDS-ON APPROACH**
To view a video of Dr. Ahmed demonstrating transscleral cyclophotocoagulation go to *http://ow.ly/gU4Lz.*

Video courtesy of Ike K. Ahmed, MD

out with a filtering procedure. In this patient I would perform TSCPC with a titrated, gentle approach, starting modestly and then re-treating again if necessary after a couple of months.

I start treatment at 1,250 mW of power for 4,000 ms and apply between 12 and 16 spots along the limbus, with the G-probe. The goal is to lower IOP to 13 to 14 mm Hg, and it is common that the patient would remain taking medication. It may be necessary to re-treat this patient, but the goal is to maintain central vision.

Re-treatment with TSCPC is not the same as re-treatment with trabeculectomy or tube shunts. If after two treatments the patient needs additional IOP lowering, I would increase the energy until I hear audible pops that indicate the explosion of the ciliary processes. I avoid this endpoint because it results in greater inflammation and risk of cystoid macular edema.

### Individualized treatment

A variety of treatment options is available today, and it is necessary to analyze which procedure is optimal for each individual patient. Trabeculectomy and tube shunts definitely still have a place in my practice, but there is a segment of the population that does not do well with these procedures. Patients with failed filtering surgeries, fixation defects, risk of suprachoroidal hemorrhage, or high risk in general often will lose vision following trabeculectomy or tube shunts. Losing vision after undergoing such a procedure is devastating.

TSCPC is not the same as cryotherapy of the past; it has the ability to lower IOP and preserve vision similar to trabeculectomy and tube shunts, while avoiding a complicated filtering surgery. Instead of searching for one ideal glaucoma procedure, ophthalmologists should be identifying the best option for each patient.**OT**

### References

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## author info

**Ike K. Ahmed, MD**
is in practice at Credit Valley Eyecare and assistant professor at the University of Toronto; fellowship director, Glaucoma and Anterior Segment Fellowship; University of Toronto Research Fellowship Director; University of Toronto, Department of Ophthalmology and Vision Sciences Chief; and co-medical director of TLC Laser Eye Center, Mississauga, ON. He receives consultant/consulting fees, speakers honoraria, or research grant/support from numerous companies.