



JEFFREY KAMMER, MD

Vanderbilt Eye Institute / Vanderbilt University Medical Center
Nashville, TN United States

PATIENT CASE REVIEW

Non-Incisional Choice for the Battle Against Glaucoma

MICROPULSE TRANSSCLERAL CYCLOPHOTOCOAGULATION (MP-TSCPC)

While cyclophotocoagulation (CPC) has traditionally been an effective option for reducing aqueous secretion and lowering of intraocular pressure (IOP) in glaucoma patients, it is destructive to the ciliary body^{1,2} and is often viewed negatively. The use of an 810nm continuous wave diode laser during contact transscleral cyclophotocoagulation (TSCPC) proved to be a safer option, but its cyclodestructive nature is still concerning.³⁻⁶ A more recent treatment which modifies rather than destroys tissue is MicroPulse Transscleral Cyclophotocoagulation (MP-TSCPC) using the MicroPulse treatment mode of the Cyclo G6® Glaucoma Laser System (IRIDEX). MicroPulse technology breaks the continuous laser waves into a series of short bursts, allowing tissue to cool between the intervals, thus greatly reducing damage to tissue. Its comparable efficacy and superior safety profile have been illustrated in numerous studies⁷⁻¹¹ with only rare incidence of visually significant adverse events.

IMPROVED QUALITY OF LIFE

Distinguishing between MP-TSCPC's modifying effect and its more destructive predecessors is critical. The excellent results and benign side effect profile documented with MP-TSCPC are why I use it frequently with my glaucoma patients. In a study in which I participated,⁷ glaucoma patients experienced a 30% reduction in IOP with a 27% reduction in the medication burden. Moreover, there were no significant side effects or reduction in vision. Reducing topical medications can improve compliance and be a significant financial savings for patients.¹² We are fortunate enough to have many choices in glaucoma therapies right now, and MP-TSCPC is one I gravitate towards frequently because it effectively lowers IOP and improves patient quality of life by reducing medication burden, all without the risks of incisional glaucoma surgery.

INDICATIONS

MicroPulse technology broadens our horizons. This treatment is advantageous for a wide variety of glaucoma patients including: those with early to moderate glaucoma, who may be poor surgical candidates, who have high-risk ocular co-morbidities, or who may have transportation issues. In addition to the benign safety profile, MP-TSCPC is also beneficial in that it can be performed in an office setting with retro or peribulbar anesthesia, increasing convenience for the patient. MP-TSCPC can also be titrated to the severity of disease by repeating the procedure as necessary. Clinical data show that patients may need between one and three procedures for the best results.^{8,9} With MP-TSCPC, it is possible to repeat as necessary. It is also beneficial as an adjunctive treatment to many other glaucoma treatments if the patient has a pressure just above target and requires further IOP lowering. In fact, MP-TSCPC with the Cyclo G6 laser can be used prior to, in conjunction with, and as a follow up to any other glaucoma procedure.

CASE REVIEW

A patient presented from an ophthalmic oncologist with a highly suspicious intraocular lesion that he was monitoring clinically. This individual was also experiencing significantly elevated IOP in the same eye that was recalcitrant to IOP lowering medications. Incisional surgery was therefore not practical, and several other doctors had been hesitant to treat her due to anxiety over the potential intraocular malignancy, concerned that a penetrating glaucoma surgery could have deleterious side effects.

RESULTS

I treated her with MP-TSCPC with excellent results, lowering the IOP from 34mmHg on two drops/three medications to 19mmHg on one nightly prostaglandin analogue. Ultimately, her lesion did progress and manifested itself as a choroidal melanoma, so the MP-TSCPC was indeed the most appropriate intervention for this woman.



RECOMMENDATIONS FOR ANESTHESIA AND TREATMENT

- Either conscious sedation or a block is necessary for this procedure. Despite widespread training, some surgeons prefer to avoid blocks. However, I perform a transconjunctival peribulbar injection that significantly decreases risk of globe perforation or retrobulbar hemorrhage. This technique also provides excellent anesthesia.
- During the surgery, I employ the use of artificial tears or an eye gel such as Celluvisc (Allergan) to facilitate the movement of the probe across the conjunctiva. However, movement is typically adequate with the artificial tears. At times, patients with smaller orbits may be challenging and a muscle hook can be utilized to provide better access and exposure to the hemisphere being treated.
- Straightforward, non-incisional procedures are beneficial to both the specialist and generalist and a great advantage to patients. With the documented efficacy and favorable side effect profile, MP-TSCPC meets the requirements for “next-generation” glaucoma therapy.

1. Feldmann RM, El-Harazi SM, LoRusso FJ, McCash CE, Lloyd WC 3rd, Warner PA. Histopathologic findings following contact transscleral semiconductor diode laser cyclophotocoagulation in a human eye. *J Glaucoma* 1997; 2: 139–40.
2. Noecker RJ, Kelly T, Patterson E, Herrygers LA. Diode laser contact transscleral cyclophotocoagulation: getting the most from the G-Probe. *Ophthalmic Surg Lasers Imaging* 2004; 35: 124–30.
3. Rotchford AP, Jayasawal R, Madhusudhan S, Ho S, King AJ, Vernon SA. Transscleral diode laser cycloablation in patients with good vision. *Br J Ophthalmol*. 2010 Sep; 94(9):1180-3. doi:10.1136/bjo.2008.145565.
4. Egbert PR, Fladoyor S, Budenz DL et al. Diode laser trans-scleral cyclophotocoagulation as a primary surgical treatment for primary open angle glaucoma. *Arch Ophthalmol* 2001; 119:345–50.
5. Schlote T, Darse M, Rassman K et al. Efficacy and safety of contact trans-scleral diode laser cyclophotocoagulation for advanced glaucoma. *J Glaucoma* 2001; 10: 294–301.
6. Leszczynski R, Giersek-Lapinska A, Forminska-Kapuscik M. Trans-scleral cyclophotocoagulation in the treatment of secondary glaucoma. *Med Sci Monit* 2004; 10: CR542–8.
7. Radcliffe N, Vold S, Kammer J, et al. MicroPulse trans-scleral cyclophotocoagulation (mTSCPC) for the treatment of glaucoma using the MicroPulse P3 device. Poster presented at the American Glaucoma Society annual Meeting. April 2015.
8. Tan AM, Chockalingam M, Aquino MC, et al. MicroPulse transscleral diode laser cyclophotocoagulation in the treatment of refractory glaucoma. *Clin Experiment Ophthalmol*; 2010; 38: 266-72.
9. Aquino MC, Barton K, Tan AM, et al. MicroPulse versus continuous wave transscleral diode cyclophotocoagulation in refractory glaucoma: a randomized exploratory study. *Clin Experiment Ophthalmol*; 2014;10:1-7.
10. Kuchar SD, Moster M, Waisbourd M. Treatment outcomes of MicroPulse transscleral cyclophotocoagulation in advanced glaucoma. Poster presented at: Congress of the American Glaucoma Society. 2015 Feb 27; San Diego, CA.
11. Johnstone et al. Transscleral laser induces aqueous outflow pathway motion and reorganization. AGS Meeting, Coronado, CA, 2017.
12. Muir KW, Lee PP. Glaucoma Medication Adherence: Room for improvement in both performance and measurement. *Arch Ophthalmol*. 2011 Feb; 129(2): 243–245.

iridex.com/cyclog6 • info@iridex.com