

**Ian Conner, MD, PhD**

University of Pittsburgh Medical Eye Center
Pittsburgh, PA United States
connerip@upmc.edu

PATIENT CASE REVIEW**Broad Use for Effective, Non-Invasive Treatment of Glaucoma****MICROPULSE TRANSSCLERAL CYCLOPHOTOCOAGULATION (MP-TSCPC)**

We have many options for the surgical treatment of glaucoma today. However, few procedures have the broad applicability of MicroPulse TSCPC with the MicroPulse P3® Glaucoma Device and the Cyclo G6® Laser System. MicroPulse technology segments the laser beam in to a series of short bursts allowing tissue to cool between the bursts to reduce damage from thermal spread. The result is a modification of the tissue rather than the destruction of cells, creating a treatment with similar efficacy to continuous-wave TSCPC with fewer complications and less pain.^{1,2} I have used this advanced technology to treat a wide range of patients—from patients with healthier eyes looking to reduce their medication burden, to those with very advanced glaucoma who cannot tolerate invasive procedures and the extensive post-op regimens that accompany them. I have used the MicroPulse P3 probe both at the office and in the operating room (OR). Patients do very well in both settings and the choice of location is usually based on the patient profile. Studies have shown that MP-TSCPC can significantly reduce the amount of medications patients are required to take as well as lower IOP by 30%.^{1,3} I have seen these same results in my own practice. The ability for MP-TSCPC to be repeated multiple times also allows for a more direct and targeted approach to IOP management.

CASE REVIEW

An 86-year-old patient presented with inadequately treated, advanced stage primary open angle glaucoma in both eyes. IOPs were elevated to 26 mmHg and 30 mmHg in the right and left eyes, respectively. His retinal nerve fiber layer was significantly depleted in both eyes (<60 microns) and his visual field tests showed steady decline over the last couple of years with a recent sharp downturn. He had previously undergone cataract surgery and Trabectome microcautery in both eyes, and his current visual acuity was 20/200 in his right eye and counting fingers in his left eye. In addition, his underlying dementia was exacerbated due to a prescribed alpha-2-agonist, causing him to slump forward in his chair and present as largely unresponsive. This patient was very sick, both at his ocular nerves and systemically. I performed the MP-TSCPC procedure in the OR so that I could maximize his comfort by sedating him with a Propofol bolus, avoid a retrobulbar block, and treat both eyes at the same time. I applied tetravisc to the ocular surface. I treated each hemisphere for 90 seconds (4 passes per hemisphere), using a 31.3 % duty cycle and 2000 mW. I then gave him a drop of topical atropine and an injection of subconjunctival dexamethasone. Following the procedure, I prescribed prednisolone 4 times a day for one week.

RESULTS

At his one week follow up, his IOP was 13 mmHg in the right eye and 18 mmHg in the left with his vision remaining stable. At five months, his pressure was 22 mmHg in the right eye and 19 mmHg in the left eye; with vision remaining stable. I also switched the alpha-2-agonist to a carbonic anhydrase inhibitor and his coherence rebounded positively. He can sit up in his chair and make eye contact and his wife is beside herself with happiness. For this gentleman, is IOP of 22 mmHg good enough? I think it is. He has advanced stage disease, but he is 86 years old, is not in good health and has dementia. He is now on medications that he can tolerate, his vision is stable, and he does not have to endure the follow-up care or potential complications of a filtering surgery, which I feel is beyond the ability of him and his wife to manage. This patient needed efficacy and a light touch, and MP-TSCPC was a big win.

CLINICAL PEARLS

- 1.** For patients who need additional comfort during treatment, consider sedating the patient in the OR with a Propofol bolus to avoid a retrobulbar block.
- 2.** My initial treatment technique was to deliver 5 passes over 80 seconds across each hemisphere (16 seconds per pass). However, I have found that dividing the eye into quadrants (4 passes over 40 seconds per quadrant) has given me the ability to more precisely and consistently deliver the energy across the tissue and without as much eye movement. Furthermore, my standard practice has now evolved to 60 seconds per quadrant (6 passes per quadrant; 10 seconds each pass; using 2000 mW). This seems to provide a nice balance between efficacy and risk.
- 3.** In patients who will not tolerate a block, I have found conscious sedation with Propofol, administered by an anesthetist, to be highly effective and have lower risk of complications.

1. 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.
2. Aquino MC, Barton K, Tan AM, Sng C, Li X, Loon SC, Chew PT. Micropulse versus continuous wave transscleral diode cyclophotocoagulation in refractory glaucoma: A randomized exploratory study. *Clin Exp Ophthalmol*, 2015;43(1):40-6.
3. Radcliffe N, Vold S, Kammer JA, et al. MicroPulse trans-scleral cyclophotocoagulation (mTSCPC) for the treatment of glaucoma using the MicroPulse P3 Device. Presented at the American Glaucoma Society annual meeting, 2015.

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