REVOLUTIONIZE TREATMENT OF SIMPLE AND COMPLEX GLAUCOMA CASES WITH THE NEW MICROPULSE P3 PROCEDURE

BY NATHAN RADCLIFFE, MD

The MicroPulse P3 device (IRIDEX) is the first safe, nonincisional, noninvasive laser for the treatment of glaucoma that has a number of unique features. It can be used emergently and it can be repeated, not just once or twice like some procedures, but really as much as needed to treat the patient. It can be titrated to the patient's level of risk, and any procedure can precede or follow. This procedure can be used for simple or complex cases, and because the safety profile is favorable, it can be used earlier in the glaucoma spectrum.

Early work from Prof. Paul Chew, MBBS, MMed(Ophth), FRCSEd, FRCOphth, FAMS, of the National University of Singapore demonstrated a 33% IOP reduction at 18 months among 38 patients. Average medications reduced from 2.1 to 1.3, which translates to a 73% success rate with an average of 1.3 treatment sessions.

Preferred Pre- & Postoperative Regimen

Preoperatively, patients are continued on maximum tolerated medical therapy. Unlike traditional filtration surgery, where early hypotony is a problem, these medications will not be problematic if still used (or if not washed out) in the early postoperative period.

Just prior to the procedure, I prefer to do a retrobulbar injection of 2% lidocaine without epinephrine. I patch the eye that night, but I typically do not see the patient the first day after. Instead, I have him or her start taking prednisolone acetate 1%, four times a day for a week, and then I see the patient after 2 weeks. There is a lot of flexibility in terms of follow-up to the MicroPulse P3 procedure, so the follow-up visit can change to accommodate the needs (clinical or practical) of the physician and patient.

MicroPulse P3 Serving a Variety of Patients

Patients who may be particularly good candidates for this procedure are those for whom going to the operating room will be inconvenient or difficult, e.g., someone who lives alone, or who does not have anyone to accompany them to the procedure. The MicroPulse P3 procedure is also ideal for patients for whom the prolonged recovery of a traditional surgery is not a viable option. Patients with compliance difficulties are good candidates as well, because a serious infection is unlikely to present from missed eye drops, and because a periocular steroid injection can be given in place of topical steroids. Patients can go home after this in-office procedure without activity restrictions, with a minimal burden of additional medications.

Here, I present four patients with varying severity of disease and a variety of scenarios, all of whom I treated with the MicroPulse P3.

Case No. 1

A 52-year-old man with proliferative diabetic retinopathy had developed neovascular glaucoma. He was treated using a laser, and there were no ongoing retinal issues. However, his IOP was 32 mm Hg on maximum medical therapy, and his visual acuity was still 20/20. His eyes had severe anterior segment scarring and were prone to heavy bleeding, which suggested that his risk of bleeding with a trabeculectomy would likely be high. Therefore, I treated him using the IRIDEX MicroPulse P3 device as a primary glaucoma surgery at 2000 mW for 120 seconds, divided between the superior and inferior regions (60 seconds per hemisphere), sparing the nasal and temporal clock hours, and he had great results. His pressure decreased to 19 mm Hg, and he was able to stop the acetazolamide and one additional eye drop.

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Case No. 2

The second patient is a 70-year-old pseudophakic woman with 20/100 vision from advanced glaucoma who presented to me in crisis. She was on all the appropriate medicines—oral acetazolamide, a fixed combination, a prostaglandin, and pilocarpine 2%—had advanced damage, and an IOP of 35 mm Hg. She needed surgery but was going out of town the following week for the entire summer and was not willing to delay her trip. There was nothing more I could do for her medically, and she was vacationing in a setting where glaucoma surgery was not an option.

TABLE 1.

	Preop Regimen*	Postop Regimen	Preop IOP	Postop IOP	Mean IOP change
Case #1†	3 drops + acetazolamide	Prednisolone acetate 1% 4x/day for 1 wk Patch eye first night Resulting meds: 2 drops	32 mm Hg	19 mm Hg	40%
Case #2†	4 drops + acetazolamide	Prednisolone acetate 1% 4x/day for 1 wk Patch eye first night Resulting meds: 4 drops + acetazolamide	35 mm Hg	17 mm Hg	50%
Case #3†	3 drops	Prednisolone acetate 1% 4x/day for 1 wk Patch eye first night Resulting meds: 0 drops	25 mm Hg	20 mm Hg	20%
Case #4†	3 drops	Prednisolone acetate 1% 4x/day for 1 wk Patch eye first night; resulting meds: 2 drops	22 mm Hg	14 mm Hg	36%

*All patients received a retrobulbar injection of 2% lidocaine without epinephrine.
†All cases treated with a range of 100-150 seconds total (50-75 seconds per hemisphere) and 2000-2500 mW.

This patient was on the cusp of losing vision, and I was able to offer her treatment with the MicroPulse P3 that day. I treated her with 150 seconds total (75 seconds applied to each hemisphere) at 2500 mW, an aggressive setting that I chose because her vision was already reduced, her eye was not heavily pigmented, and her disease and pressure elevation were severe. I was able to see her 5 days later, and her pressure had decreased to 17 mm Hg prior to her departure. Upon her return, her multiple medications may be tapered.

Case No. 3

A third patient was a 92-year-old woman with exfoliation glaucoma (mild damage but high IOPs) who lived alone and needed surgery. Her IOPs were in the mid-20s, and she had some balance issues and trouble with confusion with her eye drops (a fixed combination and a prostaglandin analog). She was a poor candidate for incisional glaucoma surgery because of the age-related risk of choroidal hemorrhage or hypotony, which could lead to decreased vision. For a patient like this, who is age 92 and lives alone, having a 2-week period of decreased vision would create significant problems.

However with the MicroPulse P3, there are no restrictions on activities, it is an easier use of drops afterward, and so the patient could have a more rapid recovery. I treated her with my moderate settings of 2250 mW for 120 seconds total (60 seconds applied to each hemisphere). She was able to use just the prednisolone four times a day while living alone, and was able to stop her glaucoma drops (and the prednisolone) over the next few weeks. Her IOP is now 20 mm Hg, and she is off all drops.

Case No. 4

A 78-year-old man who had an Ahmed valve (New World Medical) placed for uncontrolled glaucoma presented to me with an IOP of 22 mm Hg. He was being treated with a prostaglandin analog plus a fixed combination drop. He had advanced damage, so his target pressure was 15 mm Hg.

He represented a fantastic scenario for the MicroPulse P3 device, because it seems to work better, in my experience, in patients who have an Ahmed valve. These patients can experience a 50% pressure reduction and still seem to have good protection against hypotony, presumably from the valve. Therefore, I did not need to return the patient to the operating room and put in a second valve. His pressure, after treatment with standard settings of 2000 mW for 100 seconds (50 seconds per hemisphere), was 14 mm Hg, and in this case, I had discontinued the PGA drop and continued the fixed combination therapy.

Conclusion – the MicroPulse P3 Advantage

The MicroPulse P3 device has benefits for both the surgeon and the patient: it can be used in the office or the operating room, and there is no major recovery time for the patient. As you can see from the cases (Table 1), the MicroPulse P3 device can serve a variety of patients. In some patients who cannot take medications, IOP can be controlled and medications replaced (Case 3). In other patients, IOP can be controlled; allowing the patient to maintain his or her quality of life (or life plans, as in Case 2) without having to undergo incisional surgery. For patients at high risk of complications from incisional surgery (Cases 1 and 3), this device can provide a safe alternative. I have been impressed that it works well in exfoliation and angle-closure eyes (Case 3 and 1). Finally, I have found that the MicroPulse P3 device complements prior tube shunt procedures (Case 4), possibly by providing a dual-mechanism synergy to the aqueous outflow afforded by the tube. ■

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