



David Gossage, DO, FFAO, FAOCO

## Results show procedure is “viable alternative”

**M**icroPulse laser trabeculoplasty (MLT, IRIDEX, Mountain View, Calif.) is proving to be a viable alternative to costly pharmacological treatment for the reduction of IOP in glaucoma patients. In the retina, MicroPulse laser therapy with the IRIDEX 532 laser is known to induce beneficial intracellular biological factors that are primarily anti-angiogenic and restorative,<sup>1,2,3</sup> with no collateral damage. I recently acquired 24 months of data from glaucoma patients treated with MLT and saw encouraging outcomes.

MicroPulse technology evolved similarly to phacoemulsification energy. In the past, the continuous delivery of ultrasound energy to the phaco tip produced a build-up of heat in the needle that would result in a thermal injury during the removal of very dense nuclei. To prevent the heat build-up at the tip, phacoemulsification machines incorporated duty cycles, which phase the energy on and off to maintain a safe tip temperature and remove the nucleus without causing a cornea burn.

Likewise, MicroPulse utilizes a 5% to 15% duty cycle, effectively eliminating burn complications. My early results with this emerging technology were promising, prompting me to conduct a long-term study of MLT to determine its efficacy in reducing and maintaining IOP over time.

### The study

I initially chose 18 patients diagnosed with primary open angle glaucoma (POAG) for study. Selection criteria included “virgin” eyes, or previously untreated (previous argon laser trabeculoplasty excepted), and the patients took no more than 1 eye drop medication. I did not

# Two-year data on MicroPulse laser trabeculoplasty

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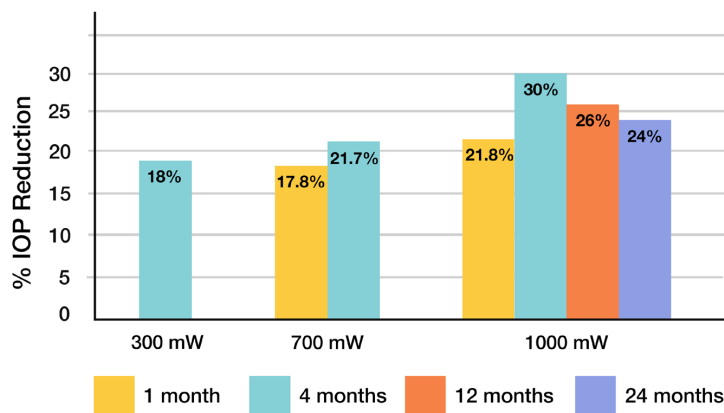


Figure 1: Evidence of dose response at 2-year follow-up

Source: David Gossage, DO, FFAO, FAOCO

include severe POAG cases requiring a multiple drop regimen or patients who had previous selective laser trabeculoplasty (SLT).

MLT was performed at dosages of 300 mW, 700 mW, and 1,000 mW. The percentage of IOP reduction response was measured at 1-, 4-, 12-, and 24-month intervals. After 2 years, the patients receiving a dosage of 1,000 mW indicated an IOP reduction averaging 24%, dropping only slightly from 26% after the 1-year mark. Of the study subjects, 1 person lost effect in both eyes. Removing this patient from the data indicates a 28% reduction after 2 years for those patients in whom a pressure lowering effect was noted (Figure 1).

The study results indicate that the IOP reduction response is generally well maintained. I am currently retreating patients that have lost effect over time if they had an initial response. The study has verified the safety of retreatment; we know that a patient treated at 700 mW can be retreated at 1,000 mW and get an additional response. Anecdotally, we know that a patient treated at 1,000 mW and retreated at the same level will also get an additional effect, and I continue to follow these patients for the study.

### Treatment

As a pioneer in MLT for treatment of POAG, I developed my technique conservatively. At the outset, I

preoperatively instilled brimonidine and Pred Forte (prednisolone acetate, Allergan, Irvine, Calif.) drops to prevent or reduce inflammatory reactions. I subsequently discontinued this practice in the absence of any pressure spikes or postoperative inflammation and now only administer an anesthetic. I started with the laser set to 300 mW, increasing it to 700 mW, and then 1,000 mW. Eyes treated at 1,000 mW showed significantly better results; therefore, I only treat at the 1,000 mW dosage now. Although electron microscope scans indicate no thermal damage at the 1,000 mW dosage, I have not continued to increase the dosing pending safety verification.

Based on my experience, I adhere to the following settings on my IQ 532 and IQ 577 (IRIDEX) lasers:

Power: 1,000 mW  
Spot: 300 μm  
Duration: 300 ms  
Duty cycle: 15%

I place treatment applications a full 360 degrees and do not administer medications pre- or postoperatively. I conduct follow-up with my patients at 1 month; however, this can vary based on the level of severity.

### Advantages

MLT offers many advantages for both the patient and the doctor over pharmacotherapy. In my practice, I have shifted to making this a first-line treatment option for my

patients with elevated IOP. From a compliance standpoint, I feel comfortable that the patient is receiving treatment that will reduce IOP long term, versus relying on patients to take and properly administer drops in their eyes. Simply reducing the medication load is a significant factor in improving a patient's quality of life—patients will not need to worry about getting the drops in and can avoid the toxicity associated with these medications including dryness, irritation, and keratitis. The ability to treat a patient without the side effects of medications is appealing to all parties. Furthermore, the cost benefit to patients is making laser treatment an increasingly viable option. Often insurance will cover laser treatments while covering only a portion or none of the pharmaceuticals required.

MLT offers a safe, effective alternative to pharmacotherapy in treating elevated IOP in patients. I expect continuing research to yield promising results. **EW**

### References

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