MicroPulse® Laser Therapy Resolves Persistent Fluid when Added to Anti-VEGF in AMD Patient

Ziad Bashshur, MD, is a Professor of Ophthalmology at American University of Beirut in Lebanon. His clinical focus is vitreoretinal disease and surgery, and his primary research interest is retinal vascular disease, particularly neovascular age-related macular degeneration.

I've been using MicroPulse laser therapy to treat several types of retinal conditions for nearly 7 years and have come to expect successful outcomes. Moreover, I have been pleasantly surprised to see its effectiveness for my neovascular age-related macular degeneration (AMD) patients who don't respond to anti-VEGF therapy. It has been suggested that MicroPulse can restore responsiveness to anti-VEGF agents due to its effect on the retinal pigment epithelium (RPE).[1] In my experience, MicroPulse doesn't eliminate the need for anti-VEGF treatment but converts anti-VEGF non-responders to responders and enables longer injection-free intervals, which reduces the treatment burden on patients and costs to healthcare.

AMD PATIENT CASE

Two years ago, a 60-year-old male presented with neovascular AMD, confirmed with fluorescein angiography. I treated him monthly for 6 months with intravitreal injections of bevacizumab. The response was poor; OCT showed persistent subretinal fluid. I changed the medication to ranibizumab. After six injections in 6 months, visual acuity (VA) remained stable at 20/40 but I continued to see fluid on OCT. I performed indocyanine green angiography which confirmed the patient had wet AMD rather than a masquerading condition, and then administered monthly injections of aflibercept for 3 months followed by an injection every 2 months for a year with no improvement based on OCT. In July 2015, with central retinal thickness (CRT) at 356 µm (Figure 1A), I administered an aflibercept injection and then performed MicroPulse laser therapy 1 week later (Table 1). Two months after MicroPulse, the retina was completely dry (Figure 1B), VA remained stable, and CRT improved to 195 µm. I continued to administer aflibercept every 2 months, and at last follow-up, almost 1 year later, the macula has remained dry. I'll likely extend the treatment interval in the near future.

VERSATILITY OF MICROPULSE IN MY PRACTICE

I've observed that among my AMD patients who don't respond to anti-VEGF treatment, as in the case

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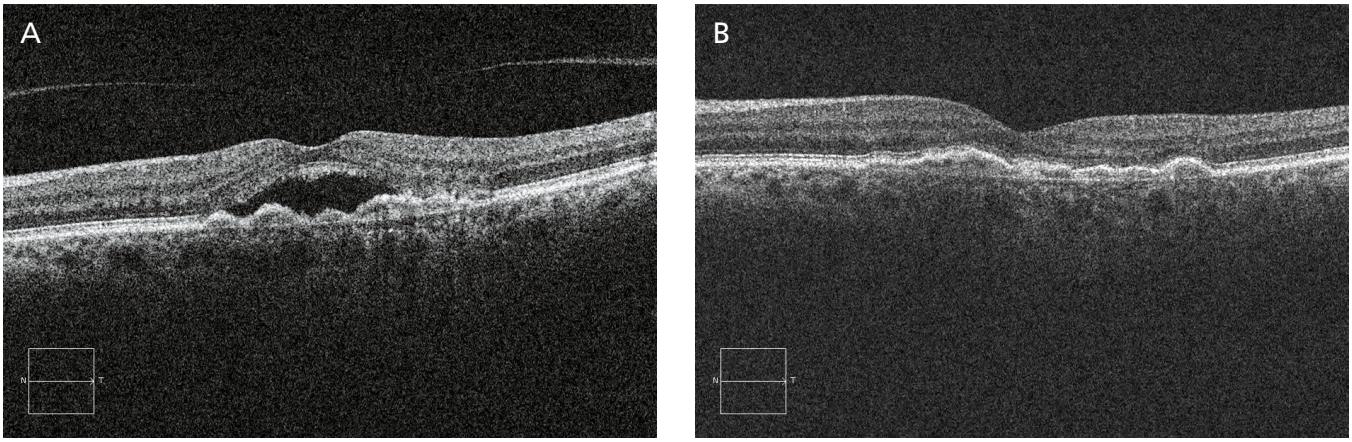

Figure 1. (A) July 2015 | post multiple anti-VEGF injections over 2 years and prior to MicroPulse | CRT 356 µm | VA 20/40; (B) Sept. 2015 | 2 months post MicroPulse | CRT 195 µm | VA 20/40.

described here, the eyes that tend to do the best with adjuvant MicroPulse are those with pachychoroid. Also, I've found MicroPulse to be an excellent tool in the management of any retinal vascular disorder that manifests in exudation. I use it most often to treat diabetic macular edema as a first-line treatment when edema is < 400 µm, and after anti-VEGF when edema is worse. MicroPulse is my first and only treatment for central serous chorioretinopathy because verteporfin for PDT isn't readily available where I practice. In addition, I use MicroPulse for patients with retinal vein occlusion, radiation retinopathy, and post-surgery cystoid macular edema, all with good to excellent results.

I decided to incorporate MicroPulse into my practice because it doesn't have the limitations of traditional continuous-wave laser treatment. Initially, I used the IRIDEX IQ 810™ laser. Later, I switched to the IRIDEX IQ 532™ laser and now I use the IRIDEX IQ 577™. My experience matches the available literature reporting that all three wavelengths (810 nm, 532 nm and 577 nm) are equally effective.[2,3] I switched to 577 nm because, in my experience, it's more comfortable for patients when used for continuous-wave panretinal photocoagulation and for the treatment of peripheral retinal breaks.

EFFECTIVE RESULTS ALLEVIATE INITIAL CONCERNS

Like many physicians considering incorporating MicroPulse laser therapy into practice, I had two concerns: The first was not being able to see the laser spots on the retina. When properly administered, MicroPulse doesn't produce a visible tissue reaction during treatment, i.e., the white burn all retina specialists are conditioned to see. How would I know what I was doing? The second concern was transfoveal treatment. Would the fovea be damaged? Seeing edema routinely resolve several weeks after MicroPulse convinced me that a white burn wasn't necessary for the treatment to be beneficial; and once I saw how safe the treatment is for the fovea, that concern was also alleviated.

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I wouldn't hesitate to recommend MicroPulse to colleagues. I'd remind them they'll have to overcome the need to see a retinal burn, and advise them to start their first series of cases with a test spot. (A test spot is performed with the laser in continuous-wave mode using a 200 µm spot, 200 ms duration and 50 mW of power. Laser pulses are delivered to an area outside the macula and titrated up in increments of 10 mW moving to a new area each time until a barely visible tissue reaction is observed. The laser is switched to MicroPulse mode and the power quadrupled.) However, after some hands-on experience, many physicians will realize, like I did, that most patients require similar treatment parameters and the test burn isn't necessary. Furthermore, I use the TxCell™ Scanning Laser Delivery Device, which is helpful to visualize where the laser energy will be delivered. Lastly, I'd recommend physicians use MicroPulse in eyes with a relatively intact or healthy RPE, where the treatment's mechanism of action lies, and always use 5% duty cycle. ■

Table 1. TREATMENT PARAMETERS

IQ 577 with TxCell-guided MicroPulse for neovascular AMD

- Wavelength: 577 nm
- Duty cycle: 5%
- Spot size on slit lamp adapter: 200 µm
- Contact lens: HR Centralis (Volk)
- Exposure duration: 200 ms
- Power: 460 mW
- TxCell-guided MicroPulse delivery: 400 confluent spots applied to the fovea and area of choroidal neovascularization using a 7x7 treatment grid with zero-spot spacing.

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IRIDEX | 1212 Terra Bella Avenue | Mountain View, CA 94043 | 800.388.4747 (U.S. inquiries) | info@iridex.com (U.S. & int'l inquiries) | www.iridex.com