

DME: Luttrull & Sinclair

Retina, Advanced online publication 34:2010-2020, 2014 (October)

Article Title: Safety of Transfoveal Subthreshold Diode MicroPulse Laser for Fovea-involving Diabetic Macular Edema in Eyes with Good Visual Acuity

Takeaway: **MicroPulse laser was safe and effective for the treatment of fovea-involving DME in eyes with good preoperative visual acuity (20/40 or better) that were not candidates for conventional photocoagulation or intravitreal injection.**

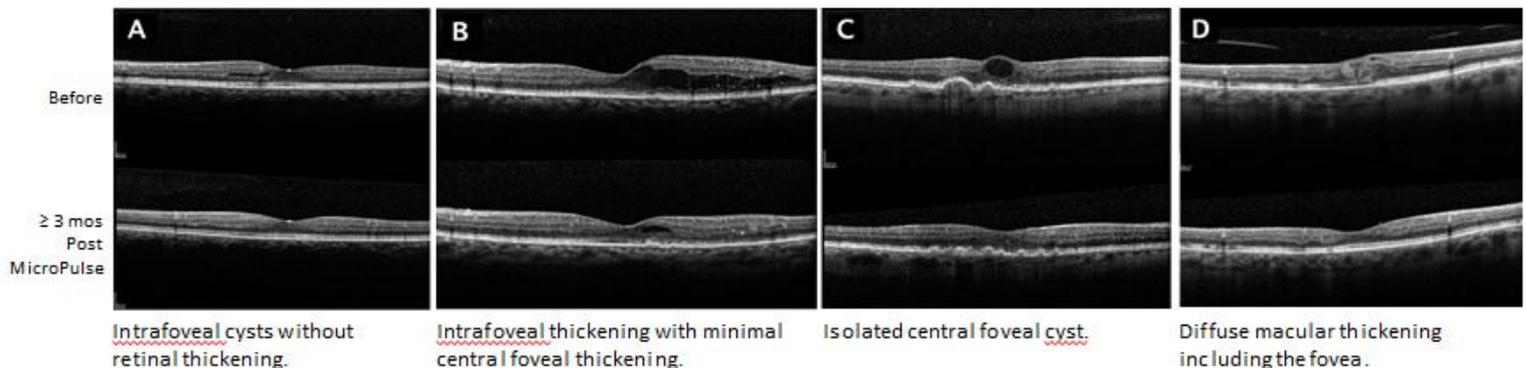
Summary: Retrospective study, 39 eyes of 27 patients with fovea-involving DME, pretreatment VA 20/40 or better.

Follow-up: 3 to 36 months, mean 11 months

- No adverse events
- No eye had evidence of laser-induced macular damage by any imaging means
- VA remained stable throughout follow-up with a significant improvement at 4 to 7 months

Parameters: **All patients:** 810 nm, 5 % duty cycle, 300 ms delivering high-density applications over the entire area of edema including the fovea indicated by optical coherence tomography (OCT) and macular leakage by fluorescein angiography (FA).

Clinic #1: 125 µm spot, 950 mW or 200 µm spot, 1400 mW. **Clinic #2:** 125 µm spot, 780 mW



DME: Mansouri, Sampat, Malik, Steiner, Glaser

Eye, Advanced online publication (November)

Article Title: Efficacy of Subthreshold Micropulse Laser in the Treatment of Diabetic Macular Edema is Influenced by Pre-treatment Central Foveal Thickness

Takeaway: **MicroPulse as a monotherapy is safe and effective in treating edema of mild to moderate ($\leq 400 \mu\text{m}$) severity.**

Summary: In a retrospective study, patients were divided into two groups based on central foveal thickness (CFT). All patients were treated with MicroPulse. MicroPulse retreatment was considered at 3 months if macular edema had not improved. Patients were considered for rescue anti-VEGF injections if there was clinically significant macular edema at 6 months. Follow-up was at 3, 6, and 12 months. No adverse effects from MicroPulse in either group were recorded.

Group 1: CFT $\leq 400 \mu\text{m}$, 33 eyes

At 12 months:

- Average reduction in CFT: $55 \mu\text{m}$
- VA gain: 0.2 logMAR (2 lines) ($P < 0.001$)
- No patient required rescue anti-VEGF therapy

Group 2: $> 400 \mu\text{m}$, 30 eyes

From 6 to 12 months:

- All patients received rescue anti-VEGF therapy despite MicroPulse retreatment in 19 eyes
- After anti-VEGF therapy, reduction in CFT: $307 \mu\text{m}$
- VA gain: 0.3 logMAR ($P < 0.001$)

Parameters: 810 nm, $125 \mu\text{m}$ spot, 300 ms, 950 mW, 5% duty cycle. Confluent applications to the entire area of edema and leakage guided by OCT and FA.

Abstract link: <http://www.ncbi.nlm.nih.gov/pubmed/25359290>

PDF via journal subscription or purchase: <http://www.nature.com/eye/index.html> (search Mansouri)

CSR: Malik, Sampat, Mansouri, Steiner, Glaser

Retina, Advanced online publication (October)

Article Title: Low-Intensity/High-Density Subthreshold Micropulse Diode laser for Chronic Central Serous Chorioretinopathy

Takeaways: **1. High-intensity, low-density MicroPulse laser using a 5% duty cycle seems to be safe and effective for treating chronic CSR.**
2. Low or no response may be an indication of under treatment.

(Note – This is the first published study for CSR that shows a 5% duty cycle is safe and effective. The authors comment that their results are similar to those described using higher duty cycles of 10 - 15% in prior studies.)

Summary: Retrospective, interventional case series to evaluate visual outcomes and macular thickness change in patients with chronic (at least 3 months) CSR that may or may not have involved the foveal center.

Follow-up: 2 to 12 months

- Maximum macular thickness (MMT)
- 8 of 11 (72.7%) eyes demonstrated significant reduction in MMT after a single MicroPulse treatment.
- 1 eye required retreatment after 6 months for recurrent fluid due to under treatment.
- 2 eyes that did not respond had the least number of laser applications.

Visual outcomes

- Pre-treatment: 39.2 letters, mean (range, 8-58 letters; standard deviation = 15.1)
- Post-treatment 45.5 letters, mean (range, 14-55 letters; standard deviation = 12.0)

Parameters: All 10 patients: 810 nm, 5% duty cycle.

- 7 patients: 950 mW, 300 ms duration
- 3 patients: 750 mW, 900 mW, and 1000 mW. Of these 3 patients, a 300 ms duration was used on one and a 200 ms duration was used on two patients.
- MicroPulse was applied to areas of leakage seen on fluorescein angiogram, over the areas of clinical neurosensory detachment, and/or pigment epithelial detachments.

Abstract link: <http://www.ncbi.nlm.nih.gov/pubmed/25127050>

PDF via journal subscription or purchase: http://journals.lww.com/retinajournal/Abstract/publishahead/LOW_INTENSITY_HIGH_DENSITY_SUBTHRESHOLD_MICROPULSE.98225.aspx

DME: Inagaki, Ohkoshi, Ohde, Deshpande, Ebihara, Murakami

Jpn J Ophthalmology 2014 Nov 14 [Epub ahead of print]

Article Title: Comparative Efficacy of Pure Yellow (577-nm) and 810-nm Subthreshold Micropulse Laser Photocoagulation Combined with Yellow (561-577-nm) Direct Photocoagulation for Diabetic Macular Edema

Takeaway: **There were no statistically significant differences in efficacy between the 810 nm and 577 nm wavelengths for the treatment of DME.**

Summary: In a prospective, nonrandomized, interventional case series of 49 patients with DME, 53 eyes were treated with either 577 nm or 810 nm MicroPulse grid pattern followed by direct photocoagulation of the microaneurysms. In eyes that received 810 nm MicroPulse, direct photocoagulation of the microaneurysms was conducted with 561 nm.

At 12 months follow-up, both 577-nm and 810 nm MicroPulse combined with direct photocoagulation for microaneurysm closure reduced DME, maintained visual acuity and reduced the additional treatment rate. 577 nm required less energy than 810 nm, and was suitable for direct photocoagulation of microaneurysms.

No laser scars were detected on color photographs, no patient developed any macular complication of laser therapy, and none of the patients complained of scotoma.

Parameters: Power used for MicroPulse laser was achieved based upon a continuous-wave test burn:

- 810 nm MicroPulse powers ranged from 500 mW to 2000 mW
- 577 nm MicroPulse powers ranged from 180 mW to 400 mW
- In all cases, a 200 μ m spot, a 200 ms duration, and a 15% duty cycle was used.

Abstract link: <http://www.ncbi.nlm.nih.gov/pubmed/25392274>

PDF via journal subscription or purchase: <http://link.springer.com/article/10.1007/s10384-014-0361-1>

ME due to BRVO: Inagaki, Ohkoshi, Ohde, Deshpade, Ebihara, Murakami

Journal of Ophthalmology 2014;2014:251257. Epub 2014 Sep 4.

Article Title: Subthreshold Micropulse Photocoagulation for Persistent Macular Edema Secondary to Branch Retinal Vein Occlusion Including Best-Corrected Visual Acuity Greater than 20/40

Takeaway: **Early intervention with MicroPulse may maintain best-corrected visual acuity (BCVA) and reduce macular edema in patients with macular edema due to BRVO with good visual acuity >20/40.**

Summary: Thirty-two patients with macular edema secondary to BRVO for at least 6 months and central macular thickness (CMT) of <600 μm were treated with MicroPulse laser. Patients were categorized into 2 groups: **Group 1** (15/32 eyes) BCVA \leq 20/40 and **Group 2** (17/32 eyes) with BCVA >20/40. Baseline BCVA ranged from 20/222 to 20/20.

This study demonstrates that MicroPulse can effectively resolve macular edema and maintain visual acuity in Japanese patients with mild or moderate persistent macular edema secondary to BRVO, including patients with BCVA > 20/40. In the total subject-pool in this study, at 3 months after laser treatment, macular edema was significantly reduced ($P=0.014$) and remained stable through 12 months follow-up, and the total macular volume was significantly reduced at 6 months ($P=0.002$).

No fluorescein angiograms showed no evidence of laser spots. No patients complained of ocular discomfort after MicroPulse.

Parameters: 810 nm, Continuous-wave test burn using a 200 μm spot, 100 ms duration with the lowest energy required to make a visible burn outside the vascular arcade without retinal edema. MicroPulse was delivered using a 15% duty cycle, 2x continuous-wave test burn power, and either a 200 ms or 300 ms duration.

Abstract Link: <http://www.ncbi.nlm.nih.gov/pubmed/25276413>

PDF download for free: <http://www.hindawi.com/journals/joph/2014/251257/>