

A New Treatment for Chronic Central Serous Retinopathy

Micropulse yellow laser resolves leakage and retinal detachment without scarring or retinal damage.

BY ANDRÉ MAIA, MD, PhD

Central serous retinopathy (CSR) is an idiopathic disease that primarily affects young white men, 20 to 50 years of age, although it is seen occasionally in older patients, females, and other ethnic groups. The condition may be triggered or exacerbated by stress or corticosteroid use.

CSR is characterized by avascular focal leakage through the retinal pigment epithelium (RPE), resulting in serous detachment of the neurosensory retina. It is usually self-limiting and in most cases resolves spontaneously within a 3-month period, with visual acuity usually recovering to 20/30 or better. In a small minority of cases, however, chronic CSR may develop, with the potential for progressive RPE atrophy and permanent visual loss.

In such cases, treatment is challenging. Options include focal laser, which itself can cause scarring and result in visual loss, and photodynamic therapy, which is not always effective. I thought the yellow 577-nm micropulse laser, which I have used successfully to treat diabetic macular edema,

would be a safe and effective method of treatment.

The IQ 577 (Iridex Corporation, Mountain View, CA) laser is a solid-state, multimode laser. In micropulse mode, the laser energy is delivered in short pulses. The laser stays on only 10% to 15% of the time (depending on duty cycle selected), generating less heat and producing less damage to the retina than continuous-wave photocoagulation. The 577-nm yellow wavelength is ideal for CSR and other retinal applications because it is highly selective for the RPE. Oxyhemoglobin in the RPE absorbs yellow light better than any other wavelength, while xanthophylls have negligible uptake of yellow light, localizing the effects to the RPE and further protecting the fovea.

The results from a small series of patients with central serous retinopathy treated with the yellow laser have been very encouraging. Here, I present three interesting cases.

CASE 1: RAPID RECOVERY

A 36-year-old male physician presented with reduced vision in the right eye over the previous 8 months. Uncorrected visual acuity (UCVA) was 20/80 in the right

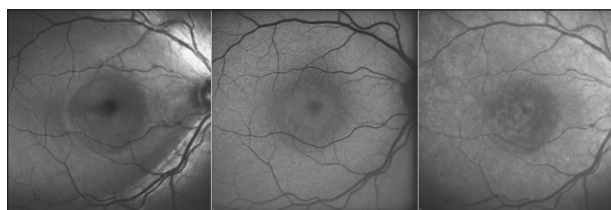


Figure 1. Dark area on the infrared and other fundus imaging corresponds to the area of retinal detachment.

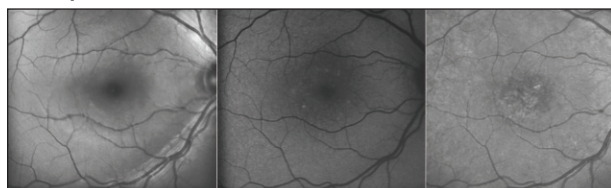


Figure 2. Post-treatment improvement in autofluorescence.

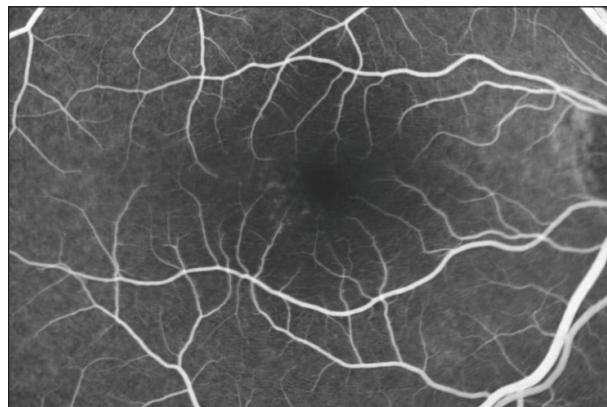


Figure 3. Treatment resolved leakage; no thermal retinal burns.

eye and 20/20 in the left eye. Fundus exam showed a foveal retinal detachment and leakage near the fovea in the right eye (Figure 1).

The patient was treated with 577-nm yellow laser, with a 0.3 msec pulse duration (120 mW), 200- μ m spot size and 15% duty cycle. Two hundred fifteen shots were delivered to the center of the macula over the location of the detachment.

Only 14 days later, UCVA had returned to 20/20. We could see subtle but definite improvement in the autofluorescence (Figure 2). Fluorescein angiography shows that the leakage has resolved with absolutely no visible laser burns (Figure 3). Such rapid improvement after 8 months of CSR is remarkable.

CASE 2: NO DAMAGE, EVEN AFTER REPEAT TREATMENT

A 47-year-old male was referred after 1.5 years with CSR. UCVA was 20/20 in the right eye and 20/80 in the left eye. Fundus exam showed a foveal detachment and distinct RPE changes (Figure 4) with both a hypo- and hyperautofluorescence response (Figure 5).

The patient was originally treated with bevacizumab (Avastin, Genentech, Inc.) 2.5 mg. One month later, there was no improvement in visual acuity and no change on optical coherence tomography (OCT; Figure 6). The patient was then treated with 577-nm yellow laser, with 0.3-msec pulse duration (200 mW), 200- μ m spot size and 15% duty cycle. A large number of shots (471) were deliv-

ered to the area of retinal detachment, aiming for the RPE.

Nine days later, UCVA had improved to 20/60 in the left eye with almost complete resolution of the retinal detachment. One week later, however, vision deteriorated again,

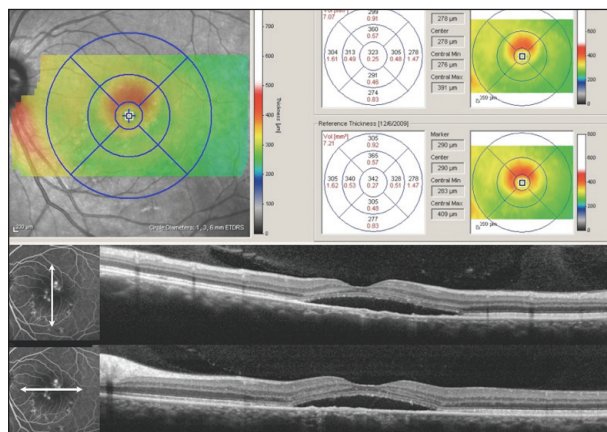


Figure 6. Avastin treatment did not resolve detachment, as seen in OCT images.

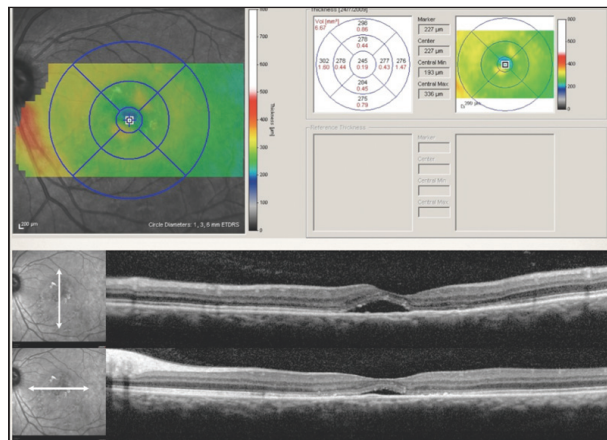


Figure 7. Despite initial resolution, the retinal detachment returned and worsened.

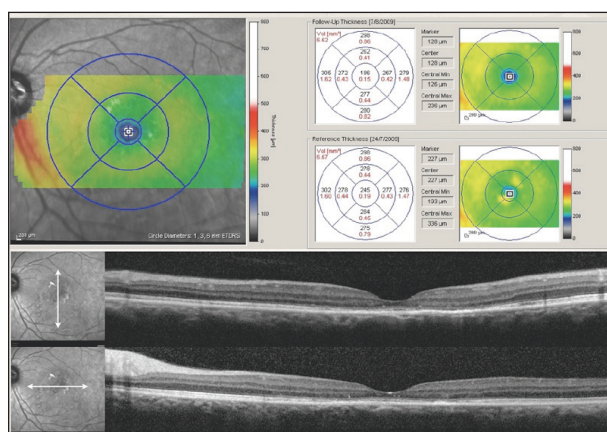
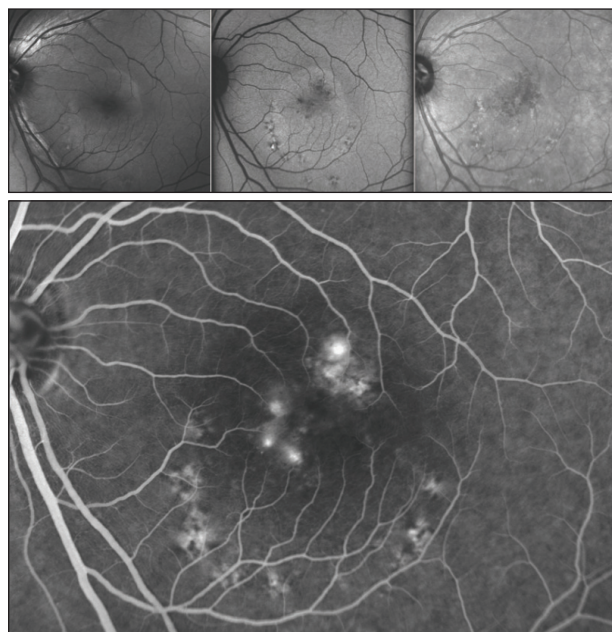


Figure 8. A second yellow laser micropulse treatment improved the vision and resolved detachment without damage.



Figures 4 (top) and 5. Long duration of CSR with hypo- and hyperautofluorescence, RPE changes and foveal detachment.

and a detachment worse than the original detachment was apparent on OCT (Figure 7). The patient was retreated (parameters: 566 spots at 0.3 msec pulse, 160 mW, 15% duty cycle). Two weeks after the second treatment, vision improved to 20/25, and the OCT was almost flat (Figure 8). Not only is this rapid recovery after such a long duration of disease surprising; we were also pleased to see no apparent damage to the retina, even after two laser treatments that delivered more than 1,000 spots to the RPE.

CASE 3: GOOD RESULTS IN COMPLEX CASE

A 40-year-old woman with lupus and a kidney transplant presented with decreased vision. She had a 10-year history of corticosteroid and cyclosporine use to prevent transplant rejection. Visual acuity was 20/25 in the right eye and 20/50 in the left eye at the initial exam. There were subtle RPE changes in both eyes, most likely due to her complex medical conditions, but the left eye had three small areas of leakage close to the fovea (Figure 9). Microperimetry showed poor sensitivity near the center of the macula before treatment.

Using the yellow 577-nm laser, 709 shots were delivered to the RPE in the left eye, with a 0.3-msec pulse duration (260 mW), 200- μ m spot size and 15% duty cycle.

One month later, there was no improvement in visual acuity. Angiography and OCT, however, showed significant, if not total, resolution of the fluid and detachment. On autofluorescence, a small area of hyperautofluorescence in the area of the laser treatment was apparent (Figure 10). We did not see this in any other case treated with this laser; I believe it is due to greater sensitivity to the laser in this compromised eye with most likely a more fragile RPE initially. Microperimetry testing performed before and after treatment demonstrated significant improvement in retinal sensitivity after treatment,

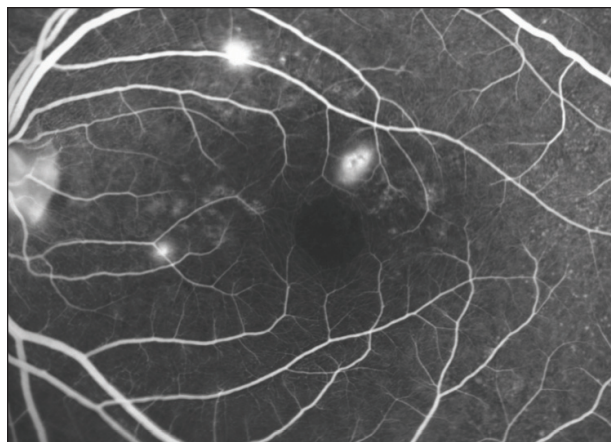


Figure 9. Patient with complex medical history had three small areas of leakage close to the fovea.

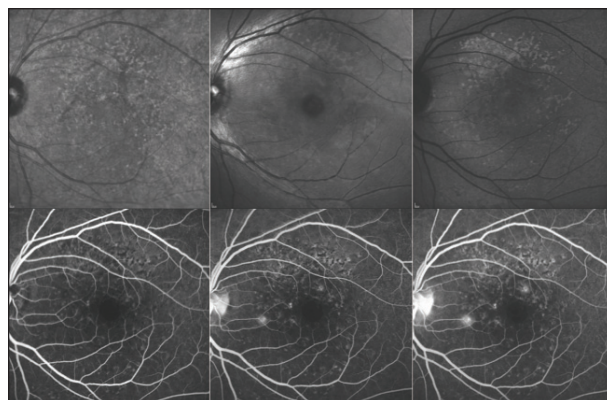


Figure 10. Following laser treatment, there is a small area of hyperautofluorescence.

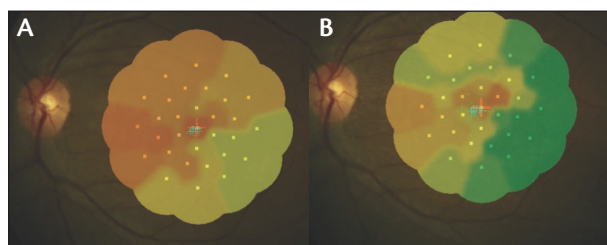


Figure 11. On microperimetry images, areas of greater sensitivity are green, while areas of reduced sensitivity are redder. Before (A) and after (B) images demonstrate significant improvement in retinal sensitivity following treatment, although there is still a reddish area in the center of image (B) where a small detachment remains.

although one can still see an area of reduced sensitivity corresponding to the small detachment remaining after treatment (Figure 11).

CONCLUSIONS

Yellow micropulse laser appears to be effective for chronic CSR. In every case we treated in this series, the improvement following treatment was significant. No retinal damage was seen in any of the eyes, except for minimal hyperfluorescence in one immunocompromised patient with RPE changes in both eyes prior to treatment. While most patients in our series responded well within 30 days of treatment, some may need more than one laser treatment. Long-term, prospective studies are needed to confirm the safety and efficacy of this approach. ■

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