



Ophthalmology

OCULAR SURGERY NEWS

New software improves outcomes of retina procedures

OSN Retina, October 2013

Daniel Lavinsky, MD

My results from laser treatment of diabetic macular edema, chronic central serous retinopathy and macular edema secondary to branch venous occlusion have improved — along with my confidence — with the use of a new algorithm-based software.

For nearly a year I have used Endpoint Management (Topcon Medical Laser Systems) software in conjunction with a pattern scanning laser (Pascal Streamline 577, Topcon Medical Laser Systems) to treat a variety of retinal conditions and have had great success obtaining accurate feedback and visible markers (landmark patterns).

The key tangible benefit of using this algorithm-based software during laser treatment is my ability to titrate the laser energy to achieve a barely visible burn, then decrease the energy to achieve the intended laser endpoint. Because the energy delivered is so low, resulting in photothermal stimulation rather than photocoagulation, the area of treatment or number of spots needs to be increased compared to standard laser therapy (photocoagulation). I can be certain that I am delivering my intended tissue effect, so if I want to induce photothermal stimulation, I am able to do that with a high degree of certainty, as the software's algorithms automatically decrease power and duration based on the desired outcome.

With a pattern-scanning laser, treatment is quick, and the only discomfort for the patient is associated with the lens. Otherwise, the patient feels nothing, as shorter pulses reduce the patient's pain level.

I usually treat diabetic macular edema (DME) patients with anti-VEGF medications and the advanced algorithms software and pattern scanning laser. I wait for the DME to slightly resolve, and then I combine photothermal stimulation treatment with anti-VEGF.

When treating chronic central serous retinopathy (CSR), I see quicker results than with DME, typically with a decrease in subretinal fluid after 2 to 4 weeks and complete recovery after 2 months.

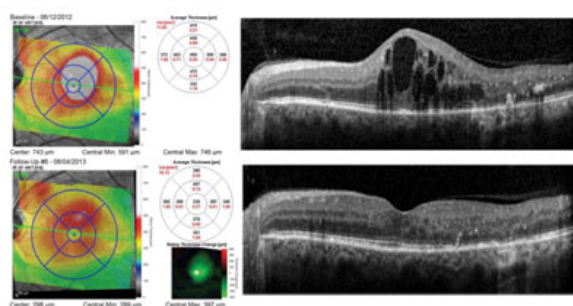


Figure 1. An OCT of a 54-year-old patient with severe nonproliferative diabetic retinopathy with macular edema treated with confluent subvisible (photothermal stimulation) macular grid before (above) and after 4 months of treatment (below).

Images: Lavinsky D

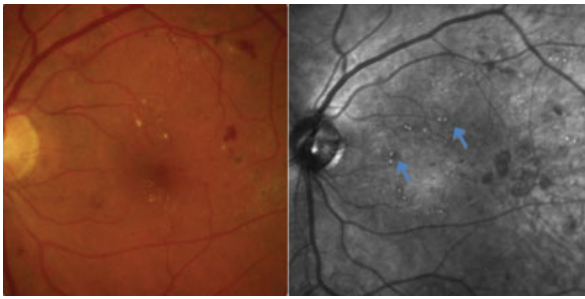


Figure 2. Fundus photo and infrared image of same patient after 4 months of photothermal stimulation. Notice that landmark patterns are only visible on infrared (arrows)

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For DME, when I combine treatments, I have noticed a decreased need for injections. In a country such as Brazil, where some insurances will not cover anti-VEGF therapy for DME, I treat with laser only. However, even with monotherapy, I have seen nice long-term results in decreasing macular thickness and improved best corrected visual acuity.

Improved postop results

I have been using a pattern scanning laser since 2008 and have noticed a significant difference in postoperative results since implementing the advanced, algorithm-based software. Previously, it was difficult for me to treat macular diseases with older software, because it was almost impossible to create a nonvisible burn. Now, I have much more confidence to treat closer to the fovea.

The software also enables me to use my pattern scanning laser for any photocoagulator treatment that I choose, whether I want to go for a moderate burn at the periphery in a panretinal photocoagulation or photothermal stimulation of the macular region.

Visible landmarks

In the past, I have used a micropulse laser for DME with good results, but the difference in micropulse lasers and pattern scanning lasers is that the former does not have a clear titration protocol or recipe and also lacks visible landmarks. Whenever I would treat with a micropulse laser, I would have difficulty comparing treatment because there were no patterns, making it difficult to treat the whole macula without placing burns on top of each other and leaving empty spaces.

With a pattern scanning laser and Endpoint Management software, I can treat subvisibly while designating and leaving visible landmark patterns, creating visible references for re-treatment.

Endpoint Management software brings to the forefront of laser treatment the term “endpoint.” Retina specialists are accustomed to discussions about the threshold and subthreshold laser therapies, but this does not send a clear message. When discussing the endpoint of a treatment, we can determine that we want to create a burn pattern that is visible on angiography and optical coherence tomography or that we want to induce stimulation of the retinal pigment epithelium. That is the laser endpoint, and it is based on laser-tissue interaction, rather than clinical visibility.

This software was based on published research that was performed at Stanford University with Daniel Palanker, PhD, and colleagues.

It ultimately sets a criterion for laser endpoint therapy and allows physicians to execute treatment based on the end result. I suspect that it will play a large role in the future of laser treatment.

Reference:

Lavinsky D, et al. *Retina*. 2013;July 18. <http://www.ncbi.nlm.nih.gov/pubmed/23873164>.

For more information:

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Disclosure: Lavinsky is a consultant to Topcon Medical Laser Systems.

