

Laser Remains an Effective Option for DME and CSCR Treatments

by Hazlin Hassan

Diabetic macular edema (DME) is the leading cause of irreversible visual loss in the diabetic population.

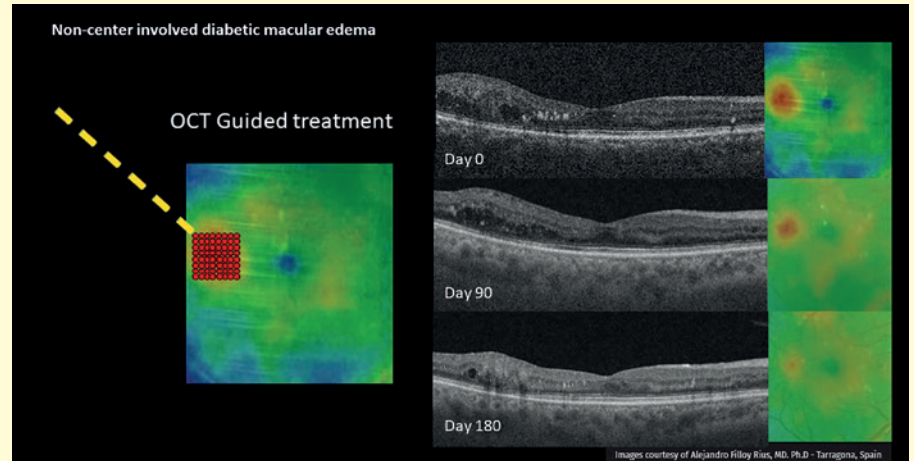
Laser plays a very important role in the treatment of DME despite the use of anti-VEGF agents, said Dr. Victor Chong, consultant ophthalmic surgeon at London Medical, United Kingdom, during a symposium at the recently held APAO 2021 Virtual.

Indeed, studies have shown that even after anti-VEGF injections, some patients still require laser therapy.

SubLiminal laser therapy in DME

Dr. Chong, who is an experienced pioneer of SubLiminal laser therapy and has published widely in this area for the last 15-20 years, cited a study on the comparative effectiveness of aflibercept, bevacizumab or ranibizumab for DME.

"The first point I want to raise is that, when you go to conferences in the United States in the past few years, you would have thought that our American colleagues are no longer using laser. However, they should look at one of the studies that was only finished a few



years ago, the Protocol T," he said.

In the DRCR.net Protocol T, the three different types of anti-VEGF agents for treating DME are compared. He noted that some 37-56% of patients required more laser treatment within the first year of the trial.

"When you start with around 40% of patients who had laser before joining the trial, and then another 40-50% requiring treatment in the first year despite injections, you will realize that laser is still very commonly used in the United States for diabetic macular edema," he continued. "The basic concept is that even in a recent study, laser is still used

in the majority of patients."

In the randomized, double-masked, multicenter, laser-controlled phase III RESTORE study involving 345 patients, results showed that ranibizumab 0.5mg combined with laser therapy was significantly more effective in treatment naive cases.

While conventional lasers, such as those used in the DRCR.net study, can sometimes cause collateral damage, Dr. Chong explained that with the SubLiminal laser therapy, laser energy is delivered in pulses with less collateral retinal damage, and there is no visible scarring.

To summarize the role of lasers in DME, Dr. Chong said: "Lasers are still used in real life. Lasers are similar to anti-VEGF in early DME with mildly-increased central retinal thickness. Combined laser and anti-VEGF in treatment naive patients showed slightly better outcomes."

"So don't be afraid to use laser if the patient has never had treatment before. In DME with very good vision, lasers can delay the needs of anti-VEGF. SubLiminal laser might improve outcomes further," he added.

DME Treatment Through 1 Year: anti-VEGF and Laser

	Aflibercept N = 208	Bevacizumab N = 206	Ranibizumab N = 206	P- Value
# of Injections (Max = 13)				
Mean	9.2	9.7	9.4	
Median (25 th , 75 th percentile)	9 (8, 11)	10 (8, 12)	10 (8, 11)	0.045 [†]
At least one focal/grid laser	37%	56%	46%	<0.001 [‡]

[†]Global (overall 3 group comparison) P-value. Pairwise comparisons (adjusted for multiple comparisons): aflibercept-bevacizumab: $P = 0.045$, aflibercept-ranibizumab: $P = 0.19$, bevacizumab-ranibizumab: $P = 0.22$.

[‡]Global (overall 3 group comparison) P-value. Pairwise comparisons (adjusted for multiple comparisons): aflibercept-bevacizumab: $P < 0.001$, aflibercept-ranibizumab: $P = 0.058$, bevacizumab-ranibizumab: $P = 0.061$.

Safety first with the SubLiminal laser

The 577nm SubLiminal laser is a safe option for the treatment of DME and central serous chorioretinopathy (CSCR), said Dr. Kenneth Fong, consultant ophthalmologist and vitreoretinal surgeon at OasisEye Specialists, Kuala Lumpur, Malaysia.

“The benefits of SubLiminal laser is that you can preserve the retinal tissues, while having an effect on reducing macular edema at the macula area,” he said.

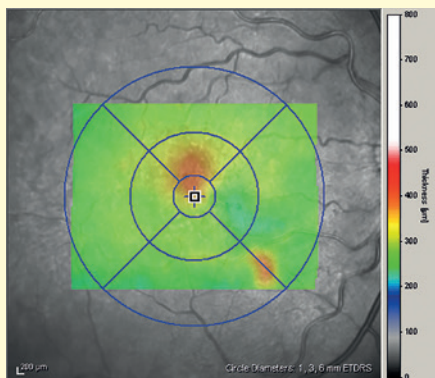
SubLiminal laser therapy is known to have a durable effect, and can be combined with intravitreal therapies including injections and implants.

SubLiminal laser refers to a laser beam that is broken into small pockets of pulses, and these small shots are controlled with a mechanism known as duty cycle. Duty cycle is the percentage of time that the laser is on, compared to the percentage of time that the laser is off. The laser’s off time helps to cool the retinal pigment epithelium and prevent the formation of scars on the retina.

“By adjusting the on and off setting for the SubLiminal laser, we manage to reduce heat diffusion around the surrounding tissue, and this prevents the formation of laser scars,” said Dr. Fong.

“The benefits are such that you can preserve retinal tissues while having the effect of reducing macular edema at the macula area,” he explained.

“I use the SubLiminal laser with the 577 nanometer wavelength, which I believe is the ideal wavelength to create a good laser reaction at the retinal



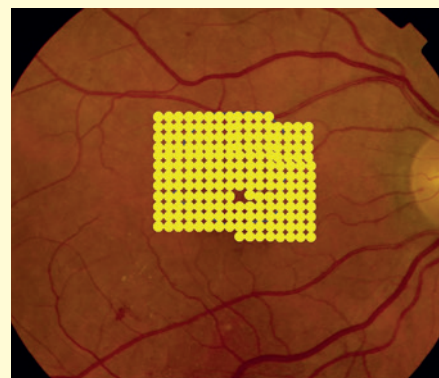
pigment epithelium, without damaging the xanthophyll pigment, which is found predominantly at the macular region. Additionally, there is good penetration through opacities, like in cataracts, and it can allow you to titrate the power quite efficiently,” added Dr. Fong.

It is important to titrate the power because every patient has different pigmentation in the retinal pigment epithelium.

For best effects, Dr. Fong recommends a dense treatment, a large laser spot size of 160 micrometers and a duty cycle of 5%.

His treatment strategy involves first testing with a 5% duty cycle, then reducing the power by 50% if he sees a mild reaction, and then lasering over the macula in the thickened area — although he cautions surgeons not to exceed 1.2W of power while titrating.

If no visible threshold happens at 1.2W, keep this power as a reference level and use half of it for treatment (i.e., 600mW). During the SubLiminal treatment, no visible reaction must be observed, and there is no need to change power with different degrees of edema. Laser impacts must be confluent, Dr. Fong said.



In addition, transfoveal is not necessary and not recommended especially for new SubLiminal users.

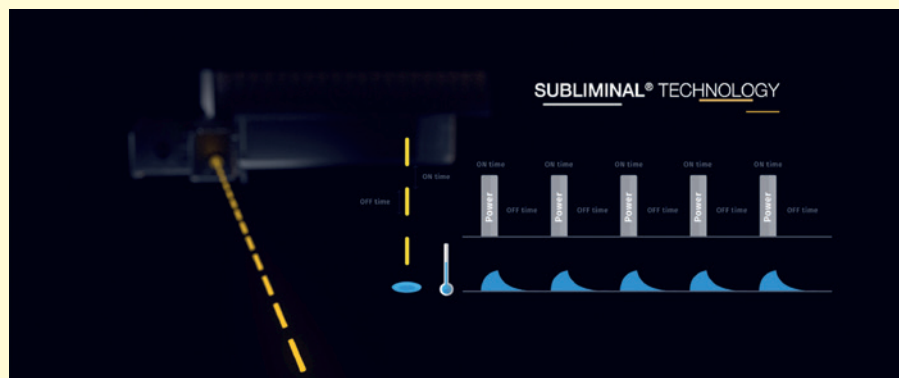
In cases of DME, the SubLiminal may be used with optical coherence tomography (OCT) to treat identified edematous areas.

In non-center involved DME, SubLiminal treatment can be used alone; meanwhile for foveal involved DME, the best treatment option still remains an open question.

“In general, the thicker the retina, anti-VEGF therapy is more likely to be the first line treatment. Once the edema is settled, SubLiminal laser can be used to reduce the number of injections,” noted Dr. Fong.

In patients without visual loss, SubLiminal laser can be used as the first-line treatment. If the edema deteriorates, then anti-VEGF therapy can be added.

The SubLiminal treatment can be used in chronic CSCR and is an excellent alternative to mid-fluence PDT in first line treatment, said Dr. Fong. 🍷



Editor's Note:

APAO 2021 Virtual was held from September 5 to 11, 2021. Reporting for this story took place during the event.