

Panretinal Photocoagulation in Patients with DME

Laser remains the mainstay of treatment in DME.

BY PASCALE MASSIN, MD

Laser photocoagulation is the primary and only proven therapy for clinically significant diabetic macular edema (DME). Its role as the principal therapy for DME was established by the Early Treatment Diabetic Retinopathy Study (ETDRS),¹ and it has never been displaced. Recently, the Diabetic Retinopathy Clinical Research Network (DRCR.net) confirmed² that focal/grid photocoagulation currently should be the benchmark against which other treatments are compared in clinical trials of DME. With 2 years of follow-up, those investigators found that focal/grid photocoagulation was more effective and had fewer side effects than intravitreal injection of triamcinolone for most patients with DME.

The indication for panretinal photocoagulation (PRP) in DME is the presence of severe peripheral ischemia, with or without neovascularization, at level 53 or worse on the ETDRS severity scale:³ that is, severe nonproliferative diabetic retinopathy (NPDR) or worse.

However, in patients with type 2 diabetes, the clinician must weigh which of these conditions, DME or the NPDR, is most urgently in need of treatment. In eyes in which severe NPDR is combined with DME, the application of PRP may worsen the DME. In these cases, then, we may first try to address the DME, for instance with intravitreal injection of a vascular endothelial growth factor (VEGF) inhibitor or a steroid such as triamcinolone acetonide, before performing PRP. If neovascularization is present, however, we must address this simultaneously with the DME, for instance by combining the intravitreal injection of steroid or anti-VEGF agent with the first session of PRP.

To state this key message in another way: When there is severe NPDR together with DME, the most important task is to try to improve the DME, not to worsen it. In these cases we focus first on the DME, and PRP is less

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urgent. In the presence of neovascularization, however, the PRP may be more urgent, so we have to perform it as we begin to treat the DME.

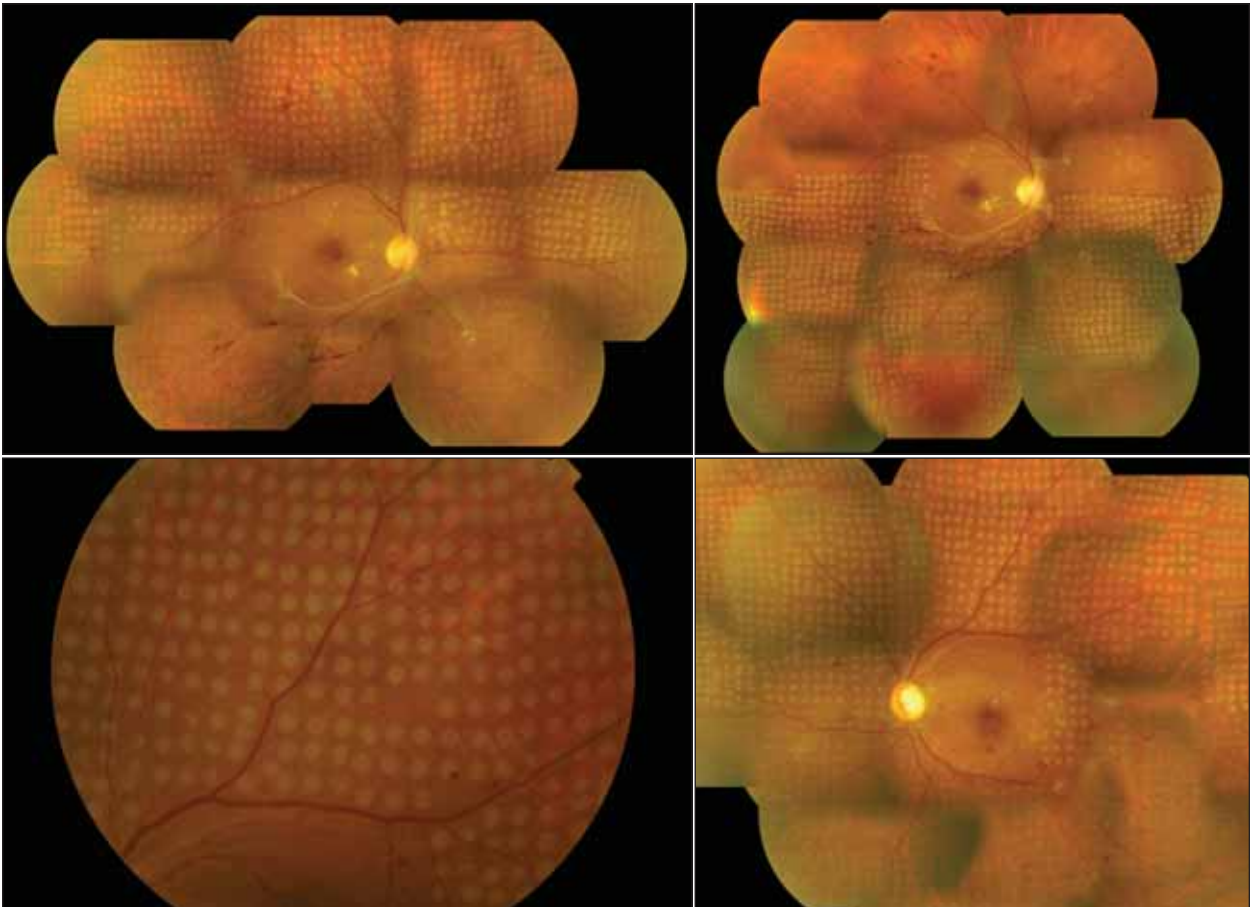
In patients with type 1 diabetes, this is not an issue. In type 1 diabetes there are none of the complicating factors of type 2, such as hypertension, that may worsen DME. In these young patients, the DME is linked directly to the peripheral ischemia, and PRP may improve DME by reducing the levels of vascular endothelial growth factor (VEGF) in the vitreous cavity.

In a recent study,⁴ in patients with type 1 diabetes exhibiting florid proliferative diabetic retinopathy (FPDR), extensive PRP and glycemic control were effective in reducing DME and improving vision. The authors theorized that, in FPDR, DME may be caused by excessive production of VEGF by the unperfused retina.

NEWER TECHNOLOGIES

Optical coherence tomography (OCT) can be useful in following patients during the administration of PRP. Serial OCT can track the patient's macular thickness, so if we detect macular thickening we know there is a risk of worsening the DME and we can lengthen the time between laser sessions.

The development of a multispot laser delivery system has recently improved the experience of PRP for both surgeon and patient. The PASCAL Pattern Scan Laser (Topcon Medical Laser Systems, Inc., Santa Clara, CA)



Eyes treated with the PASCAL Photocoagulator (Topcon Medical Laser Systems, Inc., Santa Clara, CA) by Hiroyuki Nomoto, MD, PhD, Kagawa University.

delivers multiple laser burns to the retina simultaneously in a variety of patterns (Figure 1). The laser pulses are of very short duration, so the session is less painful for the patient. We can now perform PRP in two or three sessions at maximum, and it is faster and apparently just as effective as single-spot laser.^{5,6}

CONCLUSIONS

Laser PRP is the mainstay treatment for proliferative diabetic retinopathy. It should be administered in all cases of DME in the presence of severe peripheral ischemia, with or without neovascularization, at level 53 or worse on the ETDRS severity scale. Even in severe DME, laser can be beneficial, as the peripheral ischemia may otherwise progress to rubeosis iridis and neovascular glaucoma. Newer technologies for laser delivery have helped to make the once-arduous process of PRP less burdensome for the patient and the surgeon. Treatment of the underlying diabetes should be managed in consultation with the patient's general physician, internist, or endocrinologist. ■

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