

Favourable results with SRT for focal diabetic maculopathy

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in Fort Lauderdale, Florida

SELECTIVE Retina Therapy (SRT) performed with a prototype 527-nm frequency-doubled Q-switched ND:YLF laser is a safe and effective treatment for focal diabetic maculopathy, according to a multicentre European study.

Hanno Elsner MD, department of ophthalmology, University of Schleswig-Holstein, Kiel, Germany, reported the data at the annual meeting of the Association for Research in Vision and Ophthalmology. The trial enrolled 60 patients with foveal oedema and visual acuity lower than 20/100.

All patients had standardised visual acuity assessments using ETDRS charts, fundus photography, fluorescein angiography, and optical coherence tomography (OCT III, Zeiss Meditec). These were performed at baseline and after three and six months. The findings from those assessments showed that SRT generally stabilised or improved retinal thickness, leakage, and ETDRS visual acuity without causing any significant adverse effects.

“While laser photocoagulation using the continuous wave argon laser has been the gold standard for treating diabetic macular oedema, it results in damage to the neural retina that can lead to scotoma and loss of visual acuity. To avoid those side effects, there has been increasing interest in intravitreal triamcinolone. However, its use is accompanied by potential serious risks of secondary glaucoma, endophthalmitis and rhegmatogenous retinal detachment,” said Dr Elsner.

In the multicentre study, median foveal retinal thickness was 227 microns at baseline and had increased slightly at three months, but by six months had fallen to 218 microns. Median maximum retinal thickness measured by radial OCT scans in the treated oedematous macula areas decreased gradually during follow-up from 351 microns at baseline to 330 microns at six months.

Fluorescein angiography at three months showed that leakage had decreased compared with baseline in about 28% of eyes, was stable in 45%, and worse in about 22%. By

six months, leakage activity was still improved from baseline in 24% of eyes and stable in 36%, while it had increased in 34% of eyes.

Vision stabilised

However, comparison of visual acuities measured at baseline and six months showed that 39% of patients had improved by more than one line, 51% maintained their vision within one line, and only 10% of eyes had lost more than one line of visual acuity.

“Using a very strict definition, only 10% of eyes in our series experienced vision loss. That outcome is quite favourable considering that clinical experience shows that a lot more patients would lose vision over a period of six months if left untreated,” Dr Elsner said.

Some patients have been retreated after six months for recurrent leakage. Experience accumulated so far indicates the repeat SRT is also safe and effective, he reported.

“Based on its efficacy and safety profile, SRT seems to offer a good alternative that can be used for earlier treatment in eyes with

limited pathology and to treat closer to the fovea than one would when performing argon laser photocoagulation.”

Less collateral damage than with Argon laser

SRT involves the delivery of laser energy in series of 30 1.7 microsecond pulses at a repetition rate of 100 Hz. Repeated application of those very short duration pulses results in selective damage to the retinal pigment epithelium and prevents thermal heat conduction from the centre of the laser burn towards the periphery, thereby mitigating any marked temperature increase or damage to collateral tissue.

Whereas a greyish white lesion is visible on ophthalmoscopic examination after argon laser photocoagulation, in eyes treated with SRT laser lesions are not visible ophthalmoscopically but are detectable by fluorescein angiography. Initial animal studies investigating SRT showed that it caused no damage to the photoreceptor layer. No microscotomas have been seen in microperimetry studies on top of

SRT lesions.

“The pathogenesis of diabetic maculopathy involves the reduced function of the RPE cells, and so the aim of laser treatment is to alter the metabolism of the RPE cells to enable resolution of oedema. By using SRT, that goal can be achieved without affecting the photoreceptors and producing undesirable side effects,” Dr Elsner said.

Johann Roeder, MD, director of the department of ophthalmology, University of Schleswig-Holstein, Campus Kiël, and Reginald Birngruber, Medical Laser Centre, Lübeck, Germany introduced the concept of SRT for treatment of macular diseases almost a decade ago. Professor Roeder is the coordinator of the multicentre study of SRT for diabetic maculopathy.

SRT has also been used to treat other macular diseases characterised by RPE cell damage and leakage, and from that experience Dr Elsner noted he has found it to be a particularly good option for eyes with central serous chorioretinopathy.

“In cases of central serous retinopathy where there is a single leaking point, SRT can be used to effectively close off the leakage in more the 95% of cases. That is a very impressive outcome,” he said.

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