**Pharmacologic or Surgical?**
- treating retinal vein occlusion

Stefanie Petrou Binder MD  
in Berlin  

**EUROPEAN** investigators debated the pros and cons of various medical and surgical therapies for retinal vein occlusion during a symposium at the Joint Meeting of the European Society of Ophthalmology and the German Ophthalmology Society (SOE/DOG).

“Ever since the first descriptions of retinal vein occlusion in the late 19th century we have struggled to discover effective therapies to deal with these conditions. Acute phase medical treatment so far, includes systemic steroids, fibrinolics, agents against aggregation of blood cells, isofoveal haemodilution, anticoagulants and hyperbaric oxygen. In addition laser therapies of many wavelengths and in many modalities have been applied. We remain, however, dissatisfied with our progress and continue to try out new methods,” said Tom H Williamson FRCOphth, Department of Ophthalmology, St. Thomas Hospital, London, UK.

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Dr Williamson asserted that the reason for this ongoing search may in part be due to ineffective treatments but also to a poor understanding of the exact pathogenesis of retinal vein occlusion in its different forms. Even argon grid laser photocoagulation therapy, which has been used against macular oedema in branch retinal vein occlusion (BRVO), can only be applied in some patients for improving vision, leaving out a subset that does not respond to it, he said.

Central retinal vein occlusion (CRVO) remains a devastating condition but due to its slow onset and the accessibility of the site of occlusion, Dr Williamson said it should be possible to find an effective treatment. He believes that there is no current strategy at all to combat its worst complication, neovascular glaucoma. The way forward must be further innovation but also reinvestigation of selected historical methods, he said.

Investigators associated with the US National Eye Institute believe they may have found a new approach for the treatment of CRVO and are currently recruiting CRVO and BRVO patients for the Standard Care vs. Laser trial for REnal vein occlusion (SCORE). Study. This multicentre, randomised, dose comparison Phase III trial uses intravitreal triamcinolone acetonide to combat the oedema associated with retinal vein occlusion.

This study will randomise 630 patients into one of three groups: standard care, intravitreal triamcinolone 1.0 mg, intravitreal triamcinolone 4.0 mg. Follow up exams are scheduled for every four months for three years, when researchers will evaluate visual acuity, intra-ocular pressure, ocular coherence tomography (OCT), fundus photography, and fluorescein angiography (months 4, 12, and 24). The primary outcome is improvement by 15 or more letters from baseline in EDTRS visual acuity at the 12-month visit.

Initial clinical reports suggest that the response to triamcinolone is both rapid and dramatic in terms of reducing intraretinal oedema (seen on OCT) and this improvement is frequently associated with improved visual acuity. The evidence of case reports and small case series reveal a beneficial effect of triamcinolone, along with the risk of recurrence. The researchers hope that the larger patient number and follow-up associated with the SCORE trial design will verify those results.

**New interventions for CRVO, BRVO**

Retinal endovascular lysis (REV, Weiss 2001) represents a promising new method for the treatment of CRVO, according to Lutz Lothar Hansen MD, University Eye Clinic, Freiburg, Germany. This method uses recombinant tissue plasminogen activator (rt-PA) to dissolve the venous thrombus. It has already been used successfully when given systemically in CRVO patients, he said.

To avoid any side effects that might arise from the systemic use of the drug, Dr. Hansen investigated the local retinal vein injection of rt-PA in 12 patients. He noted that the puncture of the retinal vein in eyes with CRVO was difficult at times and not always successful. Nonetheless, his study validated the feasibility of retinal endovascular lysis in eight of the 12 patients. Complications such as vitreous bleeding and neovascularisation remain a big concern.

On the surgical front, sheathotomy (arteriovenous dissection) represents a new surgical treatment option for patients with BRVO, according to Lars Hattenbach MD the Goethe University Eye Clinic, Frankfurt, Germany. With the development of more advanced vitreoretinal techniques, they claim that the mainstay medical therapies (i.e. laser photocoagulation) must yield to the more technically challenging and now feasible surgical techniques. BRVO typically occurs at the A/V crossing, where the arteriole and venule share a common adventitial sheath. Vein thrombosis may occur secondary to venous compression at this point. Decompression can therefore allow reperfusion and theoretically, also visual improvement.

In a number of trials in which sheathotomy was used to resolve macular oedema in BRVO patients, the evidence suggests that the chances of retinal reperfusion are better if the decompression is performed earlier, i.e. before macular oedema and ischaemia set in. Good timing will also benefit the visual recuperation in sheathotomy patients. As many patients suffering from BRVO have systemic hypertension, researchers believe that conscientious screening can help in diagnosing this problem before or as it occurs.

**Radial optic neurotomy**

A promising new surgical intervention for CRVO patients is radial optic neurotomy (RON). Investigators associated with the US National Eye Institute (preoperative and postoperative visual acuity, fundus appearance, and angiographic findings). They reviewed intra- and postoperative complications and used angiochrome reference images for fundus evaluation. The median follow-up time was six months.

The average visual acuity in patients was 0.05 (logMAR 1.3) before and 0.08 (logMAR 1.1) after RON surgery. Dr. Roeder noted no significant change in the visual acuity of patients with an interval in excess of 90 days between the onset of CRVO and RON, at the six-month follow up.

Cases with preoperative severe peripapillary swelling of the optic nerve showed an average increase of 4.2 lines, at the six months follow-up.

Dr Roeder demonstrated shunt vessels at the neurotomy site on angiography in 18/30 cases, after 12 months, accompanied by an average improvement of six lines of visual acuity. Visual field tests showed various defects in 86.8% of all cases. In one patient an ischaemic injury of the central retinal artery occurred.

The investigators agreed that a combined pharmacologic/surgical approach was likely to be most beneficial for these patients. Such approaches could include triamcinolone combined with photocoagulation or surgery.

**Johan Roader MD**

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“Patients who have had CRVO for less than three months with severe signs of peripapillary swelling can benefit from this surgical approach. The theory is that CRVO constitutes a neurovascular compartment syndrome at the site of the lamina cribrosa that is alleviated by performing a radial incision at the nasal part of the optic nerve to relax the cribiform plate and the adjacent sclera,” he reported.

Investigators at five retinal centres performed RON in 107 patients with CRVO (55 right and 52 left eyes), with an average age of 68 years (range 21-91 years). One centre analysed all data using a standardised protocol (preoperative and postoperative visual acuity, fundus appearance, and angiographic findings). They reviewed intra- and postoperative complications and used angiochrome reference images for fundus evaluation. The median follow-up time was six months.

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