No compelling rationale for lamina puncture or RON in CRVO patients, retina specialists say

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in Frankfurt

PILOT studies using lamina puncture and radial optic neurotomy (RON) for the treatment of patients with central retinal vein occlusion (CRVO) demonstrate results that closely parallel the projected natural history of eyes with this condition. The results are so unconvincing that some researchers are choosing to abandon these methods altogether.

“There is an enormous interest in finding some sort of surgical procedure for the treatment of CRVO, a very difficult condition. Many therapies have been attempted: laser, systemic, intravitreal drugs and surgical treatments. The role, however, of transvitreal optic nerve disc surgery for CRVO by radial optic neurotomy and by lamina puncture in 2006 is very limited,” said Donald J D’Amico MD, at the Frankfurt Retina Meeting.

Dr D’Amico performed a pilot study that included 20 patients who underwent lamina puncture for CRVO. Unlike RON that involves a radial incision in the margin of the nerve, Dr D’Amico’s technique works by creating a mid-nerve incision, adjacent to the central vein that allows it to dilate.

The results showed that four patients, whose vision was initially 20/200 or worse, had improved postoperative vision of 20/50 - 20/200. The remaining 16 study patients had no improvements in vision.

Dr D’Amico included patients with CRVO with duration of less than one year. He attempted to study patients with less than one month disease duration, but such patients were difficult to recruit. All patients were above age 65 years with visual acuity of 20/200 or worse. Twelve of these patients had the non-ischemic form of CRVO, while the remaining eight had the ischemic form.

The 20 study patients had a mean age of 72 years. The average time from CRVO to lamina puncture was 5.4 months. All but three of the patients had initial poor pre-operative visual acuity. The mean follow-up time was 20 months.

**Massaging the vein to dislodge a clot**

In lamina puncture, Dr D’Amico tries to create a space for the vein to dilate. Histological studies reveal a blood clot in the region of the lamina in CRVO eyes that both RON and lamina puncture seek to remove. By massaging the vein at the area of the puncture, he hoped during surgery to prod the clot into dislodging, or to relax the scleral fibers adjacent to the vein, allowing it to dilate and restore flow.

To achieve this, the surgeon requires a knife with one dull and one sharp edge. The dull side slides along the vein not cutting it and the sharp side creates the space adjacent to the vein.

Dr D’Amico reported that his study results basically corroborated those achieved in the Central Vein Occlusion Study (CVOS). This trial involved the careful observation of 714 CRVO eyes, with a follow-up period of one to three years.

Dr D’Amico pointed out that in CVOS overall, the initial visual acuity was strongly predictive of final visual acuity. The initial visual acuity categories were: 20/40 or above, 20/50 - 20/200, and 20/200 or below. (Arch Ophthalmol. 1997;115:486-491)

He said that if applying this observation to his pilot study eyes, three eyes should have achieved middle category vision, with no surgery at all, just with observation. Similarly, in the three eyes that had initial visual acuity in the middle category, CVOS results predict that two of these would have the same visual outcome. Dr D’Amico pointed out that the CVOS results reflected the results he achieved in the pilot study.

He noted that late postoperative vitreous haemorrhage occurred in three eyes, one of which spontaneously cleared (20/400), and two that required vitrectomy (20/500, 20/800). Other complications included one eye with retinal detachment (CF2), and another with endophthalmitis (20/200).

Five eyes developed iris neovascularisation, with and without glaucoma. Dr D’Amico was able to treat one of these successfully with panretinal photocoagulation. The remaining four patients developed severe glaucoma that required multiple laser intervention. Dr D’Amico observed that all eyes with iris neovascularisation and neovascular glaucoma had pre-operative ischemia.

When contrasting the results achieved from an investigation that used RON for CRVO (O premacl- Retina 2001;21:408-415), Dr D’Amico noted that although all eleven of the study eyes started off in the worst visual category, five reached the middle and two the best visual category - which is much better than CVOS results would predict, he said. CVOS would have predicted only but a few eyes in the middle category.

To explain this discrepancy, Dr D’Amico noted that in Dr O premacl’s paper, six eyes are described as indeterminate, due to the presence of extensive retinal or vitreous haemorrhage that produced inaccurate interpretation of fluorescein angiograms. He explains that as some of the eyes received vitrectomy for vitreous haemorrhage, there may have been media effects that improved visual acuity.

Looking at 65 eyes of all RON studies taken together, Dr D’Amico observed that 13 eyes had an initial visual acuity in the middle, while 52 were in the worst group. Final visual acuity for all 65 eyes revealed five in the best visual group, 26 in the middle and 34 in the worst. CVOS projected that there would have been three or more in the first, 15 in the second and 47 in the worst category.

Dr D’Amico concluded the additional effects of media-clearing surgery in those cases involving vitreous haemorrhage, the inevitable bias in non-randomised pilot trials, and the large complication rate. The difference between results obtained by RO N, lamina puncture, and CVO S were minimal.

He said that the analysis of transvitreal optic nerve disc surgery for CRVO by either RON or lamina puncture demonstrates results that so closely parallel the projected natural history, as seen in the CVOS, that he has stopped performing lamina puncture and recommends that RON also be abandoned.

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