Radial optic neurotomy provides little benefit in non-ischemic CRVO

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“Because radial optic neurotomy to have its desired effect, we have to differentiate between ischemic CRVO and non-ischemic CRVO. While vision improves in the ischemic type, it does not in the non-ischemic type, and this is something that retinal surgeons need to look out for. Vitrectomy is of no use in non-ischemic cases either,” said Dr Quiroz-Mercado.

In general, ischemic CRVO involves poor visual acuity (≤ 20/200), haemorrhage, absent papillary defect, and an abnormal electroretinogram. It represents approximately 40 per cent of cases. Non-ischemic CRVO, on the other hand, is defined by good visual acuity (≥ 20/50), less haemorrhage, absent afferent papillary defect, normal electroretinogram. Most of the cases an ophthalmologist will see in his office are of the non-ischemic type.

Most CRVO patients, therefore, do not require surgery, he noted, as non-ischemic CRVO tends to improve without invasive surgical intervention. Dr Quiroz-Mercado noted that benign treatments, such as anti-VEGF injections, would likely be all that these patients need.

He said that RON needs to be evaluated without vitrectomy, to determine the actual extent of its effects. He noted that in his experience, nearly all RON surgeries were performed with a complete vitrectomy and posterior hyaloid removal, and therefore the effects of RON without vitrectomy were virtually unknown.

Vitrectomy is known to increase the oxygen supply to the vitreous cavity. It also removes growth factors as well as the scaffold supporting proliferations within the posterior eye segment. Vitrectomy also improves macular function, he said, and therefore the efficacy of RON itself without the added effects of vitrectomy must be established.

Dr Quiroz-Mercado evaluated the role of vitrectomy in laser-induced chorioretinal venous anastomosis surgery in patients with CRVO. He performed laser-induced anastomoses in non-ischemic CRVO eyes and also performed pars plana vitrectomy using an erbium:YAG laser in ischemic cases, perforating the retinal vein as well as the Bruch’s membrane.

He performed vitrectomies to prevent proliferation in shunt surgeries if the use of vitrectomy and chorioretinal anastomoses in ischemic cases, Dr Quiroz-Mercado could nicely demonstrate communicating circulatory paths with angiography.

In the ischemic CRVO cases, 60 per cent of the patients showed improved visual acuity (without anti-VEGF drug therapy). The results seen after RON in non-ischemic cases (without anterior hyaloid removal) did not give visual improvement. There were, however, severe complications in these cases.

Dr Quiroz-Mercado explained that the retinal blood flow is reduced within the first week following surgery. The blood flow after pars plana vitrectomy, however, is not changed, he observed.

He noted that eyes that had the formation of chorioretinal anastomoses did not show improved blood flow. Interestingly, at six months following surgery, retinal blood flow was comparable to the pre-operative state. There is also a gradual reduction of macular oedema up to six months postoperatively, without any improvement in retinal blood flow. Dr Quiroz-Mercado believes that the vitrectomy most likely helped blood flow in these cases.

The optociliary veins provide a pre-existing shunt system that allows retinal venous blood to bypass the central retinal vein and exit from the orbit via the choroidal circulation and its anastomoses. This venous system protects CRVO eyes against anterior segment neovascularisation, he said.

Of the ischemic CRVO cases, about 50 per cent will develop acquired opticociliary veins and are likely to experience stable or improved visual acuity. Dr Quiroz-Mercado observed that there have been investigations that suggested that RON induces opticociliary vein genesis.

He noted that certain CRVO cases were likely to follow the course of their natural history with or without surgery, as shown in the Central Vein Occlusion Study - CVOS (Arch Ophthalmol 1993;111:1095). This investigation revealed the natural history and clinical management of CRVO in 725 patients with a three-year follow-up.

The patients were categorised into three main visual groups: patients with visual acuity of 20/40 or better, those with 20/50 – 20/200; and those with visual acuity of less than 20/200. Patients in the last group had an 80 per cent chance of having an outcome of below 20/200. Their treatment plan included prevention of visual acuity decrease and the development of anterior segment neovascularisation.

In contrast, 65 per cent of patients with an initially good visual acuity of at least 20/40 maintained their vision at the end of the study. In the 20/50-20/200 group, 19 per cent improved to better than 20/50, 44 per cent maintained their vision, and 37 per cent had final visual acuity of worse than 20/200.

Based on this study and his own experience with RON, Dr Quiroz-Mercado recommended that ophthalmologists perform a careful slit-lamp evaluation for iris neovascularisation and anterior chamber angle neovascularisation, upon the patient’s initial visit. Patients with visual acuity below 20/200 have a high correlation with the presence and development of ischemia.

He recommends no treatment for patients with visual acuity over 20/40 - these cases are mostly non-ischemic and do well on their own, usually spontaneously. For patients in the middle group, he recommends vitrectomy as a possible treatment. For patients categorised in the worst vision group, Dr Quiroz-Mercado believes that an effective surgical treatment has yet to be found.