Macular rotation offers a good surgical option for ARMD

William Aylward

Stefanie Petrou Binder MD in Berlin

RETINAL rotation offers a promising surgical option for exudative AMD with the possibility of visual improvement, not just stabilization, according to retinal specialist, William Aylward MD, Moorfields Eye Hospital, London, UK.

“In the treatment of AMD, surgery seems to offer a significant benefit to some patients compared to medical treatment in terms of the number of letters lost/gained after one year. Macular rotation can be applied to large membranes and offers the advantage of restoring reading vision in many cases. On the other hand, it is a long and technically demanding surgery, with a number of complications and the problem of recurrence,” Dr Aylward said during an EURETINA symposium dedicated to current therapies for AMD at the Joint Meeting of the European Society of Ophthalmology and the German Ophthalmology Society (SOE/DGO).

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Retinal rotation developed because of the failure of simple CNV excision. Although the results obtained in young patients with presumed ocular histoplasmosis syndrome (POHS) were good, AMD patients did not benefit visually due to the fact that the membrane lies below the RPE and by removing it, the RPE was excised as well. This method simply converted wet AMD into geographic AMD.

The SST Research Group (surgery for subfoveal excision in AMD) verified these results in a randomised trial that included 454 ARM patients (SST Report no 11. Ophthalmology. 2004 Nov; 111(11):1967-80). The surgeons performed simple CNV excision with a follow up of 24 months. The mean visual acuity declined from 20/100 to 20/400. However, a parallel study did show some benefit for patients with type II CNV. Dr Aylward reported.

Retinal surgeons decided that concentrating on replacing the RPE, or at least restoring the apposition between the failure and the RPE, would alleviate the problem of the loss of vision caused by the failure. Rotation was first performed by Dr Machemer in 1993 (Graefes Arch Clin Exp Ophthalmol.1993; 231(11):635-41). Since then, a study by Claus Eckardt on retinal rotation in 30 eyes with CNV resulted in 60% with ‘useful’ reading vision, five with retinal detachment, three with PVR and three recurrences (Graefes Arch Clin Exp Ophthalmol.1999; 237:313-25). Many patients appeared to have visual benefit.

Subsequent investigations by Dr Eckardt (56 eyes, 12 months follow-up) and Dr Toth (64 eyes, 12 months follow-up) revealed 57% of patients with reading vision, 12% PVR and 15% recurrence rate; 74% reading vision, 8% PVR and a 21% recurrence rate, from these two studies respectively (Retina, 2002 Dec;22(6):786-94; Retina, 2004 Aug 25(5):597-607). Complication rates are decreasing as time goes by, Dr Aylward pointed out.

Limited translocation less successful

Other surgical methods had yielded less promising results, he observed. For instance, limited translocation initially showed some sustained good results but was unfortunately also associated with a significant number of complications. This technique created a temporal retinal detachment with scleral redundancy, thereby producing a fold to allow the fovea to move. In a study published by DJ Dprimarici MD (Am J Ophthalmol. 2000; 0 ct; 130(4):419-428), 102 eyes underwent limited translocation. In that study, 49% of eyes were 20/100 at six months and 48% had two or more lines improvement. Thirty-five per cent of patients had at least one complication including retinal detachment (17.4%), retinal breaks (13.4%), macular holes (7.8%), macular fold (4.6%) and intraocular haemorrhage (9.2%).

Dr Aylward noted that although this surgery was simpler than macular rotation and was able to restore vision in some cases, it was only applicable to small membranes, the movement of fovea was unpredictable and there were significant complications and recurrences. As a result, very few surgeons are pursuing the technique, he said.

Since the 1980s, RPE cell transplantation has evoked the interest of surgeons as a significant opportunity of rotation but instead of moving the retina, move a little patch of pigment epithelium up beneath the fovea. The technique did not involve rejection and avoided the problem of the fovea might play a role here. In a larger series, Jan van Meurs translocated bigger RPE cell patches that he moved from the peripheral retina, with relatively promising results (Am J Ophthalmol 2003; 136:688-695). After 12 months, vision was at least 20/200 in 66% of patients and at least 20/80 in 21%. He observed that the method allowed him to tailor the patch to the defect and that he used thinner patches, which may be important.

Gabriel Coscas MD, who moderated the AMD treatment session, supported rotation surgery in the treatment of wet-AMD patients. Autologous transplantation of RPE and choroid, although more straightforward surgically and with less complications, may be associated with less visual improvement or improvements which are not sustained, he said.

He commented that several pharmacological therapies were now available that have been shown to reduce visual loss from exudative AMD. But he stressed that only surgical treatment has so far been shown to restore vision in selected cases.

“Retinal rotation can result in the restoration of reading vision in a significant proportion of patients. As the surgical technique has developed, the success rate has increased and the complication rate has fallen.”

Gabriel Coscas MD

It was not quite clear, however, if the RPE cells improved vision in the patients that benefited from the procedure or if they may have improved anyway with simple excision of the defect, Dr Aylward observed. He also noted that one of the biggest problems with RPE cells is that they do not stick to a damaged Bruch’s membrane.

RPE translocation

In a case study of his own at Moorfields Eye Hospital, Dr Aylward investigated RPE translocation. The aim was to achieve the same anatomical results of rotation but instead of moving the retina, move a little patch of pigment epithelium up beneath the fovea. The technique did not involve rejection and avoided the problem of adherence to Bruch’s membrane (by transplanting sheets of cells). He observed that the surgery was straightforward and was done in less than an hour.

One case involved a 72-year-old patient in which Dr Aylward moved a patch of choroid and RPE cells to the area beneath the fovea. He noted that the patch did seem to support the fovea and speculated that one problem was that the patch was too small.

The results of the five-year follow-up were not as promising however, revealing visual decline, patch loss, pigment dispersion, fibrosis and a loss of autofluorescence (which probably indicates death or loss of metabolic activity of RPE cells). The visual improvement was less than that achieved with retinal rotation. Dr Aylward speculated that the blood supply to the patch might play a role here.

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