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SHORT COMMUNICATION

Delayed atrophy of the retinal pigment epithelium after submacular surgery

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PURPOSE. *We report a case of delayed atrophy of the retinal pigment epithelium (RPE) eighteen months after apparently successful excision of submacular choroidal new vessels (CNV) in a patient with age-related macular degeneration (AMD).*

METHODS. *Case report.*

RESULTS. *Submacular surgery for CNV was achieved without visible disturbance of the underlying RPE in an 83 year old man diagnosed with AMD. At the time of surgery the CNV displayed clinical features consistent with lying internal to Bruch's membrane (Type 2 configuration). There was no visible RPE defect at the fovea and vision improved during the subsequent 12 months follow-up. Eighteen months later, however, an atrophic central RPE defect appeared, with a similar shape to the CNV originally excised.*

CONCLUSIONS. *This case demonstrates that submacular CNV with Type 2 configuration can occur in AMD and lead to an initially favourable outcome following submacular surgery. Atrophy of the RPE nevertheless did eventually occur and in a pattern consistent with damage during the original operation. It is important to consider results of longer term follow-up when interpreting success rates for surgery in AMD. (Eur J Ophthalmol 2005; 15: 170-2)*

KEY WORDS. *Retina, CNV, Bruch's membrane, Choriocapillaris, Macular degeneration*

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INTRODUCTION

Submacular surgery for CNV is an established technique with favourable results in patients diagnosed with the presumed ocular histoplasmosis syndrome (1), but is less successful in AMD (2, 3). Gass has suggested that CNV location is crucial in determining the success of surgery (4), with Type 2 CNV (lying between the RPE and retina) having a better prognosis than Type 1 CNV (lying external to the RPE). Submacular surgery on the latter is almost invariably associated with concurrent removal of the overlying RPE during surgery, creating an atrophic defect and an immediate loss of vision. Here however we report an unusual case in which the CNV appeared to be of Type 2 configuration and submacular surgery had an initially favourable outcome.

Case report

An 83 year old man presented with a two month history of metemorphopsia in his left eye. On examination his best corrected visual acuity was 6/60 in the amblyopic right eye and 6/24 in the left eye. Macular RPE changes were noted in both fundi and a fluorescein angiogram showed a wholly 'classic' subfoveal CNV in the left eye (Fig. 1A) with late staining of macular drusen in the right eye. Optical coherence tomography confirmed the presence of a lesion at the fovea with elevation of the overlying retina (Fig. 2). He was diagnosed with AMD and after informed consent, was enrolled into an RPE translocation trial to undergo submacular surgery. One month later he underwent left CNV excision using a technique previously described (3). During surgery, the deep surface

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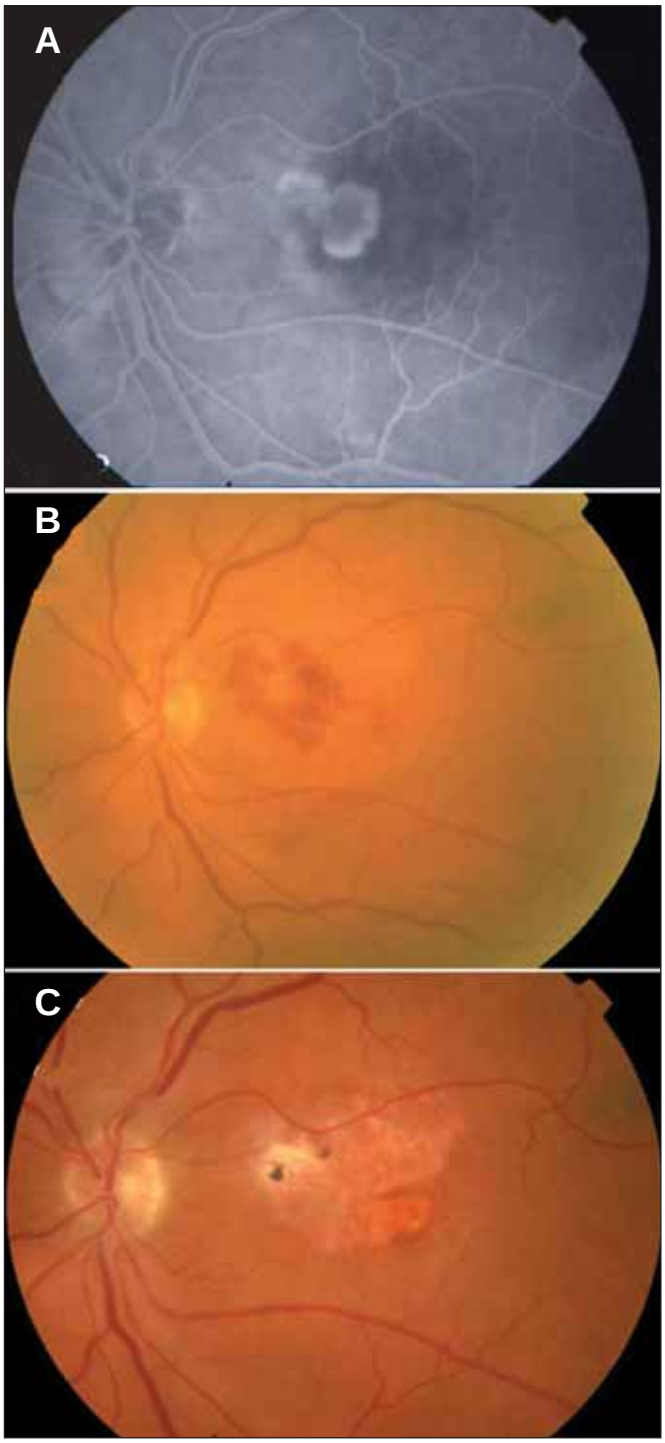

Fig. 1 - (A) *Early phase fluorescein angiogram showing 'classic' CNV extending under the left fovea.* **(B)** *Left fundus photograph six weeks after surgery showing intact subfoveal retinal pigment epithelium and a small subretinal haemorrhage around the retinotomy site.* **(C)** *Left fundus photograph eighteen months after surgery showing widespread subfoveal atrophy of the retinal pigment epithelium. The shape of this defect matched the underlying extensions of the CNV noted at surgery.*

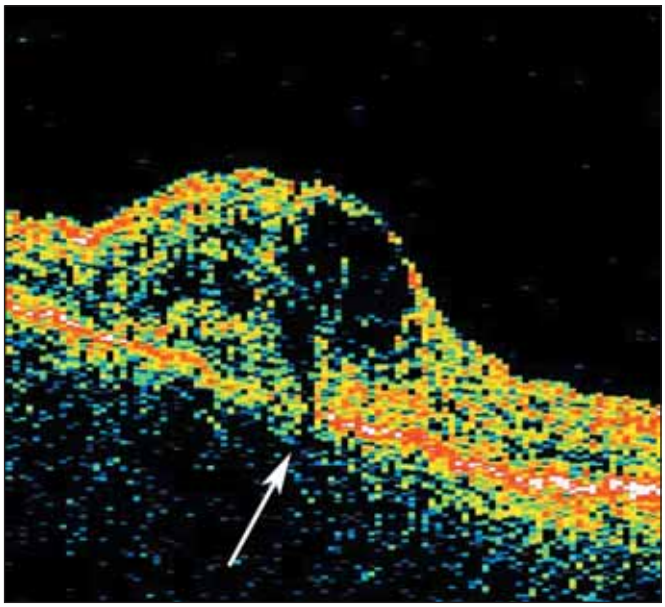

Fig. 2 - *Horizontal optical coherence tomography of the fovea prior to surgery. A focal deficit in the underlying RPE echo is seen (white arrow), which may represent the site of ingrowth of the CNV into the subretinal space. The dark areas in the elevated retina most likely represent fluid leakage which contributed to the presenting complaint of metamorphopsia.*

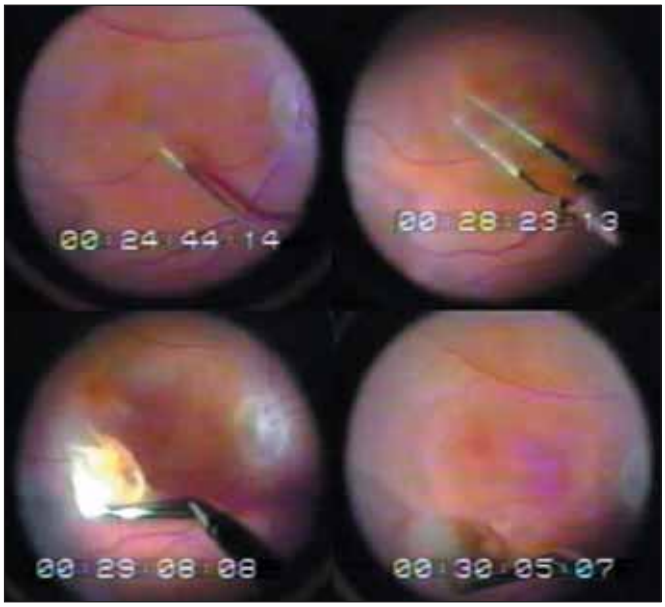

Fig. 3 - *Captured still frames from a video taken at the time of submacular surgery (GWA) - the duration of surgery is shown with each frame.* (Above Left) *Subretinal injection of balanced salt solution over the CNV.* (Above Right) *Engaging the CNV with membrane forceps.* (Below Left) *Removal of the CNV.* (Below Right) *No RPE defect is seen in the macular region.*

of the CNV was noted to be covered with RPE, consistent with a Type 2 configuration and the excised tissue was considerably larger than the perfused CNV originally seen on angiography (Fig. 3). After CNV removal, there was a small subretinal haemorrhage nasal to the fovea, but no RPE defect was seen. The patient had initially been enrolled into an RPE translocation trial, but in the absence of any visible RPE defect, it was decided not to translocate an RPE patch and the globe was closed after air fluid exchange. Postoperative follow-up confirmed no obvious RPE defect (Fig. 1B) and during this time the vision improved from 6/60 to 6/36 with only a small RPE defect noted at the retinotomy site. One year later he underwent phacoemulsification cataract surgery and the vision remained at 6/36 with no sign of recurrence of CNV or further macular changes in either eye. At final review 18 months after surgery, however, a large RPE defect had appeared in the submacular region and the vision had fallen to 6/60. The angular shape of this defect was consistent with the RPE having been damaged at the time of surgery (Fig. 1C).

CONCLUSIONS

The development of an atrophic patch of RPE following excision of CNV in AMD is well recognised and had previously been reported (2). This case is unusual in that surgery appeared successful for at least one year during the follow-up period. RPE atrophy did eventually occur, but was not apparent until 18 months after surgery when vision also fell. This event may have been triggered by cataract surgery, or it may have occurred as a co-incidence, possibly secondary to late photoreceptor cell death. The irregular shape of the RPE defect (Fig. 1c) matched precisely the subretinal extensions of the fibrotic elements of the original CNV noted at surgery (Fig. 3) and for this reason, was most likely related to it. To our knowledge, this is the first reported instance in AMD of late RPE atrophy, occurring 18 months after an initially successful surgical excision of Type 2 CNV. Late widespread atrophy of the RPE is not a feature observed after surgery for non-AMD related CNV in our cases and other studies (2). The interaction between Type-2 CNV and the underlying RPE is more complicated in AMD when compared to other causes of subretinal neovascularization and caution is advised when interpreting good results from relatively short-term follow-up after submacular surgery.

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