

Pigmented epiretinal membranes caused by RPE migration: OCT-based observational case reports

*Vasumathy Vedantham, MS, FRCS;
Kim Ramasamy, DNB*

Epiretinal membranes are cellular sheets on the retinal surface that are formed due to varied etiologies. We present two observational case reports to demonstrate the transretinal migration of the retinal pigment epithelium in pigmented idiopathic epiretinal membranes using optical coherence tomography.

Key words: Epiretinal membrane, idiopathic, optical coherence tomography, retinal pigment epithelium, transretinal migration.

Retina-Vitreous Service, Aravind Eye Hospital and Postgraduate Institute of Ophthalmology, Madurai, Tamil Nadu, India

Correspondence to Dr. Vasumathy Vedantham, Retina-Vitreous Service, Aravind Eye Hospital and Postgraduate Institute of Ophthalmology, 1, Anna Nagar, Madurai - 625 020, Tamil Nadu, India. E-mail: drvasumathy@yahoo.com

Manuscript received: 24.11.05; Revision accepted: 01.07.06

Indian J Ophthalmol 2007;55:148-9

Epiretinal membranes (ERMs) are cellular sheets on the retinal surface that arise in a variety of situations.^{1,2} Transretinal migration of retinal pigment epithelium (RPE) has been shown to be involved in the formation of secondary ERMs after retinal detachment.³ This is a report of two cases with optical coherence tomography (OCT) illustrating the translocation of RPE in idiopathic ERMs.

Case Reports

Case 1

A 64-year-old man was discovered to have a pigmented ERM over the macula in the right eye incidentally [Fig. 1A]. On questioning, he admitted to having had poor vision (perception of hand movements) for many years. The left eye was within normal limits with a vision of 20/20. Detailed examination failed to reveal an ocular cause of the ERM, which was therefore designated as idiopathic. OCT demonstrated the highly reflective ERM seen as a bright orange-red-colored membrane on the inner retinal surface with optical shadowing of the underlying structures [Figs. 1 B, C] and focal intraretinal spots suggestive of transretinally migrated RPE [Fig. 1D]. The patient was advised observation and regular follow-up.

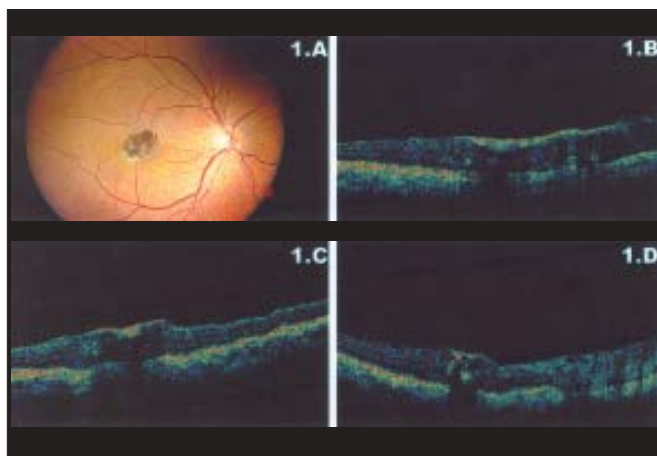


Figure 1: (A) Color fundus photograph of the right eye of case 1 showing a pigmented epiretinal membrane over the macula, (B) OCT (Horizontal line scan) through the fovea showing a highly reflective ERM and shadowing of the underlying retinal layers including the RPE, (C) OCT (Vertical line scan) through the fovea showing a highly reflective ERM and shadowing of the underlying retinal layers including the RPE, (D) OCT (Oblique line scan) through the fovea showing a highly reflective ERM as well as focal intraretinal spots of the same reflectivity below the ERM suggestive of transretinally migrated RPE

Case 2

An 18-year-old female patient presented with the complaints of longstanding defective vision in the left eye with a visual acuity of 20/200. The right eye had a visual acuity of 20/20. Ocular examination revealed an ERM that had two parafoveal pigmented patches. There were adjacent RPE atrophic changes as well [Fig. 2A]. No other ocular cause of the ERM could be discerned. OCT of the fovea showed a highly reflective epiretinal membrane over the fovea with disruption of the underlying RPE layer (true disruption) [Fig. 2B]. Other areas of focal outpouchings and disruptions of the RPE as well as intraretinal accumulations of highly reflective material suggestive of intraretinally migrated RPE, were revealed by parafoveal scanning [Figs. 2 C, D]. Systemic investigations were noncontributory. Based on the above findings, a diagnosis of idiopathic ERM in the left eye was made and the patient was advised observation and discharged.

Discussion

The formation of ERMs comprises both reparative processes (gliosis) by Muller and other glial cells and fibrosis by the RPE cells and fibroblasts.² The migration of these component cells, especially the RPE towards the developing ERM and then within the ERM is crucial. However, the directionality and the exact stimuli for the migration are still unclear. Zacks *et al.* have demonstrated transretinal migration of RPE by OCT in secondary ERMs (post retinal detachment with documented retinal breaks), that facilitated the access of the RPE cells to the epiretinal surface.³ In this observational case series, a similar transretinal migration of RPE was observed in two cases of idiopathic ERMs. These cases had no retinal break that could account for the access of the RPE to the retinal surface. The intraretinal high reflective

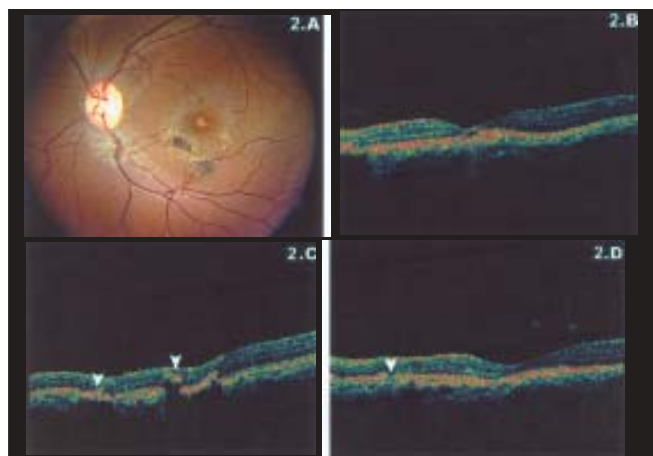


Figure 2: (A) Color fundus photograph of the left eye of Case 2 showing an epiretinal membrane over the macula that has two areas of focal pigmentation inferior to the fovea, (B) OCT (Horizontal line scan) through the fovea showing a highly reflective ERM and disruption of the underlying RPE layer, (C) OCT (Horizontal line scan) inferior to the fovea through the pigmented parts of the ERM showing local areas of outpouching and intraretinal spots of high reflectivity suggestive of migrated RPE (white arrow heads). Pseudodisruption of the RPE layer due to shadowing by the overlying intraretinal RPE is also obvious, (D) OCT (Vertical line scan) inferior to the fovea through the pigmented parts of the ERM showing a local area of true disruption of the RPE (white arrow head)

(orange-red) spots seen by OCT had the same reflectivity as the RPE and were found in the same location as the pigments seen on the fundus photograph. They are not likely to be caused by isolated translocated melanin, since RPE cells are unable to form melanin after birth⁴ and the spots probably represent proliferated and migrated RPE cells themselves. This is also corroborated by the demonstration by OCT in Case 2 of local areas of outpouching of the RPE [Fig. 2C] and true disruption of the RPE [Figs. 2B and D].

This suggests that transretinal migration of RPE might be the primary pathogenetic mechanism in the formation of selected ERMs. Although the direct access of the RPE to the retinal surface via an open break as in the case of ERMs following retinal detachments does occur, it might be a secondary additional mechanism occurring solely in the formation of such membranes. Further histopathologic studies on various ERMs are needed to support this contention.

References

1. Mori K, Gehlbach PL, Sano A, Deguchi T, Yoneya S. Comparison of epiretinal membranes of differing pathogenesis using optical coherence tomography. *Retina* 2004;24:57-62.
2. Hogg PA, Grierson I, Hiscott P. Direct comparison of the migration of three cell types involved in epiretinal membrane formation. *Invest Ophthalmol Vis Sci* 2002;43:2749-57.
3. Zacks DN, Johnson MW. Transretinal pigment migration: An optical coherence tomographic study. *Arch Ophthalmol* 2004;122:406-8.
4. Wallow IH, Ts'o MO. Proliferation of the retinal pigment epithelium over malignant choroidal tumors. A light and electron microscopic study. *Am J Ophthalmol* 1972;73:914-26.