International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 20s, 2025
https://theaspd.com/index.php

An Unusual Case Of Pigmented Epiretinal Membrane

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Abstract: *Pigmented epiretinal membrane (ERM) is a rare clinical entity that can pose diagnostic and management challenges. We report a case of a 58-year-old female who presented with progressive visual distortion and metamorphopsia in the left eye. Fundoscopic examination and multimodal imaging revealed a hyperpigmented epiretinal membrane with associated retinal striae. The patient underwent pars plana vitrectomy with membrane peeling, resulting in significant visual improvement. This case highlights the importance of considering pigmented ERM in differential diagnoses and discusses its possible pathogenesis, clinical presentation, and management.*
Keywords: *Pigmented epiretinal membrane, Epiretinal fibrosis, Retinal pigment migration, Vitrectomy, Multimodal imaging*

INTRODUCTION

Epiretinal membranes (ERMs) are fibro cellular proliferations on the inner surface of the retina, typically over the macula. These membranes may cause retinal wrinkling, metamorphopsia, and decreased visual acuity. Most ERMs are idiopathic and non-pigmented, arising from glial and myofibroblast cells, with some contribution from retinal pigment epithelium (RPE) cells in secondary cases(1) (2). Pigmented ERMs are rare and may represent RPE cell migration due to retinal breaks, inflammation, or unnoticed trauma (3).

Pigmented ERMs have been sporadically reported and can often be misdiagnosed due to their unusual appearance. Here, we report a rare case of a pigmented ERM in an otherwise healthy elderly female, with no apparent secondary cause.

Case Presentation:

A 58-year-old female presented with progressive metamorphopsia and decreased visual acuity in the left eye over the past 1 month. Her best-corrected visual acuity (BCVA) was 6/12 in the right eye and CF@1m in the left eye.

Slit-lamp examination was unremarkable, but fundoscopic examination of the left eye revealed an irregularly pigmented epiretinal membrane with tractional bands surrounding it [Fig 1]. Optical coherence tomography (OCT) demonstrated a hyperreflective epiretinal membrane over the fovea seen as a bright orange-red-coloured membrane on the inner retinal surface with optical shadowing of the underlying retinal layers including the RPE [Fig 2]. OCT also shows focal intraretinal spots of the same reflectivity below the ERM suggestive of transretinally migrated RPE.

Given the progressive visual symptoms and structural changes, the patient underwent a 25-gauge pars plana vitrectomy with membrane peeling. Intraoperatively, the membrane was noted to have dark pigmentation, which was carefully peeled without complications. At 3 months postoperatively, the patient's BCVA improved to 6/12. OCT showed resolution of traction and restoration of the foveal contour.

DISCUSSION:

Epiretinal membranes (ERMs) are fibro cellular proliferations on the inner surface of the retina, primarily over the macular area. While most ERMs are translucent or grey-white and composed predominantly of glial cells, a rare variant contains melanin-bearing cells, typically of retinal pigment epithelium (RPE) origin. This pigmentation gives these membranes a distinctive appearance that may lead to diagnostic confusion with other pigmented retinal lesions (4).

Pathogenesis of ERM generally involves proliferation and migration of glial cells, hyalocytes, fibroblasts, and in some cases, RPE cells on the inner limiting membrane (ILM)(2). Pigmented ERMs are often associated with retinal breaks, trauma, or inflammation, where RPE cells gain access to the retinal surface through disruptions in the neurosensory retina or the ILM (3). In such settings, RPE cells may undergo epithelial-mesenchymal transition (EMT), acquire migratory capacity, and contribute to the fibro cellular

membrane (3). However, our case lacked any signs of retinal break, posterior uveitis, prior ocular surgery, or trauma, raising the possibility of idiopathic pigmented ERM.

Histopathological findings in pigmented ERMs have confirmed the presence of melanin-laden cells along with glial components. Saito et al. (3) demonstrated in their histological study that pigmented ERMs contain melanin-positive, cytokeratin-positive, GFAP-negative cells, consistent with RPE origin. Similarly, Kampik et al.(1) described RPE and fibroblast-like cells in ERMs obtained during vitrectomy in cases of proliferative vitreoretinopathy (PVR) and idiopathic ERM. The presence of RPE cells in an otherwise idiopathic case suggests that subclinical retinal injury, microtears, or unnoticed episodes of inflammation may have allowed RPE migration to the retinal surface.

Multimodal imaging plays a key role in differentiating pigmented ERMs from other retinal pigmentary lesions. Optical coherence tomography (OCT) typically shows a hyperreflective membrane on the retinal surface with underlying traction, distortion, or retinal thickening (5). Fundus autofluorescence (FAF) may demonstrate hypoautofluorescent areas corresponding to melanin deposits due to the pigment's light-blocking effect.

Differential diagnoses include conditions such as congenital hypertrophy of the RPE (CHRPE), pigmented scar tissue from old choroiditis, retinal haemorrhages, or even intraocular foreign bodies. The presence of surface wrinkling and characteristic tractional features on OCT should raise suspicion for pigmented ERM (3).

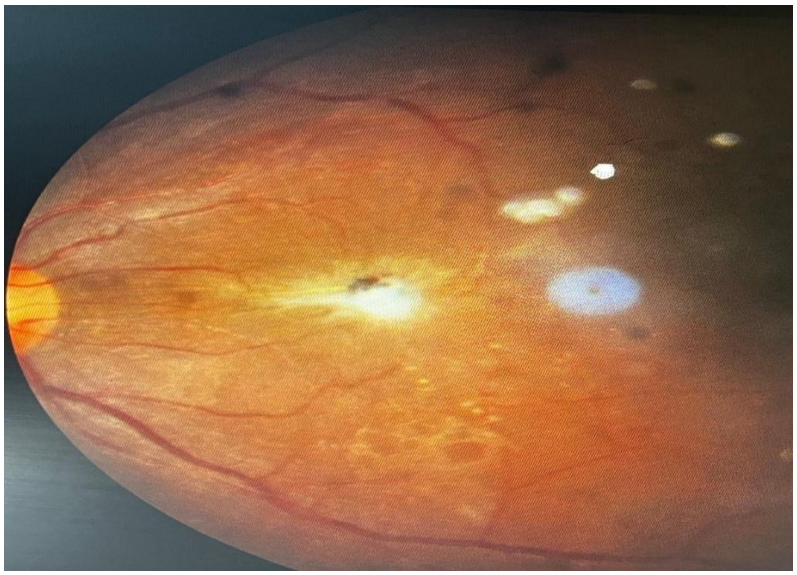
Management of symptomatic ERMs, whether pigmented or not, involves pars plana vitrectomy with membrane peeling. Surgical outcomes in pigmented ERMs are generally favourable, although long-standing cases may show limited visual recovery due to chronic retinal distortion. In a small series by Shimada et al.(5), patients with pigmented ERMs who underwent membrane peeling experienced visual improvement and anatomical restoration on OCT. Our patient also showed improvement in visual acuity at 3 months postoperatively, along with resolution of retinal surface distortion.

It remains unclear whether the presence of pigment itself affects prognosis. Some authors have speculated that pigment may act as a scaffold or adhesive substrate, making membrane dissection more challenging (6). However, with modern vitrectomy techniques and staining agents such as trypan blue or brilliant blue G, complete membrane peeling can typically be achieved.

CONCLUSION:

In summary, pigmented ERM is a rare clinical entity that requires careful differentiation from other pigmented macular lesions. Multimodal imaging and histopathology are crucial for diagnosis. Surgical peeling is effective and can result in visual improvement, especially if performed before permanent retinal damage occurs.

Fig 1: Colour fundus photograph of the left eye showing a pigmented epiretinal membrane over the macula



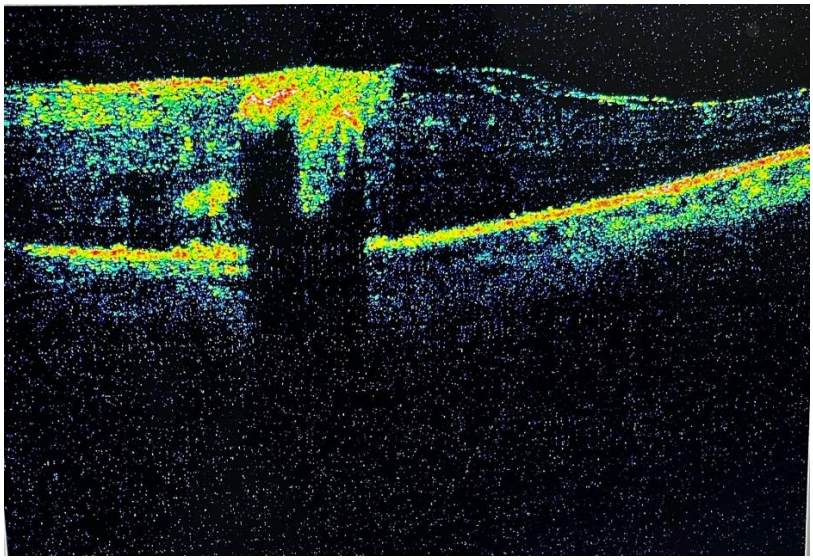


Fig 2: OCT (Horizontal line scan) through the fovea showing a highly reflective ERM and shadowing of the underlying retinal layers including the RPE

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