Massive Retinal Pigment Epithelial Detachment found in an asymptomatic patient with Macular Degeneration

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Abstract
Retinal pigment epithelial detachments (PED) are known to develop in eyes with macular degeneration. This case report will explore the asymptomatic presentation of a serous PED 1,003 µm in height and 2,311 µm in width in a patient with moderate dry AMD.

Case History

- Patient demographics:
  - 76 year old white male
  - Chief complaint: No visual complaints. Patient reported to clinic for a 6 month follow-up to monitor a flame hemorrhage OS noted at exam 12/2010

- Medical History
  - Atrial fibrillation
  - Colon polyps
  - Sensorineural hearing loss
  - Hyperlipidemia

- Ocular history:
  - Moderate dry AMD OD > OS
  - Flame-shaped hemorrhage OS
  - Pseudophakia OU
  - Map-dot dystrophy OS>OD

- Medications
  - Aspirin 81MG
  - AREDS
  - Recorded allergies to penicillin

Pertinent Findings

Clinical:

Exam July 28, 2011 White River Junction, VA Eye clinic

- Symptoms: No ocular symptoms
- VA : without correction
  - OD 20/30+ NIPH
  - OS 20/25 NIPH

- Slit Lamp Examination:
  - Lids/Lashes: Clear OU
  - Sclera/Conjunctiva: White and quiet OU
  - Cornea: Mild EBMD OU
  - Iris: Flat OU
  - Anterior Chamber: Deep and quiet OU; Angles 4/4 by Van Herrick

- IOP @ 10:45am Goldmann tonometry
  - OD: 19mmHg
  - OS: 19mmHg
Dilation: 1gt Tropicamide 1% and 1gt Phenylephrine 2.5% OU

Dilated fundus exam
  o Lens: PCIOL OU
  o Vitreous
    ▪ Moderate syneresis OU
  o Optic Nerve
    ▪ OD: C/D 0.20 rounds with PPA
    ▪ OS: C/D 0.20 round with PPA
  o Macula: Intermediate sized drusen and macular mottling OU
    ▪ Large PED temporal to the macula OD with overlying intermediate sized drusen
    ▪ No blood or exudates – clear fluid filled PED OD
  o Vessels: healthy OU with arterial-venous ratio of 2/3 OU
  o Periphery: flat and intact, no holes or tears OU

Amsler
  o OD distortion nasal to fixation
  o OS clear

OCT – macular
  o OD: Signal strength 8/10; Very large PED temporal to the macula
  o OS: Signal strength 7/10; Mild edema superior to macula, irregular foveal contour

Fluorescein Angiopathy
  o IVFA: transit time <30 seconds
    ▪ Early
    ▪ Missed due to blepharospasm
  o Mid:
    ▪ OD: Well circumscribed area of hyperfluorescence corresponding to area of RPE detachment
    ▪ OS: Scattered hyper-fluorescing soft drusen.
  o Late:
    ▪ OD: Scattered hyper-fluorescing soft drusen and continued WELL CIRCUMSCRIBED
    ▪ hyperfluorescence of RPE detachment. No sign of neovascularization
    ▪ OS: Scattered hyper-fluorescing soft drusen.

Differential diagnosis

- Primary: Serous retinal pigment epithelial detachment OD

- Other differential diagnosis
  o Choroidal neovascular membrane
  o Central serous chorioretinopathy
  o Drusenoid PED
  o Cystoid macular edema
  o Maculopathy associated with optic disk pit

Central serous chorioretinopathy is commonly found in younger male patients with ‘type A’ personalities, typically there are not coexisting retinal findings consistent with AMD. 1-2 Cystoid macular edema can be encountered in the post-operative period from ocular surgery but is also associated with diabetic retinopathy, vein occlusions, retinitis pigmentosa among others. 1-2 Cystoid macular edema can be present in AMD but can be differentiated from a PED using OCT and/or ophthalmoscopy. 1-2 Maculopathy associated with an optic pit usually present during adolescent years in patients with optic pits. 1-2 Drusenoid PEDs is a term given to an area of confluent soft drusen. 3-4 A drusenoid PED can be a risk factor for the development of a serous PED because the soft drusen create areas of focal RPE detachments. 3-4 Choroidal neovascular membranes can grow through breaks in Bruch’s membrane and leak
blood and fluid in wet macular degeneration. The leakage of the neovascular vessels can contribute to the formation of a neovascular PED. 5

**Diagnosis and Discussion**

A PED is a localized area of RPE detachment resulting from the accumulation of sub-RPE fluid. 5 The exact etiology remains elusive but current hypotheses include a reduction of hydraulic conductivity of the thickened Bruch’s membrane which impedes the movement of fluid from the RPE towards the choroid. 3, 5-6 Accumulation of lipid in Bruch’s membrane, seen clinically as drusen, renders it a hydrophobic barrier to normal movement of fluid and ions by the RPE into the choroid inducing serous PED. 3, 5-6 In the presence of a choroidal neovascular membrane (CNVM) the new blood vessels can also contribute to the sub-RPE fluid. 3, 5-6

PEDs are classified based on the fluid composition beneath the detachment and according to the presence or absence of a CNVM. 3-4

- Drusenoid PED
  - Pseudo-PED
  - Presence of areas of confluent soft drusen can be a pre-disposing risk factor for serous PEDs because the soft drusen create areas of focal RPE detachments (drusenoid PEDs)
- Serous
  - Clear subpigment epithelial fluid
- Turbid
  - Cloudy subpigment epithelial fluid
  - No evidence of blood or lipid in the subpigment epithelial fluid
- Hemorrhagic without CNVM
  - Evidence of blood or lipid in the subpigment epithelial fluid but no identifiable CNVM
- Hemorrhagic with CNVM
  - Identifiable CNVM

Ocular coherence tomography and fluorescein angiography are useful imaging tests to differentiate among the various forms of PED lesions and discriminate from other maculopathies with similar funduscoscopic appearances. 7 On OCT imaging PEDs appear as a dome shaped elevation. 7 In a normal eye the highly reflective band of RPE should be continuous with the normal retinal configuration. 7 In the presence of a PED distortion to the normal retinal contour is often present but the retinal architecture should remain intact. 7 Disruptions to the layer of RPE should raise flags concerning potential RPE tears. 7 PEDs exhibit increased backscattering, shadowing of the choriocapillaris, possibly due to the refractive index difference between the serous fluid and the choriocapillaris. 7

Flourescein angiography of a serous PED include early hyperfluorescence which remains well circumscribed without leakage throughout late phase. 8 If the PED has an associated CNVM leakage from the neovascular vessels will be visible in the later stages of the angiography. 8

**Treatment and Management**

Our patient was referred to a local retinologist for evaluation due to the size and location of the PED. He will be seen in early September 2011 and we are waiting to hear the retinal specialists impressions of this lesion. The preferred practice patterns established by the Academy of Ophthalmology classifies any PED as a neovascular maculopathy even in the absence of CNV. 9 Despite this definition the decision to treat and how to treat in the absence of CNVM remains controversial.

Limited research is available focused on serous PED as a majority of studies examine the response of PEDs to treatment in the presence of a CNVM. Moorfields Macular Study Group found a poorer visual acuity outcome in serous PED patients treated with argon laser photocoagulation compared with untreated control. 10 More recent findings, although not limited to serous PEDs, include Chan et al who identified PED height as an independent risk factor for development of an RPE tear spontaneously or associated with various methods of treatment. 11 Recent
Publications in Retina have shown promising results for various types of antiangiogenic therapy but further studies are needed to determine if the benefits of treatment outweigh the risks for PEDs without associated CNVMs.\textsuperscript{12-14} The results of recent studies have established antiangiogenic therapy as an acceptable form of treatment for eyes with neovascular AMD and a PED component.\textsuperscript{14} However, serous PEDs or other forms of PEDs without an associated CNVM seem to be particularly difficult to treat.\textsuperscript{13} Given that there may be an increasing risk of an RPE tear with each intravitreal injection, there may be limited therapeutic benefit to treatment of the PED component alone.\textsuperscript{14} Deciding on the best course of treatment must be made on an individual basis and balance treatment of the PED component with observation.\textsuperscript{14} In the absence of treatment these patients should be carefully monitored as patients with serous PED have a high risk for developing CNVM. Studies have shown anywhere between 32 – 67% of serous PED patients will develop a CNVM within two years.\textsuperscript{5,15}

**Conclusion**

PEDs are a common finding in patients with AMD. While it has been established that antiangiogenic treatment is beneficial for PEDs associated with CNVMs the decision to treat and the preferred treatment method for a PED in the absence of a CNVM is still evolving. This is an area of ocular disease where treatment options are being continually modified as our understanding of the underlying etiology grows and new treatment options become available.

**Images**

Image 1: Red-free retinal photo

![Red-free retinal photo](image1.jpg)

Image 2: Late phase image captured during fluorescein angiography

![Late phase image captured during fluorescein angiography](image2.jpg)
Bibliography


11. Chan, Clement; Abraham, Prema; Meyer, Carsten; Kokame, Gregg; Kaiser, Peter; Rauser, Michael; Gross, Jeffery; Nuthi, Asha; Lin, Steven; Daher, Noha. Optical coherence tomography-measured pigment epithelial detachment height as a predictor for teinal pigment epithelial tears associated with intravitreal bevacizumab injections. Retina. 2010. Volume 30. Number 2.


