

# Retinal Pigment Epithelium Tear Following Intravitreal Bevacizumab Treatment for Choroidal Neovascular Membrane without Previous Pigment Epithelium Detachment: (Case Report)

Nadon QAFA.

Ophthalmology Department, American Hospital of Tirana, Albania

**Abstract:** ***Background:** Retinal pigment epithelium (RPE) tears are well recognized complications of pigment epithelial detachments (PED) in age related macular degeneration (AMD) and may arise spontaneously after trauma, photocoagulation, or photodynamic therapy (PDT).<sup>1</sup> Many studies reported favorable results after intravitreal (IV) bevacizumab (Avastin) injection in neovascular AMD.<sup>2</sup> We present one patient, who developed an RPE tear after intravitreal bevacizumab (Avastin) injection, without any pre-existing PED. **Aim:** To present one 76 year-old patient suffering from choroidal neovascularization (CNV) due to age related macular degeneration without pre-existing PED, who underwent a series of bevacizumab injections. After the second injection he developed a RPE tear which resulted in decrease vision. **Discussion and conclusion:** Many authors have demonstrated the possible higher incidence of RPE tears after intravitreal treatment with anti-VEGF (Vascular Endothelial Growth Factor) drugs for choroidal neovascularization (CNV) associated with pigment epithelium detachment (PED)<sup>3,4</sup>. In this case RPE tear occurred in an exudative AMD eye without pre-existing PED. Continuing the anti-VEGF therapy resulted in improved and stabilized visual acuity for the next 6 months of follow up.*

**Keywords:** Retinal pigment epithelium (RPE) tear, pigment epithelial detachments (PED), age related macular degeneration (AMD), choroidal neovascularization (CNV)

## 1. Introduction

The retinal pigment epithelium (RPE) tears may arise spontaneously after trauma, laser photocoagulation of the retina, photodynamic therapy<sup>1</sup>, choroidal neovascularization (CNV), or due to age related macular degeneration (ARMD). This complication can cause acute decrease in visual acuity, although, a good level of vision can be preserved.<sup>5</sup> The use of anti-angiogenic therapy, was hopefully expected to reduce the incidence of RPE tears incidence. However, this complication is reported to occur even in the combined therapy of intravitreal triamcinolone and pegaptanib with PDT.<sup>6,7</sup> Recently, some authors reported cases of RPE tears creation after intravitreal bevacizumab injections, mainly in patients suffering from ARMD and choroidal neovascular membranes with pre-existing pigment epithelial detachments (PED), considering the last one as an independent risk factor for this complication.<sup>8,9</sup>

We are presenting one case of RPE tear creation after the second intravitreal injection of bavacizumab, in one patient suffering from classic CNV in ARMD, without pre-existing PED.

## 2. Case Report

One 76 years old male patient, without any previous eye diseases history, underwent an intravitreal bevacizumab injection (1.25 mg/0.05 ml) series, for his left eye decrease in vision due to a classic CNV in ARMD, without pre-existing PED. This diagnosis was established after complete eye examination, fluoresceine angiography (FFA) (Figure 1), and optic coherent tomography (OCT) (Figure 2) were

performed. Before starting the treatment, the best corrected visual acuity was found to be 2/10 of Snellen chart, and the central retinal thickness (CRT) of 406  $\mu$ m. One month after the first injection of bevacizumab, the vision increased in 4/10 and the CRT decreased in 324  $\mu$ m. Two weeks after the second injection, the patient experienced decrease of vision (1/10) and increase in metamorphopsia perception in the same eye. Dilated fundus examination, FFA (Figure 3), and OCT (Figure 4) confirmed the diagnosis of RPE tear formation after bevacizumab intravitreal injections treatment. After consulting similar cases in literature, the continuation of the treatment was decided. After three more consecutive (every 4 weeks) injections of bevacizumab, the visual acuity stabilized at 3/10, and it remained same during the 6 consecutive months of the follow-up period.

## 3. Discussion

Usually, retinal pigmented epithelium tears occur in the presence of a pre-existed RPE detachment. It is thought that the combined stress forces that act at the level of RPE can cause a tear, especially in the point where the detached epithelium meet the normal one. The detached epithelium slides, leaving an uncovered area of the choroid. The patients with occult CNV tend to be at higher risk of RPE tear formation, because they are often associated with pigmented epithelium detachment.<sup>8,9</sup> In our case, we present one patient with RPE tear formation after intravitreal bevacizumab treatment, in one eye suffering from choroidal neovascularization due to age related macular degeneration without pre-existing PED. The probability of this complication is found to be low in this condition (0.6-2.1%)<sup>10</sup>, in this group of patients treated with anti-VEGF drugs for CNV due to AMD. Here it is demonstrated that,

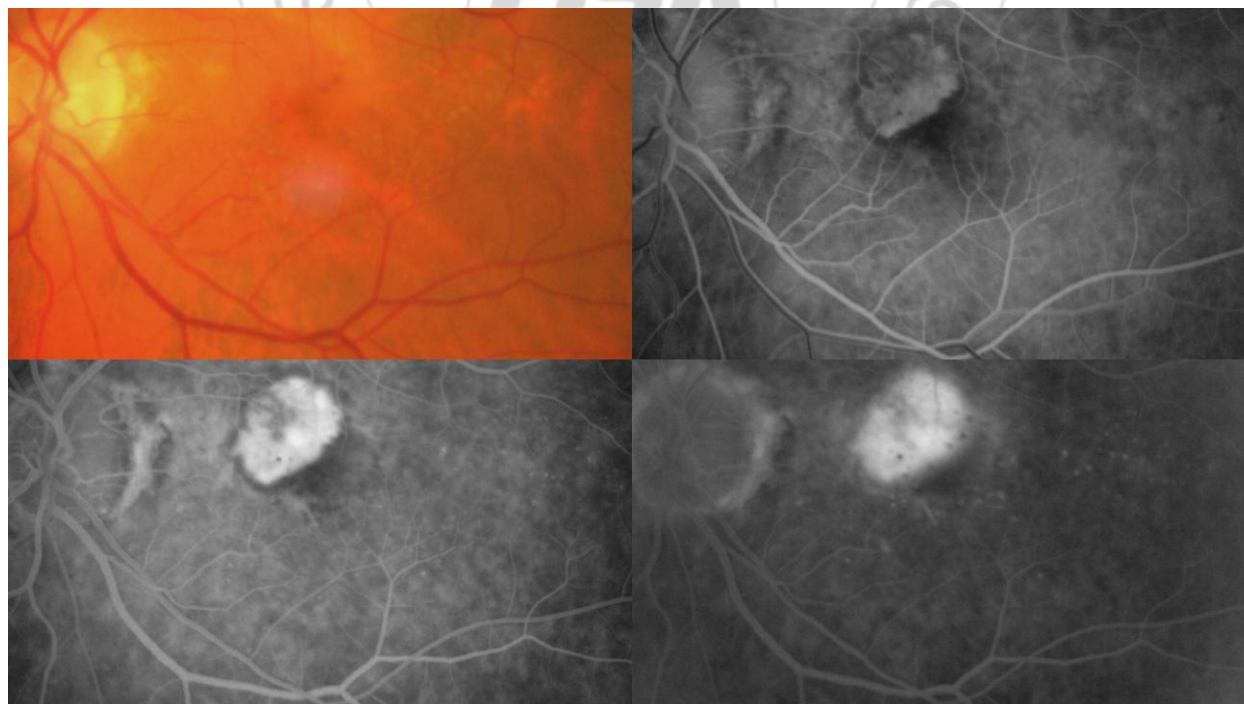
regardless this complication, the visual acuity can be preserved and sometimes improved, if the center of the fovea is not involved in the tear and the macular edema is responsive to treatment. We must add that RPE tear formation is not a contraindication to continuation of the treatment (anti-VEGF injections).<sup>10</sup> In our case, RPE tear has most likely happened from a direct treatment effect, rather than from the natural course of the disease. However, we don't exactly know if this complication happened due to the direct drug effect or the route of the administration.<sup>8</sup> Maybe one contraction of the CNV due to the drug effect, can cause the RPE tear after this treatment. New data are needed to enlighten this argument in the future.

#### 4. Conclusions

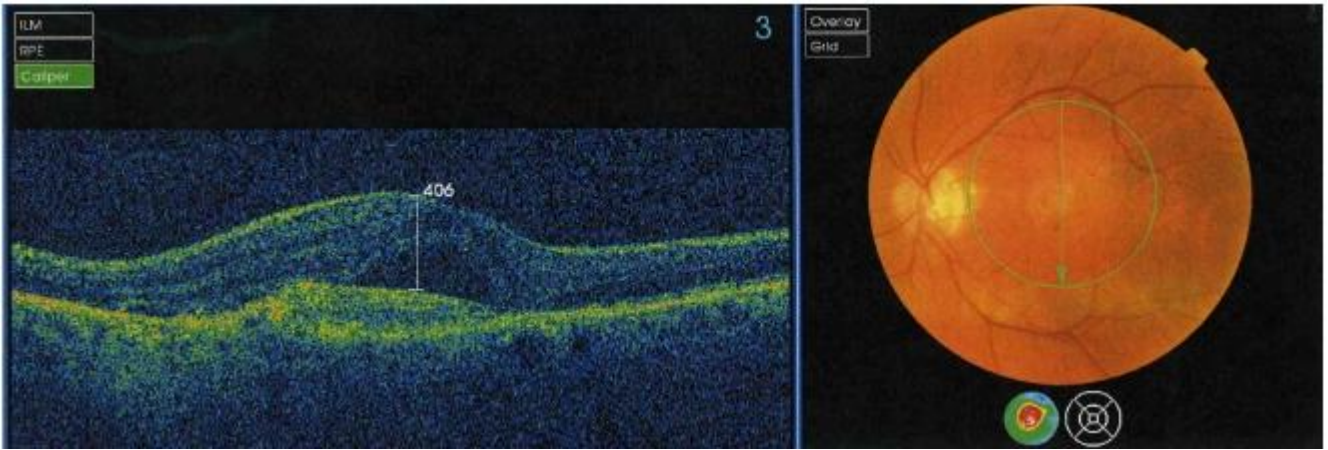
Many authors have demonstrated the possible higher incidence of RPE tears formation after intravitreal treatment with anti-VEGF drugs for choroidal neovascularization associated with pigment epithelium detachment<sup>3,4</sup>. In this case, RPE tear occurred in an exudative AMD eye without pre-existing PED. Continuing the anti-VEGF therapy resulted in improved and stabilized visual acuity for the next 6 months of follow up.

#### References

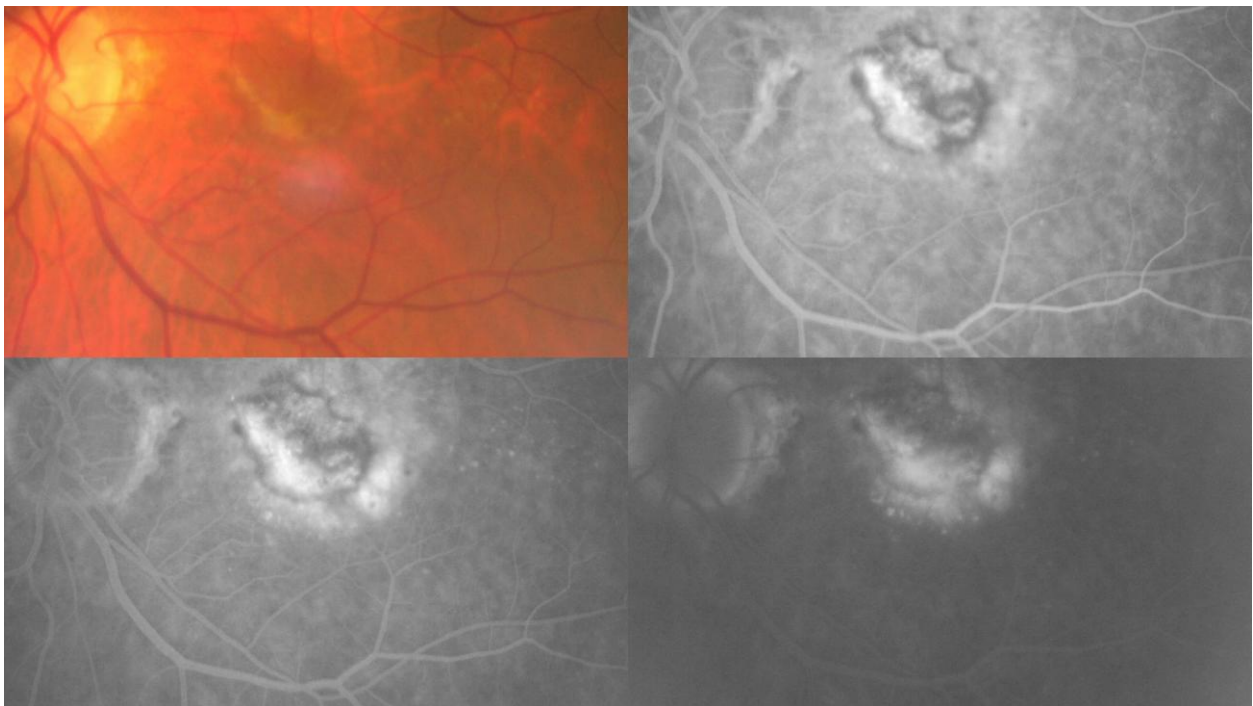
- [1] Gelisken F, Inhoffen W, Partsch M, et al. Retinal pigment epithelial tear after photodynamic therapy for choroidal neovascularization. *Am J Ophthalmol* 2001;131:518–20.
- [2] Rosenfeld PJ, Moshfeghi AA. Optical coherence tomography findings after an intravitreal injection of bevacizumab (Avastin) for neovascular age related macular degeneration. *Ophthalmic Surg Lasers Imaging* 2005;36:331–5.
- [3] Weinberger AWA, Thiel M, Mohammadi B, et al. Retinal pigment epithelium tears after intravitreal bevacizumab in pigment epithelium detachment. *Am J Ophthalmol* 2007;44:294-296.
- [4] Chan CK, Meyer CH, Gross JG, Abraham P, et al. Retinal pigment epithelial tears after intravitreal bevacizumab injection for neovascular age-related macular degeneration. *Retina* 2007;27:541-551.
- [5] Bressler NM, Finkelstein D, Sunness JS, et al. Retinal pigment epithelial tears through the fovea with preservation of good visual acuity. *Arch Ophthalmol* 1990; 108: 1694-7.
- [6] Michels S, Aue A, Simader C, et al. Retinal pigment epithelium tears following verteporfin therapy combined with intravitreal triamcinolone. *Am J Ophthalmol* 2006; 141: 396-8.
- [7] Dhalla MS, Blinder KJ, Tewari A, et al. Retinal pigment epithelial tear following intravitreal pegaptanib sodium. *Am J Ophthalmol* 2006; 141: 752-4.
- [8] Meyer CH, Mennel S, Schmidt JC. Acute retinal pigment epithelial tear following intravitreal bevacizumab (Avastin) injection for occult choroidal neovascularization secondary to age-related macular degeneration. *Br J Ophthalmol* 2006; 90: 1207-8.
- [9] Spandau UH, Jonas JB. Retinal pigment epithelium tear after intravitreal bevacizumab for exudative age-related macular degeneration. *Am J Ophthalmol* 2006; 142: 1068-70.
- [10] Doguizi S, Ozdek S. Pigment epithelial tears associated with anti-VEGF therapy: incidence, long-term visual outcome, and relationship with pigment epithelial detachment in age-related macular degeneration. *Retina*. 2014 Jun;34(6):1156-62



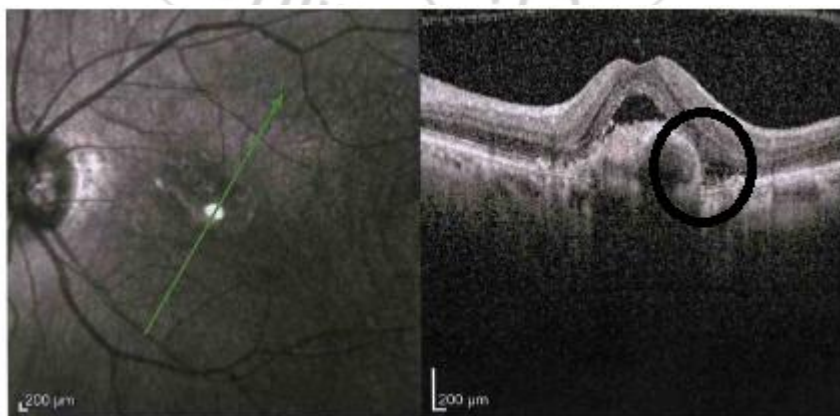
Picture 1: Fundus color photo and fluorescein angiography of the left eye before treatment



Picture 2: Macular OCT of the left eye before treatment



Picture 3: Fundus color photo and fluorescein angiography of the left eye, 2 weeks after the second injection of bevacizumab.



Picture 4: Macular OCT of the left eye, 2 weeks after the second injection of bevacizumab. Note the discontinuation of the RPE in the tear area (encircled area).