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SHORT COMMUNICATION

Retinal pigment epithelial tear following intravitreal injection of bevacizumab (Avastin)

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PURPOSE. *To report one case of retinal pigment epithelium tear following intravitreal bevacizumab injection for neovascular age-related macular degeneration.*
METHODS. *A 59-year-old patient presented with occult choroidal neovascularization associated with a serous pigment epithelial detachment secondary to age-related macular degeneration. The patient was treated with an intravitreal injection of bevacizumab.*
RESULTS. *The patient developed a retinal pigment epithelium tear 60 days following the intravitreal injection.*
CONCLUSIONS. *This report describes the development of retinal pigment epithelium tear after intravitreal bevacizumab injection. Future studies should be performed to evaluate which subtypes of lesions are most susceptible to this potential devastating visual complication. (Eur J Ophthalmol 2006; 16: 770-3)*

KEY WORDS. *Bevacizumab, Age-related macular degeneration, Choroidal neovascularization, Tear.*

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INTRODUCTION

Retinal pigment epithelial (RPE) tear may occur as a complication of neovascular age-related macular degeneration (1). Visual recovery after RPE tears is uncommon but possible in some instances, especially when the foveal center is spared. Bevacizumab, an antivascular endothelial growth factor agent (VEGF), has recently been used as off label treatment of neovascular age-related macular degeneration (2). We report a case of retinal pigment epithelium tear after intravitreal bevacizumab injection.

Case report

A 59-year-old man presented with a 3-week history of metamorphopsia in the left eye. He also reported long-standing poor vision in the right eye, which was attributed to amblyopia. Best-corrected visual acuity was 20/40 in the right and 20/32 in the left eye with a mild myopic correction. Fundus evaluation of the right eye revealed soft macular drusen. The left fundus had a serous detachment of the RPE with an occult choroidal neovascularization as demonstrated by fluorescein (FA) and indocyanine green (ICG) angiography and optical coherence tomography (OCT) (Fig. 1). After an informed discussion of available therapies, the patient underwent one uneventful 1,25 mg bevacizumab intravitreal injection. The patient was carefully monitored every 7 days by means of BCVA and OCT measurements. One month after injection BCVA was 20/20 and there was a significant flattening of the PED and a 70 micron reduction in central macular thickness (Fig. 2, a and b), although the patient still referred slight metamorphopsia. Sixty days after injection the patient returned to the follow-up

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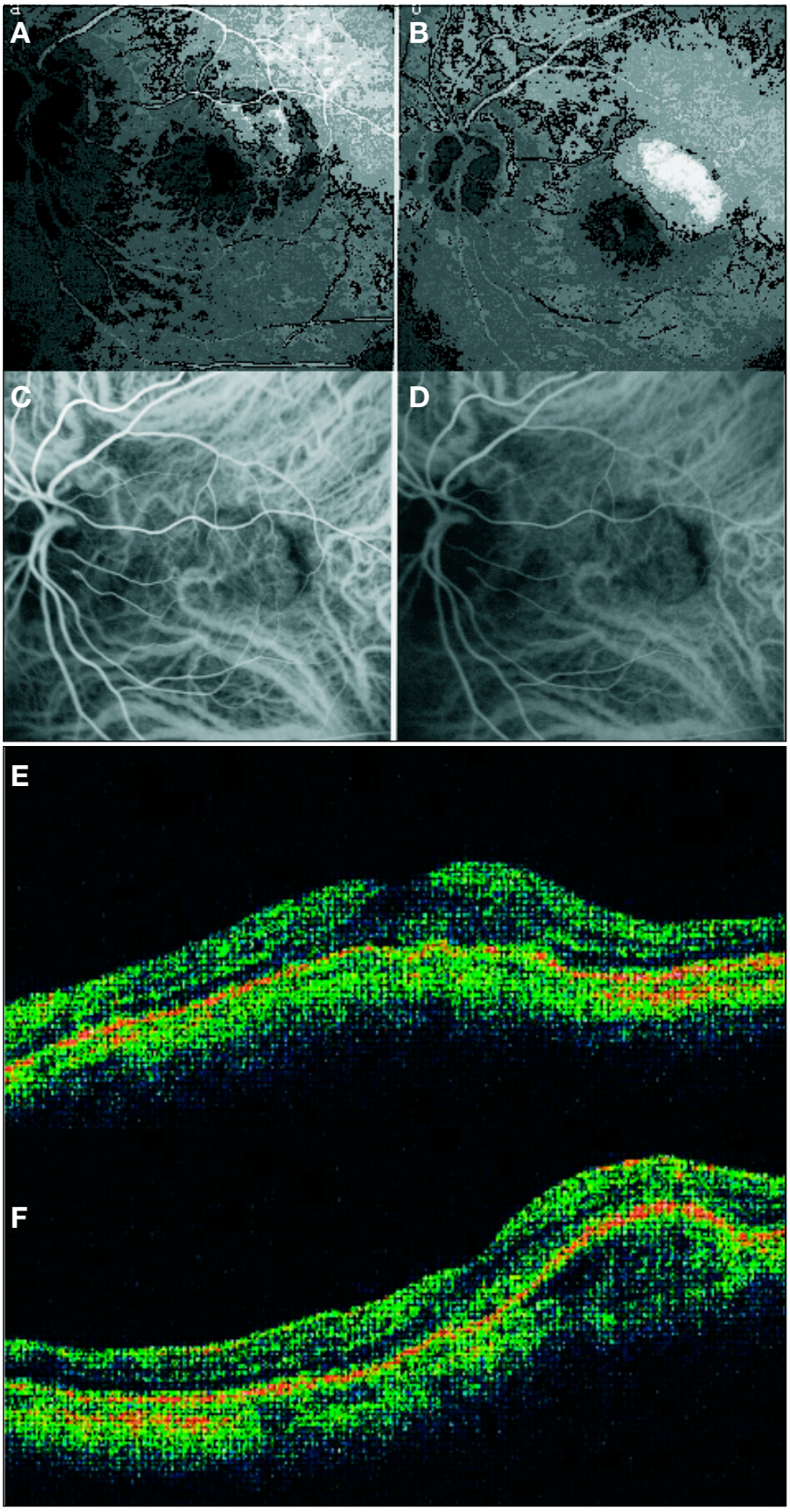

Fig. 1 - *Fluorescein angiography early* (**A**) *and late* (**B**) *phase showing the serous detachment of the retinal pigment epithelium before intravitreal injection of bevacizumab. Indocyanine green angiography* (**C**, **D**) *shows the occult choroidal neovascularization underneath the pigment epithelial detachment. Optical coherence tomography findings before intravitreal injection of bevacizumab.* (**E**) *Horizontal 6-mm scan through the fovea shows increased thickness of the macular region and* (**F**)*, the elevation of the pigment epithelial detachment.*

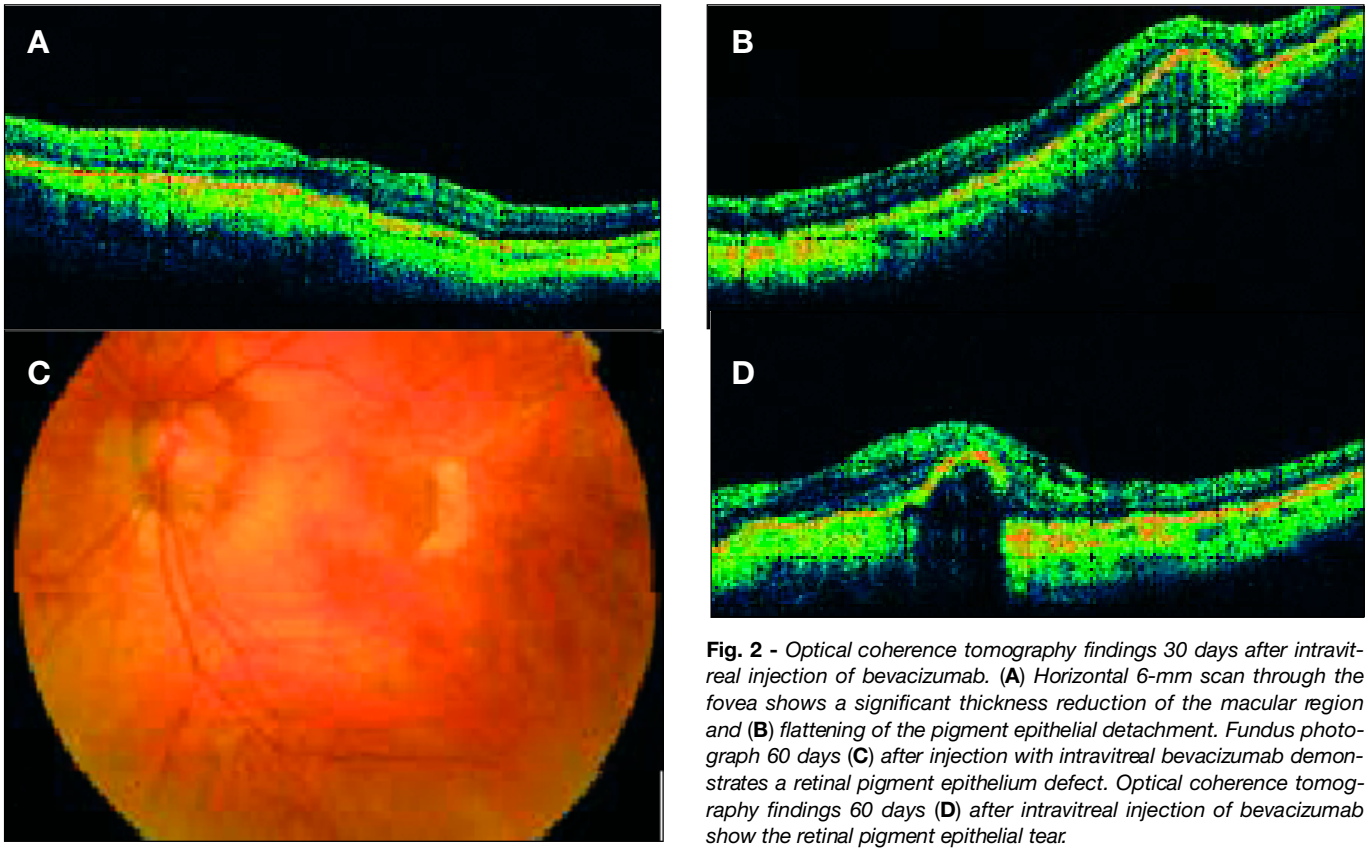

Fig. 2 - *Optical coherence tomography findings 30 days after intravitreal injection of bevacizumab.* (**A**) *Horizontal 6-mm scan through the fovea shows a significant thickness reduction of the macular region and* (**B**) *flattening of the pigment epithelial detachment. Fundus photograph 60 days* (**C**) *after injection with intravitreal bevacizumab demonstrates a retinal pigment epithelium defect. Optical coherence tomography findings 60 days* (**D**) *after intravitreal injection of bevacizumab show the retinal pigment epithelial tear.*

visit complaining of an increase of metamorphopsia. BCVA was still 20/20 but fundus examination revealed an area of RPE tear not involving the fovea (Fig. 2, c and d).

DISCUSSION

The development of a RPE tear in choroidal neovascularization may occur as a spontaneous process or as a result of contracting vessels after thermal laser, photodynamic therapy, combination therapy, and after intravitreal injection of anti-VEGF drugs (1, 3-5).We describe a RPE tear after one intravitreal injection of bevacizumab in a patient with a serous detachment of the RPE. Although the RPE tear in our patient could have been the natural history of disease, we were also concerned that the RPE tear occurred relatively soon after a single intravitreal bevacizumab injection, suggesting a possible causal role. In cases of photodynamic therapy or laser treatment, it is hypothesized that the tear in the RPE occurs as a result of both the thermal injury and photochemical toxicity (1, 3). In case of anti-VEGF drugs it could be hypothesized that the decrease in VEGF availability initiates a change in RPE cell structure and tight junction.

As a matter of fact, VEGF treatment of human RPE cells increases tight junction gene transcription and conversely, a critical decline in tight junction formation and intracellular adherence with the use of VEGF inhibitor has been noted (6).

This weakening event together with the already stressed RPE cells might contribute to the tear formation. Further studies are needed to determine whether lesion subtypes (occult CNV with associated PED) may be at a higher risk for developing RPE tears after anti-VEGF therapy.

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REFERENCES

1. Gass JDM. Retinal pigment epithelial rip during krypton red laser photocoagulation. Am J Ophthalmol 1984; 98: 700-6.
2. Avery RL, Pieramici DJ, Rabena MD, Castellarin AA, Nasir MA, Giust MJ. Intravitreal bevacizumab (Avastin) for neovascular age-related macular degeneration. Ophthalmology 2006; 113: 363-72.
3. Michels S, Aue A, Simader C, Geitzenauer W, Sacu S, Schmidt-Erfurth U. Retinal pigment epithelium tears following verteporfin therapy combined with intravitreal triamcinolone. Am J Ophthalmol 2006; 141: 396-8.
4. Dhalla MS, Blinder KJ, Tewari A, Hariprasad SM, Apte RS. Retinal pigment epithelial tear following intravitreal pegaptanib sodium. Am J Ophthalmol 2006; 141: 752-4.
5. Singh RP, Sears JE. Retinal Pigment epithelial tears after pegaptanib injection for exudative age-related macular degeneration. Am J Ophthalmol 2006; 142: 160-2.
6. Ghassemifar R, Lai CM, Rakoczy PE. VEGF differentially regulates transcription and translation of ZO-1alpha+ and ZO-1alpha- and mediates trans-epithelial resistance in cultured endothelial and epithelial cells. Cell Tissue Res 2005; 15: 1-9.