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SHORT COMMUNICATION

Fundus autofluorescence imaging findings in retinal pigment epithelial tear

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PURPOSE. *Retinal pigment epithelial (RPE) tear is a clinical and angiographic entity, which usually occurs in association with pigment epithelial detachments (PED), in the context of neovascular age-related macular degeneration (ARMD). The recording of fundus autofluorescence (FAF) has been introduced as a technique of retinal imaging, allowing the in vivo assessment of the integrity of RPE. The authors describe the FAF imaging findings in a patient with RPE tear.*

METHODS. *Observational case report.*

RESULTS. *A 70-year-old woman developed RPE tear after the application of photodynamic therapy for choroidal neovascularization associated with PED. The diagnosis of the RPE tear was confirmed by fluorescein angiography (FA) and indocyanine green angiography (ICGA). FAF imaging revealed absence of autofluorescence at the area which was denuded of RPE, while at the area where the RPE was rolled, a heterogeneous signal of FAF was recorded. The intensity of the signal in that area was, on average, not different from the normal background FAF signal expected in an unaffected RPE/photoreceptor complex.*

CONCLUSION. *The authors report the FAF imaging findings in a patient with RPE tear. These findings can be interpreted from the ability of FAF imaging to access in vivo the integrity of RPE, and correlate well with the histopathology of this clinical entity. FAF imaging, as a fast and noninvasive technique, may be a useful modality, alternative to FA and ICGA, in the diagnosis and evaluation of such cases. Moreover, it may contribute to a more detailed phenotyping of the various clinical pictures associated with neovascular ARMD. (Eur J Ophthalmol 2006; 16: 767-9)*

KEY WORDS. *Age-related macular degeneration, Autofluorescence imaging, Retinal pigment epithelial tear*

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INTRODUCTION

Retinal pigment epithelial (RPE) tear is a well-characterized clinical and angiographic entity. It usually occurs in the context of neovascular age-related macular degeneration (ARMD), in association with pigment epithelial detachments (PED), either spontaneously or following therapeutic intervention like laser photocoagulation or photodynamic therapy (PDT) (1, 2).

The recording of fundus autofluorescence (FAF) has been introduced as a technique of retinal imaging, specifically designed as a tool to access the integrity of RPE (3). FAF is generally considered to derive from the lipofuscin in RPE cells, allowing, thus, RPE changes to be documented clinically (3, 4). In patients with ARMD and geographic atrophy, the FAF imaging findings are well described (4). However, the FAF imaging findings in the various aspects of neovascular ARMD are less well studied (5).

We report herein the FAF imaging findings in a patient with RPE tear, associated with neovascular ARMD.

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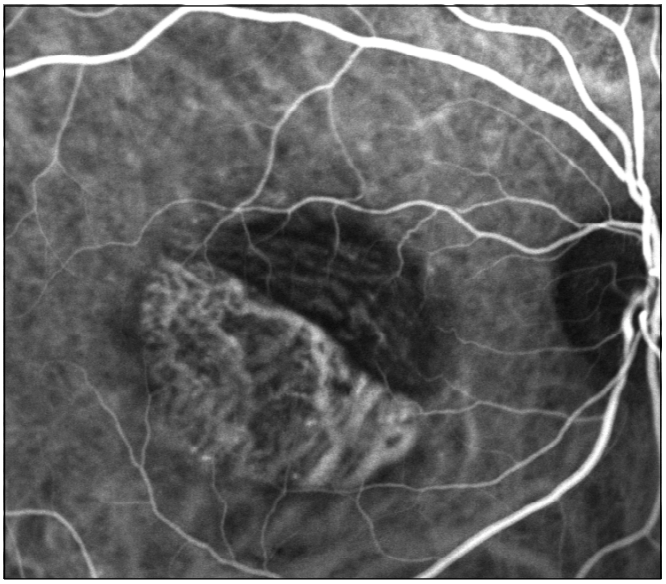

Fig. 1 - *Retinal pigment epithelial (RPE) tear. Indocyanine green angiography, in early phase, reveals that RPE is absent at the inferior-temporal macular area where the underlying choroidal circulation is clearly visible. RPE is rolled up at the upper-nasal macular area causing hypofluorescence; at the posterior aspect of the rolled up RPE detached choroidal vessels may be seen.*

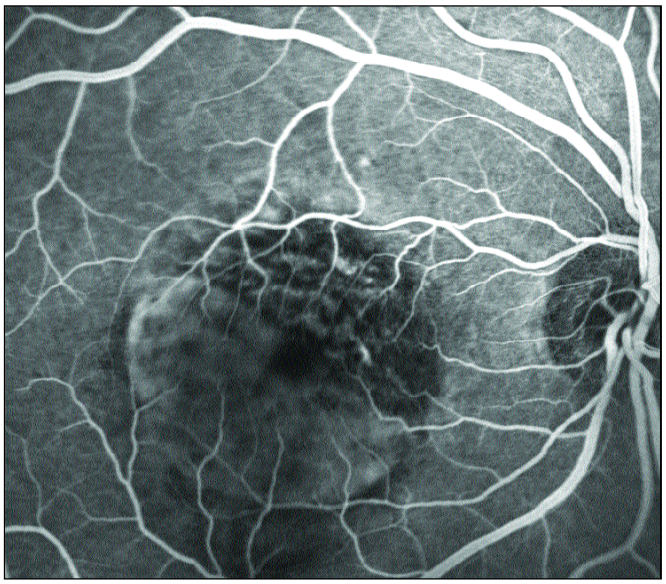

Fig. 2 - *Retinal pigment epithelial tear. Fluorescein angiography shows hyperfluorescence at the inferior-temporal macular area and hypofluorescence at the upper-nasal macular area.*

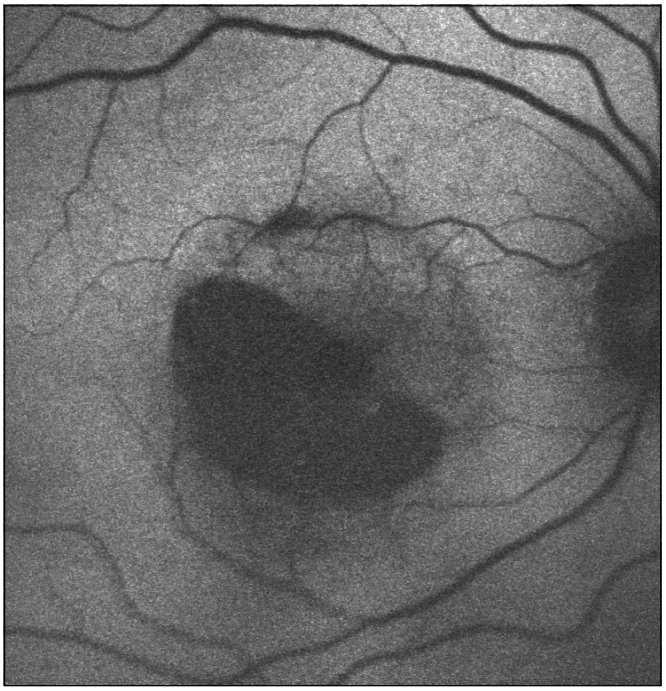

Fig. 3 - *Retinal pigment epithelial (RPE) tear. Fundus autofluorescence (FAF) imaging shows absence of autofluorescence at the inferior-temporal macular area where the RPE is absent, while at the upper-nasal macular area, where the RPE is rolled, a heterogeneous signal of FAF is recorded. The intensity of the signal in that area is, on average, not different from the normal background FAF signal expected in an unaffected RPE/photoreceptor complex.*

Case report

A 70-year-old woman initially presented with a pigment epithelial detachment in the right eye (OD), associated with ARMD. Fluorescein angiography (FA) and indocyanine green angiography (ICGA) revealed the presence of choroidal neovascularization beneath the PED, close to the nasal border of the detachment. Photodynamic therapy was performed guided by ICGA at the area of choroidal neovascularization. At the examination 3 months after PDT the funduscopy raised the suspicion for the presence of RPE tear. ICGA (Fig. 1) and FA (Fig. 2) confirmed the diagnosis, showing that RPE was absent at the inferior-temporal macular area, where the underlying choroidal circulation could be clearly seen. The retracted RPE was rolled up at the upper-nasal macular area, causing hypofluorescence in both FA and ICGA, while at the posterior aspect of the rolled up RPE, detached choroidal vessels could be seen in ICGA.

Images of FAF were recorded by means of a new generation confocal scanning laser ophthalmoscope (Heidelberg Retina Angiograph 2; Heidelberg Engineering, Germany). The principles of this technique have been described previously (3, 4). FAF imaging (Fig. 3) showed absence of autofluorescence at the inferior-temporal

macular area which was denuded of RPE, while at the upper-nasal macular area, where the RPE was rolled, a heterogeneous signal of FAF was recorded. The intensity of the signal in that area was, on average, not different from the normal background FAF signal expected in an unaffected RPE/photoreceptor complex.

DISCUSSION

We report the FAF imaging findings in a patient with RPE tear, which developed after the ICGA guided application of PDT in a vascularized PED. To our knowledge, there are no other published reports describing the FAF imaging findings in this entity. Autofluorescence was absent at the clearly delineated area, which was denuded of RPE. This is consistent with the perception that autofluorescence signal is derived from the lipofuscin of RPE cells. Similarly dark areas have been recorded in cases of RPE atrophy of different etiologies (4). In contrast, the area where the RPE was rolled up and pathologically folded in a double layer appeared heterogeneous in FAF imaging and, on average, not different from the normal background FAF signal expected in an unaffected RPE/photoreceptor complex. One could possibly expect that this pathologic double layer of RPE would potentially lead to the recording of increased signal. However, since the recorded FAF signal is a mixture of signal and blockage (e.g., by vessels but also melanin within RPE cells) a folded (and thus double layer of) RPE should have twice the signal but also twice the blockage/light absorption by RPE melanin.

In conclusion, we describe the FAF imaging findings in a patient with RPE tear. These findings can be interpreted from the ability of FAF imaging to access in vivo the integrity of RPE, and correlate well with the histopathology of this clinical entity. FAF imaging, which is a fast and noninvasive imaging technique, may be a useful modality, alternative to FA and ICGA, in the diagnosis and evaluation of such cases. Moreover, it may contribute to a more detailed phenotyping of the various clinical pictures associated with neovascular ARMD.

The authors have no proprietary or commercial interests related to any aspect of this article.

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REFERENCES

1. Gass JDM. Stereoscopic Atlas of Macular Diseases. 4th ed. St Louis: CV Mosby Co, 1997; 88-91.
2. Axer-Siegel R, Ehrlich R, Rosenblatt I, et al. Photodynamic therapy for occult choroidal neovascularization with pigment epithelium detachment in age-related macular degeneration. Arch Ophthalmol 2004; 122: 453-9.
3. von Rückmann A, Fitzke FW, Bird AC. Distribution of fundus autofluorescence with a scanning laser ophthalmoscope. Br J Ophthalmol 1995; 79: 407-12.
4. Holz FG, Bellmann C, Staudt S, Schütt F, Volcker HE. Fundus autofluorescence and development of geographic atrophy in age-related macular degeneration. Invest Ophthalmol Vis Sci 2001; 42: 1051-6.
5. Karadimas P, Bouzas EA. Fundus autofluorescence imaging in serous and drusenoid pigment epithelial detachments associated with age-related macular degeneration. Am J Ophthalmol 2005; 140: 1163-5.