FAF imaging in AMD

When examined with autofluorescence, the fundus of patients with AMD may show a range of signal changes[(20,33-37)].

Assuming that RPE has an important role in the pathophysiology of AMD and that the major fluorophores in the retina are located within RPE cells, FAF imaging can show changes in the concentration and distribution of RPE LF and hence establish the condition of RPE in patients with AMD.

Therefore, atrophic RPE typically appears as dark patches in FAF and can be clearly delineated, even better than in normal fundus photograph[(21,38)], [(Fig. 2)].

All this information can be obtained from a quick and minimally invasive exploration with FAF.

The decreased FAF intensity may also be associated with hyperpigmented areas due to the melanin absorption of light[(35,39)].

However, it should be considered that other fluorophores than LF can be found in RPE and become more prominent in AMD patients, and hyperpigmented areas may also cause an increase in the signal, which is supposed to result from the accumulation of melanolipofuscin.

Other changes in FAF which are not related to RPE defects may appear in AMD.

Fresh haemorrhages typically appear dark due to blocked fluorescence [(Fig. 3)].

However, these haemorrhagic areas eventually synthesize substances and fluorophores, which are observed in the fundus as yellowish areas and in FAF images as increased signals[(40)] [(Fig. 4)].

Pigment epithelial and neurosensory detachment and areas with extracellular fluid accumulation associated with exudative lesions can be observed in FAF as increased or decreased signal intensity.

Fluid accumulation under pigment epithelium detachment, extracellular deposition of material under the RPE (drusen), and fluid originated from CNV can occur with increased, normal or decreased FAF intensity.

This phenomenon is a consequence of the presence of unknown autofluorescent molecules other than LF, in the same spectral range than LF.

FAF imaging alone may not distinguish between melanolipofuscin from RPE cells migrated into the neurosensory retina and LF within the normal RPE layer.

It is always necessary to compare the FAF findings with those from other techniques such as fundus photograph, reflectance image, fluorescein angiography or optical coherence tomography (OCT)[35, 39].

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