CHAPTER 4

Fundus Autofluorescence

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Fundus autofluorescence (FAF) imaging is a rapid and noninvasive technique to evaluate retinal pigment epithelial (RPE) function. The predominant source of FAF in the macula is lipofuscin granules.

Typically, RPE cells ingest and digest photoreceptor outer segments and produce a by-product called lipofuscin; the pigment within lipofuscin that autofluoresces is A2E. The autofluorescence is the intrinsic fluorescence emitted by lipofuscin granules when stimulated by blue laser excitation energy (488 nm) with a barrier filter (500 nm), using a scanning laser ophthalmoscope.

A hallmark of aging is the gradual accumulation of lipofuscin granules in the RPE cells. Normal macula (Fig. 4.1) shows decreased AF at the center of the macula due to blockage by luteal pigments such as lutein and zeaxanthin. The rest of the macula shows a diffuse, homogenous signal; blood vessels and the optic disc appear black (no AF material).

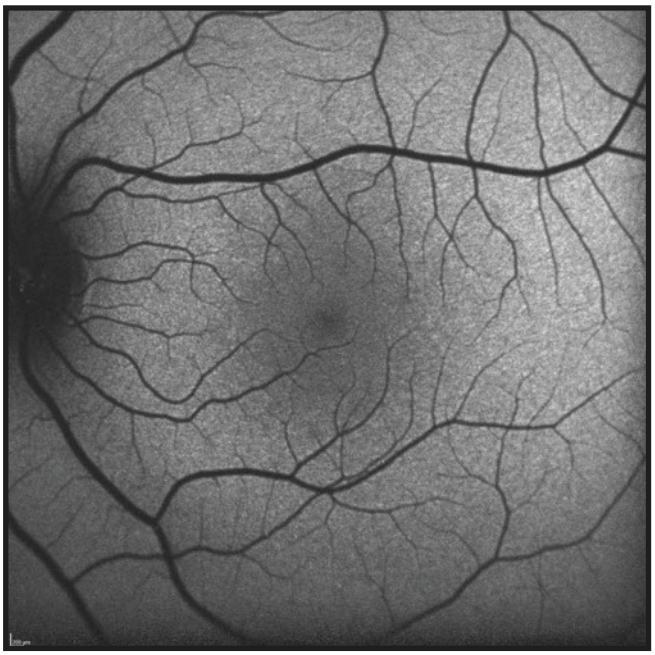

Fig. 4.1 Normal autofluorescence of the macula

FAF has become an important noninvasive tool in evaluating inherited retinal diseases, revealing the health of RPE cells both in diagnosis and in monitoring disease progression. In Best vitelliform dystrophy, the signal is increased owing to accumulation of lipofuscin, whereas in geographic atrophy, the signal is decreased owing to the loss of lipofuscin-containing RPE cells.

Suggested Reading

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