Reticular pseudodrusen (RPD) represents a distinct phenotype of age-related macular degeneration (AMD) that is characterized by worse macular function and an overall greater occurrence of development of both forms of late AMD (1-5).

Based on both in vivo and ex vivo observations, RPD are known to be associated with a fibrotic replacement of the choroidal vessels (6), this resulting in a choroidal thinning (7-11) and choriocapillaris hypoperfusion (12,13). The latter features were speculated to cause a dysfunction of the retinal pigment epithelium (RPE) and resulting disturbance in turnover of the photoreceptor outer segment (OS) (14), this ultimately causing the accumulation of photoreceptor OS over the RPE (15,16). Alternatively, RPE cells may fail to bind or uptake cycled lipids, this eventually leading to the accumulation of lipids above the RPE (16).

As specified above, the presence of RPD is associated with worse visual function. As an example, dark adaptation, which is an indicator of macular function, is known to be impaired in eyes with AMD, especially in presence of RPD. Dark adaptation can be described as the deferred recuperation of light responsiveness in darkness after photobleaching (light exposure). Using structural optical coherence tomography (OCT), important studies on healthy subjects have demonstrated that exposure to light (photobleaching), and the following recuperation in the dark, is characterized by distinguishing modifications in the measures of photoreceptor OS (17-20).

In a recent study (21), our group employed structural OCT to investigate photoreceptors’ structural modifications following photobleaching and throughout the successive recuperation in darkness, in intermediate AMD eyes, with and without RPD. In details, we prospectively enrolled 20 eyes of 20 intermediate AMD patients and 15 matched controls without disease. In normal subjects, our data demonstrated that photobleaching is followed by an increase in OS volume in the foveal region. This expansion was succeeded by a rapid recuperation of baseline values. Similarly, in the perifoveal region, healthy subjects had a late expansion of the photoreceptors’ OS (approximately 10 minutes after photobleaching). Importantly, the OS thickening was speculated to be secondary to an osmotic swelling reaction following a phototransduction-related raise in OS osmolarity (18,19). On contrary, in intermediate AMD eyes with RPD, this physiologic response was significantly affected as these eyes were characterized by an early and longstanding photoreceptor OS broadening after photobleaching, without a significant recuperation.

Assuming that OCT structural modifications following photobleaching could be contemplated as an imaging surrogate for functional dark adaptation, this study further corroborated the theory that eyes with RPD are characterized by a significant damage in dark adaptation. This reflects a larger impairment of the unit comprised of photoreceptors and RPE in RPD eyes (1). These results are helpful to further understand the disease pathophysiology.

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Footnote

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**References**


