



Mesa: José Henriques, Paulo Rosa, Ricardo Faria

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RETICULAR PSEUDODRUSEN AND THE FIVE-YEAR RISK OF PROGRESSION FOR LATE AMD: A MULTIMODAL IMAGING APPROACH

João Quadrado Gil¹, João Pedro Marques¹, Inês Lains², Miguel Costa³, Sandrina Nunes³, Maria Da Luz Cachulo⁴, Rufino Silva⁴

(1-Centro de Responsabilidade Integrado em Oftalmologia - Centro Hospitalar e Universitário de Coimbra; Associação para Investigação Biomédica e Inovação em Luz e Imagem (Aibili), 2-Centro de Responsabilidade Integrado em Oftalmologia - Centro Hospitalar e Universitário de Coimbra; Faculdade de Medicina da Universidade de Coimbra (Fmuc); Massachusetts Eye And Ear Infirmary - Harvard Medical School, Boston, Usa, 3-Associação para Investigação Biomédica e Inovação em Luz e Imagem (Aibili), 4-Centro de Responsabilidade Integrado em Oftalmologia - Centro Hospitalar e Universitário de Coimbra; Faculdade de Medicina da Universidade de Coimbra (Fmuc); Associação para Investigação Biomédica e Inovação em Luz e Imagem (Aibili))

Introduction:

To determine whether reticular pseudodrusen (RPD) confer a long-term increased risk of progression to late age-related macular degeneration (AMD) in the second eye of patients with unilateral wet AMD

Methods:

Retrospective, observational, institutional study. Patients with wet AMD in one eye were included for evaluation of the risk of progression to late AMD in the second eye (study eye). A minimum follow-up of 5 years was required, unless progression to late AMD occurred first. Baseline images were analyzed, including fundus color photography (FCP), fundus auto-fluorescence (FAF), infra-red (IR) and red-free (RF) images. The images were graded using an innovative software (RetmarkerAMD®). Presence of RPD was considered when visible in at least one image mode. Baseline RPD profile and its impact in long-term AMD progression was evaluated.

Results:

63 patients (37 female) were included; with a mean age of 76.19±6.63 years and mean follow-up of 66.03±20.95 months. All patients performed FCP, RF and FAF but only 33.33% (n=21) had IR available. When all cases were considered, the prevalence of RPD was 55.6% (n=35). The sub-group analysis of subjects with IR revealed a similar prevalence (57.1%, n=12). The presence of RPD was more easily noted in IR and FAF (52.4% for both) than in FCP (15.8%). 65.1% (n=41) of the study eyes progressed to late-stage AMD, after a mean time of 30±20.88 months. Time to progression was not significantly different between patients with and without RPD (30.64 and 31.77 months respectively, p=0.79). Of the study eyes which progressed, 82.9% (n=34) developed CNV and 17.1% (n=7) geographic atrophy (GA). After correcting for age and gender, the presence of RPD was significantly associated (OR=3.96, 95% CI[1.37–11.50], p=0.01) with development of late-stage AMD. This significance was maintained for CNV subtype (OR=3.96, 95% CI[1.37 – 11.50], p=0.011) but not for GA (OR=0.943, 95% CI[0.19 – 4.64], p=0.94). Mean total area of RPD did not correlate with an increased risk of progression to late AMD, regardless of areas being measured in FAF (p=0.44) or IR (p=0.46). Mean drusen area also did not impact significantly the 5-year risk of progression for late AMD (p=0.99). However, the presence of large drusen (OR=4.36, 95% CI[1.33-14.33], p=0.02) but not intermediate (OR=1.20, CI[0.19-7.60], p=0.84) was associated with a higher risk of progression when each variable was entered as an isolated covariate. In a model where intermediate and large drusen were considered, the association between RPD detection and progression to late-stage AMD was maintained (OR=5.14, CI[1.50-17.65], p=0.009).

Conclusion:

A multimodal approach using FAF and IR is mandatory for detecting RPD, underdiagnosed with FCP. RPD are associated with an increased risk of progression to late AMD in the second eye of patients with wet AMD. This additional risk is significant even in the presence of other known risk factors like intermediate or large drusen.