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Tractional Abnormalities of the Central Foveal Bouquet in Epiretinal Membranes:
Clinical Spectrum and Pathophysiological Perspectives

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Abstract:

Purpose: To investigate the tractional alterations of the central bouquet (CB) in idiopathic epiretinal membranes (ERMs).

Design: Retrospective, consecutive, observational case series.

Methods: ERMs were classified according to a 4-stage grading system. The CB was defined as a circular area of approximately 100µm comprised of densely packed cones (and Müller cells) in the central fovea. Tractional abnormalities of the CB were identified with spectral-domain optical coherence tomography. Ex-vivo histopathological analysis was performed.

Results: In this study 263 eyes with ERMs were included. Mean follow-up was 21.2 ± 16.7 months. At baseline, tractional abnormalities of the CB were diagnosed in 58 out of 263 eyes (22%) and divided into three categories: cotton ball sign (defined as a fuzzy hyperreflective area between the ellipsoid zone and the interdigitation zone in the central fovea), foveolar detachment and acquired vitelliform lesion. The presence of ectopic inner foveal layers was negatively correlated with the presence of CB tractional abnormalities ($p=0.002$). Visual acuity was highest in association with the cotton ball sign and lowest in the acquired vitelliform lesion group. Sequential morphological progression was identified in 7 eyes. Ex-vivo histopathological analysis illustrated characteristic staining patterns supporting a potential mechanism of traction by Müller cells in the CB.

Conclusions: The cotton ball sign, foveolar detachment and acquired vitelliform lesion may comprise a continuum in the same clinical spectrum and may represent subsequent stages of CB abnormalities. Foveal Müller cells may play an integral role in the transmission of mechanical forces to the central foveal cones.

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