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Disorganization of Retinal Inner Layers as a Biomarker for Idiopathic Epiretinal Membrane After Macular Surgery – The DREAM Study

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Abstract

Objective: Epiretinal membrane (ERM) can cause distortion and disorganization of all inner retinal layers. The purpose of our study was to evaluate the extent of disorganization of the retinal inner layers (DRIL) and to investigate its predictive value for visual outcome in cases of idiopathic ERM that were treated by pars plana vitrectomy (PPV) and ERM peeling.

Design: Multicenter international retrospective case series.

Participants: 90 eyes from 90 patients with idiopathic ERM treated by PPV and membrane peeling with 12 month follow-up.

Methods: OCT scans previous to surgery were evaluated for presence and severity of DRIL, central foveal subfield thickness (CST), maximal retinal thickness (MRT), presence of intraretinal cystoid changes and subretinal fluid, and integrity of the inner/outer segment layer and of the interdigitation zone. Best corrected visual acuity (BCVA), CST and MRT were recorded at baseline and at 3, 6 and 12 months after surgery. Correlations between baseline OCT measures (DRIL) and functional and visual outcome were analyzed.

Main Outcome Measures: Presence and severity of DRIL at baseline, anatomical and functional outcomes after 3, 6 and 12 months and the correlation between DRIL and baseline characteristics and outcome measures.

Results: Patients without and with mild DRIL had a significantly better baseline BCVA compared with patients with severe DRIL (0.61 ± 0.13 , 0.56 ± 0.23 , 0.73 ± 0.20 [logMAR], respectively). BCVA, CST and MRT at baseline were statistically significantly correlated with DRIL severity ($p=0.003$, $p<0.001$, and $p<0.001$, respectively). DRIL status before surgery showed a statistically significant interaction with change in BCVA, CST and MRT over 12 months ($p<0.001$ for all). Patients without and with mild DRIL gained a mean of 3 lines of vision after 12 months, in contrast to 1 line in patients with severe DRIL.

Conclusions: DRIL grading correlates with functional and anatomical measures in patients with idiopathic ERM and could serve as a biomarker to predict outcome after surgery. Patients with severe DRIL have limited benefits from surgery. This should be considered in the decision process whether to perform ERM peeling in this patient group.

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