

Abstract 95

ASSESSMENT OF RE-DETACHMENT BASED ON PROLIFERATIVE VITREORETINOPATHY FINDINGS ON SS-OCT

Martins Melo I.*, Samet S., Pecaku A., Demian S., Cruz--Pimentel M., Sabour S., Muni R.

University of Toronto ~ Toronto ~ Canada

Proliferative vitreoretinopathy (PVR) findings on swept-source optical coherence tomography (SS-OCT) might be a valuable predictor of re-detachment in rhegmatogenous retinal detachment (RRD). Therefore, the purpose of this study was to evaluate the association of anatomic outcomes with PVR on SS-OCT in primary RRDs.

Retrospective cohort study of consecutive primary RRDs presenting to St. Michael's Hospital from 2021-2023. PVR was classified according to the Retina Society (RS) 1991 criteria based on fundus imaging, and SS-OCT scans were evaluated for microstructural characteristics. Patients were divided into three groups: no OCT PVR, intra-retinal (IR) OCT PVR, and subretinal (SR) OCT PVR. To be included in the IR group, patients had to have thick high-amplitude outer retinal corrugations (ORCs) with photoreceptor-photoreceptor apposition and/or fused ORCs. To be included in the SR group, patients had to have subretinal material in the OCT. Re-detachments that did not have membrane peeling and/or retinectomy during the second surgery were classified as non-PVR related.

100 patients were included, of which 49% (49/100) had no signs of PVR or PVR A, 24% (24/100) had PVR B, and 27% (27/100) had PVR C, as per the Retina Society Classification. Overall, 64% (64/100) were male, with a mean age of 54.2 (± 15.9) years old, and 72% (72/100) were phakic. The mean baseline logMAR visual acuity was 1.28 (± 0.63), with a mean RRD extent of 6.1 (± 2.1) clock hours. Regarding the primary surgical procedure, 75% (75/100) of patients underwent pneumatic retinopexy with a 65% (49/75) success rate, 8% (8/10) had pars plana vitrectomy (PPV) with 75% (6/8) success rate, 9% (9/100) had scleral buckle (SB) with 89% (8/9) success rate, 5% (5/100) had combined PPV/SB with 80% (4/5) success rate, and finally 3% (3/100) had laser retinopexy barricade, of which all remained stable. The primary reattachment rate (PARR) was 70% (70/100). From patients who failed to reattach after the first procedure (30/100), 37% (11/30) re-detached, with 63% (7/11) of the re-detachments due to post-operative PVR formation. Among those with PAR (70/100), 3% (2/70) re-detached after 3 months due to post-operative PVR. Among patients who had outer retinal corrugations (ORCs) at baseline [63% (63/100)], those presenting with fused ORCs or photoreceptor-photoreceptor apposition [75% (27/63)] were significantly associated with re-detachment due to postoperative PVR ($p=0.0006$). The presence of baseline ORCs alone was not associated with PVR re-detachments ($p=0.0917$). Fused ORCs were associated with postoperative PVR re-detachment ($p=0.0006$) which remained significant ($p=0.0461$) when adjusting for primary reattachment rate, detachment extent and baseline RS PVR grade. When considering the OCT PVR categories, 54% (54/100) of patients had no OCT PVR changes, 17% (17/100) had SR OCT PVR, and 29% (29/100) had IR/PR OCT PVR. The presence of IR OCT PVR was associated with postoperative PVR re-detachment ($p=0.00972$). OCT PVR (IR or SR) was also associated with a lower overall PARR [58% (27/46)] when compared to patients with no OCT PVR changes [83% (45/54)], $p=0.00624$. When creating a model to predict re-detachments with baseline RRD characteristics, including age, extent of detachment, baseline OCT PVR and RS PVR grade, the model achieved an overall predictive accuracy for postoperative PVR re-detachments of 91% (AUC 0.91). A classification threshold of 0.86

yielded the best combination of sensitivity (0.91) and specificity (0.89).

SS-OCT provides useful imaging biomarkers for PVR. Thick high-amplitude ORCs with photoreceptor-photoreceptor apposition within and between individual corrugations (fused ORCs) are the most characteristic component of the intra-retinal PVR assessed with OCT. Fused ORCs were shown to be associated with postoperative PVR-related re-detachments after adjusting for various covariates. OCT-based PVR staging could enhance postoperative-PVR and re-detachment risk stratification and guide the search for potential therapeutic targets.