Independent Risk Factor Analysis for Poor Visual Outcomes in the Primary Retinal Detachment Outcomes (PRO) Study

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Purpose:
To assess the impact of preoperative, intraoperative, and postoperative variables on final visual acuity (VA) in patients undergoing primary rhegmatogenous retinal detachment (RRD) repair.

Methods:
This study is a multicenter, interventional cohort study of consecutive primary RRD surgeries. At least 1 year of follow-up was required. The primary outcome was final postoperative VA. First, univariate linear regression was used to select statistically significant variables, using a threshold of P < .0005. Then, multivariate linear regression was used to evaluate the influence of each variable on postoperative VA, while controlling for confounders.

Results:
A total of 1178 patients met inclusion criteria and were followed for a mean of 506 days. 145 (12.3%) underwent scleral buckle (SB), 623 (52.9%) underwent pars plana vitrectomy, and 410 (34.8%) combination PPV/SB. VA overall improved from logMAR 1.1 ± 1.1 (20/250) to 0.5 ± 0.7 (20/63, P < 0.001). Univariate regression of 85 variables identified 20 statistically significant clinical variables, which were included in a multivariate linear regression model. On multivariate regression, the preoperative risk factors for worse visual outcomes included presence of proliferative vitreoretinopathy (-3 ± 1 ETDRS lines, P < 0.001), poor preoperative VA (-1 line for every 10 lines missed preoperatively, P < 0.001), history of intravitreal injections (-5 ± 2 lines, P = .003), choroidal detachment (-6 ± 2 lines, P = 0.01), anterior segment abnormalities (-4 ± 2 lines, P = 0.02), and surgery performed after a week of vision loss (-1 ± 1 lines, P = 0.04). Independent postoperative risk factors included presence of silicone oil (-8 ± 1 lines, P < 0.001), subsequent retina surgeries (-2 ± 1 lines per surgery, P < 0.001), recurrent retinal detachment (-5 ± 1 lines, P = 0.001), and postoperative cataract (-3 ± 1 lines, P = 0.002). The variance of different surgeons accounted for 2 lines. Choice of surgical modality was not significant in this model.

Conclusions:
In this study of 1178 patients, the most important preoperative predictors of poor visual outcomes were poor preoperative vision, significant anterior segment abnormalities, intravitreal injections, complex detachments, and delaying surgical intervention more than 1 week following symptom onset.