

Strategy for the Management of Uncomplicated Retinal Detachments

The European Vitreo-Retinal Society Retinal Detachment Study Report 1

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Objective: To study success and failure in the treatment of uncomplicated rhegmatogenous retinal detachments (RRDs).

Design: Nonrandomized, multicenter retrospective study.

Participants: One hundred seventy-six surgeons from 48 countries spanning 5 continents provided information on the primary procedures for 7678 cases of RRDs including 4179 patients with uncomplicated RRDs.

Methods: Reported data included specific clinical findings, the method of repair, and the outcome after intervention.

Main Outcome Measures: Final failure of retinal detachment repair (level 1 failure rate), remaining silicone oil at the study's conclusion (level 2 failure rate), and need for additional procedures to repair the detachment (level 3 failure rate).

Results: Four thousand one hundred seventy-nine uncomplicated cases of RRD were included. Combining phakic, pseudophakic, and aphakic groups, those treated with scleral buckle alone ($n = 1341$) had a significantly lower final failure rate than those treated with vitrectomy, with or without a supplemental buckle ($n = 2723$; $P = 0.04$). In phakic patients, final failure rate was lower in the scleral buckle group compared with those who had vitrectomy, with or without a supplemental buckle ($P = 0.028$). In pseudophakic patients, the failure rate of the initial procedure was lower in the vitrectomy group compared with the scleral buckle group ($P = 3 \times 10^{-8}$). There was no statistically significant difference in failure rate between segmental ($n = 721$) and encircling ($n = 351$) buckles ($P = 0.5$). Those who underwent vitrectomy with a supplemental scleral buckle ($n = 488$) had an increased failure rate compared with those who underwent vitrectomy alone ($n = 2235$; $P = 0.048$). Pneumatic retinopexy was found to be comparable with scleral buckle when a retinal hole was present ($P = 0.65$), but not in cases with a flap tear ($P = 0.034$).

Conclusions: In the treatment of uncomplicated phakic retinal detachments, repair using scleral buckle may be a good option. There was no significant difference between segmental versus 360-degree buckle. For pseudophakic uncomplicated retinal detachments, the surgeon should balance the risks and benefits of vitrectomy versus scleral buckle and keep in mind that the single-surgery reattachment rate may be higher with vitrectomy. However, if a vitrectomy is to be performed, these data suggest that a supplemental buckle is not helpful.

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The optimal treatment of rhegmatogenous retinal detachment (RRD) has been debated for decades. Different surgical procedures are available to the vitreoretinal surgeon, including scleral buckle, pars plana vitrectomy, and pneumatic retinopexy. However, the method of choice sometimes depends on the individual surgeon or institution as opposed to evidence-based outcomes. Retrospective studies in the literature, while demonstrating the overall high anatomic success rate of all methods, do not provide a consensus regarding the best procedure in terms of outcome.¹⁻⁴ Few

prospective, randomized clinical trials have been performed, and even they report conflicting outcomes and recommendations.⁵⁻⁸ It is obvious that additional data are needed, either prospective or retrospective, to help formulate accurate recommendations regarding optimal treatment selection.

The gold standard for clinical studies is the prospective, randomized clinical trial. Overall, the treatment of RRD is very successful with a low failure rate. This necessitates that each treatment group be very large to attain statistical significance. In fact, the number of patients needed to conduct a meaningful

study may make the investigation very difficult and costly. Given this, other methods of analysis must be considered.

The European Vitreo-Retinal Society (EVRS) is an organization of more than 1900 retina specialists from 75 countries organized in 2001. In 2010, a clinical study was announced to the members of EVRS to record the individual treatment successes and failures of the primary procedure for RRDs with proliferative vitreoretinopathy (PVR) ranging from grade 0 (no PVR) to grade C-1 PVR. A total of 176 surgeons from 48 countries provided information on 7678 RRDs with at least 3 months of follow-up. To our knowledge, this is the largest report of the treatment of retinal detachment in the literature. Herein we discuss the results of the treatment of RRDs in those eyes with no or mild PVR (grade 0 or grade A). Our primary focus in this analysis was uncomplicated retinal detachments without choroidal detachment, significant hypotony, or posterior, large, or giant retinal tears.

Methods

The EVRS Retinal Detachment Study was a nonrandomized, retrospective, multicenter study in which the goal was to analyze surgical strategy in RRD repair (grades 0, A, B, and C-1 PVR), focusing on the influence of initial clinical details and the primary surgical procedure on final anatomic results. This analysis was based on the choice of primary procedure and not on subsequent procedures performed, if indeed the initial procedure failed to repair the detachment.

A request was made in 2010 for all members of EVRS who were interested in reporting the RRDs that they operated on from April 2010 through April 2011. A portal was created on the EVRS website that contained the reporting questionnaires to be filled out for each patient treated. By the cutoff of July 2011, the study organizers received complete data on 7678 RRDs operated on by 176 contributors from 48 countries, with follow-up ranging from 3 months to 1 year. The results were analyzed independently of the investigators by the French National Institute of Statistics and Economic Studies.

Because this study was performed in 48 countries on 5 continents, the regulations and institutional review board requirements were different in different countries. Thus, each participant was responsible for following the rules and regulations of his or her own country and institution. The EVRS committees also approved the design and ethical aspects of the study.

Because this was a nonrandomized study, this study carried a risk: even if the input was anonymous and data on all of the surgeries of each surgeon were requested, a small number of surgeons might have selected the cases that they wanted to contribute, therefore affecting the quality of the results. To face this problem, the Institute of Statistics, which analyzed the study, made 2 decisions. First, one should not present the results of a technique as an individual result, but always in comparison with at least 1 of the other techniques, so that the possibility of bias could have a comparative effect in both groups. Second, a high number of surgeons are required for each technique so that the effect of selection error will be negligible.

Surgery Reports

Surgeons independently chose the surgical technique according to the clinical situation. For each case of operated RRD, they had to describe 25 items: 6 on the RRD clinical findings, 14 on the surgical procedure details, 1 on perioperative complications, and 4 on the postoperative results. After having cleaned the database, the global

working sheet was sent to each contributor, masking the name of the other contributors, so that cleaning accuracy could be agreed on.

Success Criteria

Because of the high percentage of success during the study, it was decided that the failure data were the most important parameter to evaluate. The failure rate was presented in 3 categories. The level 1 failure rate was the true failure rate declared by the surgeon and represented eyes with detached retina judged to be inoperable by the conclusion of the study. The level 2 failure rate was the percentage of eyes that had not been declared as a level 1 failure, but silicone oil was remaining in the eye at the conclusion of the study. In this level, we do not know if the result was a success or a failure. A level 2 failure group might have had a successful outcome after the removal of the silicone oil. The level 3 failure rate was the percentage of eyes that had been declared as a success but had a recurrence of the detachment or a complication after the initial procedure and required an additional surgery.

Statistical Analysis

The National Institute of Statistics and Economic Studies first performed univariate and bivariate analyses for the entire database to have a graphical representation of the results. This was the first step taken to identify the variables that were linked to failure rate. Multivariate analysis then was performed. A step-by-step logistic regression was performed for the entire database on clinical findings and surgery parameters for identification of the variables that were linked independently to the failure rate. A logistic regression was performed in cases where vitrectomy was performed for determination of vitrectomy machine parameters and their association with failure rate. These data were reported independently and were combined to formulate a strategy based on the results. Statistical significance was defined as a 2-tailed *P* value of less than 0.05.

Results

The details regarding the treatment and outcome of the primary procedure for 7678 cases of RRD was reported by 176 retinal surgeons from 48 countries. Of the 7678 cases reported, 2349 were grade 0 (30.6%), 2829 were grade A (36.8%), 1390 were grade B (18.1%), and 1110 were grade C-1 (14.5%). Baseline demographic data, including lens status and initial procedure performed, are displayed in Table 1.

Evaluation of the Variables Linked to Failure Rate

An initial univariate analysis identifying major independent explanatory variables of the failure rate found that the presence of choroidal detachment and significant hypotony were associated with higher failure rates independent of other factors (Table 2, available at <http://aajournal.org>). Subsequent analysis of other variables was carried out in eyes without either choroidal detachment or significant hypotony.

The relationship between PVR and failure rates was as expected, with increasing level of PVR corresponding to increasing

Table 1. Baseline Demographic Patient Data

Lens Status	Initial Procedure Performed			
	Vitrectomy Alone	Vitrectomy With Scleral Buckle	Scleral Buckle Alone	Pneumatic Retinopexy
Phakic	1159	261	1103	92
Pseudophakic	1076	227	238	23

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