

# A quality of life study comparing scleral buckle and pneumatic retinopexy for the treatment of rhegmatogenous retinal detachment

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## Introduction

Patients who have undergone surgical treatment for retinal detachment may have significantly impaired visual-related quality of life.<sup>1</sup> Although there are many studies that compare the visual outcomes and anatomical success of scleral buckle and pneumatic retinopexy in treating retinal detachment, there are inadequate data contrasting quality of life measures between these two approaches.<sup>2,3</sup> A recent Cochrane review found that patients who underwent pneumatic retinopexy may be more likely to have recurrence of detachment but less likely to have choroidal detachment or a myopic shift than those who had scleral buckle.<sup>4</sup> They concluded that there is still a dearth of important patient-centered information such as quality of life outcomes with these procedures.<sup>4</sup> This study aimed to compare quality of life between patients who underwent scleral buckle or pneumatic retinopexy for treatment of rhegmatogenous retinal detachment.

## Methods

Patients who underwent either scleral buckle or pneumatic retinopexy for rhegmatogenous retinal detachment at the Yale Eye Center between January 1993 and December 2013 were identified. A modified version of the National Eye Institute Visual Function Questionnaire-25 (VFQ-25) was administered by mail or phone interview to patients within 8 years after their surgery.<sup>5</sup> For data received from respondents, results were calculated by subgroup analysis of the VFQ-25, independent two-tailed *t*-test, and a chi-squared test.

The study was reviewed and approved by the Yale University Institutional Review Board, which found that written informed consent could be waived because the research presented no more than minimal risk of harm to subjects. All subjects were provided an information sheet or given verbal information that described the risks and benefits of the study, and the decision to participate in the survey was considered consent.

## Results

Fifty-nine patients participated in the survey, including 31 scleral buckle patients and 28 pneumatic retinopexy patients. There was no difference in VFQ-25 composite scores between scleral buckle (78.9±19.0) and pneumatic retinopexy (81.1±19.0) patients ( $P=0.64$ ). Both groups scored similarly in general health, general vision, ocular

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**Table 1** VFQ-25 subscale scores for scleral buckle and pneumatic retinopathy

VFQ-25 subscale score	Mean (standard deviation)		95% confidence interval of the difference		P-value
	Scleral buckle (N=31)	Pneumatic retinopathy (N=28)	Lower	Upper	
General health	66.9 (25.3)	73.2 (25.4)	-19.5	7.0	0.35
General vision	71.8 (14.3)	75.7 (15.7)	-11.7	3.9	0.33
Ocular pain	76.6 (23.9)	82.6 (21.1)	-17.8	5.8	0.31
Near activities	79.3 (21.4)	75.1 (20.7)	-6.8	15.1	0.45
Distance activities	77.6 (21.0)	81.0 (20.0)	-14.1	7.3	0.53
Social functioning	89.9 (20.0)	92.0 (17.1)	-11.8	7.7	0.68
Mental health	71.4 (28.5)	79.0 (24.0)	-21.5	6.2	0.27
Role difficulty	72.7 (20.2)	77.2 (25.9)	-16.5	7.5	0.46
Dependency	88.0 (24.3)	90.6 (24.1)	-15.2	10.1	0.68
Driving	74.9 (21.3)	75.0 (27.0)	-12.8	12.5	0.98
Color vision	94.8 (16.4)	93.3 (16.1)	-7.0	9.9	0.73
Peripheral vision	71.5 (28.7)	72.3 (28.3)	-15.8	14.0	0.91

**Notes:** The VFQ-25 consists of 25 questions that ask the patient to rate their general health and vision, the difficulty of completing different tasks because of vision limitations, and how well they have responded to their level of vision. Questions are assigned to one of 12 subscales. Each item is translated to a score from 0 to 100, with 100 being the best functioning. Scores from questions within each subscale are averaged together to create a score from 0 to 100 for each subscale. Finally, a composite score for the VFQ-25 is calculated by averaging all of the subscale scores, except the general health rating question. No significant differences were found for any of the subscale scores.

**Abbreviation:** VFQ-25, National Eye Institute Visual Function Questionnaire-25.

pain, near activities, distance activities, social functioning, mental health, role difficulties, dependency, driving, color vision, and peripheral vision (Table 1). Also, there were no significant differences found for any of the additional post-operative questions (Table 2). There was a trend toward a higher percentage (85%) of pneumatic retinopathy patients preferring to have the same procedure in their fellow eye compared to scleral buckle patients (59%,  $P=0.06$ ).

## Discussion

These findings suggest that patients who had scleral buckle or pneumatic retinopathy treatment have a similar postoperative

quality of life. Indeed, primary and overall surgical success rates appear to be similar in the two treatments.<sup>6,7</sup> In addition, studies have generally found comparable final visual acuity outcomes in patients with uncomplicated rhegmatogenous retinal detachment.<sup>2</sup>

Although this effect did not reach statistical significance due to small sample size, it is interesting that a much lower proportion of scleral buckle patients than pneumatic retinopathy patients may choose to repeat the procedure, although both groups now enjoy similar levels of quality of life. Pneumatic retinopathy is a newer, quicker, less expensive, and less invasive procedure than scleral buckle.<sup>8,9</sup> Perhaps the

**Table 2** Additional question scores for scleral buckle and pneumatic retinopathy

Additional questions	Mean (standard deviation)		95% confidence interval of the difference		P-value
	Scleral buckle (N=29)	Pneumatic retinopathy (N=26)	Lower	Upper	
Difficulty with activities	2.9 (1.9)	2.7 (2.1)	-0.8	1.4	0.61
Limitations	2.7 (1.8)	2.8 (2.2)	-1.2	0.9	0.78
Pain	2.3 (2.4)	2.0 (2.2)	-0.9	1.5	0.62
Early pain	4.2 (3.0)	3.7 (2.6)	-1.0	2.1	0.49
Pain 48 hours postoperative	5.3 (3.1)	4.4 (3.2)	-0.8	2.6	0.29
Difficulty postoperative	5.3 (2.8)	4.9 (3.0)	-1.2	1.9	0.66
Resume normal activity (weeks)	3.4 (1.5)	3.1 (1.2)	-0.5	1.0	0.46
Choosing the same operation (%)	59	85	NA	NA	0.06

**Notes:** Eight questions were added to the VFQ-25 in order to create a modified survey targeted to patients who have undergone retinal detachment procedures. Scores ranged from 1 to 10, with higher numbers indicating increased difficulty or pain. No significant differences were found for any of the questions, but chi-squared analysis revealed a trend toward a higher percentage of patients choosing the same procedure for their fellow eye in the pneumatic retinopathy group compared to the scleral buckle group ( $P=0.06$ ).

**Abbreviations:** VFQ-25, National Eye Institute Visual Function Questionnaire-25; NA, not applicable.

differences in likelihood to reelect the procedure are due to factors not assessed in this survey. In addition, it is possible that there exist postoperative pain and recovery differences between the groups, but they simply did not reach statistical significance due to sample size. If pneumatic retinopexy patients experienced an easier recovery than patients in the scleral buckle group, it may explain why they are more likely to choose the procedure again.

A few limitations of this study can be identified. For example, patients completed surveys at variable times up to 8 years following their surgeries given the study's retrospective design. In addition, we excluded patients who underwent reoperation for subsequent retinal detachment, as our primary endpoint focused on those patients who underwent one of two single procedures. The sample size of 59 patients is relatively small because many patients with uncomplicated rhegmatogenous retinal detachment undergo vitrectomy or a combination of procedures. Future work involving a larger patient cohort, randomization to scleral buckle or pneumatic retinopexy in a prospective fashion, and multi-institutional collaboration may further elucidate quality of life measures depending on the specific surgical approach. We also suggest administering the VFQ-25 both pre- and postoperatively to better compare patients' baseline with follow-up opinions on their vision quality of life.

## Conclusion

Patients who had scleral buckle or pneumatic retinopexy had a similar postoperative quality of life, although scleral buckle is more invasive. However, there was a trend toward a higher percentage of patients preferring to have the same procedure on their fellow eye in the pneumatic retinopexy group than the scleral buckle group, suggesting that quality of life is not the only factor that determines patient preferences.

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## Author contributions

All authors contributed toward data analysis, drafting and critically revising the paper and agree to be accountable for all aspects of the work.

## Disclosure

The authors report no conflicts of interest in this work.

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