DOI: https://doi.org/10.53350/pjmhs2023175717

ORIGINAL ARTICLE

Variables Impacting Post-Retinal Detachment Visual Outcomes

ASNA TAHIR[1], SYED SHUJAAT ALI SHAH[2], NESR FAROOQ[3], MUHAMMAD NAEEM[4], MUHAMMAD AWAIS ASHRAF[5], LT COL AYYAZ HUSSAIN AWAN[6], BILAL KHAN[7]

[1]*Post Graduate Resident (PGR) Department of Ophthalmology Khyber Teaching Hospital Peshawar, Kpk.*
[2]*Assistant Professor Department of Ophthalmology PAQSJ institute of medical sciences and Gambat medical college Gambat*
[3]*Assistant professor Department of Ophthalmology Shalamar Medical and Dental College Lahore*
[4]*Assistant Professor Department of Ophthalmology Lady Reading Hospital (LRH) Peshawar*
[5]*Associate professor Department of Ophthalmology Multan Medical and dental college ibnesiena hospital and research institute Multan*
[6]*Associate Prof Department of Ophthalmology Farooq hospital Akhtar Saeed Medical College Rawalpindi*
[7]*Assistant Professor Ophthalmology department khyber Medical College/ khyber Teaching Hospital Peshawar*
Correspondence to: Bilal khan, Email: drbilalokz@gmail.com

ABSTRACT

Objective: The purpose of this study was to determine how often patients whose retinal detachment symptoms did not improve after surgery and how often treatment was successful in terms of visual and surgical results.

Methods: This quasi experiment was conducted at Department of Ophthalmology Khyber Teaching Hospital Peshawar. In this study 60 patients with 60 eyes were included. We evaluated all cases of delayed retinal detachment that underwent Pars Plana Vitrectomy (PPV) and followed them up for 6 months. We looked at the anatomical attachment of the retina, pre- and post-surgery Best Corrected Visual Acuity (BCVA), and factors that affect anatomical success. SPSS 22.0 was used to analyze all data.

Results: There were 38 (63.3%) males and 22 (36.7%) females among all cases. The patients average age was 45.16 years. Post-operative significant improvement was seen in visual acuity <0.004. The multiple logistic regression analysis found that three factors—primary anatomic success (p=0.047), preoperative visual acuity (6/60 or better; p=0.025), and lack of advanced PVR grade C-1 or worse (p=0.010)—had a positive effect on visual outcome.

Conclusion: Preoperative visual acuity of 6/60 or greater, absence of posterior vitreous reattachment grade C-1 or worse, and primary anatomic success all contribute to a good visual prognosis following surgery for rhegmatogenous retinal detachment.

Keywords: optical coherence tomography, rhegmatogenous retinal detachment

INTRODUCTION

Retinal detachment (RD) is a major cause of blindness, and its treatment has a success rate of more than 80% when started early.Delays in the commencement of retinal detachment are more common in low-income countries; this could be because of a lack of education, limited access to healthcare, or high costs. With an annual incidence rate of 13 cases per 100,000 persons, RD is more common in men than in women.[1,2] Rhegmatogenous RD is a surgical emergency since it is a common ophthalmic illness that can cause permanent damage to the eye's eyesight. Lattice degeneration, trauma, and intraocular surgeries are some of the factors that might cause RD. that came after Poor visual and anatomical outcomes, including baseline decreased eyesight, are the result of diagnostic delays.It is common for RD treatment to cause apoptotic retinal and vitreous alterations, which frequently call for urgent surgical intervention[3,4]. Many effective methods exist for the treatment of eye conditions, including scleral buckles (SBs), air-fluid exchange, endolasers, lensectomy, and long-acting gas or silicone oil tamponade. In order to address the root cause of retinal detachment, the main PPV approach releases vitreo-retinal tension and allows for a little but efficient intraocular tamponade. Reduced motility issues and non-physiological globe deformation due to scleral buckling treatment are additional benefits of this method. Reducing postoperative discomfort and swelling of the conjunctiva or lids is a major benefit of doing vitrrectomies without a scleral buckle.Important factors to consider while choosing the best surgical approach include the number, location, and severity of retinal tears as well as the presence or absence of posterior vitreous reattachment (PVR),[5,6] The surgeon's preferences, degree of experience, the lens's condition, the patient's ability to assume a posture that allows the ideal insertion of intraocular tamponade agents, and many other factors are also considered. The greatest indicator of primary surgical failure is a high preoperative viral load (PVR), which reduces the success rate. When rhegmatogenous RD (RRD) develops, it causes the vitreoretinal interface to become sick and the retina to become thin, avascular, and fragile, which makes the condition particularly challenging for surgeons. Treatment options include scleral buckling and pars plana vitrectomy. Another option is to combine the two. In comparison to adult RRD without ROP, the prognosis isn't good, and it's only the beginning.Repair duration and visual results for macula-on and macula-off RRDs must be clarified in order to maximize treatment[7]. We set out to determine, using data from sixty eyes, what characteristics were linked to a positive visual outcome following retinal detachment surgery. A previous meta-analysis looked at visual results after scleral buckling (SB) and how long it took for RRD repair to take effect[8-12] The authors found that the probability of final BCVA rose as the duration of macular detachment increased, from zero to three days.

MATERIALS AND METHODS

This quasi experiment study was conducted at Department of Ophthalmology Khyber Teaching Hospital Peshawar. We analyzed data from the medical records of patients who came in within the allotted time. At least three months of follow-up were conducted on all eyes that were examined. Prior to the procedure, patients had evaluations using several instruments, including a slit lamp biomicroscope for the anterior segment, an applanation tonometry for intraocular pressure, a binocular indirect ophthalmoscope for the posterior region, and a pupillary light reaction. The three authors who conducted the surgeries used various techniques, including sclera buckling procedures (SB) and three-port pars plana 20G vitrectomy (3PPV) with internal 3 8 tamponade (silicon oil or C F gas in one case), or a mix of the two. During the period being reviewed, no pneumatic retinopexy procedures were performed. Proliferative vitreoretinopathy (PVR), severe or numerous posterior or large breaks that would not heal with a sclera buckle, the need to remove vitreous debris or traction bands, or the necessity to peel off PVR membranes were all reasons to perform a vitrectomy. When needed, perfluorocarbon liquids were also utilized.

Retina reattachment after the initial surgery and preservation of that connection for a minimum of three months without further surgical procedures was considered primary anatomic success. Attached retina at least 3 months after the latest intervention was considered final anatomic success, independent of the number of procedures. At least two months following the last procedure, visual result was defined as the best corrected visual acuity. A satisfactory visual result was defined as 6 out of 60 or higher. In this study, proliferative vitreoretinopathy (PVR) was classified according to the following criteria established by the Retina Society in 1983: Class A (minimal): cloudiness of the vitreous and clusters

of vitreous pigment • Moderate (Grade B): inner retinal surface wrinkles, rolled edges of retinal fractures, stiffness of the retina, and venous tortuosity. Full-thickness permanent retinal folds affecting one, two, or three quadrants (C-1, C-2, and C-3, respectively) constitute Grade C (marked). • Grade D (massive): the retina appears to be fixed in four quadrants with distinct folds: D-1 is a broad open funnel form, D-2 is narrow, and D-3 is closed. Additionally, the optic nerve head is not visible. Any PVR score above C-1 was deemed advanced for the purposes of this study. The data was examined using a chi-square test in the Epi Info program. Means and standard deviations were used to summarize continuous variables, whereas percentages were used for discrete variables. Frequency tables accompanied the data summaries. Statistical significance was defined as a p-value less than 0.05. To find the adjusted odds ratios for the factors influencing the visual outcome, stepwise multiple logistic regression was employed. Age, sex, lack of preoperative posterior vitreous reattachment (grade C1 or worse), presence of giant retinal tears, surgery type, lens status, macula status (on or off), preoperative vision (6/60 or better), primary anatomic success, and non-rhegmatogenous complications are all potential associated factors that could be examined.

RESULTS

There were 38 (63.3%) males and 22 (36.7%) females among all cases. (figure 1)

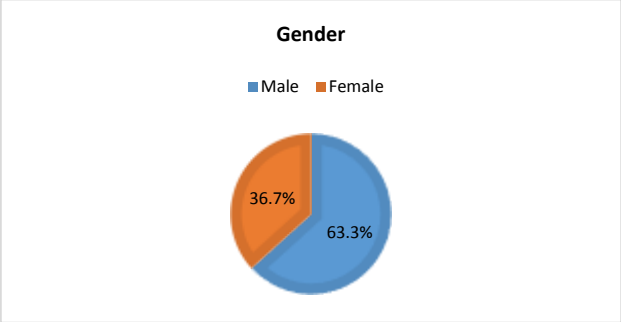

Figure-1: Gender distribution among all cases

Among all cases, 15 (25%) cases had age 20-30 years, 10 (16.7%) cases had age 31-40 years, 30 (50%) cases had age 41-50 years and 5 (8.3%) cases had age > 50years.(figure 2)

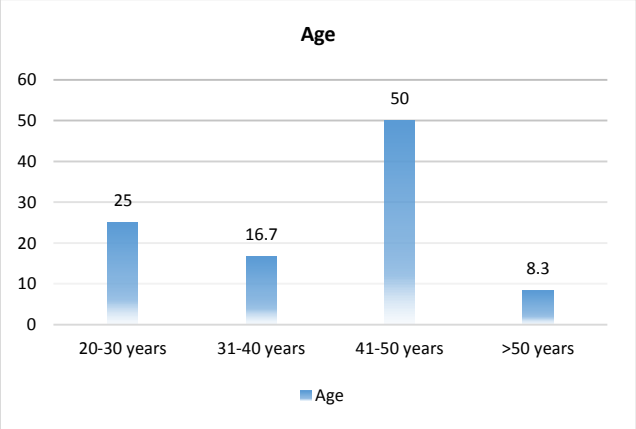

Figure-2: Age distribution of the presented cases

Post-operative significant improvement was seen in visual acuity <0.004.(table 1)

Table-1: Comparison of visual acuity pre and post operative

Visual Acuity	Pre-operative	Post-operative
3/60	49 (81.7%)	30 (50%)
>3/60 to <6/60	4 (6.7%)	10 (16.7%)
6/60 to <6/18	4 (6.7%)	14 (23.3%)
6/18 and better	3 (5%)	6 (10%)

The multiple logistic regression analysis found that three factors—primary anatomic success (p=0.047), preoperative visual acuity (6/60 or better; p=0.025), and lack of advanced PVR grade C-1 or worse (p=0.010)—had a positive effect on visual outcome.(table 2)

Table-2: Visual outcome and its explanatory variables in a multiple logistic regression model

Variables	Odds ratio	95% CI	Z-statistic	P Value
Primary anatomic success	4.7845	0.9521 – 22.7521	1.7854	0.047
Pre-operation VA of 6/60 and better	5.2154	1.0784 – 23.9658	2.0631	0.0478
Scleral buckle only	3.10574	0.9278 – 10.4178	1.5321	0.0875
Absence of PVR grade C-1 and worse	5.2298	1.3256 – 20.3524	2.2354	0.0256
Intercept	-	-	-3.7254	0.001

DISCUSSION

Many studies used preoperative visual acuity as a primary clinical variable; ours was no different, finding that good visual outcome was associated with a preoperative visual acuity of 6/60 or greater[13,14]. It is important to use caution when using this clinical variable for patient counseling in units without optical coherence tomography (OCT) or other sensitive equipment, as there are other important clinical and pathologic factors to consider.

Three primary surgical approaches were employed: combined 3PPV with SB and silicon oil, SB alone with or without subretinal fluid drainage, and 3PPV with silicon oil exchange. One eye was tamponaded with C3F8 gas following 3PPV. Each patient was given specific instructions regarding the surgical procedure to undergo. There were no predetermined standards. The results are consistent with those of other research that have shown that, across all RRD kinds, there is no clear winner among the procedures. The associated pathologies must be considered while choosing the procedure[15,16]. The majority of patients referred to our center are those in need of pars plana vitrectomy, as SBs are commonly performed at other institutes nationwide. Because of this, our study had a high 3PPV rate of 74.8%, which is comparable to other studies conducted in Europe and Africa. SBs were primarily utilized for simple cases of retinal detachment in our patient series[17,18]. Therefore, it was initially statistically significant on basic logistic regression, but this was not maintained on subsequent multiple regression analyses.

Postoperative results were better for patients with PVR stage-B than for those with PVR stage-C. Consistent with previous and ongoing studies, it was shown that preoperative PVR and the degree of separation were the main risk factors for primary failure. The risk of immediate surgical failure was more than tripled when preoperative advance percutaneous valve replacement (PVR) was used. The year 19 With every extra hour of detachment, the risk of surgical failure rose sharply, by about 12%. Delays in presentation might cause macula separation. A macula-off retinal detachment produces a less desirable visual outcome. In developing nations, patients with RD may show up later than expected. Furthermore, the complexity of detachments in developing nations is high.[19]

The level of competence of the surgeon and the complexity of the underlying pathology are two factors that can affect the

success rate of main anatomic surgeries. This study's 82% primary anatomic success rate is consistent with previous research in both developed and developing countries and is positively correlated with good visual outcome[20,21]. If surgeons could only control one thing, it would be the rate of initial anatomic success. Thorough preoperative and intraoperative procedures, together with meticulous patient selection, are necessary to achieve higher primary anatomic success rates. Additionally, early discovery and presentation are critical to prevent the eye from acquiring severe diseases during its healing process. Since our study was retrospective in nature and relied solely on data that was previously included in the case files, it did have certain limitations. For precise analysis, it was necessary to incorporate the following details into multiple files: the expected duration of retinal detachment, the degree of inflammation, and any recent changes in symptoms. However, a plethora of useful data was uncovered during the investigation.

CONCLUSION

Preoperative visual acuity of 6/60 or greater, absence of posterior vitreous reattachment grade C-1 or worse, and primary anatomic success all contribute to a good visual prognosis following surgery for rhegmatogenous retinal detachment.

REFERENCES

1 Anguita R, Ting MYL, Makuloluwa A, Charteris DG. Causal factors for late presentation of retinal detachment. Eye. 2023;37(1):185-186. Doi: 10.1038/s41433-022-02109-z

2 Nielsen BR, Alberti M, Bjerrum SS, la Cour M. The incidence of rhegmatogenous retinal detachment is increasing. Acta ophthalmol. 2020;98(6):603-606. Doi: 10.1111/aos.14380.

3 Wasim S, Ghayoor I, Shakir M, Afza R, Ali W. Factors Predisposing to Rhegmatogenous Retinal Detachment in a Tertiary Care Hospital of Pakistan: Pak J Ophthalmol. 2021;37(2).doi: 10.36351/pjo. v37i2. 1172.

4 Steel D. Retinal detachment. BMJ Clin Evid. 2014;2014:0710. PMID: 24807890; PMCID: PMC3940167.

5 Zhou A, Ong SS, Ahmed I, Arevalo JF, Cai CX, Handa JT. Socioeconomic disadvantage and impact on visual outcomes in patients with viral retinitis and retinal detachment. J Ophthalmic Inflamm Infect. 2022;12(1):26.Doi: 10.1186/s12348-022-00303-4

6 Sultan ZN, Agorogiannis EI, Iannetta D, Steel D, Sandinha T. Rhegmatogenous retinal detachment: a review of current practice in diagnosis and management. BMJ Open ophthalmol. 2020;5(1):e000474. Doi: 10.1136/bmjophth-2020-000474

7 Kaiser RS, Trese MT, Williams GA, Cox MS Jr. Adult retinopathy of prematurity: outcomes of rhegmatogenous retinal detachments and retinal tears. Ophthalmology. 2001;108:1647-1653.

8 Zapf MAC, Kothari AN, Markossian T, et al. The “weekend effect” in urgent general operative procedures. Surgery. 2015;158(2):508–514. doi:10.1016/j.surg.2015.02.024

9 Ross WH, Kozy DW. Visual recovery in macula-off rhegmatogenous retinal detachments. Ophthalmology. 1998;105(11):2149–2153.

10 Hassan TS, Sarrafizadeh R, Ruby AJ, Garretson BR, Kuczynski B, Williams GA. The effect of duration of macular detachment on results after the scleral buckle repair of primary, macula-off retinal detachments. Ophthalmology. 2002;109(1):146–152.

11 Kubay OV, Charteris DG, Newland HS, Raymond GL. Retinal detachment neuropathology and potential strategies for neuroprotection. Surv Ophthalmol. 2005;50(5):463–475.

12 Tani P, Robertson DM, Langworthy A. Prognosis for central vision and anatomic reattachment in rhegmatogenous retinal detachment with macula detached. Am J Ophthalmol. 1981;92(5):611–620.

13 Lecleire-Collet A, Muraine M, Menard JF, Brasseur G. Predictive visual outcome after macula – off retina detachment surgery using optical coherence tomography. Retina 2005; 25(1): 44-53

14 Sullivan P M, Luff A J, Aylward G W. Results of primary retina reattachment surgery (a prospective audit) Eye 1997; 11: 869-71

15 Heimann H, Bartz-schimidt KU, Bornfeld N, Weiss C, HilgersRD, Foerster MH: Scleral Buckling versus Primary Vitrectomy in Rhegmatogenous Retina Detachment Study Group. Scleral buckling versus primary vitrectomy in rhegmatogenous retina detachment a prospective randomized multicenter clinical study. Ophthalmology 2008; 115(9): 1634-5.

16 Azad RV, Chanana B, Sharma YR, Vohra R. Primary vitrectomy versus conventional retina detachment surgery in phakic rhegmatogenous retina detachment. Acta Ophtalmol Scand 2007; 85(5): 540-5.

17 Peters A L. Retina detachment in black South Africans. S Afr Med J 1995; 85: 158-159.

18 Sodhi A, Leung LS, Do DV, Gower EW, Schein OD, Handa JT. Recent trends in the management of rhegmatogenous retina detachment. Surv Ophthamol 2008; 53 (1): 50-67.

19 Anguita R, Roth J, Makuloluwa A, Shahid S, Katta M, Khalid H, Charteris DG. LATE PRESENTATION OF RETINAL DETACHMENT: CLINICAL FEATURES AND SURGICAL OUTCOMES. Retina. 2021 Sep 1;41(9):1833-1838. doi: 10.1097/IAE.0000000000003131.

20 Hsu HT, Yu-Chuan Kang E, Blair MP, Shapiro M, Komati R, Hubbard BG, Price KW, Capone A Jr, Drenser KA, Trese MT, Shields R, Kondo H, Matsushita I, Yonekawa Y, Patel SN, Kusaka S, Mano F, Olsen KR, Ells A, Amphornphruet A, Walsh MK, Besirli CG, Moinuddin O, Baumal CR, Enriquez AB, Hwang YS, Lai CC, Wu WC. Late Vitreoretinal Complications of Regressed Retinopathy of Prematurity: Retinal Break, Vitreous Hemorrhage, and Retinal Detachment. Ophthalmol Retina. 2023;7:72-80.

21 Chiang MF, Quinn GE, Fielder AR, Ostmo SR, Paul Chan RV, Berrocal A, Binenbaum G, Blair M, Peter Campbell J, Capone A Jr, Chen Y, Dai S, Ells A, Fleck BW, Good WV, Elizabeth Hartnett M, Holmstrom G, Kusaka S, Kychenthal A, Lepore D, Lorenz B, Martinez-Castellanos MA, Özdek Ş, Ademola-Popoola D, Reynolds JD, Shah PK, Shapiro M, Stahl A, Toth C, Vinekar A, Visser L, Wallace DK, Wu WC, Zhao P, Zin A. International Classification of Retinopathy of Prematurity, third edition. Ophthalmology. 2021;128:e51-e68.