Comparative Study of Combined Pars Plana Vitrectomy-Scleral Buckle versus Pars Plana Vitrectomy in Cases of Inferior Retinal Break with Proliferative Vitreoretinopathy

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Abstract

Background: The Researchers have compared the safety and effectiveness of pars plana vitrectomy with scleral buckle (PPV-SB) to pars plana vitrectomy (PPV) without scleral buckle, and the use of scleral buckle is only a matter of discussion among surgeons when it comes to complex retinal detachment surgery. In instances with inferior retinal break complicated with Proliferative Vitreoretinopathy, this study aimed to compare the surgical outcomes of combination PPV-SB versus PPV alone using optical coherence tomography (PVR). We used a prospective, randomised controlled trial design to examine the outcomes of surgical repair of retinal detachment in 58 eyes that had an inferior break and posterior vitreous recession (PVR) (RD). Each patient was randomly assigned to one of two groups: Treatment in Group A included both PPV and SB. Only PPV was performed on Group B. The results showed that in group A, there were no notable differences between the two groups in terms of age, sex, laterality, axial length < 26mm, intraocular pressure (IOP) before surgery, IOP three months later, lens status before surgery, macula status before surgery, and preoperative posterior vitreous refraction grading. Individuals in group B who had a successful single surgery had axial lengths that were noticeably greater than 26mm. There were no notable changes between the groups in terms of age, sex, laterality, intraocular pressure (IOP) before surgery, IOP three months after surgery, lens status before surgery, macula status before surgery, or preoperative visual acuity (PVR) grade. Conclusion: For patients with inferior breaks and PVR, restoring retinal detachment can be accomplished with either PPV alone or PPV combined with SB. Both surgical techniques are valid and have comparable outcomes.

Keywords: Combined Pars Plana Vitrectomy-Scleral Buckle; Inferior Retinal Break; Pars Plana Vitrectomy; Proliferative Vitreoretinopathy.

1.Introduction

Retinal The neurosensory retina becomes detached from the underlying retinal pigment epithelium when detachment (RD) occurs (RPE). Rhegmatogenous detachment forms when a tear occurs, tractional separation occurs when fibrovascular membranes are involved, and exudative detachment forms when fluid leaks into the subretinal area [1].

An abnormal process known as proliferative vitreoretinopathy (PVR), which was previously known as "massive vitreous retraction" or "massive periretinal proliferation," causes the formation of epi/subretinal membranes after rhegmatogenous retinal detachment (RRD), which in turn causes retinal traction and subsequent RD. Retinal shortening, also known as intraaretinal PVR, can be caused by activated glial tissue proliferating within the retina. As a significant consequence of RD, PVR occurs in around 5-10% of RRD cases. Overall, PVR is similar to RD, an aberrant wound-healing process that occurs after tissue damage [2].

Among the many ophthalmologic techniques available for the correction of RDs, a scleral buckle (SB) stands out. Under the conjunctiva, the SB is fastened around the eyeball. As a result, the eye's periphery draws nearer to the detached retina. It appears that the fluid that has built up under the retina can be pushed out and the retina can re-attach thanks to this change in the interactions between the tissues [3].

Cryotherapy and laser photocoagulation are also common components of RD surgeries. Cryotherapy or laser treatment creates a lasting adhesion around the retinal tear, stopping fluid buildup and re-detachment. For complicated RD surgeries, surgeons disagree on whether or not to use SB. Studies have compared the efficacy and safety of pars plana vitrectomy with scleral buckle (PPV-SB) to pars plana vitrectomy (PPV) without SB [3].

According to a recent Cochrane Review, patients with RD associated with PVR who were treated with C3F8 gas and standard SO had better visual and anatomic outcomes compared to patients who were treated with SF6 [4].

For patients of inferior retinal break complicated with PVR, this study aimed to compare the surgical outcomes of combined pars plana vitrectomy-scleral buckle (PPV-SB) with those of pars plana vitrectomy (PPV) alone using optical coherence tomography.

2.Patients and methods

This compared the surgical results of pars plana vitrectomy (PPV) alone with those of combined PPV and subcutis vitrectomy (SB) in instances of inferior retinal break complicated with perforated vitreous retina (PVR).

In this study, 58 eyes that had RD repaired surgically were included; all of these eyes had an inferior break and PVR. From November 2021 to October 2022, two equal groups of patients were recruited from Alpha Eye Center's outpatient clinics: Treatment in Group A included both PPV and SB. Only members of Group B had pars plana vitrectomy (PPV) procedures.

Patients' written informed consent was acquired. A secret code and an explanation of the study's goal were given to each patient. After receiving approval from Benha University's Research Ethics Committee, the Faculty of Medicine conducted the study.

Patients exhibiting rhegmatogenous RD, inferior break, or PVR were eligible for inclusion.

Patients who did not have percutaneous vein revascularization (PVR), had tractional or exudative RD, superior fractures, or new RD were not included.

3.Methodology

Before In order to determine if they were eligible for the experiment, all patients underwent an initial clinical evaluation prior to surgery. The eyes that were eligible for treatment were assigned to different groups using simple randomization. Thorough ophthalmic examinations were conducted, including the following: patient history, visual acuity, slit lamp examination of the anterior segment to rule out cataracts and corneal opacities, intraocular pressure (IOP) measured using goldmann applanation tonometry, fundus examination with indirect ophthalmoscope and slit lamp biomicroscopy to evaluate optic nerve health, macular attachment, detachment limits, detached retina height, retinal break locations, and PVR status using B-scan US. A color-coded fundus drawing chart was created for each patient, and standard preoperative laboratory investigations were performed.

The interventional procedure was carried out by trained surgeons. The patient's pupils were dilated the morning before the operation using a mixture of phenylepherine and cyclopentolate, 2.5 percent. The conjunctival sac was infused with 5% betadine eye drops after sterilisation and draping, and then rinsed after 1 minute.

Group A: 360 degree conjunctival periotomy, isolation and hanging of the inferior rectus muscle with lateral and or medial and or superior recti muscles with 3/0 silk sutures with exposure of peri equatorial sclera, localization of the retinal break using indirect ophthalmoscope and sterile 20 D lens with marking of the scleral site with sterile ink marker, scleral suture passes were designed according to location and site of the break or breaks using 5/0 non absorbable sutures, insertion of explant without tightening the sutures, tightening of scleral sutures over the explant was done to achieve the required buckle height, three 23 gauge ports were inserted 4 mm from limbus at upper temporal, nasal

and lower temporal locations, core vitrectomy using 23 gauge vitreous cutter and endo illum drainage retinotomy, a 23 gauge fluid extrusion cannula for fluid exchange, endo laser treatment for the retinal break and the retinotomy, intraocular tamponade injection, removal of the three ports with sterile cotton swabs to ensure their closure, 7/0 vicryl sutures for conjunctiva closure, antibiotic drops and ointment instillation, and patching were all utilised.

Group B: Three 23 gauge ports were inserted 4 mm from limbus at upper temporal, nasal and lower temporal locations, core vitrectomy using 23 gauge vitreous cutter and endo illumination probe with help of resight system of lumera 700 surgical microscopes, intravitreal injection of diluted triamcinolone to complete core vitrectomy and shave the vitreous base and vitreous around retinal break, treating the edge of the break with endo diathermy, drainage retinotomy, air fluid exchange by help of 23 gauge fluid extrusion cannula, endo laser treatment around the retinal break and the retinotomy, injection of intraocular tamponade, removal of the 3 ports with insuring their closure by milking and tamponading with sterile cotton tipped swab, closure of the conjunctiva with 7/0 vicryl sutures, the

Following the operation:

Retinal reattachment three months following intraocular tamponade "SO" removal and the total number of retina-affecting surgeries needed to re-flatten the retina following retinal re-detachment were the main outcomes.

Using the lens opacity classification system LOCS-III, the development of cataract in phakic eyes and the change in mean BCVA from the initial examination to visit 4 were the secondary end measures. "Development of cataract" is defined as a 1.0 point rise on any LOCS-III grading scale between the first exam and the fourth appointment.

Statistical analysis

Statistical data was analysed using SPSS v28 (IBM, Armonk, New York, United States). The mean and standard deviation ($\pm$ SD) of quantitative data were given. The data was checked for normality using the Shapiro-Wilk test and direct data visualisation methods. For quantitative variables that did not follow a normal distribution, the independent t-test or Mann-Whitney U test were used for comparisons between the two groups. We used the Chi-square or Fisher's exact test to compare the numerical or percentage categorical data. The success of a single operation was predicted using multivariate logistic regression analysis. A 95% confidence interval (CI) was used to determine the accuracy of odds ratios (OR), where a p-value is deemed significant if it is less than 0.05 at a 95% confidence level.

4.Results

The 58 eyes that had RD surgically repaired were included in the present investigation; all of them had an inferior break and PVR. They were 47 ± 13 years old on average in group A and 49 ± 14 years old in group B. There were no statistically significant variations in age or sex between the two groups under investigation; nevertheless, men made up 78.6% of group A and 57.1% of group B. Listing 1

With 53.5% of each group showing right-eye attachment and 46.4% showing left-eye affection, laterality was similar in the two groups. In terms of axial length and intraocular pressure (IOP), 75 percent of group A and 82.1% of group B had axial lengths less than 26 mm, but there was no significant difference. Similarly, there was no significant difference in the mean IOP between the two groups. Both groups had similar preoperative lens status (P = 0.771), with 67.9% of patients in group A and 71.4% of patients in group B having phakic lenses. When comparing groups A and B, the percentage of pseudophakic lenses was 32.1% and 28.6%, respectively. The levels of preoperative macular status were similar across the two groups (P = 0.789), with 46.4% in group A and 50% in group B having on-status and 53.6% in group B having off-status lenses. In group A, 10.7 percent had grades C P 3-6, 28.6 percent had grades C P 6-9, and 60.7 percent had grades C P 9-12 before surgery (P = 0.377). In group B, 7.1% had grades C P 3-6, 50 percent had grades C P 6-9, and 42.9 percent had grades C P 9-12 before surgery. There was no statistically significant difference between groups A and B with regard to reattachment rates following 3 months of intraocular pressure tamponade (P = 0.342; Table 2). With respect to the amount of operations required for re-flattening re-detachment, the percentages were as follows: 8.21%, 10.8%, and 7.1%. There was no statistically significant difference between the three groups (P = 0.653), while group B had a higher rate of operations (11.4 percent vs. 21.5% vs. 7.1%). There was no statistically significant difference between the two groups, with 82.1% of patients in group A and 71.4% in group B reporting success after a single surgery (P =

0.342). Baseline (median = 2.3 vs. 2.05 logMar, P = 0.882), 1-week (median = 1.77 logMar for each, P = 0.967), 1-month (median = 1.47 vs. 1.3 logMar, P = 0.497), 2-months (median = 1.3 vs. 1.15 logMar, P = 0.855), and 3-month (median = 1 logMar for each, P = 0.882) BCVA data were not significantly different between groups A and B (Table 3). There was no statistically significant difference between groups A and B when it came to cataract incidence (67.0%) or retinal re-detachment (17.9% vs. 28.6%, P = 0.342; see Table 4). According to Table 5, the only significant predictor for the outcome of a single surgery at the univariate level was axial length (OR = 5.286, 95 percent CI = 1.316 - 21.229, P = 0.019). Axial length less than 26mm (OR = 19.19, 95 percent CI = 1.855 - 198.506, P = 0.013) and macula-on (OR = 7.682, 95 percent CI = 1.019 - 57.892, P = 0.048) were the significant predictors in multivariate analysis. As predictors for single operation success, combined surgery and female gender demonstrated borderline significance (P = 0.057 and 0.088, respectively). Patients in Group A were categorised based on the success rate of a single operation (Table 6). In terms of age (P = 0.114), gender (P = 0.553), laterality (P = 0.333), axial length < 26mm (P = 0.574), preoperative intraocular pressure (IOP) (P = 0.902), 3-month IOP (P = 0.164), preoperative lens status (P = 1.0), preoperative macula status (P = 0.333), and preoperative postoperative vascular refraction grading (P = 1.0), there were no statistically significant differences between the groups. The success rate of a single operation was used to categorise patients in Group B (see Table 7). Axial lengths less than 26mm were considerably higher in those who had a successful single surgery (95 percent vs. 50 percent, P = 0.015). In terms of age (P = 0.574), gender (P = 1.0), laterality (P = 0.410), intraocular pressure (IOP) before surgery (P = 0.926), intraocular pressure (IOP) three months after surgery (P = 0.387), lens status (P = 0.508), macula status (P = 0.678), and preoperative perioperative visual field grading (P = 0.153), there were no statistically significant differences between the groups. The eighth table

Table (1) Characteristics of the research subjects.

		Group A (n = 28)	Group B (n = 28)	P-value
Age (years)	Mean ±SD	47 ±13	49 ±14	0.450
Gender				
Males	n (%)	22 (78.6)	16 (57.1)	0.086
Females	n (%)	6 (21.4)	12 (42.9)	

Table (2) Axial length, intraocular pressure, and eye laterality are presented and The examined groups' preoperative lens and macular health, as well as their PVR grades

		Group A (n = 28)	Group B (n = 28)	P-value
Laterality	**Right**	15 (53.6)	15 (53.6)	1.0
	Left	13 (46.4)	13 (46.4)	
Axial length < 26 mm	n (%)	21 (75)	23 (82.1)	0.515
Intraocular pressure	Preoperative	14 ±4	13 ±4	0.450
	At 3 months	20 ±5	20 ±4	1.0
lens status preop.	Phakic	19 (67.9)	20 (71.4)	0.771
	Pseudophakic	9 (32.1)	8 (28.6)	
Macula status preop.	On	13 (46.4)	14 (50)	0.789
	Off	15 (53.6)	14 (50)	
Grade of PVR preop	C P 3-6	3 (10.7)	2 (7.1)	0.377
	C P 6-9	8 (28.6)	14 (50)	
	C P 9-12	17 (60.7)	12 (42.9)	

Table (3) Reattachment, total number of procedures, and success rate of single surgery for the groups under study

		Group A (n = 28)	Group B (n = 28)	P-value
Reattachment after 3 months of IO tamponade removal	**n (%)**	23 (82.1)	20 (71.4)	0.342
Operations needed to re-flatten re-detachment	**One**	23 (82.1)	20 (71.4)	0.653
	Two	3 (10.8)	6 (21.5)	
	Three	2 (7.1)	2 (7.1)	
Single surgery success	**n (%)**	23 (82.1)	20 (71.4)	0.342

Table (4) The best corrected visual acuity at various times in the groups.

BCVA (logMar)		Group A (n = 28)	Group B (n = 28)	P-value
Baseline	Median (range)	2.3 (0.4 - 2.8)	2.05 (0.4 - 2.8)	0.882
After 1 week	Median (range)	1.77 (0.5 - 2.3)	1.77 (0.4 - 2.8)	0.967
After 1 month	Median (range)	1.47 (0.4 - 2.3)	1.3 (0.4 - 2.8)	0.497
After 2 months	Median (range)	1.3 (0.1 - 2.3)	1.15 (0.4 - 2.3)	0.855
After 3 months	Median (range)	1 (0.2 - 2.3)	1 (0.3 - 2.3)	0.882

Table (5) Cataract and retinal re-detachment rates after surgery.

		Group A (n = 28)	Group B (n = 28)	P-value
Cataract	n (%)	19 (67.9)	19 (67.9)	1.0
Retinal re-detachment	n (%)	5 (17.9)	8 (28.6)	0.342

Table (6) Analysis of univariate and multivariate logistic regression for the prediction of success in a single surgical procedure.

	Univariate		Multivariate	
	OR (95% CI)	P-value	OR (95% CI)	P-value
Combined surgery (ref: PPV only)	1.842 (0.518 – 6.536)	0.346	5.952 (0.945 – 37.037)	**0.057†**
Age (years)	1.031 (0.986 - 1.079)	0.184	1.053 (0.984 - 1.127)	0.135
Female gender (ref: Male)	1.786 (0.425 - 7.496)	0.428	8.057 (0.733 - 88.552)	**0.088†**
Left side (Ref: Right)	1.014 (0.292 - 3.521)	0.982	0.283 (0.043 - 1.875)	0.191
Axial length < 26 mm	5.286 (1.316 - 21.229)	**0.019***	19.19 (1.855 - 198.506)	**0.013***
Preoperative intraocular pressure	1.006 (0.861 - 1.176)	0.938	0.991 (0.804 - 1.221)	0.932
Pseudophakic lens status (ref: Phakic)	0.975 (0.254 - 3.745)	0.971	0.382 (0.052 - 2.807)	0.344
Macula-on (ref: Off)	2.587 (0.69 - 9.7)	0.159	7.682 (1.019 - 57.892)	**0.048***
Grade of PVR preop (ref: Grade C P 3-6)				
Grade C P 6-9	1.583 (0.129 - 19.422)	0.719	0.742 (0.032 - 17.018)	0.852
Grade C P 9-12	0.556 (0.054 - 5.7)	0.621	0.336 (0.02 - 5.753)	0.451

Table (7) Group A factors influencing the success of a single procedure

		Single surgery success		
		Yes (n = 23)	No (n = 5)	P-value
Age (years)	Mean ±SD	48 ±13	38 ±14	0.114
Gender				
Males	n (%)	17 (73.9)	5 (100)	0.553
Females	n (%)	6 (26.1)	0 (0)	
Laterality				
Right	n (%)	11 (47.8)	4 (80)	0.333
Left	n (%)	12 (52.2)	1 (20)	
Axial length < 26 mm	n (%)	18 (78.3)	3 (60)	0.574
Intraocular pressure				
Preoperative	Mean ±SD	14 ±4	14 ±5	0.902
Three-months	Mean ±SD	19 ±5	23 ±2	0.164
Lens status preop.				
Phakic	n (%)	15 (65.2)	4 (80)	1.0
Pseudophakic	n (%)	8 (34.8)	1 (20)	
Macula status preop.				
Off	n (%)	11 (47.8)	4 (80)	0.333
On	n (%)	12 (52.2)	1 (20)	
Grade of PVR preop.				
C P 3-6	n (%)	2 (8.7)	0 (0)	1.0
C P 6-9	n (%)	7 (30.4)	2 (40)	
C P 9-12	n (%)	14 (60.9)	3 (60)	

Table (8) Group B factors influencing the success of a single procedure.

		Single surgery success		
		Yes (n = 20)	No (n = 8)	P-value
Age (years)	Mean ±SD	50 ±14	47 ±13	0.574
Gender				
Males	n (%)	11 (55)	5 (62.5)	1.0
Females	n (%)	9 (45)	3 (37.5)	
Laterality				
Right	n (%)	12 (60)	3 (37.5)	0.410
Left	n (%)	8 (40)	5 (62.5)	
Axial length < 26 mm	n (%)	19 (95)	4 (50)	**0.015***
Intraocular pressure				
Preoperative	Mean ±SD	13 ±4	13 ±2	0.926
Three-months	Mean ±SD	20 ±4	19 ±3	0.387
Lens status preop.				
Phakic	n (%)	15 (75)	5 (62.5)	0.508
Pseudophakic	n (%)	5 (25)	3 (37.5)	
Macula status preop.				
Off	n (%)	9 (45)	5 (62.5)	0.678
On	n (%)	11 (55)	3 (37.5)	
Grade of PVR preop.				
C P 3-6	n (%)	2 (10)	0 (0)	0.153
C P 6-9	n (%)	12 (60)	2 (25)	
C P 9-12	n (%)	6 (30)	6 (75)	

5.Discussion

Proliferative Patients with RRD are at increased risk for developing vitreoretinopathy (PVR), a condition that leads to the development and traction of a membrane surrounding the retina. PVR accounts for 5–10% of RRD and is involved in 75% of postoperative redetachment. As of right now, there isn't a universally accepted method for treating RRDs with PVR. While SB is occasionally used to treat PVR, its efficacy in PVR treatment remains unclear [5].

At both the pre- and post-operative three-month marks, there were no statistically significant differences between the groups with respect to age, sex, or intraocular pressure (IOP). Three months following the operation, however, intraocular pressure (IOP) was much greater than preoperative levels in both groups.

About 9% of patients who underwent vitrectomy acquired some degree of glaucoma, according to a research by Mansukhani et al., which focused on age-matched patients who had SB, SB plus vitrectomy, or vitrectomy alone. This rate was more than the 1% prevalence seen in the overall population prior to these surgical procedures. According to the results, vitrectomy may raise intraocular pressure [6].

The incidence of intraocular pressure (IOP) rise following SB was also shown to be between 1.4% to 4.4% by Mansoori et al. The theory put forward was that SB flattens the sclera over the ciliary body, which causes the ciliary process to rotate anteriorly and the lens-iris diaphragm to move anteriorly. According to a study conducted by Eliassi-Rad et al., a number of factors were shown to be linked to a higher likelihood of acute intraocular pressure (IOP) elevation following pars plana vitrectomy [7]. This chain reaction could directly cause the angle to narrow and cause an increase in IOP (PPV). Pars plana lensectomy with PPV, intraoperative scatter endophotocoagulation, fibrin formation following PPV, and combination SB and PPV were among these. Furthermore, postoperative intraocular pressure increase was more common in individuals having PPV for PVR as opposed to those having the operation for macular hole repair [8].

After three months of intraocular (IO) tamponade removal, the reattachment rate in Group A was 82.1% and in Group B it was 71.4%. Nevertheless, the statistical significance of this difference was not established (P = 0.342). Znaor et al. found a comparable proportion of patients in both groups attaining retinal reattachment at least 3 months following the operation, so these results are in line with their findings [9].

The current investigation compared the two groups with respect to the amount of procedures needed to re-flatten re-detachment. Out of the patients in Group A, 82.1% had positive outcomes after a single procedure, 10.8% after two, and 7.1% after three. While 71.4% of Group B patients had success after a single operation, 21.5% after two, and 7.1% after three, the numbers were reversed. There was no statistically significant difference (P = 0.653) in the amount of procedures required between the two groups. In a similar vein, Znaor et al.

found that pars plana vitrectomy (PPV) patients needed fewer procedures overall to reach their desired anatomical outcome. They did point out that the data were skewed and the difference was tiny, so they emphasised the need of being careful with their interpretations because the evidence was so weak (9).

Results showed that a sizeable percentage of patients in both groups were able to get the desired results after just one operation; specifically, 81.1% of patients in Group A and 71.4% of patients in Group B. The change, however, did not reach statistical significance (P = 0.342). The combined vitrectomy + SB group had a non-significantly lower number of surgeries needed to re-flatten re-detachment (P = 0.546) and a non-significantly higher rate of retinal reattachment (P = 0.342) after silicone oil removal compared to the vitrectomy alone group.

In contrast, a study conducted by Vangipuram et al. indicated that 77.5% of eyes that received pars plana vitrectomy (PPV) and 91.7% of eyes that underwent PPV combined with SB (PPV/SB) achieved single-surgery anatomic success. There was a statistically significant difference (P = 0.006) in the two therapies' success rates for single-surgery anatomic procedures [10].

Both groups' preoperative best-corrected visual acuity (BCVA) in LogMar units and BCVA at different postoperative intervals (1 week, 1, 2, and 3 months) did not differ statistically from one another. Nevertheless, it should be mentioned that after the defined postoperative periods (1 week, 1, 2, and 3 months), BCVA levels significantly improved compared to preoperative levels.

These results are in line with those of Znaor et al., who also discovered no significant difference in postoperative visual acuity between the two groups. Statistically, there was no discernible change in visual acuity on average (9). There was likewise no statistically significant difference in postoperative visual acuity in the groups studied by Lai et al., although BCVA did significantly improve [11].

Retinal redetachment and problems related to cataract, as measured by the "LOCS-III score," did not differ significantly among the groups included in the present study.

Lindsell et al. found similar results regarding postoperative sequelae, with the exception of an increased incidence of macular edoema in the group that had coupled SB with pars plana vitrectomy (SB with PPV). There were no other significant differences [12]. In contrast, a study conducted by Kessner et al. revealed that complications like macular edema and a temporary rise in intraocular pressure were more common in the group that underwent combined surgery (P = 0.014), suggesting that there are disparities in the complication rates between the two approaches [13]. Vitrectomy with additional SB in Grade B and C1 PVR cases was linked to a greater failure probability, according to Adelman et

al. The failure rate was 8.9% greater in individuals treated with additional SB compared to those who did not, however the difference was not statistically significant [14].

When looking at the success rate of a single operation, the present study found no statistically significant differences between the groups. In contrast to the vitrectomy-only group, the combined vitrectomy + SB group had a non-significantly greater rate of single-surgery anatomic success (P = 0.865).

When comparing PPV-SB to PPV alone, Lai et al. discovered that the former had a greater success rate at 12 months postoperatively, particularly in instances of grade C PVR (11). In a similar vein, Storey et al. found that PPV-SB yielded far better Single Surgery Anatomic Success (SSAS) rates than PPV alone [15].

One study found that the combined vitrectomy + SB group had a slightly reduced rate of single-surgery anatomic success compared to the vitrectomy alone group, although the difference was not statistically significant (P = 0.683). [13].

Success after a single surgical procedure was predicted for the patients in this study using univariate and multivariate logistic regression models. Factors such as age, gender, axial length, preoperative intraocular pressure (IOP), lens status, macular status, and PVR grading were analysed as potential predictors. Only axial length (OR=5.286, 95 percent CI = 1.316 - 21.229, P = 0.019) was a significant predictor of single operation success on the univariate level. Two significant predictors, however, emerged from multivariate analysis: axial length smaller than 26mm (OR = 19.19, 95 percent CI = 1.855 - 198.506, P = 0.013) and macula-on (OR = 7.682, 95 percent CI = 1.019 - 57.892, P = 0.048). Furthermore, as predictors for single surgery success, female gender and combination surgery both exhibited borderline significance (P = 0.088 and P = 0.057, respectively).

Alternatively, the SB-PPV strategy was determined by Echegaray et al. to be the most consistent and statistically significant variable suggesting better Single Surgery Anatomic Success (SSAS). According to their findings, a significantly higher percentage of instances in the SB-PPV group were able to attain SSAS (92.2% vs. 81.1% in the PPV-only group; p=0.0010). SB-PPV showed that SSAS rates were greater in eyes with phakic lenses compared to pseudophakic lenses. In addition, SB-PPV outperformed PPV alone in terms of survival outcomes across the board and in the phakic and pseudophakic subgroups (16).

When comparing the groups of patients who had and did not have successful single surgeries, researchers found no statistically significant differences in age, gender, laterality, axial length, intraocular pressure (IOP) before and after surgery, lens status, macular status, or preoperative PVR grading. On the other hand,

there was a noticeably greater incidence of axial length less than 26mm in Group B, which consisted of patients who had successfully undergone a single surgery (95 percent vs. 50 percent, P = 0.015). Patients with and without successful single surgery did not differ significantly in terms of age, gender, laterality, intraocular pressure (IOP) before and after surgery, lens status before surgery, macular state before surgery, or preoperative PVR grading.

These findings are in agreement with those of Lai et al., who used a multivariate logistic regression model to show that SSAS was unaffected by any of the baseline factors or RD surgery types [11].

6.Conclusion

In final thoughts: for patients with inferior breaks and PVR, our study shows that PPV-SB paired with PPV alone are both valid surgical methods with comparable outcomes for correcting RD.

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Contribution of the author

All authors made equal contributions to the study.

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