



Original Article

Anatomical Outcome Following Pars Plana Vitrectomy alone Versus Pars Plana Vitrectomy with Scleral Buckling for the Repair of Rhegmatogenous Retinal Detachment.

Authors

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Purpose : To compare the anatomical outcome in terms of retinal reattachments following pars plana vitrectomy (PPV) versus combined pars plana vitrectomy and scleral buckling (PPV/SB) for the repair of primary rhegmatogenous RD.

Materials and Methods: 160 patients were included in the study. It was conducted at Institute of Ophthalmology, Unit-3, Mayo hospital, Lahore. It was a quasi-experimental study. The patients with Rhegmatogenous Retinal detachment were divided in two groups (80 each). The reattachment surgery was done, and whereas group A patients underwent Pars Plana Vitrectomy, group B patients were treated with Pars Plana Vitrectomy and Scleral Buckling. Ethical approval was taken from institutional review board (IRB) of KEMU Lahore.

Results: Out of 160 (80 in each group) cases, on comparison of anatomical outcome in both groups, it was found that 67.5% (n=54) in Group-A and 48.75% (n=39) in Group-B had successful retinal re-attachment after the respective surgeries. The difference was significant ($p = 0.01$).

Conclusion: We concluded that on comparison between pars plana vitrectomy (PPV) versus combined pars plana vitrectomy and scleral buckling (PPV/SB) for the repair of primary rhegmatogenous RD, anatomical outcome in terms of retinal reattachments was better in PPV group and addition of scleral buckling had no advantage on PPV.

Keywords: Primary rhegmatogenous retinal detachment, repair, pars plana vitrectomy, scleral buckling, retinal reattachment.

Introduction

Rhegmatogenous retinal detachment (RRD) is a condition in which fluid from the vitreous cavity passes through a full thickness defect in neurosensory retina into the sub retinal space to cause separation of neurosensory retina from underlying retinal pigment epithelium. RD occurs in one out of 10,000 people per year.¹ RRD is an important cause of reduced visual acuity,² particularly in subgroup of individuals who are predisposed to the development of retinal tears. Predisposing associations of RRD such as high myopia, previous cataract surgery, direct ocular trauma and peripheral retinal degeneration are well established.³ RRD is one of the most common indications for vitreoretinal surgery. There are different surgical methods and the choice of method varies between surgeons and the centres.⁴ Scleral buckling (SB) and pars plana vitrectomy (PPV) or combinations of both have been used in the treatment of primary RRD.

Pars plana vitrectomy (PPV) is growing in popularity for the treatment of primary rhegmatogenous retinal detachment (RD). PPV achieves favorable anatomic and visual outcomes in a wide variety of patients, especially in pseudophakic RD. A growing number of clinical series have demonstrated generally comparable outcomes comparing PPV and scleral buckling (SB) under a variety of circumstances. Standard 20G PPV involves removing the vitreous and relieving the primary vitreoretinal traction followed by intraocular tamponade by silicon oil or gas. The sub retinal fluid is drained internally through the retinal break or through a separately created drainage retinotomy. Single surgical anatomical reattachment success with primary vitrectomy done for retinal detachment is reported to be 81.3%.⁵ Scleral Buckling (SB) is one of the several procedures that can be used to repair RD^{6,7}. It allows the reposition of separated layers by relieving traction on the retina. At times combined PPV & SB may be indicated to repair a primary RD. Combined PPV & SB can be used in conditions where there is widespread peripheral pathology associated with a retinal detachment. The encircling band provides support to the vitreous base while vitrectomy removes the direct vitreoretinal traction that is present. The single surgical anatomic success with both the procedures is reported to be 87.1%.⁵ Until now only retrospective, non randomized studies are done in this field and the optimal roles of both the procedures for RD surgery are controversial unless a well done randomized prospective trial comparing the two is carried out. Also because no local study is currently available in the literature, evaluation of the two procedures is required to enable us to choose the most appropriate technique for the repair of RD.

Materials and Methods

This quasi experimental study was conducted at Institute of Ophthalmology, Unit-3, Mayo hospital, Lahore.

Non probability purposive sampling was done. 160 (80 each) patients with Rhegmatogenous Retinal detachment, were included in the study, sample size was estimated using 5% level of significance, 80% power of test with an expected percentage of success with scleral buckling in 53% and with PPV as 72%.⁸ 160 patients were included in the study. They were divided in two group (80 each). Patients with ages between 20-70 years, both genders and Rhegmatogenous retinal detachment of less than 3 months duration were included in the study. Patients with Any previous vitreoretinal surgery on history, any other previous ocular surgery except cataract extraction, traumatic RD, tractional RD resulting from proliferative diabetic retinopathy or other retinal conditions, long standing RD (More than 3 months), old stiff RD requiring retinotomy (excision of retinal folds to flatten retina) diagnosed on slit lamp examination were excluded from the study.

After getting approval from institutional review board (IRB) of KEMU Lahore (letter provided) cases fulfilling the inclusion and exclusion criteria were registered through the OPD of unit III, institute of ophthalmology Mayo hospital Lahore. Informed consent was taken from the patients. Demographic information like name, age and gender was recorded. Patients were allocated in two groups i.e. group A and group B, by using drop box method. Group A underwent PPV and group B PPV+ SB. PPV was performed as standard 3-port PPV with fluid, air and oil exchange. For SB silicon sponges and/or encircling bands were used according to the surgeons' preference and site of break. Follow up was done on 8th post operative day to assess for retinal attachment on slit lamp examination. All the post operative examination was done by single VR surgeon to rule out bias and the findings recorded on performa. The reattachment of retina assessed by means of slit lamp examination and B-scan was recorded as final outcome.

The data was entered in SPSS version 16 and analyzed through its statistical programme. The quantitative data like age was presented as mean \pm standard deviation. The qualitative data like gender and retinal reattachment was presented in the form of frequency and percentage. Chi-square was applied for comparison of two groups of PPV/SB. Data was stratified for eye, gender and pre-op visual acuity to deal with effect modifiers. Post-stratification chi-square test was applied for comparison of retinal reattachment in both groups. P value \leq 0.05 was considered as significant.

Results

A total of 160 (80 cases in each group) compare the anatomical outcome in terms of retinal reattachments following pars plana vitrectomy (PPV) versus combined pars plana vitrectomy and scleral buckling (PPV/SB) for the repair of primary rhegmatogenous RD. Age distribution of the

patients was done showing that 33.75%(n=27) in Group-A and 30%(n=24) in Group-B were between 20-50 years of age while 66.25%(n=53) in Group-A and 70%(n=56) in Group-B were between 51-70 years of age, mean±sd was calculated as 55.45±8.00 and 57.01±8.13 years respectively. Patients were distributed according to gender showing that 67.5%(n=54) in Group-A and 72.5%(n=58) in Group-B were male while 32.5%(n=26) in Group-A and 27.5%(n=22) in Group-B were females. Comparison of anatomical outcome in both groups was done showing that 67.5%(n=54) in Group-A and 48.75%(n=39) in Group-B were recorded with retinal reattachment while remaining 32.5%(n=26) in Group-A and 51.25%(n=41) in Group-B had no findings of the retinal reattachments, p value was calculated as 0.01 showing a significant difference between both techniques. Table No.(1). Stratification for age and gender and recorded and presented in Table No. (2 & 3).

Table 1: Comparison of anatomical outcome in both groups (n=160).

Retinal reattachment	Group-A (n=80)		Group-B (n=80)	
	No. of patients	%	No. of patients	%
Yes	54	67.5	39	48.75
No	26	32.5	41	51.25
Total	80	100	80	100

P value=0.01

Table 2: Stratification for anatomical outcome in both groups with regards to age.

Age Group (Years)	Group	Retinal Reattachment		P value
		Yes	No	
20-50	A	15	12	0.61
	B	15	9	
51-70	A	39	14	0.001
	B	24	32	

Table 3: Stratification for anatomical outcome in both groups with regards to gender

Age Group (Years)	Group	Retinal Reattachment		P value
		Yes	No	
Male	A	38	16	0.02
	B	29	29	
Female	A	16	10	0.26
	B	24	12	

Discussion

We did a prospective study comparing the anatomical outcome in terms of retinal reattachments following pars plana vitrectomy (PPV) versus combined pars plana vitrectomy and scleral buckling (PPV/SB) for

the repair of primary rhegmatogenous RD. Out of 160 (80 in each group) cases, 67.5%(n=54) in Group-A and 48.75%(n=39) in Group-B had a successful retinal reattachment. Our findings are comparable with the findings of the previous study where the single surgical anatomic success with both the procedures was reported to be 87.1%⁵ and 53%.⁸ A previous study compared for scleral buckling surgery (SB) and primary pars plana vitrectomy (PPV) in rhegmatogenous retinal detachments of medium complexity concluded benefit of SB in phakic eyes with respect to BCVA improvement⁸. No difference in BCVA was demonstrated in the pseudophakic trial. Based on a better anatomical outcome, PPV was recommended in these patients, which shows that our findings are justified. Kinori M and others⁵ compared pars plana vitrectomy (PPV) with combined PPV and scleral buckle (SB) for the repair of noncomplex primary rhegmatogenous retinal detachment (RRD) and concluded that the reattachment rate and the final VA were similar in both groups. The addition of SB did not improve the results and was associated with slightly lower VA than with PPV alone. Tear location or lens status had no significant effect on success rates. It is likely that in eyes undergoing PPV for primary RRD, addition of a SB is not warranted. Weichel ED and others⁹ evaluated pars plana vitrectomy (PPV) versus a combined PPV and scleral buckle (PPV/SB) for repair of noncomplex, pseudophakic retinal detachment and concluded that primary PPV and PPV/SB seem to have similar efficacy in the repair of a matched group of patients with primary noncomplex pseudophakic retinal detachment. There was no statistically significant difference in complication rate between the 2 groups. Brazitikos PD and colleagues¹⁰ compared the anatomical and functional outcome of scleral buckle (SB) surgery with that of pars plana vitrectomy (PPV) alone in the treatment of primary rhegmatogenous pseudophakic retinal detachment (RD) and concluded that Primary PPV offers potential advantages over SB surgery in the treatment of pseudophakic RD, including less operating time, accurate diagnosis of breaks, higher reattachment rate with a single surgery, and no postoperative axial length changes. Retinal reattachment rate with multiple surgeries and final visual acuity at 1 year were similar for SB surgery and PPV, these findings correspond to our study, however, we included only one variable compared in coming trials. A number of studies conducted have shown promising results with PPV without SB for the management of RRD¹¹⁻¹⁴, there is a role of primary vitrectomy giving satisfactory results in phakic retinal detachments¹³ and



pseudophakic retinal detachments.¹⁴ Finally, we are of the view that the addition of SB did not improve the anatomical outcome in terms of retinal reattachment.

Conclusion

We concluded that on comparison between pars planavitrectomy (PPV) versus combined pars plana vitrectomy and scleral buckling (PPV/SB) for the repair of primary rhegmatogenous RD, anatomical outcome in terms of retinal reattachments was better in PPV group and addition of scleral buckling had no advantage on PPV.

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