

The Outcome Combined Pars Plana Vitrectomy and Scleral Buckling (Vit-Buck) in Pediatric Retinal Detachment

Vitrectomy and Scleral Buckling in Pediatric Retinal Detachment

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ABSTRACT

Objective: To assess the visual and anatomical outcome of combined parsplana vitrectomy and Scleral Buckling procedure in pediatric retinal detachment patients.

Study Design: A retrospective study

Place and Duration of Study: This study was conducted at the Department of Ophthalmology, Al-Ibrahim Eye hospital, Karachi for six months from April 2019 to March 2020.

Materials and Methods: A retrospective study was carried out on 57 patients with pediatric retinal detachment aged 3-14. Patients who underwent a combined surgical procedure of SB and PPV were included and had a follow-up for six months minimum. Medical records were studied thoroughly. Pre and post-operative visual acuity were assessed on follow-up, along with complications. Data were analyzed using SPSS Version 21.0 with P-value set at ≤ 0.05 .

Results: Significant difference (P-value ≤ 0.05) in Pre and Post-Operative visual acuity upon follow-up and a reduction in complications upon follow-ups.

Conclusion: SB is a strong surgical procedure in paediatric retinal detachments and combined with parsplana vitrectomy improves visual acuity and shows a strong anatomic success outcome.

Key Words: Scleral Buckling, Retinal Detachment, Visual Acuity, Anatomic Success

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INTRODUCTION

Estimates show that 43 million people blind worldwide, with 90% of these cases arising from developing nations in Asia, Latin America, and Africa. There are many causes of blindness, such as glaucoma, cataract, and trachoma. One of the causes of blindness is the detachment of the retina, which leads to complete blindness⁽¹⁾. Retinal detachment (RD) is prevalent in developing countries due to poor health care provision⁽²⁾. The number of RD in children is fairly low when comparing to the prevalence of RD in adults. Its occurrence is said to only be 3.2-6.6% in children. The main factors for RD in children include myopia, retinopathy of prematurity, associated conditions, and trauma^(3,4).

Furthermore, retinal detachment can also be idiopathic. Pediatric RD in other studies indicates the frequency to be much higher, going on effect 12.6% of all patients suffering from retinal detachment⁽⁵⁾. However, pediatric RD is often diagnosed at a later course of the disease, and the visual loss is less acute than the typical RD associated with acute posterior vitreous detachment. Combined with the fact that children possess an immature cognitive function means that they are far less likely to report and recognized any visual symptoms of acute RD⁽⁶⁾. Therefore, children present late with RD clinical features, such as macular involvement and proliferative vitreoretinopathy (PVR)⁽⁷⁾. The treatment of pediatric RD is surgical and is carried out on the same surgical principles as adult detachment. The majority of pediatric patients need to be treated using the surgical procedure called Scleral Buckling (SB). Since it was introduced way back in the 1950s, SB has proven to be a successful surgical technique in repairing RD. Although many innovations have developed since the inception of SB, the procedure still requires an intra-operative examination of the retina and the treatment of retinal breaks via indirect ophthalmoscopy⁸. SB is a challenging procedure and requires good surgical skills and prolonged duration of surgery. It is associated with low risk of ocular complications, cost-effectiveness, and similar outcomes compared with other surgical techniques such as Pars Plana Vitrectomy (PPV)^(9,10). Combination of both

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surgical procedures contributes significantly towards better outcome. Pakistan is another developing country where there is a poor provision of health care and improper eye facilities to diagnose and treat eye conditions. Therefore, a retrospective study was carried out to assess the outcome of scleral buckling combined with Pars Plana Vitrectomy in pediatric retinal detachment.

MATERIALS AND METHODS

After gaining proper approval from the ethical review board, a retrospective study was carried out at Al-Ibrahim eye hospital, Karachi. Fifty-seven medical files of patients between the ages of 3 and 14 with primary rhegmatogenous retinal detachment were selected. These patients have been treated with both pars plana vitrectomy and scleral buckling. Patients that had a follow-up course of at least six months were included in this study. 60 eyes of 57 patients were then studied. Medical records were thoroughly reviewed to obtain data related to name, age, gender, duration of symptoms. Status of the lens, location, and quadrants of retinal detachment, the number of retinal breaks, the status of the macula, the type of sclera buckle used (circumferential or segmental), intraoperative injection of temporary vitreous adjunct, anatomy after surgery, and if further surgery was needed after the primary surgery. Pre and Post-operative best-corrected visual acuity was then measured on the 1st, 2nd, and 3rd follow-up. Pre- and post-operative Intraocular pressure and post-operative refractive errors were also obtained. Data obtained from medical records were analyzed using the Statistical Package of social sciences (SPSS) version 21.0, and the paired "t" test was applied. The value of significance was kept at ≤0.05.

Surgical Technique: The surgery was carried out under general anesthesia. The ocular surface was washed using 5% povidone-iodine before the commencement of the surgery. A 360° conjunctival peritomy with dissection of the tenon capsule was done. Traction sutures were placed under the insertions of exposed rectus muscle exposure with a 4/0 silk. For circumferential buckling, a silicone band (silicone band 240) and the sleeve was used by passing it beneath the four rectus muscles and the sclera tunnels. The buckling materials, either for segmental or circumferential, were sutured to the sclera using a 5/0 ethibond sutures. Three port Pars Plana Vitrectomy was performed using a 23 G Alcon constillation. Induction of posterior vitreous detachment was done by staining it using triamcinolone. Breaks are located and identified to complete vitrectomy. Under heavy liquid, the laser is perfumed at 360° and on the breaks. Gas fluid was carried out, and silicone oil tamponade was instilled, which was removed after six months. Peritomy was closed with 6-0.

RESULTS

Sixty eyes were examined, in which 23 eyes were of female patients, whereas 37 were male patients.

Table 1: shows frequency and percentage of Pre and Post-operative Visual Outcome on 1st follow up. A significant difference was seen (P-Value= 0.01) between Pre and Post-operative Visual Outcome.

Table 2: shows frequency and percentage of Pre and Post-operative Visual Outcome on 2nd follow up. A significant difference was seen (P-Value= 0.05) between Pre and Post-operative Visual Outcome.

Table 3: shows frequency and percentage of Pre and Post-operative Visual Outcome on 3rd follow up. A significant difference was seen (P-Value= 0.01) between Pre and Post-operative Visual Outcome.

Table 4: shows the Frequency and Percentage of Post-operative complications on different days of Follow-up. Primary anatomical success in single surgery was achieved in 82%. A significantly better anatomical outcome was observed in patients with better preoperative visual acuity.

Table No.1: Shows the Frequency and Percentage of Pre and Post-Operative Visual Outcome on 1st Follow-up

Variables		Preoperative		Post-operative		P-Value
		n	%	n	%	
Best Corrected Visual Acuity (BCVA) Pre-Operative Visit	Perception of light	12	20.1	05	8.5	0.001
	Hand Movement	19	32.2	15	23.4	
	Counting fingers	0	0.0	0	0.0	
	1/60	0	0.0	0	0.0	
	2/60	17	28.4	08	14.2	
	3/60	0	0.0	0	0.0	
	4/60	0	0.0	0	0.0	
	5/60	0	0.0	0	0.0	
	6/60	12	19.3	32	53.9	
	6/36	0	0.0	0	0.0	
	6/24	0	0.0	0	0.0	
	6/18	0	0.0	0	0.0	
	6/12	0	0.0	0	0.0	
6/9	0	0.0	0	0.0		
6/6	0	0.0	0	0.0		

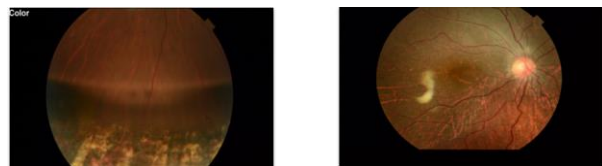


Figure No.1: Days of follow up

Table No.2: Shows Frequency and Percentage of Pre and Post-Operative Visual outcome on 2nd Follow-up

Variables		Preoperative		Post-operative		P-Value
		n	%	n	%	
Best Corrected Visual Acuity (BCVA) Pre-Operative Visit	Perception of light	12	20.1	04	7.2	0.005
	Hand Movement	19	32.2	11	19.2	
	Counting fingers	0	0.0	0	0.0	
	1/60	0	0.0	0	0.0	
	2/60	17	28.4	0	0.0	
	3/60	0	0.0	0	0.0	
	4/60	0	0.0	0	0.0	
	5/60	0	0.0	0	0.0	
	6/60	12	19.3	13	20.1	
	6/36	0	0.0	32	53.5	
	6/24	0	0.0	0	0.0	
	6/18	0	0.0	0	0.0	
	6/12	0	0.0	0	0.0	
6/9	0	0.0	0	0.0		
6/6	0	0.0	0	0.0		

Table No.3: Shows Frequency and Percentage of Pre and Post-Operative Visual outcome on 3rd Follow-up

Variables		Preoperative		Post-operative		P-Value
		n	%	n	%	
Best Corrected Visual Acuity (BCVA) Pre-Operative Visit	Perception of light	12	20.1	04	7.2	0.001
	Hand Movement	19	32.2	11	19.2	
	Counting fingers	0	0.0	0	0.0	
	1/60	0	0.0	0	0.0	
	2/60	17	28.4	0	0.0	
	3/60	0	0.0	0	0.0	
	4/60	0	0.0	0	0.0	
	5/60	0	0.0	0	0.0	
	6/60	12	19.3	10	16.1	
	6/36	0	0.0	16	25.3	
	6/24	0	0.0	19	32.2	
	6/18	0	0.0	0	0.0	
	6/12	0	0.0	0	0.0	
6/9	0	0.0	0	0.0		
6/6	0	0.0	0	0.0		

Table No.4: Shows the Frequency and Percentage of Post-Operative Complications on Different Days of Follow-up

Post-operative Complications	1 st Follow-up	2 nd Follow-up	3 rd follow-up
Rise in IOP	24(40.1)	11(17.4)	2(4.1)
PVR	11(17.4)	9(15.2)	9(15.2)
Vitreous hemorrhage	5(8.5)	5(8.5)	-
Buckle Infection	3(6.2)	3(6.2)	-

DISCUSSION

There are arrays of different surgical procedures that can be used to treat RD. SB is being used to repair RD for more than six decades, having a vital role in repairing various categories of RD, including detachments in young phakic patients, detachments caused due to dialysis, and in conjunction with vitrectomy in patients who have suffered trauma⁽¹¹⁾. SB is proven to be an effective method in treating RD⁽¹²⁾. Our study showed improvement in the best-corrected visual acuity on all follow-ups to be significantly different (P-value ≤ 0.05) compared to preoperative visual acuity in the 57 patients on which the study was conducted. An anatomic success rate of 82% was achieved in our study by carrying out a single surgical procedure; these rates are comparable to other previous studies⁽¹³⁻¹⁶⁾. Our study showed an improvement in the final visual acuity. These findings are similar to another study, which showed that SB was a superior procedure in terms of visual acuity compared to PPV⁽¹⁰⁾. Our study showed that SB is highly effective and with vitrectomy showed even better anatomical success. This was seen in another study in which SB alone had an initial success rate of 86%, whereas SB combined with vitrectomy showed a success rate of 94%⁽¹⁷⁾. After successive follow-ups, the post-operative complications also went on the decrease, and eventually, there was no indications of buckle infection or vitreous hemorrhage on the 3rd follow-up. However, studies have found that SB, combined with vitrectomy, has a much higher complication rate than both procedures alone⁽¹⁸⁾. However, these complications can be easily managed and do not necessitate shifting towards other surgical procedures to treat RD. Both PPV and SB are two procedures that are widely used in ophthalmology to treat RD. However, no one is superior to the other and combining both surgical techniques gives a better anatomic success than if both of them are used separately^{19,20}.

CONCLUSION

Scleral buckling is a strong option for patients with pediatric retinal detachment as it improves visual acuity and shows a strong anatomic success rate.

Author's Contribution:

Concept & Design of Study: Asim Ateeq
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 Data Analysis: Ali Zia, Nazia Qidwai and Attiya Zehra Rizvi
 Revisiting Critically: Asim Ateeq, Saima Majid
 Final Approval of version: Asim Ateeq

Conflict of Interest: The study has no conflict of interest to declare by any author.

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