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PEDIATRIC RHEGMATOGENEOUS RETINAL DETACHMENT: ANALYSIS AND PREDICTIVE FACTORS FOR POST-OP VISUAL OUTCOME OF 64 PEDIATRIC RHEGMATOGENEOUS RETINAL DETACHMENT

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ABSTRACT: OBJECTIVE: Evaluation of cases pediatric rhegmatogenous retinal detachment and the factors affecting the final outcome after RD surgery. Study also aims to analyze characteristics of type of retinal breaks, other eye findings and etiological factors in pediatric rhegmatogenous retinal detachment. **SETTING:** Vivekanand Netralaya, Lions NAB Eye hospital, Miraj. **MATERIAL AND METHODS:** This is a retrospective nonrandomized case series involving 64 consecutive cases of pediatric rhegmatogenous retinal detachment. Detailed evaluation of case records were done with reference to the types of retinal breaks, associated findings, etiological factors and the factors affecting the visual outcome of these cases. **RESULTS:** Male to female ratio of 4.8:1. Most common etiological factors for retinal detachment were high myopia in 43.7% (28), open globe injury in 23.4% (15), blunt trauma in 9.37% (6). Commonest retinal break noted was atrophic hole in 51.5% (33). Factors associated with poor outcome were Pre-op vision < HM 100%, Lensectomy 82.3%, cataract 70.5%, post synechiae 35.3%, use of LPFC 35.3%, closed funnel RD 29.4%. Overall anatomical success rate achieved was 95.3%, with major cause of less vision as old RD 34.4%. **CONCLUSION:** Predisposing factors for poorer visual outcome was Pre-op vision <HM, Lensectomy, cataract, post synechiae, closed funnel RD. With major cause of less vision as old RD. Most common post op complications were related with retained silicon oil. Final anatomical and visual outcome were encouraging (95.3%) despite late initial presentation and high rates of macular detachment and PVR at initial presentation.

KEYWORDS: Pediatric, Rhegmatogenous Retinal detachment, vitrectomy.

INTRODUCTION: Pediatric rhegmatogenous retinal detachment (RRD) accounts for 3.2% to 5.6% of all RRD cases.¹ In contrast to RRD in adults, children usually present late and have clinical features attributable to a longstanding retinal detachment such as macular involvement and proliferative vitreoretinopathy (PVR).² Presence of amblyopia, systemic association and preoperative and postoperative examination difficulties due to lack of cooperation from the children make things more complex. Intraoperatively the anatomic variations from the adult eye make things more challenging. Consequently, guidelines obtained from studies of adult cases may be inappropriate for the management of pediatric RRD.

AIMS AND OBJECTIVES: The study is a retrospective case series which was done to evaluate the visual outcome and the predictive factors in cases of pediatric rhegmatogenous retinal detachment. Study also aims to analyze characteristics of type of retinal breaks, other eye findings and etiological factors in pediatric RRD.

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MATERIALS AND METHODS: The present nonrandomized retrospective case series includes 64 cases of pediatric rhegmatogenous retinal detachment. Case records of all subjects aged 0-18 yrs with retinal detachment intervened from June 2006 to January 2009 were reviewed retrospectively. Thorough evaluation of the case records for history, presentation, clinical findings with special reference to slit lamp biomicroscopy, indirect ophthalmoscopy and surgical intervention done and follow up records was done. Patients with minimum follow up of 12 weeks were included, with mean follow up of 5.2 months. Only patients having rhegmatogenous retinal detachment were included.

RESULTS: Detailed review of 64 pediatric RRD cases revealed following findings. Male to female ratio of 4.8:1, suggests male preponderance. Average age of presentation was 12.8 yrs (range 4-17 yrs).

On evaluation of the etiological causes predisposing factors for retinal detachment were high myopia in 43.7% (28), open globe injury in 23.4% (15), blunt trauma in 9.37% (6), Marfans syndrome 7.81% (5), psuedophakia in 6.25% (4). Other studies have reported that trauma accounts for about 40% of all cases as compared to about 11% in adults.³ In one series the major groups, in order of frequency, were myopia greater than 4 D, ocular trauma followed by FEVR. Another series reported that the detachment was associated most frequently with trauma (44%), myopia (15%), aphakia (10%), and retinopathy of prematurity (8%).⁴

Thorough evaluation of the fellow eye was done and in uncooperative children at the end of surgical intervention evaluation of the fellow eye was done under anaesthesia. In the fellow eye 25% (16) cases had Retinal detachment, 21.9% (14) had treatable peripheral retinal degeneration & 32.8% (21) cases had vision less than 3/60 in other eye.

Evaluation of the type of break was done preoperatively and intraoperatively and the commonest retinal break noted was atrophic hole in 51.5% (33), dialysis was seen in 15.6% (10), Giant Retinal Tear in 14.6% (9) & only 6.25% (4) had Horse Shoe Tear. Macula-off RD was present in 87.5% (56), 26 (40.6%) had PVR>C3, and 12 (18.7%) had subretinal PVR. Different surgical interventions were undertaken depending on the type of retinal detachment and sixteen (25%) cases underwent scleral buckling & rest required vitrectomy. 59.37% (38) cases required lensectomy, 67.7% (43) required oil as tamponade.

The final outcome was then evaluated with respect to the predisposing factors for less post-operative visual recovery. Factors associated with poor outcome were Pre-op vision <HM 100%, Lensectomy 82.3%, oil as tamponade 88.2%, cataract 70.5%, post synechiae 35.3%, use of LPFC 35.3%, closed funnel RD 29.4%. Our findings correlate with the observations made by Gonzales C R et al, that younger age ($P=0.019$), worse initial vision ($P=0.008$), greater extent of retinal detachment ($P=0.007$), and presence of proliferative vitreoretinopathy (grade C or worse) ($P=0.008$) were associated with worse anatomical outcomes.⁵

	BCVA ($<1/60$) n = 17	BCVA ($1/60-6/60$) n = 10	BCVA ($>6/60$) n = 37
Exotropia	6(35.3 %)	3 (30%)	10(37 %)
High myopia	2(11.8)	0	6(16.2)
P trauma	4(23.5)	2 (20)	7(18.9)
One eyed	5(30)	2 (20)	6(16.2)
Other eye RD	2(11.8)	4 (40)	10(27)
Preop va $< 1/60$	17(100)	6 (60)	22(59.4)
Cataract	14(70.58)	4 (40)	14(32.4)

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Post synechie	6(35.3)	3 (30)	2(5.4)
Macula off	17(100)	8 (80)	31(83.8)
PVR D2	5(29.4)	1 (10)	0
Lensectomy	14(82.3)	6 (60)	18(48.6)
Oil as tamponade	15(88.2)	6 (60)	22(59.4)
LPFC use	6 (35.3)	0	3(8.1)
Recurrences	3 (17.6)	0	7 (18.9)
Old Rd	9 (52.9)	4 (40)	8 (21.6)
Sec glaucoma	2 (11.8)	1 (10)	5 (21.6)
Predisposing factors for final visual outcome			

BCVA	Pre-operative (n = 64)	Post-operative (n = 64)
PL	45 (70.3)	2 (3.1)
PL <1/60	7 (10.9)	7 (10.9)
1/60- 3/60	9 (14)	10 (15.6)
3/60 – 6/60	3 (4.7)	6 (9.4)
6/60 – 6/18	0	30 (46.8)
>6/18	0	9 (14)
Pre-op and Post –op visual outcome		

Preoperatively 81.2% had vision < 1/60 which postoperatively improved to >6/60 in 60.9% & 14% remained <1/60.

In the follow up the eyes were evaluated for the problems and complications and it was noted that commonest postoperative problem was oil emulsification 17.2% (11), recurrent Retinal detachment occurred in 14 % (9) and secondary glaucoma developed in 9.4%. Out of 9 recurrences who were reoperated 7 cases had retina attached till last follow up, and two remained detached, overall anatomical success rate is 95.3%, with major cause of less vision as old RD 34.4%.

DISCUSSION: When we reviewed other studies, most of them were from pre-vitrectomy era and also included limited etiological and selective surgical procedures which limited the scope of comparison with the present study which included not only sclera buckling but vitrectomy. We had similar results in relation to etiology, other eye findings, late presentation, high rate of macula off RD, PVR, type of breaks, complication rates.

Our visual and anatomical outcome are better, possibly due to improved technique of surgical intervention and tamponading agents (Most of our cases had undergone vitrectomy, lensectomy and oil tamponade).

Studies	Number of Cases	Type of Sx (%)		Anatomical Results (%)	Visual outcome (%) (>3/60)
		SB	Vit		
Fivgas et al ¹	29	28	72	72	41
Butler et al	15	80	-	86	53
Weinberg et al ⁶	39	41	46	79	50
Yokohama ²	55	76	-	87	65
Nagpal ⁷	111	61	38	78	48
Our study	64	25	75	87	70
Comparative chart review of different studies					

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Studies	N	Mean age	Macula off	PVR (%)	Bilat (%)	Breaks (%)
Fivgas et al ¹	29	9.6	79	45	22	HST- 55
Butler et al	15	12.4	67	-	-	Dialys-33
Weinberg et al ⁶	39	10	74	31	26	GRT-15
Yokohama ²	55	12	-	22	-	Holes-40
Nagpal ⁷	111	13.6	97	45	11	Holes-35
Our study	64	12.8	88	59	25	Holes-51

CONCLUSION: Management of pediatric cases though challenging with the problems of late presentation and difficult early diagnosis, associated conditions complicating the Retinal detachment like trauma, marfans syndrome, etc., various anatomical challenges like difference in surgical landmarks, relative instrument size and intraoperative challenges like corneal clouding, retinal incarceration, increased risk of iridodialysis, haemorrhage and traction on peripheral retina, etc. can be managed adequately in most of the cases.

Myopia and trauma were most common cause of RRD in children as was also noted by Lemrini F et al.⁽⁸⁾ Fellow eyes had treatable vision threatening problems. Overall anatomical success rate in the present study was 95.3%. Predisposing factors for less post-op vision was Pre-op vision < HM, Lensectomy, Oil as tamponade, cataract, post synechiae, closed funnel RD. Major cause of poor visual recovery was old RD. Most common post op complications were related with retained silicon oil. Final anatomical and visual outcome were encouraging despite late initial presentation and high rates of macular detachment and PVR as initial presentation.

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