Original Article

Surgical outcomes of vitreoretinal surgery for rhegmatogenous retinal detachment in eyes with regressed retinopathy of prematurity

Parveen Sen, Ashutosh Agarwal, Pramod Bhende, Lingam Gopal

Purpose: To report the anatomical and functional outcomes of vitreoretinal surgery in eyes with "regressed ROP" presenting with rhegmatogenous retinal detachment (RRD). **Methods:** In this retrospective interventional case series, twenty-two eyes (of 22 patients) with regressed ROP, who underwent surgery for RD. Primary outcome measures were final anatomical and visual outcome for scleral buckling and pars plana vitrectomy (PPV). Visual outcomes were categorized into three groups: improved, remained stable, and deteriorated. Univariate binary logistic regression analysis was used to determine the risk factors for RD. **Results:** Of 22 eyes in the study, overall anatomic success was achieved in 16 of 22 eyes (72.7%). The macula was attached in 17 of 22 eyes (77.3%) at final visit. In the scleral buckle (SB) group, overall anatomical success was achieved in six of seven eyes (85.7%). Overall, in the PPV group, anatomical success was seen in 10 of 15 eyes (66.7%) at final visit. At final follow-up, significant improvement in best-corrected visual acuity from baseline was seen in 11 cases (50%, $P = 0.02$), stable in 5 cases (22.7%), and significant visual deterioration was seen in 6 cases (27.3%, $P = 0.02$). The total mean follow-up duration of the patients was 45.5 months (range: 2.1 months to 11.2 years). **Conclusion:** Early recognition and surgical intervention in such cases can lead to a high rate of anatomical success and can prevent the development of profound visual impairment in some patients.

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Retinopathy of prematurity (ROP) is a neovascular vitreoretinal disorder occurring in premature infants. It is a vision-threatening disease and was first introduced as retrolental fibroplasia by Clifford in 1940 and described by Terry in 1946.[1,2] In the past few decades, the incidence of ROP has been increasing due to improvement in survival rates of low-birth-weight infants.[3] Of 26 million annual live births in India, approximately 2 million infants weighing less than 2000 g birth weight are at risk of developing ROP.[4] The incidence of ROP is 38%–51.9% in low-birth-weight infants in India.[4,5] Treatment options include observation, laser photocoagulation, cryotherapy, intravitreal injections of antivascular endothelial growth factors (VEGFs), and vitreoretinal surgery depending on the stage of the disease.

As the child grows, "sequelae of ROP" can occur either after "spontaneous regression" or after "regression of disease" following treatment of acute phase of ROP. These sequelae in premature babies develop as a result of residual cicatricial vitreoretinal changes.[6] Some ocular sequelae of regressed ROP include high myopia, ocular motility disorders, strabismus, amblyopia, anisometropia, glaucoma, early development of cataract, and retinal abnormalities.[7-9] Retinal changes include peripheral vascular changes such as incomplete vascularization with abnormal branching of vessels, telangiectatic vessels, peripheral folds, pigmentary changes, vitreous membranes, lattice-like degeneration, retinal dragging, complex retinal tears, pathological vitreoretinal interface changes, and rhegmatogenous retinal detachment (RRD).[8,10] These changes have also been described by the "International Committee for the classification of the late stages of ROP."[11] In stage 0, there are no cicatricial or peripheral retinal changes. In stage 1, there is presence of lattice-like degeneration or an avascular periphery. Stage 2 comprises macular ectopia or abnormal vessel angle. In stage 3, there is a retinal fold. Stage 4 is the presence of retinal detachment (RD) or schisis, and in stage 5, the eye becomes phthisical. Of these, macular dragging and RD are the two of the major vision-threatening complications of regressed ROP. RD in such cases can be tractional or rhegmatogenous. Surgical intervention is necessary once rhegmatogenous component is seen. Management of RRD in these cases presents unique challenge to the ophthalmologist because of the nature of the disease, presence of ocular comorbidities, and a relatively poor visual prognosis. In this study, we report the anatomical and functional outcomes of vitreoretinal surgery in eyes with "regressed ROP" presenting with RRD, which has seldom been described in literature especially from the Indian population.

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Methods

This was a retrospective, interventional case series. In all, 22 eyes (of 22 patients) with regressed ROP, who underwent surgery for development of RD at our tertiary eye care center, were enrolled in the study. The inclusion criteria involved the following:

- History of prematurity.
- One prior examination confirming ROP.
- Presence of retinal break causing RD.
- Underwent surgical procedure for RRD.

Institutional Review Board approval was obtained. The tenets of the Declaration of Helsinki were adhered to. Written informed consent was obtained from all participants (or their guardians) at the time of surgery. Data collection involved analyzing the medical records of patients from 2004 to 2016. Data collected included demographic details, history of ROP, history of ocular and systemic comorbidities, baseline best-corrected visual acuity (BCVA), refractive status of the eye, relevant anterior and posterior segment findings, intraocular pressure (IOP), primary surgical procedure, additional surgical procedures if required, outcomes (both anatomical and functional), and complications at final visit. BCVA was assessed with Snellen's visual acuity chart and converted to logMAR.

Statistical analysis

Snellen's visual acuity was converted to equivalent logMAR units. Visual outcomes were categorized into three groups: improved, remained stable, and deteriorated. Two-proportion *z*-test was used to test the difference in proportion between two independent groups. Wilcoxon signed rank test was used to determine the difference in visual acuity at baseline and at final visit. Univariate binary logistic regression analysis was used to determine the risk factors for RD. Any *P* value less than 0.05 was considered as statistical significant. All statistical tests were performed using SPSS V 14.0.

Results

The mean age of the patients was 13.3 ± 6.6 years (range: 4–28 years; median: 12.5 years). Of 22 patients, 13 (59.1%) were females. The fellow eye was blind in 12 of the 22 children (BCVA <3/60). The mean gestational age of the patients (n = 19) was 29.6 (±2) weeks with a range of 27–33 weeks. In three patients, the gestational age and birth weight (in two patients) could not be elicited due to nonavailability of previous medical records, but all three eyes had undergone either laser or surgery for ROP in infancy, hence were included in the study. The mean birth weight (n = 20) was 1.3 ± 0.3 kg with a range of 1–2.2. Other risk factors associated with ROP included oxygen supplementation (n = 14), septicemia (n = 2), blood transfusion (n = 5), consanguinity (n = 2), jaundice (n = 4), and twin birth (n = 1). Six patients had a history of laser photocoagulation for treatment of ROP and two had a history of surgery for ROP in the past. The remaining patients had not received prior treatment and had only sequelae of ROP.

The mean presenting BCVA was 1.7 ± 0.7 logMAR. Two patients were too young (age < 5 years) to be assessed reliably through Snellen's chart. Fixation to torchlight was present in both these patients. Of 20 patients assessed with Snellen's chart, 13 had profound visual impairment, 5 (25%) had moderate, and 2 (10%) had mild visual impairment. The presenting complaints were diminution of vision (n = 18), diminution of vision and squint (n = 1), and asymptomatic (n = 3).

The mean age at onset of RD was 10.4 ± 6.9 years (range: 3–24 years). Ocular comorbidities included myopia (n = 12), exotropia (n = 1), nystagmus (n = 6), microcornea (n = 1), band-shaped keratopathy (n = 2), aphakia (n = 1), hypotony (n = 5), disc pallor (n = 2), disc and macular dragging (n = 1), and choroidal detachment (n = 1). The mean refractive error was 1.2 ± 9.5 dioptres (D) (range: −20 to +13 D).

Indication for vitreoretinal surgery was RRD in all eyes. Total RD was present in 10 eyes (45.5%) at presentation. Of 22 eyes, macular involvement was present in 19 eyes (86.4%). A mean number of 3 (±1.2) quadrants were involved in the RD with a mean number of 2.1 (±1.5) retinal breaks. The inferotemporal quadrant was most frequently involved. The types of retinal breaks included retinal hole (n = 23), dialysis (n = 6), giant retinal tear (n = 1), and full-thickness macular hole (n = 2). Proliferative vitreoretinopathy (PVR) was present in eight (36.4%) eyes at baseline. Four eyes had a falciform fold along with RRD.

Table 1 shows the baseline characteristics, surgical intervention, and outcomes of all 22 eyes. Fifteen patients underwent pars plana vitrectomy (PPV) (68.2%), while seven patients (31.8%) underwent scleral buckle (SB) as the primary surgical procedure. Of 15 patients who underwent PPV, the gauge of vitrectomy was 23G (12 eyes), 25G (2 eyes), and 20G (1 eye). In 12 patients, PPV was combined with 360° encirclage. Three patients did not have a peripheral band because a relaxing retinectomy was done in all quadrants. Silicone oil tamponade was used in all 15 eyes, of which 5000 cSt silicone oil was used in three eyes. Additional intraoperative procedures included lensectomy (n = 8), membrane peeling (n = 8), relaxing retinectomy (n = 3), and scleral resection (n = 1). Intravitreal triamcinolone acetonide (IVTA) was used to aid in posterior vitreous detachment (PVD) induction in two cases. Posterior vitreous appeared densely adherent in these eyes often necessitating bimanual surgery followed by removal of vitreous using intraocular forceps and curved scissors. Intraoperative complications included iatrogenic breaks (n = 3) and submacular hemorrhage (n = 1). Of 15 cases that underwent PPV, the retina was attached in seven cases (46.7%) after single surgery. Of eight cases with a detached retina after first surgery, four underwent revitrectomy, three cases were considered inoperable at that point of time, and one patient refused resurgery. Of the four cases that underwent revitrectomy, one patient had an attached retina postoperatively. Of the three cases with a detached retina after second surgery, two underwent a third procedure successfully while one case was advised against further intervention. Patients in the PPV group underwent a mean number of 1.4 (±0.7) surgeries. Postoperative complications in the PPV group included band-shaped keratopathy (n = 4), infective keratitis (n = 1), secondary glaucoma (n = 2), disc pallor (n = 4), disc dragging (n = 1), epiretinal membrane (n = 1), macular dragging (n = 1), macular hole (n = 1), subretinal gliosis (n = 1), silicone oil emulsification (n = 5), and subretinal silicone oil (n = 1). Silicone oil removal (SOR) was done in eight eyes. Additional procedures performed during SOR included lensectomy (n = 1), phacoemulsification with intraocular lens implantation (n = 1), membrane peeling (n = 1), and band-shaped keratopathy removal (n = 1). There were no

Table 1: Details of the surgical procedure

Age	Eye	Baseline BCVA	Extent of RD; macular status	PVR grade	Primary surgery	First additional surgery	Second additional surgery	Anatomical outcome	Final BCVA
10	OD	6/60	Partial, off	0	SB + BB	V + EL + SOI	-	Attached	6/30
7	OS	HMCF	Total	0	L + V + BB + EL + MP + SOI	-	-	Attached	HMCF
9	OD	PL PR inaccurate	Total	1	L + V + EL + 1300 SOI	-	-	Attached	1/60
12	OS	3/60	Partial, off	0	BB + V + EL + Re-SOI	-	-	Attached	6/30
13	OD	HMCF	Total	2	L + V + BB + TSC + SIO 1300	-	-	Detached	6/60
6	OD	HMCF	Total	0	SB + BB	-	-	Detached	HMCF
4	OD	F and F	Partial, off	0	SB + BB	-	-	Attached	F and F
28	OS	6/60	Partial, off	0	Revit + BB + LPFC + EL + SOI	-	-	Attached	3/60
16	OS	6/60	Partial, off	0	V + BB + LPFC + EL + 5000 SOI	L + MP + EL + 5000 Re-SOI	SOR + RR + LPFC + MP + EL + Re-SOI	Attached	6/60
25	OD	6/30	Partial, off	0	V + BB + EL + TSC + SOI	-	-	Attached	6/24
20	OS	3/60	Partial, on	0	SB + BB	-	-	Attached	6/60
14	OS	1/60	Partial, off	0	SB + BB	Lens aspiration + BSK removal + IOL	-	Attached	6/60
18	OS	6/18	Partial, on	0	SB + BB	-	-	Attached	6/9
5	OS	F	Total	0	SB + BB	-	-	Attached	F
8	OS	HMCF	Partial, off	0	V + MP + EL + SOI	-	-	Detached	PL PR accurate
16	OD	PL PR accurate	Total	2	L + V + RR + LPFC + MP + EL + SOI	-	-	Detached	No PL
19	OS	2/60	Partial, on	0	V + BB + EL + LPFC + SOI	-	-	Detached	3/60
11	OS	6/60	Partial, off	2	L + V + BB + EL + 5000 SOI	-	-	Attached	3/60
12	OD	CF ½ m	Total	0	L + V + BB + EL + 5000 SOI	SOR + MP + RR + LPFC + EL + 5000 SOI	SOR + MP + RR + LPFC + EL + Re-SOI + BSK removal	Attached	HMCF
24	OD	HMCF	Total	0	Scleral resection + L + V + EL + SOI	RR + PFCL + EL + SOI	-	Attached	3/60
14	OS	1/60	Total	0	L + V + SB + BB + EL + SOI	Re-SOI + RR + El	-	Detached	PL PR inaccurate
10	OD	6/60	Total	0	L + V + BB + EL + SOI	-	-	Attached	6/18

BCVA: best-corrected visual acuity; RD: retinal detachment; RRD: rhegmatogenous retinal detachment; TRD: tractional retinal detachment; PVR: proliferative vitreoretinopathy; PL: perception of light; NPL: no perception of light; PR: projection of rays; OD: right eye; OS: left eye; SB: scleral buckle; BB: belt buckle; V: vitrectomy; EL: endolaser; SOI: silicone oil infusion; HMCF: hand motions close to face; L: lensectomy; MP: membrane peeling; TSC: transscleral cryopexy; F&F: fixates and follows light; F: fixates light; Re-Vit: repeat vitrectomy; Re-SOI: repeat silicone oil infusion; LPFC: liquid perfluorocarbon; SOR: silicone oil removal; RR: relaxing retinotomy; BSK: band-shaped keratopathy; IOL: intraocular lens

intra- or postoperative complications during SOR. Overall, in the PPV group, anatomical success was seen in 10 of 15 eyes (66.7%) at final visit. At final visit, sequelae included macular dragging (n = 2), disc pallor (n = 11), silicone oil emulsification (n = 2), band-shaped keratopathy (n = 3), and phthisis bulbi (n = 1). Of 15 eyes, at final visit, visual improvement was seen in seven eyes (46.7%), stable visual acuity in two eyes (13.3%), and deterioration in six eyes (40%).

Of the 22 patients, 7 patients underwent SB as the primary procedure. After the first surgery, the retina attached in five of seven cases (71.4%). One of the patient with recurrent RD with PVR was advised nil further intervention. The remaining patient underwent two subsequent vitrectomies, and anatomical success was achieved at the final visit. In the SB group, overall anatomical success was achieved in six of seven eyes (85.7%). A mean number of 1.3 (±0.8) surgeries

were performed in this group. At final visit, sequelae included macular dragging (n = 3) and disc pallor (n = 3). Visual improvement was seen in four cases (57.1%), while BCVA was stable in the remaining three eyes (42.9%).

Four eyes had retinal breaks associated with falciform folds. Two of these eyes underwent SB and two underwent PPV. Scleral buckling was successful in reattachment of the retina in both cases, while cases undergoing PPV needed relaxing retinectomy for reattachment of retina.

Of 22 eyes in the study, overall anatomic success was achieved in 16 of 22 eyes (72.7%) after a mean number of 1.4 (±0.7) surgeries, with a maximum of three surgeries done. Fig. 1 shows pre and post-operative montage fundus photographs of an eye in which anatomical success was achieved. Figs. 2 and 3 show eyes with attached retina post operatively of 2 different patients and also the fellow eye which shows signs of ROP sequelae. The macula was attached in 17 of 22 eyes (77.3%) at final visit. Postoperative sequelae included disc pallor (n = 14), macular dragging (n = 5), silicone oil emulsification (n = 2), band-shaped keratopathy (n = 3), and phthisis bulbi (n = 1).

The mean final BCVA was 1.45 (±0.8) logMAR. At final follow-up, significant improvement in BCVA from baseline was seen in 11 cases (50%, P = 0.02), stable in five cases (22.7%), and significant visual deterioration was seen in six cases (27.3%, P = 0.02). Details of BCVA outcomes are given in Table 2. Of 20 cases assessed with Snellen's chart postoperatively, profound visual impairment was seen in 13 cases (65%), while mild and moderate impairment was seen in 3 (15%) and 4 cases (20%), respectively.

The total mean follow-up duration of the patients was 45.5 ± 43.1 months (range: 2.1 months to 11.2 years) with a median follow-up duration of 36.3 months.

Logistic regression analysis was done to predict the outcomes for anatomical failure at final visit, details of which can be found in Table 3. A poorer baseline BCVA was associated with a 6.7 times more risk of having a detached retina at final visit (odds ratio: 6.7; P = 0.06). A poorer final BCVA was significantly associated with a detached retina at final visit (odds ratio: 6.95, P = 0.02). Presence of a total RD at baseline had a three times higher risk of anatomical failure in our series. The remaining details for logistic regression are available in Table 3.

Discussion

Management of ROP does not end with laser photocoagulation and regression of neovascularization. These eyes need lifelong care and attention. Vitreoretinal complications, especially RRD, are seen in these eyes due to the following reasons: (a) differential growth of the peripheral avascular retina and posterior retina, (b) differential growth of sclera and neural retina, (c) local abnormal vitreoretinal traction leading to retinal break especially at the area of the ridge, (d) retinal break formation at the edge of the previous laser photocoagulation marks, and (e) formation of retinal breaks along the falciform folds. Tassman and Annesley were the first to describe management of RD in regressed ROP in 1966.[12] They described six eyes treated with scleral buckling, with 100% anatomic success. Subsequently, multiple authors described the treatment of RD of regressed ROP using scleral buckling with varying anatomical success (63%–94%).[13-16] Sneed *et al.* were one of the first to describe the role of PPV for RRD in regressed ROP in 1990 in 16 eyes.[17]

In this study, we intended to describe the anatomical and functional outcomes of both SB and PPV in the era of microinvasive surgery, in RRD of regressed ROP. These RRDs are typically seen in the first to third decade of life, as was seen in our study, with mean age of the patients at presentation being 13.3 (±6.6) years with the mean age at onset of RRD being 10.4 (±6.9) years. In the studies conducted by Sneed *et al.* and Tufail *et al.*, the mean age of the patients was 23 and 22.3 years, respectively.[10,17] Kaiser *et al.* included only patients age 15 years or more;[9] whereas Park *et al.* studied only patients between 2 and 15 years of age.[8] The mean gestational age of the patients in our series was 29.6 (±2) weeks and the mean birth weight (n = 20) was 1.3 (±0.3) kg with a range of 1–2.2, which was similar to that seen in other studies.[8-10] The predominant refractive error was myopia, and 54.5% of eyes had RD in the only seeing eye.

In 17 of 22 cases, retinal break was found most frequently in the temporal periphery. Tufail *et al.* discovered retinal breaks in 28 of the 29 eyes, of which 62% were in the superotemporal quadrant.[10] Kaiser *et al.* studied 31 eyes, of which 27% had macula off detachment at baseline when compared with 19 of 22 eyes in our series (86.4%).[9] Earlier involvement of the macula is expected due to the presence of breaks in the temporal quadrant. Also, preponderance of posterior retinal breaks necessitates a pars plana approach to fix the RD in most of the cases (68.2% of our cases needed PPV as primary procedure).

Table 2: BCVA outcomes for 22 eyes

Groups	Baseline BCVA	Final BCVA	Mean change in BCVA	*P*
Improved (n=11)	1.54±0.79	0.93±0.44	−0.55±0.36	0.02
Stable (n=5)	1.87±0.75	1.87±0.75	Nil	-
Deteriorated (n=6)	1.98±0.67	2.18±0.67	0.35±0.29	0.02
Overall (n=22)	1.68±0.74	1.45±0.81	−0.19±0.52	0.19

BCVA: best-corrected visual acuity

Table 3: Binary logistic regression analysis for a detached retina at final visit

Variables	Odds ratio	95% CI		*P*
		Lower limit	Upper limit	
Baseline BCVA	6.7	0.944	47.546	0.06
Age at onset of RD	0.938	0.803	1.095	0.42
Baseline IOP	1.088	0.830	1.425	0.54
Extent of RD ≤2 quad	1.1	0.149	8.125	0.93
Total RD	3.333	0.462	24.052	0.23
Macula on	1.4	0.103	19.012	0.8
Surgery type - PPV	3	0.279	32.209	0.36
Final BCVA	6.951	1.286	37.578	0.020
Presence of PVR	2.2	0.323	14.975	0.420
Presence of falciform fold	3.5	0.368	33.308	0.276
Retinal retinectomy	6	0.39	92.777	0.199

CI: confidence interval; BCVA: best-corrected visual acuity; RD: retinal detachment; IOP: intraocular pressure; PPV: pars planavitrectomy; PVR: proliferative vitreoretinopathy

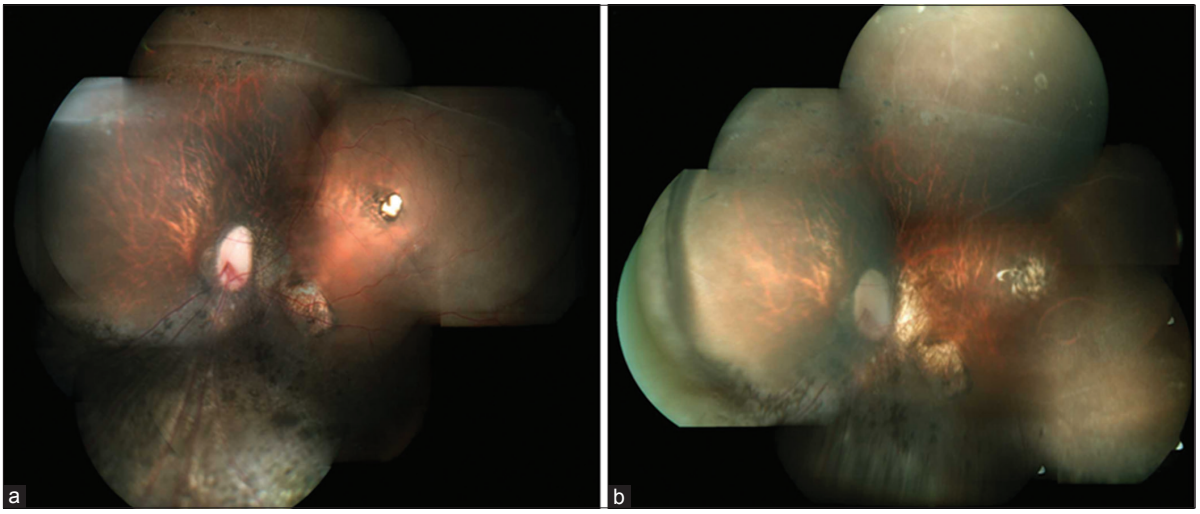

Figure 1: (a) Fundus photograph of the left eye of a 10-year-old showing rhegmatogenous retinal detachment. (b) Postoperative photograph of the same eye showing well-attached retina after pars plana vitrectomy and silicone oil injection

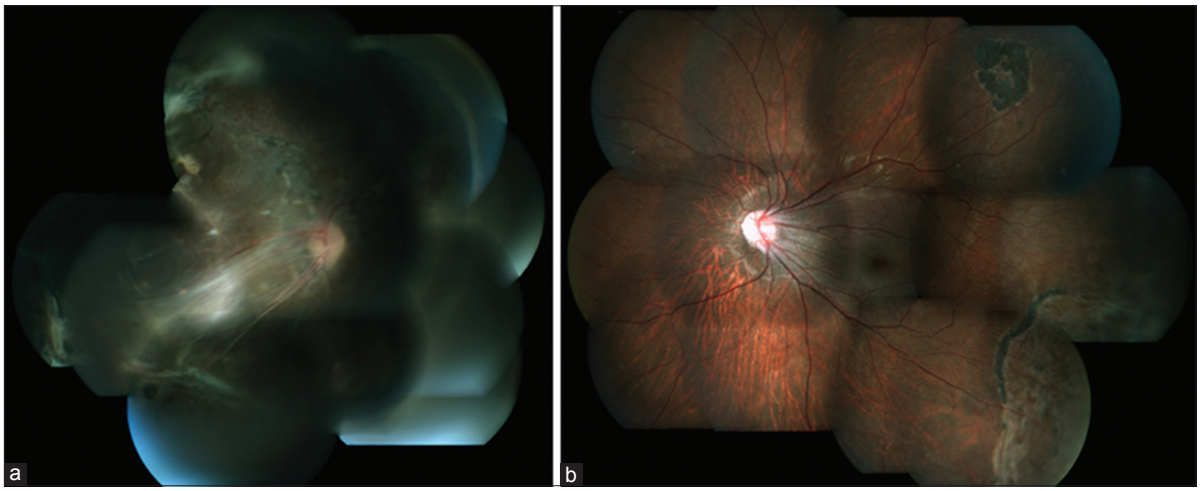

Figure 2: (a) This child underwent scleral buckling followed by pars plana vitrectomy with silicone oil. Fundus photograph showing attached retina 1 year after silicone oil removal. (b) Other eye of the same patient after laser photocoagulation to the peripheral lattice-like lesions

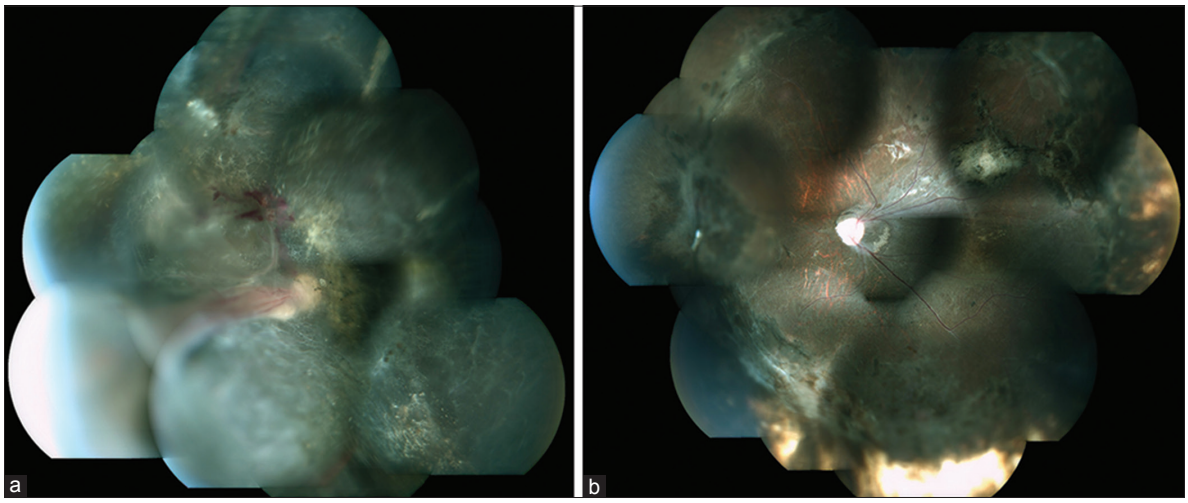

Figure 3: A 12-year-old presented with left eye preoperative BCVA 3/60 and RD of regressed ROP. The child underwent PPV with silicone oil insertion in the left eye. (a) Right eye fundus photograph showing ROP sequelae. (b) Left eye fundus photograph showing an attached retina post silicone oil removal. The child had a postoperative BCVA 6/36

Table 4: Comparison of anatomical outcome with other studies

Study	Total no. of eyes (*n*)	Overall final anatomic success regardless of method of surgery	Primary SB	Final anatomical success of SB (%)	Primary PPV (with or without SB)	Final anatomical success of PPV (%)
Sneed *et al.*[17]	16	14 (87.5%)	12	12 (100%)	4	2 (50%)
Kaiser *et al.*[9]	31	Not available*	26	19 (73.1%)*	5	5 (100%)
Tufail *et al.*[10]	29	28 (96.5%)	15	15 (100%)	14	13 (92.8%)
Our series	22	16 (72.7%)	7	6 (85.7%)	15	10 (66.7%)

SB: scleral buckle; PPV: pars planavitrectomy. *Kaiser *et al.* described the initial failure rate of SB but did not report the final outcome of initial treatment failure after resurgery

Surgical results were better with SB when compared with PPV. Of 15 cases that underwent PPV, the retina was attached in seven cases (46.7%) after single surgery when compared with a success rate of 71.4% after SB. Micro incision vitrectomy surgery (MIVS) was done in all cases of PPV except one, in which 20G PPV was done. Statistical comparison between MIVS and 20G PPV is not feasible in the present series because of smaller numbers. However, MIVS offers better intraoperative IOP control and safer vitreous removal, which is an advantage in these challenging cases. Successful anatomical outcome was seen at final visit in 9 of 12 cases (75%) which underwent 23G PPV and 1 of 2 (50%) cases of 25G vitrectomy. It is difficult to compare these cases because of complexity and uniqueness of each case. Scleral buckling is noninvasive and does not involve the complications of PPV, which can be especially hazardous in these eyes because of the dense and tenacious vitreoretinal adhesions frequently encountered. In almost all cases undergoing PPV, PVD induction was challenging necessitating various special procedures such as staining with IVTA and bimanual peeling with forceps using a fourth port with Chandelier illumination. In spite of these maneuvers, complete removal of vitreous upto the periphery was not possible in some cases, thus making an encircling band a very useful adjuvant to PPV to support the peripheral uncut vitreous. Kaiser *et al.* also suggested the use of vitrectomy with buckle for management of these cases.[9] Incomplete peripheral separation of vitreous resulted in incomplete retinal traction relief thus resulting in the need for relaxing retinectomy (three cases). These problems of incomplete retinal traction relief have been particularly reported in the presence of a falciform fold with posterior retinal breaks,[18] as was seen in two of our eyes that underwent PPV for posterior retinal breaks with falciform fold. Three-sixty-degree RR was done to reattach retina in both eyes, but the visual outcome remained poor because of hypotony and long-standing need for silicone oil tamponade. Surgeons undertaking PPV in these eyes need to be well prepared to encounter these problems while operating. PPV, however, may be the only option in many a cases due to predominant presence of posterior retinal breaks. Similar results by other surgeons are briefly tabulated in Table 4.

Scleral lamellar resection in one quadrant was done in one eye in addition to vitrectomy in an attempt to reduce disproportionate growth of the retina and the sclera. This has also been described previously but is best reserved for desperate cases.[19]

In the present series, the mean final BCVA was 1.45 (±0.8) logMAR. In spite of surgical intervention, significant improvement in BCVA from baseline was seen in only 50% of cases, while 22.7% were stable and 27.3% deteriorated. This is because the baseline visual acuity itself is poor in these cases (1.68 ± 0.74). All cases where recurrent RD was seen had a significant drop in vision. Kaiser *et al.* divided patients into various groups according to their pre- and postoperative visual acuity.[9] More than 60% of eyes with a detachment and a baseline visual acuity of 20/60 or better maintained that level of VA at final follow-up. Tufail *et al.* recorded a median preoperative visual acuity of 6/60 (6/18 for macula on and 6/60 for macula off detachment) and improving to a median 6/36 (6/18 for macula on, 6/36 for macula off detachment) postoperatively at the last follow-up visit.[10] For macula on detachments, there was an overall mean one line of vision loss with three of eight (42%) patients losing one or more lines of vision (range: 1–5 lines lost). For macula off detachments, there was an overall mean one line of vision gain with 4 of 21 (19%) patients losing one or more lines of vision (range: 1–7 lines). Park *et al.* found that compared with the preoperative visual acuity, visual improvement, no change, and decreased visual acuity were achieved, respectively, in two eyes, three eyes, and no eyes in the RRD group.[8]

By logistic regression analysis, PPV was associated with a three times higher risk of anatomical failure (odds ratio = 3) when compared with SB although the difference was not statistically significant (P = 0.36). Kaiser *et al.* also found no statistically significant difference between SB versus PPV (with or without SB), although they had a low number of vitrectomized eyes (Fisher's exact test P = 0.25).[9]

The limitations of this study were its retrospective nature, along with a small number of patients and lack of long-term visual outcomes. However, we feel that the study adds to the limited body of work on the subject and will help the reader in managing this complex form of RRD.

Conclusion

To conclude, rhegmatogenous RD occurring as a late complication of ROP can happen and can be devastating for the parents and the child who would have struggled through difficult times dealing with various levels of visual handicap in previous years. With increased awareness regarding screening of ROP, efforts must also be made to emphasize the need for long-term follow-up of these cases. Early recognition and surgical intervention in such cases can lead to a high rate of anatomical success and can prevent the development of profound visual impairment in some patients.

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Conflicts of interest

There are no conflicts of interest.

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