

Outcome of Rhegmatogenous Retinal Detachment Surgery in Uncomplicated Pseudophakic Eyes

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Purpose: To assess the anatomical reattachment and visual outcome in pseudophakic patients with rhegmatogenous retinal detachment (RD) after pars plana vitrectomy (PPV).

Material and Methods: This case series study was conducted at Isra Postgraduate Institute of Ophthalmology from July 2004 to June 2006. Thirty five eyes of 35 patients developed rhegmatogenous retinal detachment after uncomplicated extra capsular cataract extraction (ECCE) with intraocular lens (IOL) implant. All eyes went under 3 – port PPV with air fluid exchange and injection of silicon oil (SO) for internal tamponade.

Results: There were 27 male (77%) and 8 female (23%) with 3.5:1 male to female ratio. Twenty eyes (27%) had total, while 15 eyes (43%) had subtotal RD. The mean duration at which, retinal detachment was noticed after cataract surgery was 128 ± 243 days. At mean follow up of 1 year, improvement in visual acuity was seen in 23 (65%) eyes, 3 (9%) eyes showed no improvement and 9 (26%) eyes had deterioration in vision. The anatomic reattachment was registered in 31 (89%) eyes.

Conclusion: Our results suggest that 3-port PPV with use of SO is an effective procedure resulting in high proportion of cases showing successful anatomic reattachment and visual improvement.

Rhegmatogenous retinal detachment (RD) although rare but remains a dreadful complication after cataract extraction and intraocular lens (IOL) implantation¹⁻³. Retinal detachment develops in 0.5% to 1.0% of eyes, after modern cataract surgery^{4,5}. However the incidence is higher after neodymium - yttrium - aluminum - garnet (Nd - YAG) laser posterior^{5,6}.

Pseudophakic rhegmatogenous retinal detachment is commonly associated with the peripheral retinal breaks at the posterior edge of the vitreous base near ora serrata⁶. From a surgical point of view, this type of retinal detachment is difficult to treat, because of potentially poor mydriasis, disturbing rim of anterior capsule, IOL margin, residual lens matter, or any posterior capsule opacification, resulting in poor

visualization of peripheral retina, and identification of retinal breaks⁷⁻⁹. The retinal breaks cannot be found in as many as 20% of pseudophakic retinal detachment⁶. The implication of non-visualized breaks in patients with pseudophakic retinal detachment is reported with the lower rate of surgical success^{10,11}.

The treatment of pseudophakic rhegmatogenous retinal detachment is quite similar to that of phakic retinal detachment. The current treatment options are, use of pars plana vitrectomy (PPV)¹², conventional scleral buckling procedure (SBP)⁶ and intraocular gas injection with associated retinopexy^{8,13}. Scleral buckling procedure in pseudophakic eyes is reported with persistent retinal re-detachment^{9,14}. The main advantage of the primary vitrectomy over conventional buckling procedure, seems to be due to the

better intraoperative visualization of the peripheral retinal holes with controlled removal of vitreous traction and focused endolaser photocoagulation^{12,14}. The PPV in conjunction with gas fluid exchange (GFX) and expression of subretinal fluid followed by the injection of silicon oil (SO) has reported to be more effective as initial treatment of pseudophakic retinal detachment, when there is limited information about the retinal breaks¹⁵.

The objective of our study was to assess the anatomical reattachment and visual outcome in a cohort of patients developing rhegmatogenous retinal detachment, with history of uncomplicated cataract surgery and IOL implantation, after 3-port PPV with use of air fluid exchange and silicon oil tamponade.

MATERIAL AND METHODS

This interventional case series study was conducted at the Isra Postgraduate Institute of Ophthalmology, Al-Ibrahim Eye Hospital, Karachi, from July 2004 to June 2006.

A total of 35 eyes (35 patients), that underwent uncomplicated ECCE with IOL, followed by retinal detachment, were analyzed.

After informed consent, pseudophakic patients with retinal detachment having proliferative vitreoretinopathy (PVR) grade C¹⁶. (full thickness retinal folds in either 1, 2 or 3 quadrants), were included in the study. Patients with corneal opacity, traumatic retinal detachment and retinal detachment with PVR grade D¹⁶ (fixed retinal folds in 4 quadrants) were excluded.

A detailed ocular history was taken about the nature and duration of symptoms, trauma, and the time period of cataract surgery and Nd - YAG posterior capsulotomy. A family history of retinal detachment was taken into account with any systemic illness.

The ocular examination included, charting of best-corrected visual acuity (BCVA) in both eyes, anterior segment bio-microscopy with measurement of intraocular pressure (IOP) using Goldmann applanation tonometer. After pupillary dilatation, posterior segments of both eyes were examined with indirect ophthalmoscope with indentation, using +20 diopter lens and Slit lamp biomicroscope, using +90 diopter lens and Goldmann 3 - mirror lens.

All the finding of history and examination were documented in a specific proforma, designed for this

purpose. Fundus diagram was made and retinal status was mentioned in terms of location of the breaks, extent of the retinal detachment, grading of PVR and associated chorioretinal degeneration. Colored fundus photographs were taken in those eyes with clear media.

The mean duration at which detachment was noticed was 128 ± 243 days, while mean duration from cataract surgery to retinal detachment was noticed at 3.12 ± 3.19 years.

All patients were operated under local anesthesia.

SURGICAL TECHNIQUE

Patients underwent a standard 3 port parsplana vitrectomy with shaving and of the vitreous base. Air fluid exchange was initiated to replace the infusion fluid and subretinal fluid (SRF). The endolaser photocoagulation was applied with 2 to 3 rows around the breaks and 360 degrees of the peripheral retina. At the end of the procedure silicone oil was injected for prolonged internal tamponade.

Patients were examined on 1st postoperative day and were started on topical Dexamethasone 0.1% (Maxidex - Alcon, Belgium) 2 hourly, Diclofenac sodium 0.1% (Naclof - Novartis, Switzerland) 6 hourly, Ofloxacin 0.3% (Exocin - Allergan, Pakistan) 6 hourly and tropicamide 1% (Mydracyl - Alcon, Belgium) 6 hourly.

Patients were followed up in the Surgical Retina clinic at 1 week, 2 weeks, 4 weeks, 8 weeks and monthly interval afterwards. On each follow up visit, patients had detailed evaluation in terms of BCVA, IOP, anterior segment biomicroscopy and dilated fundus examination. The silicon oil was removed after 6 months postoperatively in each eye.

RESULTS

At 1 year mean follow up, 23 (66%) eyes had improvement in their visual acuity, while 3 (9%) eyes showed no improvement and 9 (26%) eyes had deterioration in vision (Fig. 1). One eye had BCVA of 6/6 - 6/12, twelve (34%) eyes had BCVA of 6/18 - 6/60, nine (25.7%) had visual acuity between 5/60 - 3/60 and ten (29%) eyes had visual acuity of 2/60 - 1/60. The comparison of pre-operative and post-operative VA is shown in Table 1.

The final anatomic reattachment was witnessed in 31 (89%) eyes, while 4 (11%) eyes had persistent retinal detachment (Fig. 2).

At the end of 1 year, out of the 35 eyes operated upon, 10 (29%) eyes developed raised IOP, controlled with topical timolol 0.5% (Betamol- Sante, Pakistan), 1 (3%) eye developed macular pucker and 1 (3%) eye showed silicon oil in the anterior chamber Table 2.

DISCUSSION

Primary PPV is a preferred technique for repair of retinal detachment developing in pseudophakic eyes, as this technique permits a direct attack on the cause of retinal detachment by the release of vitreoretinal traction internally and by permitting a very gentle but effective intraocular tamponade. This technique also alleviates the non-physiological distortion of the globe and motility problems caused by the scleral buckling procedure. Postoperatively, vitrectomised eyes without scleral buckle have very little conjunctival or lid edema and have significantly less discomfort.

The outcome of the vitreoretinal surgery is generally reported by postoperative BCVA and the retinal reattachment rate. The most common criterion in such analysis is whether the retina has remained attached for at least 6 months after the last procedure (anatomic success) and whether postoperative BCVA has improved (visual success)^{10,17}. According to these criteria, our group of patients with pseudophakic rhegmatogenous retinal detachment after an uncomplicated cataract extraction and posterior chamber IOL implant showed anatomical and visual success in 89% and 65% respectively, after a median follow up of 1 year.

In a case series of 101 enrolled patients with pseudophakic rhegmatogenous retinal detachment, undergoing similar surgical procedure, Kivela¹ and coworkers observed primary anatomical success rate of 74% and visual improvement at 74%. Bartz Schmidt¹⁴ reported 33 consecutive cases of pseudophakic retinal detachment with reattachment rate of 94% and visual improvement in 79% at mean follow up of one year. Brazitikos¹⁵ described the overall reattachment rate of 100% and visual success rate of 78% in 14 eyes. Gruterich and colleagues¹⁷ reported a series of 102 patients with pseudophakic retinal detachment undergoing PPV, showing overall reattachment rate of 99% with 69% of patients having improvement in VA.

In many eyes after the retinal detachment surgery, the visual outcome is less satisfactory than the anatomic result, mainly because of the permanent functional damage to the macula. The comparison of

visual success after retinal detachment surgery therefore is difficult because of differences between the studies, due to different ocular diseases and different types and complication rates of preceding cataract surgery¹⁰.

Even though many factors have been found to influence the visual outcome of retinal detachment surgery, the most important predictor of visual recovery is preoperative visual acuity, which is largely related to the macular attachment, age of the patient, Nd - Yag capsulotomy, duration of the retinal detachment and configuration of the retinal detachment.

In our study, 31 eyes (89%) had successful reattachment after PPV while 4 eyes (11%) were redetached again. Out of these 4 eyes 3 eyes developed PVR that lead to redetachment while 1 eye was redetached because of formation of new break. The eyes which were re-detached were re-attempted to flatten the retina with exchange of silicon oil.

The silicon oil was removed after 6 months postoperatively in each eye. None of the eye had redetachment of retina after removal of silicon oil.

As far as the duration between cataract surgery and retinal detachment is concerned, 22 eyes in our series had history of cataract surgery at less than 2 years, out of which 19 (86%) eyes had successful reattachment and VA improved in 20 (91%) eyes. Although refraction was performed but spectacles were not prescribed till the removal of silicon oil. Thirteen eyes had history of cataract surgery at greater than 2 years out of which 12 (92%) had successful reattachment and VA improved in all 13 eyes. The number of eyes with total retinal detachment were 20 (57%), of which, 16 eyes had successful reattachment while 4 eyes got re-detachment postoperatively. Those who developed sub-total retinal detachment, all remained attached over a follow up period of 1 year. They all had successful reattachment with visual improvement postoperatively.

Regarding postoperative complications. Raised IOP was noted in 10 (28%) eyes, which was controlled with topical aqueous suppressant and carbonic anhydrase inhibitors. Silicone oil in anterior chamber was noted in 1 (3%) eye, while macular pucker developed in 1 (3%) eye. Twenty three (66%) eyes did not develop any complication. Although, number of eyes included in our series is small, but overall anatomical reattachment and visual improvement is comparable to other series reported in the literature.

Table-1: Comparative evaluations of preoperative and postoperative BCVA (P = 0.02)

Best corrected Visual Acuity	Pre-operative (n %)	Post-Operative (After 1 year) (n %)
6/6 - 6/12	0	1 (3)
6/18 - 6/60	1 (2.85)	12 (34)
5/60 - 3/60	1 (2.85)	9 (25.7)
2/60 - 1/60	4 (11.4)	10 (29)
CF	2 (5.7)	1 (3)
HM	22 (63)	2 (5.7)
PL	5 (14.3)	0
Total	35	35

CF = Counting Finger, HM = Hand Movement
 PL = Perception of light.

Table 2. Post-operative complications

Complications	No. of patients (n %)
No	23 (66)
Raised IOP	10 (28)
Macular pucker	1 (3)
S.O in AC	1 (3)

IOP = Intraocular Pressure
 S.O in AC = Silicon oil in Anterior Chamber

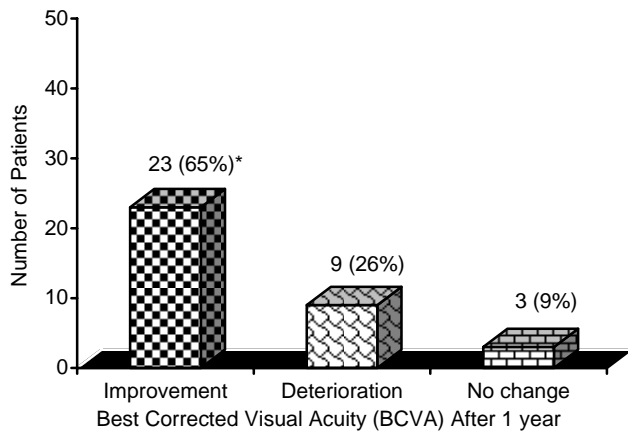


Fig. 1: Relative improvement in best corrected visual acuity, 1 year after surgical procedure

*Shows significantly greater proportion at p = 0.022 (By applying Sign test for paired set of qualitative variants: Z= -2.3).

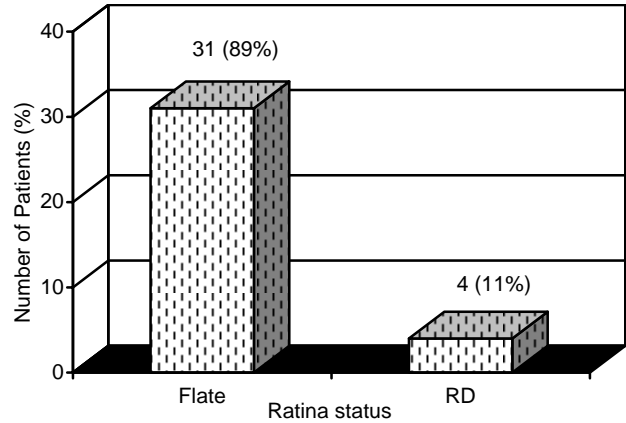


Fig. 2: Retinal status after 1 year

Flat = Successful reattachment of retina
 RD = Retinal re-detachment

CONCLUSION

Our results suggest that 3-port pars plana vitrectomy with endolaser photocoagulation and silicon oil tamponade is an effective procedure in pseudophakic retinal detachment, resulting in high proportion of cases having successful anatomical and visual outcome. However, the time of presentation, preoperative visual acuity, PVR grade and extent of retinal detachment remain determining factors influencing the final outcome of anatomical and visual success.

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