

Management of Pseudophakic Retinal Detachment

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Objective: To evaluate the functional and anatomical outcome of retinal detachment surgery in pseudophakic eyes

Material and Methods: Non comparative interventional case study was conducted at Isra Postgraduate Institute of Ophthalmology, Al-Ibrahim Eye Hospital, Malir Karachi from 1st January to December 2005. Study include 23 pseudophakic eyes of 23 patients with pseudophakic retinal detachment, who underwent three ports pars plana vitrectomy with silicone oil tamponade and endolaser. Postoperatively 3 months follow up was carried out.

Results: 22 of 23 pseudophakic eyes (95.65%) achieved anatomical success. 20 pseudophakic eyes (86.95%) showed postoperative visual acuity improvement 1 or more lines ranged from 0.025-0.33 (1/60 – 6/18). Post operative complications include raised IOP in 14 eyes (60.86%), epiretinal membrane formation in 10 eyes (4.3%) and re-detachment in 01 eye (4.3%).

Conclusion: Pseudophakic retinal detachment (RD) is always a complicated sort of detachment due to poor visualization of retinal breaks. Therefore scleral buckling (SB) alone is not sufficient to treat the RD. Three ports pars plana vitrectomy with silicone oil tamponade along with endolaser around the retinal breaks or 360° endolaser is an effective procedure to treat pseudophakic RD.

Rhegmatogenous retinal detachment (RD) remains a common problem after cataract extraction and intra ocular lens (IOL) implantation^{1,2-9}. In fact, it is the most common potentially blinding complication of this procedure. RD develops in 0.5% to 1.0% of eyes even after modern cataract surgery¹⁻⁹. Thus, it is far more common than are bacterial endophthalmitis and expulsive hemorrhage, which likewise may permanently affect vision and quality of life after cataract extraction^{1,8}.

The anatomic and visual outcome of pseudophakic RD surgery are not easy to compare because of different ways of expressing the results.

Nevertheless, several series of silicone oil tamponade for complicated RD recorded visual acuity equal to or better than 0.025 (1/60) in a percentage ranging from 45% to 63%¹⁰⁻¹⁴.

The purpose of this study was to see the anatomic and functional outcome of RD surgery in pseudophakic eyes at Isra Postgraduate Institute of Ophthalmology.

MATERIAL AND METHODS

23 eyes of 23 patients who underwent pseudophakic RD surgery from 1 January 2005 upto December 2005 at Isra Postgraduate Institute of Ophthalmology, were

included in this study. Phakic, aphakic or pseudophakic RD surgery with anterior chamber intraocular lens were excluded. Patients were informed about the procedure and written consent was taken. Pre operative evaluation included detailed history, visual acuity; slit lamp biomicroscopy-anterior segment and fundus examination carried out with 90D. Peripheral retinal evaluation performed with indirect ophthalmoscope and Goldmann three mirror contact lens. The number, type, (atrophic hole or horseshoe tear) position, (anterior, equatorial and posterior to the equator) size of break and grade of proliferative vitreo retinopathy were determined pre operatively. Most of the RD surgery were performed under general anesthesia but some under local anesthesia by different surgeons.

Three ports pars plana vitrectomy (PPV) was performed using BIOM (Binocular indirect ophthalmoscope). In all eyes central and peripheral vitreous was removed, followed by removal of all vitreous traction on retinal tears. In eyes where retinal break could not be localized even after intra operative scleral depression for 360°, drainage retinotomy was performed in the nasal quadrant. Endocautery was performed on the margin of break, retina flattened with air, sub retinal fluid (SRF) was aspirated with flute needle or with high extrusion needle. Two rows of argon laser were applied around the retinotomy site or around the break after fluid air exchange. 360° prophylactic endolaser was performed in eyes where break can't be localized.

Air was exchanged with silicone oil (5000 centistokes) as long internal tamponade agent. Sclerotomies were closed carefully with 6/0 vicryl suture.

Visual acuity (VA), anterior segment, posterior segment examination and IOP were recorded after 24 hours, one week, two weeks, one month and three months after the surgery. Silicone oil was not removed from any eye till last follow up of the study.

The data was statistically analyzed by using SPSS version 10. All categorical response variable including type of RD, pre and postoperative VA and complication were given in frequencies and percentage; Wilcoxon sign rank test was applied to compare significance of proportion in these variable at $p < 0.05$ level of significance.

RESULTS

23 post operative pseudophakic eyes (23 patients) with RD were followed for 3 months. 18 patients were men (78.26%) and 5 were women (21.73%). Mean patient age was 52.00 years (range 31-75 years). All eyes included in the study were pseudophakic with a PCIOL. Posterior lens capsule was intact in 18 eyes (78.26%) and posterior capsular rent were found in 3 patients and in 2 patients Neodymium yttrium aluminum garnet laser (ND:Yag Laser) capsulotomy had been done at the time of presentation. All eyes had macular detachment pre operatively. Type of pseudophakic RRD are shown in table I. 14 eyes (60.86%) had causative breaks located between 10 O'clock and 2 O'clock position. 5 eyes (21.73%) had causative break located between 3 O'clock and 9 O'clock position. 4 (17.39%) eyes no causative break was localized pre-operatively and intra-operatively.

Preoperative visual acuity is shown in table 2. Post operative visual acuity are shown in table 3. Numbers of patients in which post operative visual acuity improved, not improved and deteriorated on 1st day, 1st week, 2nd week, 1st month, 3rd month are shown in table 4. Complications preoperatively and post operatively shown in table 5.

DISCUSSION

Goal of RD surgery in general is to close the retinal breaks and release vitreous traction. The best method to treat a RD is one which is relatively safe and controlled, involves minimal manipulation and minimal intra and post operative complication¹⁵.

Scleral buckling (SB) procedures may pose a problem because of poor visualization due to poor mydriasis, cortical remnants, capsular opacification, glare or pitting from the intra ocular lens implant, corneal opacification, or vitreous opacities may make identification difficult, especially because anterior breaks more commonly occur in pseudophakic and aphakic RDs¹⁶. The principles of SB are to reduce vitreous traction and to seal the retinal breaks¹⁷.

The anatomic success rate in aphakic eyes has been 85% as reported by Norton¹⁸. In pseudophakic eyes results varied between 82% to 95% as reported by Ho and Tolentino¹⁹ and Johnston²⁰ et al. Machemer²¹ in 1970 revolutionized intra ocular surgery with the introduction of pars plana vitrectomy. Kloti²² in 1983 reported the use of vitrectomy in conjunction with internal drainage of sub retinal fluid and use of intravitreal tamponade.

Pars plana vitrectomy has been performed alone^{23,24} or in combination with SB procedures²⁵ for the management of pseudophakic RD. Different types of retinopathy, such as cryo therapy, argon and diode laser alone or both, were used in these studies. Different tamponade agents such as air, SF6 (Sulphurhexafluoride), C2F6 (Perfluoroethane), C3F8 (Perfluoropropane) and silicone oil were applied in these series. Most authors did not provide a complete description of causative breaks in terms of size, position and type. In all these series the initial re-attachment rate varied from 64.5% to 100%²³⁻²⁵.

Table 1: Type of RRD: Clinical presentation of pseudophakic RD

Type of RRD with Grades	PVR with Macula off	No. of Patients n (%)
Total RRD	PVR C1 - C6	13 (65.52)
SubTotal RRD	PVR B-C2	4 (17.39)
Inferior RRD	PVR B - C3	6 (26.08)

*RRD: Rhegmatogenous Retinal Detachment,
* PVR: proliferative vitreoretinopathy

Table 2: Pre operative visual acuity of subjects

Pre Operative Visual Acuity	No. of Patients n (%)
PL +ve	3 (13.04)
HM	6 (26.08)
0.025	9 (39.13)
0.05	2 (8.6)
0.1	2 (8.6)
0.2	1 (4.3)

Table 3: Post operative visual acuity of subjects

Post Operative Visual Acuity	No. of Patients n (%)
0.33 - 0.1	14 (60.86)
0.05 - 0.25	6 (26.08)

No Improvement	3 (13.04)
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*0.33 = 6/18, 0.25=6/24, 0.2=6/30, 0.1=6/60,
0.05=3/60, 0.025=1/60

In present study, the results of 23 eyes of 23 patients with pseudophakic RDs with causative break localized or could not be localized treated with primary PPV with internal tamponade are reported. All patients who underwent primary vitrectomy had pseudophakic RD with PVR grade B-C6 according to Machemer classification²⁶. Out of 23 eyes, breaks were

Table 4: Number of patients improved, not improved or deteriorates in 03 months follow up

	Improvement n (%)	No Improvement n (%)	Deterioration n (%)	P-Value
1 st Post Op Day	8 (34.78)	11 (47.82)	4 (17.39)	0.33
Post Op VA 1 st wk	17 (73.91)	5 (21.73)	1 (4.3)	0.001
Post Op VA 2 nd wk	20 (86.95)	3 (13.04)	0	0.001
Post Op VA 1 st mth	19 (82.60)	4 (17.39)	0	0.001
Post Op VA 3 rd mth	20 (86.95%)	3 (13.04%)	0	0.001

*Post op VA= Post Operative Visual Acuity
*wk= Week, mth=month

Table 5: Complications

Per Operative	No. of Patients n (%)
Active bleeding at retinotomy site	02 (8.6)
Post Operative	
Raised IOP	14 (60.86)
Epiretinal membrane formation	1 (4.3)
Re detachment	1 (4.3)
No Complication	5 (21.73)

localized in 19 eyes (82.60%), in 14 eyes (60.86%) majority of breaks localized were in superior quadrant between 10 - 02 O'clock position. 5 eyes (21.73%) had causative break located between 3-9 O'clock positions. In 4 eyes (17.39%) no causative break could be localized pre operatively and intra operatively. In aphakic and pseudophakic RDs, the incidence of non visualized break has been reported as 7% to 16% and 5% to 22.5%,²⁷⁻²⁹ respectively. Posterior capsular rents were found in 3 patients and in 2 patients ND: YAG laser capsulotomy had been done at the time of presentation. ND: YAG laser capsulotomy increases the risk of RD four times,^{4,5,30,31} but posterior capsulotomy also improves visibility of retinal breaks. Posterior capsulotomy can also be done just before or during the surgery to improve identification of peripheral retinal breaks. In this study retinal breaks were not found in 4 eyes (17.3%). The anatomic success rate in eyes with non visualized breaks is thought to be lower than average. In our study, the anatomic success rate did not differ³²⁻³⁵.

Anatomical success at the last follow up was achieved in 22 pseudophakic eyes (95.65%) In one eye (4.34%) there was inferior recurrence of RD due to PVR after 3 weeks of RD surgery. Anatomical success rate previously reported ranged from 75% to 100%^{36,37}. Functional result in 20 pseudophakic eyes (86.95%) showed post operatively VA improvement 1 or more lines ranged from 0.025-0.33 (1/60-6/18) at follow up examination. 14 eyes (60.86%) had VA better than or equal to 0.1 (6/60). In 3 patients (13.04%), VA after RD surgery did not improve because in 1 eye re detachment occurred with macular involvement. Two eyes anatomical success was achieved but functional success could not be achieved probably because these RDs were more than two months old. The results in term of visual function are not easy to compare because of the different ways of expressing the results. Nevertheless, several series of silicone oil tamponade for complicated RD recorded VA equal to or better than 0.025 (1/60) in a percentage ranging from 45% to 63%¹⁰⁻¹⁴.

We observed increased IOP is a common complication in our series i.e. 60.86%. All patients with raised IOP were controlled with anti glaucoma medication. In most studies, early transient IOP rise was the most common complication of primary vitrectomy combined with fluid gas exchange. In the studies by Bartz Schmidt³⁸ et al and Speicher³⁹ et al this rate was reported to be 48% and 17.4% respectively. Probably the high percentage in our

series was due to use of high viscosity silicone oil. Macular epiretinal membrane in our series developed in 4.3% of patients. Martinez-Castillo⁴⁰ reported 5% patients developed macular epiretinal membrane. Ahmadieh⁴¹ reported increased incidence of epiretinal membrane during the 6 months follow period. No cases of keratopathy and emulsification of silicone oil were noted in our series probably because of short follow-up period in the study and use of high viscosity silicone oil.

Our study had several limitations. One limitation was the sample size and short follow up period. Another limitation was the use of high viscosity silicone oil (5000 centistokes) that was not compared with standard silicone oil (1000 centistokes).

Based on our experiences in this study one should do prospective randomized controlled study to compare high viscosity silicone oil and standard silicone oil in case of complicated RD.

CONCLUSION

Pseudophakic retinal detachment (RD) is always a complicated sort of detachment due to poor visualization of retinal breaks. Therefore scleral buckling (SB) alone is not sufficient to treat the RD Three ports pars plana vitrectomy with silicone oil tamponade along with endolaser around the retinal breaks or 360° endolaser is an effective procedure to treat pseudophakic RD.

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