

Frequency of retinal re-detachment after removal of silicone oil Tamponade in cases of proliferative vitreoretinopathy

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Abstract

Objective: To determine the frequency of retinal re-detachment (reRD) following silicone oil removal (SOR) in patients who had undergone pars planavitrectomy for treatment of Proliferative vitreoretinopathy (PVR) detachment.

Methods: A total of fifty (50) patients with diagnosis of PVR in LRBT hospital Lahore were selected within a duration of 12 months from April-2018 to April-2019 for this prospective observational study. Patients of rhegmatogenous retinal detachment (RD) who underwent vitrectomy using temporary SO tamponade and had completely attached retina at the time of SOR, were included. SOR was done via 3 ports pars plana vitrectomy (PPV) using EVA DORC machine. In 20 patients, scleral buckling (SB) was also done alongwith vitrectomy procedure. After SOR all patients were followed up for 6 months to determine the frequency of retinal re-detachment.

Results: There was male pre-dominance with 30 (60%) of total proportion. There were 26 (52%) patients who had a grade C PVR (C1), 18 (32%) had grade B PVR. The retinal re-detachment was found in 2 (4.0%) patients out of 50 patients. In comparison of retinal re-detachment, there was no case of retinal re-detachment in patients with SB and re-detachment occurred in 2 (6.6%) out of 30 patients in whom SB was not done (p -value 0.51).

Conclusion: The rate of retinal re-detachment after silicone oil removal (SOR) was 4.0%. Implantation of SB at the time of PPV is associated with lower risk of retinal re-detachment after vitrectomy in patients of Proliferative vitreoretinopathy (PVR).

Keywords: Proliferative vitreoretinopathy (PVR), Silicone oil, Retinal detachment. (JPMA 70: 1404; 2019).

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Introduction

Proliferative vitreoretinopathy (PVR) is a complex entity and is linked to a group of intra-ocular diseases causing retinal detachment (RD).¹ PVR is presumed to be the result of the repair process of retinal breaks and an inflammatory reaction.² RRD is encountered in 5.4-18.2/100,000 people, with the highest incidence rate (52.5/100,000) between the age of 55-59 years.³⁻⁵

Pars plana vitrectomy (PPV), pneumatic retinopexy (PR) and scleral buckling (SB) are commonly used treatment options for management of RRD. The ultimate goal of treatment is to prevent the re-occurrence of RRD for which the long acting endo-tamponade agent as silicone oil is used.^{6,7} But silicone oil (SO) tamponade is not without complications, as it can cause keratopathy, or glaucoma

or cataract. To prevent these complications removal of SO is performed. After SO removal (SOR), PVR, retinal detachment can re-occur most probably due to vitreoretinal traction at the base of the vitreous.^{8,9} Some other factors e.g. intra or post-operative inflammation, intra-operative bleeding, retinectomy and long duration of surgery can also play a role in the development of these complications.

Some authors have proposed that before SOR, prophylactic 360° laser retinopexy might reduce the risk of retinal re-detachment (reRD).^{10,11} Use of encircling scleral buckling (SB) at the time of vitrectomy has also shown to reduce the incidence of retinal re-detachment.^{12,13} Many ophthalmologists now practice the removal of SO in the second stage of the procedure, usually after 06 months when adequate anatomical and functional recovery has been achieved. In the present study we aimed to determine the reRD rate following

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temporary SO tamponade removal in patients of PVR.

Methods

A total of 50 subjects were enrolled in 2018 at Layton Rahmatulla Benevolent Trust(LRBT) Eye hospital, Lahore in this prospective observational study. The study duration was 12 months from April-2018 to April-2019. Patients who had rhegmatogenous RD with PVR (Grade A to C1) underwent pars plana vitrectomy using temporary SO tamponade were studied. Silicone oil was the only tamponade available for intraocular use during that period of the study for PVR detachments. Retina Society Terminology Committee (1983) criteria was used for classification of PVR.¹⁴ Patients having grade A to Grade C (C1) PVR were included. While those having Grade D PVR were excluded. The sample size was calculated by taking estimated incidence of retinal reRD rate of 3.27% patients and desired precision level 6.0%, which amounted to 49 patients.¹⁵ Patients having retinal attachment at the time of SOR were included. Patients having SO tamponade for other indications than RRD, those in whom SO tamponade was removed before 4 months, patients who were lost to follow-up, were excluded. Approval was taken from the Ethical Review Board of LRBT Eye hospital in April 2018. PPV procedure was performed in all patients through 3 ports using the EVA DORC machine. In 20 patients, SB was done at the time of PPV. While in the remaining 30 patients no SB was carried out. After 06 months, SO was removed using 3 ports pars plana vitrectomy (PPV) using the EVA DORC machine. Membrane peeling or cataract extraction, if required in any patient was also performed. If residual oil was present, air fluid exchange was done to ensure complete SO removal before concluding the procedure. Endolaser was also used simultaneously if required.

After SOR all patients were followed for 6 months to determine the incidence of retinal reRD. Enrolled patients were examined at 1 month, 3 months and 6 months after removal of SO.

Additionally, the retinal reRD rate was compared between the patients who received PPV and SB with those in whom SB was not done, by using chi-square test. P-value ≤ 0.05 was taken as significant.

Results

The mean age of studied patients was 50.90 ± 10.45 years. There was male dominance with 30 (60%) of total

Table-1: Baseline Data of Study Patients.

Total Number	50
Mean age (Years)	50.90±10.45
Male Gender	30 (60%)
Female Gender	20 (40%)
Proliferative vitreoretinopathy Grades	
A	06 (8.0%)
B	18 (32%)
C	26 (52%)

proportion. There were 26 (52%) patients who had grade C1 PVR, 18 (36%) had grade B PVR, while least number of patients 6 (12%) were having grade A PVR (Table 1). Retinal reRD was found in 2 (4.0%) patients out of 50 patients. On comparison of retinal reRD, there was no incidence of retinal reRD in patients with SB and reRD occurred in 2 (6.6%) out of 30 patients in whom SB was not done (p -value 0.51).

Discussion

In the present study we evaluated the incidence of retinal reRD after SOR in patients who underwent PPV for treatment of PVR. Also compared was the retinal reRD rate among patients in whom encircling buckling was done with those in whom buckling was not done. The main purpose of encircling buckling is to strengthen the vitreous base and to obtain better visualization. However, some studies have suggested that the use of buckling is associated with increased procedural time, can reduce blood flow to the eye and sometimes can cause complications such as buckle infection or dislocation.^{16,17} In the present study we did not encounter any complication of buckling in the follow-up period. We found retinal reRD in 4.0% patients after SOR, while there was no single incidence in patients in whom encircling buckle was made during PPV. Similar to our study, Schmidt et al. also did not find any significant beneficial effect of buckling on retinal reRD rates. The primary success rate in their study in patients with SB was 89.5% versus 84.6% in patients with PPV alone.¹⁸

A study conducted by Goezinne et al. in a multivariate analysis concluded that absence of SB is a significant risk factor of reRD after removal of SO. The authors also found age more than 60 years a risk of reRD.¹⁹

Another study by Lindsell et al. compared PPV with and without SB and found similar reRD rate, PVR reoccurrence and final visual acuity score in both of the groups.²⁰ Storey et al. conducted a study on patients at high risk of

Table-2: Incidence of Retinal Re-Detachment Reported in Previous Studies.

Author's Name and Year of Study	Re-detachment Rate (%)
Naggal et al. ²⁶ (2012)	12.7
Tranos et al. ²⁷ (2015)	8.0
Jain et al. ²⁸ (2010)	11.6
Teke et al. ²⁹ (2014)	13.2
Al-Wadani et al. ¹⁵ (2014)	3.27

PVR, the author found significant higher primary success rate in SB group, 75% as compared to only 48.3% in patients of PPV alone.²¹ More-over some studies have suggested that SB alone can provide comparable outcomes as compared to PPV plus SB in patients of uncomplicated RRD and it is also cost effective as compared to the combined procedure of PPV alone.^{22,23}

Lam et al. conducted a study to determine the factors leading to retinal reRD after PPV. The authors concluded that axial length and number of previous surgeries are risk factors of anatomical success rate of PPV, in spite of the type of procedure done.²⁴ However, we found an influence of type of procedure on retinal reRD rate after SOR. But we did not evaluate other factors leading to lower success rate in our study.

In the present study we used high-viscosity 5000 Cs oil for tamponade. Soheilian et al. reported that the choice of SO can also predict anatomic failure after SOR. They reported higher rate of reRD in high viscosity SO as compared to the low viscosity SO (1000 Cs).²⁵

In the present study the rate of retinal reRD was lower or comparable to the results of previously published studies (Table 2).

The major limitation of present study is its observational nature, there is a need to conduct randomized trials to determine the rate of reRD after scleral buckling with those with no scleral buckling.

Conclusion

The rate of retinal reRD after silicone oil removal (SOR) was 4.0%. Implantation of SB at the time of PPV is associated with lower risk of retinal reRD after vitrectomy in patients of Proliferative vitreoretinopathy (PVR), which implies that scleral buckling must be undertaken at least for high grade PVR detachments in order to improve retinal attachment results and decrease remote reRD complication rates following SOR.

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Conflict of Interest: None

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