

Comparison of Anatomical Success Between Early and Late Removal of Silicone oil after Retinal Detachment Surgery

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ABSTRACT

Objectives: The objective of the study is to assess the retinal redetachment after early and late removal of silicone oil.

Place and Duration of Study: Department of ophthalmology eye unit 3, KEMU /Mayo hospital, Lahore from February 2021 to July 2021 .

Study: Quasi experimental trial.

Patients and Methods: Time of silicone oil removal of first group (29 patients) at 6 weeks and second group (29 patients) at 12 weeks post-operatively. Presence of 360 barrage laser. The two groups were compared as to the condition of the eye at the time of SOR at 1st day 1st week, 1st months.3rd month following SOR. Inclusion Criteria PPV for rhegmatogenous RD with all types of breaks with silicon oil tamponade, both gender 360 barrage laser. Exclusion criteria bands keratopathy grade c PVR, presence of cataract, GRT, only eye

Results: The risk of retinal re-detachment was similar in both groups.

Conclusion: The danger of re-detachment was not increased by early removal of silicone oil after six weeks, and higher compliance with the removal period was ensured. In patients who are less likely to follow a procedure for delayed removal, it is especially advised..

INTRODUCTION

In complicated surgery of retinal detachment, injection of silicone oil has observed as a standard method to develop the diagnosis of intricate detachment linked with giant retinal tears, proliferative vitreoretinopathy, ocular trauma or proliferative diabetic retinopathy.^{1,2} If matched with sulfur hexafluoride gas by means of intraocular tamponade for the organization of retinal detachment, eyes in which silicone oil was administered more probably re-attached, for gaining better visual results and minimal complications post-operatively, usually pars plana vitrectomy is performed in which surgically vitreous gel is removed. Machemer in 1972 invented pars plana vitrectomy which is a single port, multifunctional cutter of 17-gauge known as vitreous infusion suction cutter. O'Malley and Heintz in 1975 invented the 20-gauge three port system.^{1,3}

The rhegmatogenous type of retinal detachment with pars plana vitrectomy has been successfully treated with this procedure, proliferative diabetic retinopathy, proliferative vitreoretinopathy, tractional retinal detachment, amputation of intraocular external body vitreous hemorrhage, elimination of dislocated lens from Eales and vitreous disease.^{2,3,4} CIBIS (1962) firstly introduced silicone oil use for the treatment of retinal detachments, later on Scott and Zivojnovic modified this technique.⁵

Mostly it is used as a tamponade for retinal detachment surgery since it was first introduced in 1962. It is good practice to remove silicone oil after some period, it is beneficial to reduce post-operative complication. Silicone oil is good intraocular tamponade. it also has few side effects which are glaucoma, cataract, bands keratopathy, ocular hypotony and silicone oil emulsification.^{6,7} Complication by silicone oil depends upon duration of intraocular tissue exposure; it may or may not be reversible.

Proliferation of the epiretinal membrane and traction on the retina might cause retina detachment if silicone oil is not removed within a period of 3 to 6 months.⁸ Retinal detachment has been reported up to 20 to 40 % after silicone oil removal.^{9,10} After a period of six months, we used to adopt a protocol for SOR. While observing the non-compliance of many of our patients (mostly those from rural areas), we found that the majority of them only sought oil removal treatment after experiencing severe headaches, decreased vision, or the perception of something white in their

eyes as a result of their blended silicone frontal chambers. Early (after 6 weeks) versus delayed (12 weeks) SOR removal was evaluated in terms of patient compliance, silicone oil ocular problems, and the risk of retinal reattachment in this study.

MATERIAL AND METHODS

In the early and late removal series at KEMU/Mayo Hospital, Lahore, Pakistan, patients received successful 3port pars plana vitrectomy with silicone oil tamponade from February 2021 to July 2021. Twenty-nine males and ten females were participated in the early removal study, which was a prospective one and included 29 patients (29 eyes). Patient ages range from 35 to 66 years old, with the median being 43 years old. This study was conducted only with the informed consent of all participants.

29 patients were involved in the study, which was conducted on a prospective basis (29 eyes). Males made up 22 of the patients, while females made up seven. Patients ranged in age from 36 to 65 years old. There were a large number of patients who arrived from rural areas served by our hospital and clinic. In the early and late removal series, patients were instructed to return for SOR six weeks and twelve weeks after the procedure was completed.

As part of their preoperative evaluation, all patients had their vision tested and their corneas and lenses examined with special attention paid to their position. Binocular indirect ophthalmoscopy was used to check retinal health.

The oil-fluid exchange process eliminated the silicone oil. The infusion cannula was inserted via an inferior temporal sclerotomy. A second sclerotomy was used to insert an active aspiration cannula and extract the oil. Endoillumination was utilised to check the retina's health after the oil had been removed. Corticosteroid and topical antibiotic post-operative cycloplegics were used in the conventional manner and reduced appropriately after 4 to 6 weeks.

One day, one week, one month, and three months after surgery, ophthalmologists performed a complete ocular examination. If the retinal detachment persisted or additional issues arose, we closely monitored the patients. (SPSS) version 20 will be used to evaluate and analyse the data. The Chi-square test was used to determine the statistical significance of the

difference between the early and late removal groups. Statistical significance was defined as a P 0.005 value.

RESULTS

In late removal group, six out of twenty-nine (20.69%) patients had retinal re-detachment. Two of them (33.33%) had re-detachment during first week after silicon oil removal. While other four (66.66%) patients developed retinal re-detachment at one month follow up. In early removal group, six out of twenty-nine (20.69%) patients suffered from retinal reattachment after silicon oil removal. Retinal detachment occurred in two (33.33%) patients at first week, in three (50%) patients at one month and in one (16.67%) patients at three months after removal of silicon oil.

Table 1: Retinal Re-detachment after silicon oil removal

Follow up	Early Group (Re-detachments)	Late Group (Re-detachments)
One week	02(33.33%)	02(33.33%)
One month	03(50%)	04(66.67%)
Three months	01(16.67%)	00.00

Timing of silicone oil removal: Silicone oil removal was done in the early removal group at 6 weeks and in late removal group at 12 weeks.

Ocular condition before silicone oil removal: In the early removal series, cases with raised IOP were controlled by IOP-lowering drugs.

Silicone oil complication, glaucoma, band keratopathy, Grade C PVR, Incomplete vitrectomy and Presence of dense cataract are in exclusion criteria.

DISCUSSION

In published studies, the timeframe of SOR varies from 8 weeks to 6 months¹¹, to 6 and 22 months, depending on the study. During a minimum of three months of follow-up, we found no difference in retinal reattachment between patients who had silicone oil removed early (after six weeks) and those who had silicone oil removed late (up to 12 weeks). Six eyes (out of 29 eyes) in the early removal series and six eyes (out of 29 eyes) in the delayed removal group experienced retinal re-detachment.¹² To reduce the risk of silicon oil-related problems, we scheduled the early ROSO 6 weeks after the initial surgery. The longer the silicone oil is in the eye, the greater the risk of problems. The most common consequence of delayed ROSO was an elevated IOP, which was treated with medication. Despite having SOR for an extended period of time, some of the eyes remained healthy.

We found a recurrent retinal detachment rate of 20.69 percent in the early removal series and a recurrent retinal detachment rate of 20.69 percent in the late removal series in our research. Recurrence of retinal detachment has been reported in studies ranging from less than 1% to more than 50% of the cases.¹³

It has been noted that the risk of retinal re-detachment after ROSO is highest within the first 50 days of oil removal, which diminishes over the course of three to five months. Because the silicone oil had tamponade previous cracks in the retina,¹⁴ of the retinal detachments occurred before ROSO. An early onset of retinal detachment is associated with abnormalities in the epiretinal membrane. Retinal re-attachment can be prevented by tamponade with silicone oil for an adequate period of time.¹⁵

Re-detachment rates following silicone oil tamponade of 6–8 weeks were found to be 13% in a study of PVR.¹⁶ After ROSO, there is a substantial risk of retinal detachment due to large retinal tears, which were not included in this study. Inflammation and overfilling may be at blame for a high intraocular pressure (IOP) following pars plana vitrectomy, which was tamped down using silicone oil.¹⁷ Because of the presence of red blood cells, plasma lipoproteins, membranes, and oil aqueous movement, emulsification is a key cause of increased intracranial pressure (IOP).^{18,19} Silicone emulsion may be clogging the trabecular meshwork, causing the

IOP to rise following SOR.¹⁸ The presence of aphakic eyes is an absolute no-no. The incidence of retinal re-detachment following SOR was observed to be increased when oil emulsification was used.^{20,21} Early or late silicone oil removal after retinal detachment surgery has little effect on retinal anatomical success.

Implications of the findings: We found no long-term benefit to allowing silicone oil to remain in the eye for more than three months. There is only one advantage: the retina of the patient is kept attached till the SOR procedure is performed. Retinal detachment occurs when silicone oil is withdrawn from a break or a lower PVR condition.

CONCLUSION

In our early and late removal series, silicone oil tamponade had no significant effect on the re-attachment rate. Removal after 12 weeks provided the same therapeutic effect as early SOR after 6 weeks. In rural areas, patients were more likely to comply with early scheduled removals. Oil removal was delayed for too long, and some patients were left with major health issues.

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