Original article

Frequency of retinal re-detachment after silicone oil removal through posterior capsulotomy combined with phacoemulsification

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ABSTRACT

Background: Various techniques are used for the removal of silicone oil from eyes including 2 pars plana ports, 3 pars plana ports technique or through pupil combined with cataract surgery performing posterior capsulotomy which is a relatively newer technique. Retinal redetachment is the most common complication occurring after removal of silicone oil. Purpose of the study was to determine the frequency of retinal redetachment after silicone oil removal through posterior capsulotomy combined with phacoemulsification after rhegmatogenous retinal detachment surgery.

Patients and methods: This descriptive study was conducted in Ophthalmology Department Lahore General Hospital, Lahore from February 2017 to February 2018. Total 81 patients having silicone oil with cataract were included. After performing phacoemulsification and cortical aspiration, posterior capsulotomy was made and silicone oil was aspirated followed by a posterior chamber foldable intraocular lens implantation. The outcome was recorded by examining the patients through slit lamp biomicroscope using 90D lens on outdoor basis up to 2 months after removal of silicone oil.

Results: Mean age was 38.6 ± 12.5 years. Out of 81 patients, 58 (71.6%) were males and 23 (28.4%) were females with male to female ratio 2.5:1. Frequency of retinal redetachment after silicone oil removal through posterior capsulotomy combined with phacoemulsification was found to be 18.5%.

Conclusion: Silicone oil removal through posterior capsulotomy combined with phacoemulsification is a safe and effective technique with no risk of pars plana port break formation and can be performed under local anesthesia in patients having cataract after vitrectomy.

Keywords:
Rhegmatogenous retinal detachment, Silicone oil removal, Phacoemulsification.

INTRODUCTION

Rhegmatogenous retinal detachment is the most commonly occurring form of retinal detachment.[1] Rhegmatogenous retinal detachment is an ophthalmic emergency and the treatment options include scleral buckle, pars plana vitrectomy with tamponade (silicon oil, gas) or a combination of both.[2] Silicone oil for long duration has complications like cataract, glaucoma, emulsification and keratopathy. Therefore, it is recommended that silicone oil should be removed from eye between 3 to 6 months after injection.[3] Retinal re-detachment is the most common complication occurring after removal of silicone oil which ranges from 2% to 33% cases.[4] Proposed mechanisms for re-detachment after oil removal include the re-opening of breaks that had been adequately tamponaded by silicone oil, the posterior migration of occult rhegmatogenous retinal detachment and formation of a new break. Other complications of silicone oil removal include, vitreous haemorrhage (2.1%), residual oil, keratopathy, persistent hypotony, elevated intraocular pressure.[5] Cataract is formed more commonly after retinal detachment surgery occurring 96% after 20-gauge pars plana vitrectomy, 72% after small gauge (23- and 25-gauge) vitrectomy.[6] Almost all the patients require a cataract surgery following vitrectomy. Therefore, silicone oil removal along with cataract surgery through a single route is more beneficial than performing two procedures separately. Moreover, there is shorter duration of surgery and early rehabilitation. The purpose of this study was to determine the frequency of retinal redetachment after silicone oil removal through posterior capsulotomy combined with phacoemulsification in patient having cataract after vitrectomy for rhegmatogenous retinal detachment. There is no previous study conducted on this particular topic in Pakistan.

Competing interest: The authors have declared no competing interests exist.

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PATIENTS AND METHODS

This prospective descriptive observational study was conducted in Department of Ophthalmology Lahore General Hospital, Lahore from February 2017 to February 2018 after approval from ethical committee. Inclusion criteria were the patients of both gender with age 18-70 years and having cataract after vitrectomy with silicon oil (5000cs) for rhegmatogenous retinal detachment done 3-6 months before. Patients with non-rhegmatogenous retinal detachment (tractional and exudative) surgery, clear crystalline lens, aphakia, pseudophakia and glaucoma were excluded. Total 81 cases were included and were operated under local anesthesia (Topical/Subtenon) by the same consultant ophthalmologist with 10 years of experience in ophthalmic surgery. After nucleus removal with phacoemulsification and cortical aspiration, a small puncture made in posterior capsule with a 23G needle tip and posterior capsulotomy completed using utrata forecep. Silicon oil was removed by active aspiration by using 18G branula connected to a 10cc disposable syringe and that is inserted through limbal wound (made for phacoemulsification) up to anterior vitreous level passing through posterior capsulotomy. Irrigation with anterior chamber (AC) maintainer was fixed in a side port made at 3 or 9 o'clock limbus. Foldable intraocular lens was implanted in posterior chamber (single piece IOL in bag/multi piece IOL in sulcus) in all the cases after completion of silicon oil removal. All patients were examined through slit lamp biomicroscope using 90D lens to evaluate for retinal redetachment on 1st postoperative day and then on follow up visit at 1 week, 1 month and 2 months after silicon oil removal or any patient presenting with symptoms of retinal re-detachment during this period. All data was analyzed by using SPSS version 20.

RESULTS

Age range was from 18 to 60 years with mean age of 38.65 ± 12.58 years. Majority of the patients 44 (54.3%) were between 18 to 40 years of age as shown in Table 1. There were 58 (71.6%) male and 23 (28.4%) female patients; male to female ratio being 2.5:1. Frequency of retinal redetachment after silicone oil removal through posterior capsulotomy combined with phacoemulsification after rhegmatogenous retinal detachment surgery was found to be 18.5% (15 patients). Silicon oil was completely removed in all the cases with no residual silicon oil bubble in vitreous cavity. Time of retinal detachment after silicon oil was ranging from 1 to 28 days with a mean of 7.9+7.2 days. 86.6% (n=13) cases of retinal detachment presented within 2 weeks of silicon oil removal. Table 2 summarizes the stratification of retinal re-detachment with respect to age groups and gender with no statistical significance. Patients presented with retinal redetachment underwent pars plana vitrectomy with silicon oil tamponade for longer duration/permanent. No other complication was observed like vitreous hemorrhage, choroidal detachment or endophthalmitis after silicon oil removal.

Table 1. Distribution of patients according to age and gender distribution (n=81).

Age groups (years)	Male	Female	Total
18-40	32	12	44 (54.3%)
41-60	26	11	37 (45.7%)

DISCUSSION

Silicone oil was successfully introduced to retinal surgery by Cibis and group in 1962[7]. Silicone oil serves as intraocular tamponade after pars plana vitrectomy and is widely used for the treatment of complex retinal detachments. Because the incidence and severity of its complications such as cataract and glaucoma increase with its intraocular duration, it is recommended that silicone oil is removed as soon as its tamponade effect is no longer needed.[8] There are various techniques used for the removal of silicone oil from eyes including 2 pars plana ports, 3 pars plana ports technique or through pupil combined with cataract surgery performing posterior capsulotomy which is a relatively newer technique.[9,10] In our study silicon oil was removed through pupil after phacoemulsification and performing a posterior capsulotomy. In 1995, Baer and colleagues[11] were the first to describe a single surgical procedure for silicone oil removal and extracapsular cataract extraction. Cataracts can develop in nearly 100% eyes in which the silicone oil remains in situ for more than 3 months and up to 60% of lenses that appear relatively clear at the time of silicone oil removal will also develop a clinically significant cataract after 2 years.[12] So, cataract extraction and silicon oil removal in a single surgery is good option in such cases.

Table 2. Stratification of retinal redetachment with respect to age groups and gender

Characteristics	Retinal redetachment		p-value*
	Yes (N=15)	No (N=66)	
Age (years)			
18-40	06 (13.6%)	38 (86.4%)	0.217
41-60	09 (24.3%)	28 (75.7%)	
Gender			
Male	09 (15.72%)	49 (84.48%)	0.269
Female	06 (26.09%)	17 (73.91%)	

*p-value was calculated by chi-square test and <0.05 was taken as significant.

In our study mean age of patients was 38.65 + 12.58 years and majority of patients 44 (54.32%) were between 18-40 years of age. In a study done by Narayanan and colleagues[13] found that mean age of patient undergoing 23-guage and 20-guage vitrectomy with silicon oil for rhegmatogenous retinal detachment was 48.05 ± 10.37 years and 42.57 ± 17.84 years respectively. Male to female ratio in our study was 2.5:1 which was comparable with international studies. Poulsen CD[14] documented that male gender is a risk factor for retinal detachment up to twofold while Berrocal MH[15] concluded that retinal detachment with Giant retinal tears (GRT) are more common in males, as 72% of all cases are males. As more male undergo retinal detachment surgery, more male will be presenting with silicon oil after retinal detachment surgery.

Silicon oil was completely removed in our cases with no residual oil bubble in vitreous cavity. Similar results were found by Zhu and colleagues[16] after transpupillary silicon oil removal combined with phacoemulsification. Frequency of retinal redetachment after Silicone oil removal through posterior capsulotomy combined with Phacoemulsification after Rhegmatogenous retinal detachment surgery was found to be in 15 (18.52%) patients. Jonas and colleagues[17] compared rate of retinal redetachment with 2 techniques and they found that retinal redetachment was 36.2% (21/58) after oil removal through posterior capsulotomy and 24.4% (31/127) after oil removal through pars plana sclerotomies. A study conducted in Pakistan[18] found retinal redetachment rate is 29.8% (14/47) after removal of silicon oil through 2 pars plana ports. Tan and colleagues[19] compared oil removal through 2-pars plan ports and 3-pars plana ports and found 16.8% and 19.2% retinal redetachment. Zhu and colleagues[16] found retinal redetachment in only 2 cases after transpupillary oil removal combined with phacoemulsification but in their study they included patient operated for diabetic tractional detachments as well as rhegmatogenous retinal detachments. Limited data is available on retinal redetachment after transpupillary oil removal in cases of rhegmatogenous retinal detachment.

Unlu and colleagues[20] found that retina redetached in the first 10 days in 81.3% of patients after silicone oil removal. In our study we found mean time of retinal redetachment ranging from 1 to 28 days with a mean of 7.9+7.2 days after removal of silicon oil. 86.6% cases of retinal redetachment presented within 2 weeks of oil removal. Limitation of our study was that it was a single center study and was a single technique of silicon oil removal.

CONCLUSION

Silicone oil removal through posterior capsulotomy combined with phacoemulsification in patients having cataract after vitrectomy with silicone oil is satisfactory technique in terms of retinal re-detachment with results comparable to other techniques. Complete silicone oil removal and cataract extraction with intraocular lens implantation is possible in single surgery under local anesthesia. By using this technique, port breaks can be avoided which are common in oil removal through pars plana ports. Silicone oil removal through posterior capsulotomy may be used as primary method in patients having cataract after vitrectomy with silicone oil.

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