Original Article

Removal of Silicone Oil from the Anterior Chamber: New Technique

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Purpose: To describe a new technique of removal of silicone oil from the anterior chamber and to report the safety and effectiveness of the procedure.

Material and Methods: The prospective feasibility study of a new technique was concluded on twenty patients who presented with silicone oil in the anterior chamber postoperatively between six weeks to six months after complicated retinal detachment surgery. An air pump commonly used in vitreo-retinal procedures was connected with tubing to anterior chamber, which was entered by a twenty seven gauge needle. Air was pumped gradually (maximum pressure required to build-up was 40 mmHg) into the chamber with the foot pedal to push silicone posteriorly as well as across the anterior chamber to the opposite side. Simultaneously oil was egressed out through a self sealing corneal incision held open by depressing its posterior lip.

Results: 20 patients under went removal of silicone oil from the anterior chamber by this technique. The procedure was uneventful and complete removal of oil was accomplished in all patients.

Conclusion: The technique is simple, safe, effective and cheap for managing silicone oil in the anterior chamber.

Siliconc oil has been used in the management of complex retinal detachments for over a quarter of a century. Silicone oil is very efficacious in producing retinal reattachment and improves vision in eyes with severe proliferative vitreoretinopathy (PVR)[1,2]. It has been associated with complications like anterior chamber herniation[3]. Silicone oil in the anterior chamber may obstruct the view when emulsified[3], can cause glaucoma[4,5] and keratopathy[6]. Most frequent causes of siliconc oil herniation into the anterior chamber are blockage of the inferior peripheral iridectomy in aphakic eyes, recurrent retinal detachment and hypotony[3]. Silicone oil in the anterior chamber is quite challenging for vitreo-retinal surgeons. Air being lighter than silicone and could be compressed hence we used sterile air to evacuate silicone oil from anterior chamber. Air was pumped into the anterior chamber through a standard infusion set tubing by an air pump commonly used in vitreo-retinal procedures.

MATERIAL AND METHODS

This procedure was done in 20 eyes of 20 patients (12 men, 8 women) who presented with silicone oil in the anterior chamber postoperatively after complicated retinal detachment surgery between six weeks to six months. In our patient population there is high rate of PVR may be because of highly pigmented eyes. We prefer not to remove silicone oil especially from one eyed patients for years if it is causing no complications. Seventy percent of our patients were pseudophakic, twenty percent were phakic and ten percent were aphakic.

Equipment used in this procedure was an air pump with filter, standard infusion set tubing, 27 gauge needle and 3.2 mm phaco knife. All cases were done under topical anesthesia except six uncooperative patients who were given retrobulbar anesthesia. Conjunctiva was washed with povidone-iodine 5% solution. Miosis was achieved with intracameral carbachol 0.01% to truncate silicone oil in the anterior chamber from posterior chamber. An air pump was connected to the anterior chamber by tubing and the chamber was entered by a 27 gauge needle. Air was pumped gradually (maximum pressure required to buildup was 40 mmHg) into the chamber with the foot pedal to push silicone posteriorly as well as across the anterior chamber to the opposite side. A self sealing corneal incision was made by phaco knife opposite to the needle entry. Simultaneously silicone oil was egressed out by depressing the posterior lip of the corneal incision (Figure 1). Pre-placed single stitch of ten zero nylon applied in eight cases to seal the wound in patients who were squeezing and in which the posterior pressure was high. Intraocular pressure was checked in all cases with tonopen. To avoid the risk of glaucoma every patient was put on anti-glaucoma medication till all air absorbed from the anterior chamber.

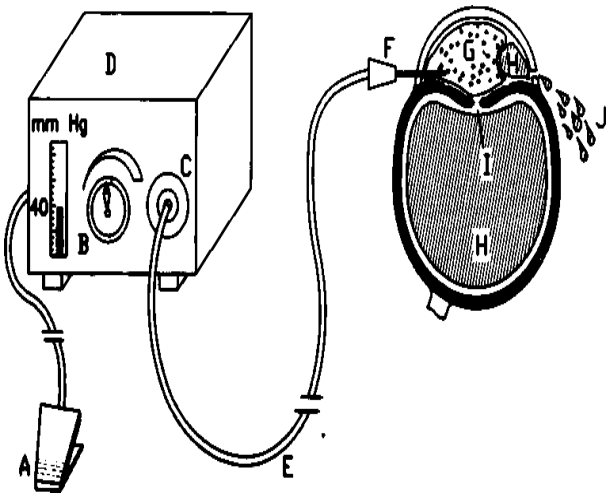

Fig. 1: Schematic diagram of silicone oil removal from anterior chamber

RESULTS

Twenty eyes of twenty patients underwent silicone oil removal from the anterior chamber by this technique. Seventy percent were pseudophakic, twenty percent were phakic and ten percent were aphakic. In all patients silicone oil was removed successfully from anterior chamber. One patient under went the same procedure again after one week.

DISCUSSION

Silicone oil is an accepted form of intraocular tamponade for complicated retinal detachment. Silicone oil is usually removed from the eye to avoid complications when the retina is attached, while chorioretinal adhesions are formed and no significant traction on the retina is present. The timing of silicone oil removal remains controversial in different reports in the literature[7,8]. The silicone is left in generally for 6 months to 1 year, but in some cases it is left in permanently[9]. In our patient population there is high rate of PVR may be because of highly pigmented eyes. We prefer not to remove silicone oil especially from only eyed patients for years if it is causing no complications. One of the complications of silicone oil is herniation into the anterior chamber leading to vision threatening keratopathy and glaucoma[3,6]. Removal of silicone oil from anterior chamber is a challenging job for vitreo-retinal surgeons. For managing silicone oil in the anterior chamber complete removal has been suggested from both anterior chamber and posterior segment followed by re-injection[3]. This is a major procedure and it is costly and risky. It has been mentioned in the literature that injecting sodium hyaluronate to evacuate silicone oil from the anterior chamber prevents further herniation of oil from the posterior segment, but it needs to be replaced with physiological infusion fluid[3]. In our opinion this procedure with infusion fluid does not prevent silicone getting again in to the anterior chamber. Kirkby and Gregor[10] have advocated the removal of silicone oil using sodium hyaluronate replacing it with infusion fluid. Zivojnovic[11] also is of the opinion to inject sodium hyaluronate into the anterior chamber which prevent getting silicone into the anterior chamber. He does not explain when and how to replace sodium hyaluronate with physiological infusion fluid. In our experience if sodium hyaluronate is left it induces severe inflammatory reaction and membrane formation within pupillary area. Complication like raised intraocular pressure can be managed but intense fibrin reaction leading to membrane formation is difficult to manage. Zivojnovic[11] very rightly expressed that it is a nerve-racking game to deal with silicone oil in the anterior chamber. We describe a new technique in which an air pump is used to create a pressurized air bubble in the anterior chamber that pushes the silicone oil out of the anterior chamber through a self sealing

incision at the limbus. We found this technique simple and effective and it also saves time and money.

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REFERENCE

1. The silicone study group. Vitrectomy with silicone oil or sulfur hexafluoride gas in eyes with severe proliferative vitreo-retinopathy: results of a randomized clinical trial. Silicone study report 1. Arch Ophthalmol. 1992; 110: 770-9.
2. The silicone study group. Vitrectomy with silicone oil or perfluoropropane gas in eyes with severe proliferative vitreoretinopathy: results of a randomized clinical trial. Silicone study report 2. Arch Ophthalmol. 1992; 110: 780-92.
3. **Gallemorc RP, McCuen II BW.** Silicone oil in vitreoretinal surgery. Wilkinson CP. Retina. Third edition. Volume three. St. Louis, C.V. Mosby Company. 2001. 2208-11.
4. **Valone Jr J, McCarthy M.** Emulsified anterior chamber silicone oil and glaucoma. Ophthalmology 1994; 101: 1908-12.
5. **Nguyen QH, Lloyd MA, Heuer DK, et al.** Incidence and management of glaucoma after intravitreal silicone oil injection for complicated retinal detachments. Ophthalmology 1992; 99: 1520-6.
6. **Gurelik G, Safak N, Koksal M, et al.** Acute corneal decompensation after silicone oil removal. Int Ophthalmol. 1999; 23: 131-5.
7. **Hutton WL, Azen SP, Blumenkrans MS,** et al. The effects of silicone oil removal. Silicone study report 6. Arch Ophthalmol. 1994; 112: 778-85.
8. **Bassat IB, Desatnik H, Alhalel A, et al.** Reduced rate of retinal detachment following silicone oil removal. Retina 2000; 20: 597-603.
9. **Coleman J.** Advances and new controversies in vitreoretinal surgery part-2. Highlights of Ophthalmology. 1994; 22: 4.
10. **Kirkby GR, Gregor ZJ.** The removal of silicone oil from the anterior chamber in phakic eyes. Arch Ophthalmol. 1987; 105: 1592.
11. **Zivojnovic R.** Silicone oil in vitreoretinal surgery. Peroperative complications. Martinus Nijhoff / Dr W. Junk publishers, 1987. 126.