

New approach: removal of silicone oil and trocar assisted sutureless scleral fixated intraocular lens implantation at the same session

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Dear Sir,

I am Dr. Remzi Karadag, from the Department of Ophthalmology, Istanbul Medeniyet University School of Medicine, Istanbul, Turkey. I write to present two case reports of removal of silicone oil and trocar assisted sutureless scleral fixated intraocular lens implantation at the same session.

Pars plana vitrectomy (PPV) and silicone oil tamponade injection are commonly performed procedures in treatment of complicated retina detachment. However, prolonged duration of silicone oil can cause serious complications, thus silicone oil should be removed as soon as it completes its tamponade function^[1].

Different techniques have been used for removal of silicone oil. In one of these techniques, silicone oil is removed from clear corneal incision in aphakic patients who underwent combined lensectomy and vitrectomy with silicone tamponade. In this method, silicone oil can be removed easily and simply under topical anesthesia^[2]. Visual rehabilitation after removal of silicone is debating in aphakic patients with inadequate capsular support. There is no consensus on which intraocular lens (IOL) should be used for visual rehabilitation. The IOL selection varies based on surgeon's experience and skill levels.

For visual rehabilitation in aphakic patients, IOL implantation is preferred rather than glasses or contact lens. In aphakic patients with inadequate capsular support, anterior chamber IOL, iris fixated IOL, or scleral fixated posterior chamber IOL (PC-IOL) can be used for visual rehabilitation^[3]. Johnston *et al*^[4] combined PPV and suture fixated PC-IOL successfully.

Currently, sutureless scleral fixated PC-IOL with or without fibrin glue has gaining increased popularity^[5,6]. We have previously modified the technique for sutureless scleral fixated PC-IOL implantation without fibrin glue^[6]. In our technique, we use 25 gauge transconjunctival sutureless vitrectomy (TSV) trocars for scleral tunnel preparation thus shortening the duration of operation and causing less trauma to the surrounding tissues^[7].

We aimed to present a new technique combining silicone oil removal from clear corneal incision and sutureless scleral fixated PC-IOL implantation using 25 g TSV trocars in eyes with inadequate capsular support and previously underwent vitreoretinal surgery with silicone oil tamponade.

Sutureless scleral fixated PC-IOL implantation *via* 25 gauge TSV trocars was previously described^[7]. The removal of silicone oil along with this implantation technique, was performed as described below. Two scleral tunnels, 180 degree apart from each other, were prepared parallel to and 1.5 mm away from the corneal limbus with 25 gauge TSV trocar. In this stage, 3 mm scleral tunnel was formed (without opening the conjunctiva) with 25-gauge trocar by entering with 10-degree angle in the sclera similar to opening of transconjunctival sutureless vitrectomy entrance with 25-gauge trocar (Figure 1A, 1B). Intraocular pressure was maintained with the third infusion TSV cannula entered from pars plana (Figure 1C). Superior clear corneal incision was performed with 3 mm blade. Then 16 gauge Peyman cannula was entered from clear corneal incision behind iris and silicone oil was actively aspirated (Figure 1D). Therefore, silicone leakage to the anterior chamber and its related endothelial contact was prevented. Standard three-piece IOL with propylene haptic was implanted *via* injector into the anterior chamber (Figure 2A). The tip of haptics was captured with a 25 gauge serrated retinal forceps entered through TSV cannula with assistance of 23 gauge serrated

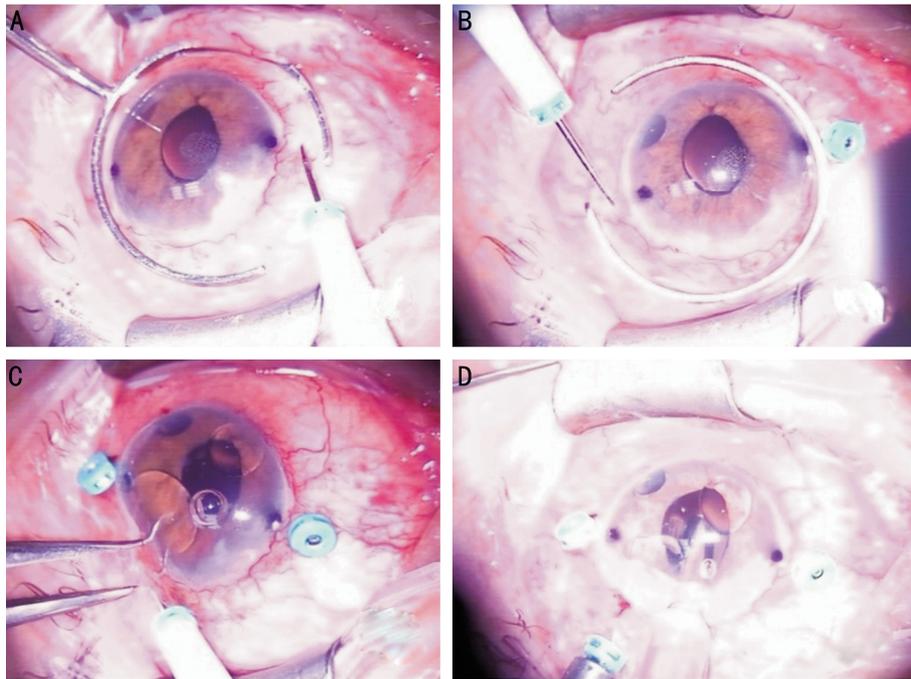


Figure 1 Preparation of scleral tunnels and removal of silicone oil A, B: Preparation of two scleral tunnels, 180 degree apart from each other, parallel to and 1.5 mm from the limbus with 25 gauge TSV trocar; C: Entrance of a 3rd TSV cannula from parsplana for infusion; D: Removal of silicone oil with 16-gauge Peyman cannula through clear corneal incision.

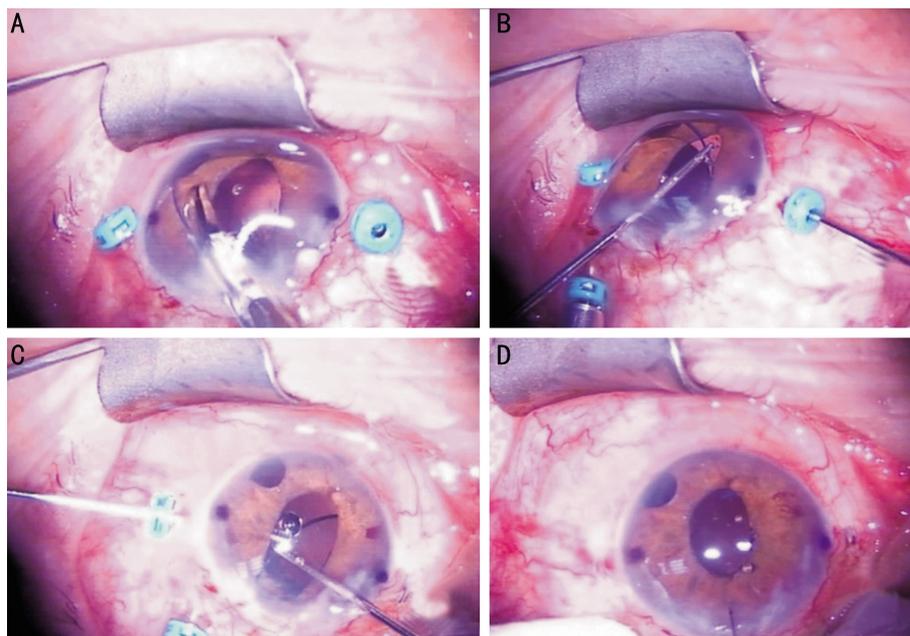


Figure 2 Implantation of haptics into the scleral tunnels A: Implantation of standard three-piece foldable IOL by the injector into the anterior chamber; B, C: Capture of the tip of haptics with a 25 gauge serrated retinal forceps entered through TSV cannula with the assistance of 23 gauge forceps; D: Postoperative appearance.

retinal forceps entered from the opposite corneal paracentesis (Figure 2B). The haptic was then removed from the scleral tunnel together with the 25 gauge TSV cannula. In this stage, haptic edges were gently grasped and removed from scleral tunnel with 25-gauge cannula. The haptics should be grasped from its edge and 25-gauge cannula should be gently held with another tool. Both of them should be removed cautiously. If haptics are removed with only holding haptics without holding the cannula, haptics can be damaged. The

same procedure was applied for the other haptic (Figure 2C). The haptics were then properly placed into the scleral tunnel by pushing their tips up to the trocar entry under the conjunctiva. The scleral tunnel was closed with an 8/0 vicryl transconjunctival suture. The clear corneal incision was closed with a 10/0 monofilament suture and the surgery was ended with administration of intra-cameral antibiotic (0.1 mL vigamox) (Figure 2D). The sutures were removed at the end of first post-operative week. This combines technique was

applied on the two eyes of two patients and no serious complications including glaucoma, hypotonia, endophthalmitis, IOL tilt or decentralization and retinal detachment were observed during 20mo follow-ups.

One of the silicone oil removal techniques, silicone oil is removed *via* a corneal incision in aphakic patients [2]. Removal of silicone oil from corneal incision can be performed actively or passively [8,9]. The passive silicon oil removal can cause corneal contact and endothelial damage [8]. However, similar in our case, if removal of silicone oil is actively aspirated from behind the iris, silicone leakage to the anterior chamber and its related endothelial damage can be prevented. Thus, endothelial damage can be minimized [9].

In aphakic patients with insufficient capsular support, different IOL implantation methods can be performed [3]. In the early 1980s, implantation of anterior chamber (AC) IOL was very popular in aphakic patients since it is simple and quickly performed procedure. However, due to occurrence of AC-IOL related serious complications including pseudophakic bullous keratopathy, resistant inflammatory condition with or without cystoid macular edema, glaucoma, and hyphema, it has lost much of its previous popularity [3].

Iris fixated IOL has gained some popularity. However, the lens effect on the corneal endothelium is still not very clear. Furthermore, owing to the requirement of 5 mm corneal incision for the IOL implantation, IOL related pupil dilatation problem, occurrence of IOL tilt due to iris erosion, and requirement of surgical experience and skills, the procedure can be stressful and challenging for the surgeons [10].

The implantation of PC-IOL has been performed more commonly due to the AC-IOL related issues. However conventional scleral fixated IOL implantation techniques can cause suture related complications including suture erosion, suture knot exposure, and recurrent dislocation due to suture rupture [3]. Suture-related complications can not be seen in sutureless scleral fixated PC-IOL implantation.

In sutureless scleral fixated PC-IOL technique, small clear corneal incision is enough for injection of foldable IOL thus reducing surgical induced corneal astigmatism. Furthermore, standard three-piece IOL can be used without any change in its design [5,6]. Chronic inflammation or recurrent bleeding is less common in the sutureless technique than other ciliary

sulcus techniques [3,6,7,11]. In addition, intraoperative maneuver and trauma occur less frequently in the sutureless technique [6]. In our modified trocar technique, we can also minimize intra-operative maneuver and trauma to the surrounding tissues. Those patients usually do not have healthy conjunctiva due to having several previous ocular surgeries. In our method, no conjunctival intervention is required, therefore no conjunctival complications occur [7,11].

In conclusion, this combined technique, sutureless scleral fixated PC-IOL implantation and removal of silicone oil, can be simply and easily performed with accustomed tolls by vitreoretinal surgeons, and can shorten the operation time and cause less trauma to the surrounding tissues.

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Conflicts of Interest: Totan Y, None; Karadag R, None.

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