Trocar-assisted Transconjunctival Scleral-fixated Intraocular Lens Implantation Combined with Pars Plana Vitrectomy Using Same Entrances

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ABSTRACT

The aim of this study is to report a trocar-assisted transconjunctival sutureless scleral fixation (SSF) technique using flanges in aphakic patient due to posterior dislocation of intraocular lens (IOL) with inadequate capsular support. A 70-year-old patient presented with reduced vision in his left eye. He had an in-the-bag IOL in vitreous. Pars plana vitrectomy (PPV), IOL removal and sutureless scleral fixation IOL implantation were performed for the patient under local anesthesia. One year postoperatively, no complications developed, the IOL remained centralized. 23-gauge transconjunctival sutureless vitrectomy (TSV) trocar system can be used successfully for both PPV and scleral fixation by flange in management of a posteriorly dislocated IOL.

Keywords: Intraocular lens, scleral fixation, sutureless, trocar, vitrectomy

INTRODUCTION

Dislocation of a posterior chamber intraocular lens (PC IOL) into the vitreous is an uncommon but serious complication after cataract surgery. Most cases of drop IOL occur spontaneously. In- the-bag IOL dislocations usually occur because of a zonular weakness[1].

Various IOL implantation methods are available for the correction of aphakia in eyes without adequate capsule support and zonular weakness. These include IOL implantation with anterior chamber IOL (AC IOL), IOL with iris fixation and IOL with scleral fixation[1].

Sutureless scleral fixation (SSF) of IOL methods have increasingly been used in recent years. It has been created to dispose of suture-related complications of sutured fixation such as inflammation, infection, and suture breakage or degradation[2-4].

The purpose of this report is to present a case with drop IOL in which we have removed the IOL using 23-gauge pars plana vitrectomy (PPV) and implanted the new IOL with trocar-assisted transconjunctival sutureless scleral fixation technique with a flange using same entry sites.

Case Presentation

A 70-year-old man was referred to our clinic with reduced vision in the left eye. He had undergone cataract surgery 10 years prior to his presentation. Uncorrected distal visual acuity (UDVA) was counting fingers at 2 meter in the left eye.

On slit-lamp examination, right eye was pseudophakic and left eye was aphakic. Fundus examination revealed macular drusens in both eyes. An IOL was seen with the capsular bag in vitreous in the left eye.

A combined left eye PPV, IOL removal and SSF IOL implantation were planned.

Under local anesthesia, an infusion catheter was placed in the inferotemporal pars plana-4 mm from the limbus in the left eye. 23-gauge TSV trocars preloaded with the overlying microcannula inserts were performed with an angle of 180 degrees at the direction of 3 o'clock and 9 o'clock, so as to be 2 mm from the limbus thus the 3 mm

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long scleral tunnel was created (Figure 1a). The direction of the trocar entry sites were reversed for placement of IOL haptics.

The trocar was removed leaving the microcannula in scleral tunnel. Vitrectomy was performed (Figure 1b). Then, the IOL in vitreous was captured with the help of a retinal forceps and raised behind the iris (Figure 1c). This raising IOL was taken to the anterior chamber with a support by endoilluminator (Figure 1d). This foldable IOL was cut in butterfly style with the help of scissors (Figure 1e) and removed through the 3.0 mm clear corneal incision (CCI) (Figure 1f). The vitreous and capsule residues in the anterior chamber were removed with the help of vitrectomy (Figure 2a). After viscoelastic material injection into the anterior chamber, a standard 3-piece IOL was implanted with an injector through the CCI (Figure 2b). Trailing haptic was kept outside to prevent the IOL from falling into the vitreous cavity. The IOL haptic was captured with 23 gauge serrated retinal forceps entering through the corneal side port and held by the haptic tip with the other 23-gauge serrated retinal forceps entering through the temporal trocar cannula. This haptic was then removed from the eye through the scleral tunnel with the cannula (Figure 2c). Distal end of the haptic was melted with a thermal cautery creating a flange (Figure 2d). A 10-0 nylon suture was placed at the exit site of the scleral tunnel for safety to be removed after 1 week (Figure 2e). The same processes were repeated for the other haptic. Corneal incisions were closed by hydration (Figure 2f). The patient did not have any complications in the intraoperative and postoperative one-year-follow-up. The CDVA was 0,8 decimal due to AMD one (1) year later.

DISCUSSION

Sutureless scleral fixation of IOL methods have increasingly been used in recent years due to its advantages such as minimal trauma to the surrounding tissues, good IOL stabilization decreasing the incidence of IOL tilt along with shorter operation time and its features available to prevent suture-related complications like late endophthalmitis and recurrent dislocation caused by a broken suture[2-6]

Todorich et al[7] published a case report on a patient with Marfan syndrome in which sutureless trocar-assisted scleral fixation was applied, using a 27-gauge vitrectomy system. Differently from the previously reported similar study of Totan and Karadag[8], they prepared two new sclerotomies for performing scleral tunnels.

We used flanged IOL fixation technique as described by Yamane[4] by pushing haptic tips up to the trocar entry under the conjunctiva. 30-gauge double-needle Yamane technique[4] is an excellent economic alternative to trocar

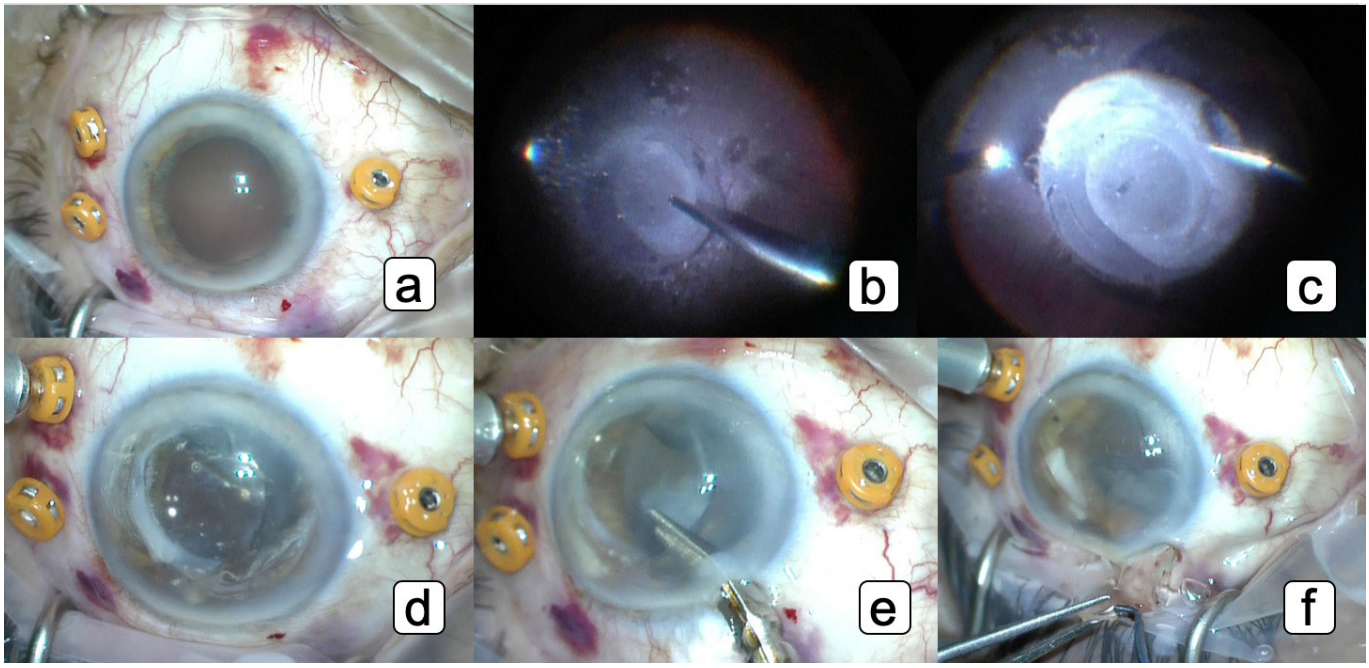

Figure 1: *a) Two 3-mm scleral tunnels are created 2 mm away from and parallel to the limbus with the 23-gauge vitrectomy trocars at the 3 o'clock and 9 o'clock meridians and another trocar is placed in the inferotemporal pars plana-4 mm from the limbus for infusion catheter, b) Core vitrectomy is performed, c) The IOL in front of the retina is captured with the help of a retinal forceps and raised behind the iris, d) IOL is taken to the anterior chamber, e) The foldable IOL in the anterior chamber is cut using a scissor, f) The IOL is removed through the 3.0 mm clear corneal incision.*

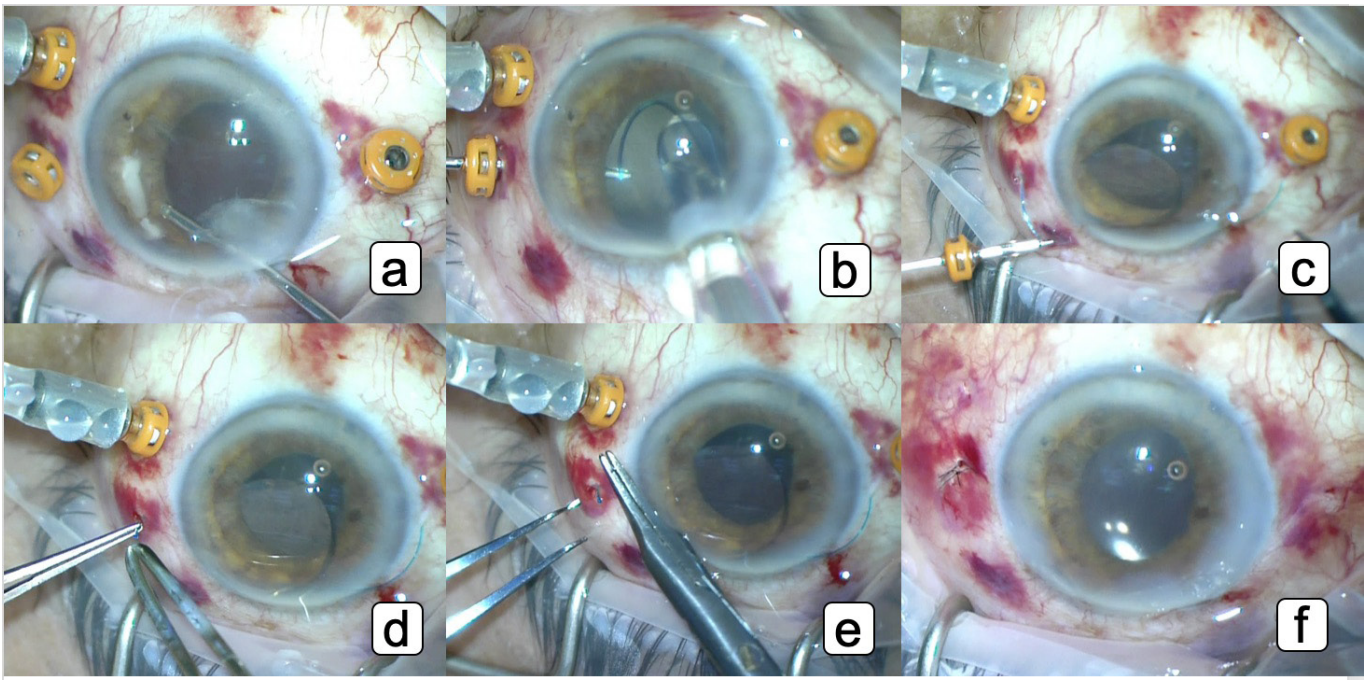

Figure 2: *a) The vitreous and capsule residues in the anterior chamber is cleaned with the anterior vitrectomy, b) A 3-piece foldable IOL is implanted into the anterior chamber with an injector and the tip of one of the IOL haptics is grasped using a 23-gauge serrated retinal forceps, c) The haptic is removed from the scleral tunnel together with the trocar out of the globe, d) The end of the haptic is cauterized to make a flange, e) A transconjunctival safety 10-0 nylon suture was placed at the scleral tunnel entry site, f) At the end of the surgery.*

system but not suitable for vitrectomy. In our case, we had to do vitrectomy to remove the drop IOL. Also, in case of drop IOL during scleral fixation, you cannot handle it and need a new trocar entry side. And needle tip may reach the retina and ciliary body after the puncture[9].

We[2] presented 23-gauge trocar-assisted, flanged sutureless scleral fixation with silicone oil injection after penetrating keratoplasty surgery at the same session. After 3 port 23-gauge vitreoretinal trocars were placed, we performed two new 3 mm scleral tunnels created 2 mm away from and parallel to the limbus. We used same trocar entries for performing scleral tunnels in this presented case.

Recently, Diamint and Giambruni[10] published a study on 6 patients with aphakia due to cataract surgery complications with inadequate capsular bag using 27-gauge trocar-assisted transconjunctival sutureless technique very similar to our study. They externalized first haptic using 27-gauge forceps inserted through one of the 27-gauge trocars and distal haptic with the help of 23-gauge forceps inserted through paracentesis. They removed the haptics and 27-gauge valved trocars together from the sclerotomy. Finally, they cauterized the haptics to make a flange. All patients demonstrated statistically significant CDVA improvement and excellent anatomic results. They suggested 27-gauge is the best option to perform this technique because it allows the tunnel to be small and prevent the slippage of the haptics in surgery. We used 23-gauge TSV, because creating a flange prevent the haptics of the IOL from detaching.

Jujo et al[9] just published an article on 18 patients in which using a 3-piece IOL haptic grasped by a 27-gauge retinal forceps and pulled from the 27-gauge trocar, is a modification of the handshake technique. They fixed the IOL by making a flange like us.

The aim of this study was to report 23-gauge vitrectomy system that allows to do the PPV and transconjunctival SSF without the need to make new incisions, ensuring a shorter operation time as peritomy and scleral flaps are not used, causing less trauma and providing better IOL stabilization than the other sutureless techniques, therefore leaving more untouched conjunctival tissue remains for further surgeries.

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