

# Luxated intraocular lens fixation using anterior chamber slipknot of the haptic to the sclera: A simple procedure to fixate intraocular lens to the sclera

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**PURPOSE.** *To describe a technique for suturing a luxated intraocular lens (IOL) in the vitreous cavity directly to the ciliary sulcus using intraocular slipknot without IOL extraction.*

**DESIGN.** *Noncomparative interventional case series.*

**MATERIALS AND METHODS.** *A three-port vitrectomy was performed in all cases. According to the Lewis procedure, two scleral flaps and relative sclerectomies were performed at 3 and 9 o'clock position. IOL was rescued from vitreous cavity by means of perfluorocarbon and stabilized in anterior chamber by intravitreal forceps. Corneal endothelium was preserved by a dispersive ophthalmic viscosurgical device coating. Double armed 10-0 polypropylene was introduced into the vitreous cavity through the 9 o'clock sclerotomy incision and both the needles were passed out of the eye by the 3-o'clock position sclerotomy, guided by a bent 27-gauge needle 1.5 mm from the limbus. Hooking the slipknot around the haptics of the IOL in the anterior chamber by means of vitreous forceps, the 10-0 polypropylene was pulled so that the IOL haptic was fixated onto the sulcus. The same procedure was used to fixate the opposite haptic to the ciliary sulcus at the opposite position.*

**RESULTS.** *In all four cases, the IOL fixated stably and remained well positioned. No significant intraoperative or postoperative complications occurred.*

**CONCLUSIONS.** *This technique enables secure fixation of the luxated IOL in the vitreous without extracting it. (Eur J Ophthalmol 2003; 13: 532-5)*

**KEY WORDS.** *Luxated intraocular lens, Scleral fixation, IOL*

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*Accepted: March 10, 2003*

## INTRODUCTION

Several techniques for fixating a subluxated or luxated intraocular lens (IOL) in the ciliary sulcus have been described (1, 2). Some authors suggest extracting

the IOL, but this can lead to intraoperative or postoperative complications, especially postoperative astigmatism. Other techniques do not require IOL extraction (3-5). For a luxated IOL, several techniques for fixating the haptics in the ciliary sulcus have been

described (6-14). We describe a new method of suturing a luxated IOL in the vitreous cavity to the ciliary sulcus using an intraocular slipknot without IOL extraction.

## METHODS

In the last 2 years (June 2000 through June 2002), four patients with a luxated IOL in the vitreous cavity were scheduled for scleral fixation of the dislocated IOL at the Department of Ophthalmology, University of Bari. In three of them, this complication occurred during the initial surgery with complete capsular rupture; in the fourth, a frontal trauma dislocated IOL in posterior chamber with subtotal capsular rupture.

Patients were evaluated for visual acuity, refraction, and surgical complications associated with the procedure. The median follow-up period was 16.42 months (range 9 to 27.5 months). We performed a three-port pars plana vitrectomy with the removal of peripheral vitreous and lens capsule. Following Horiguchi et al's technique (15), two lamellar scleral incisions 2.0 mm long were made radial to the limbus at the 3- and 9-o'clock position by means of bevel-up knife. Perfluorocarbon was then injected in vitreous cavity to rescue the luxated IOL (Fig. 1, step 1) and by means of vitreous forceps it was stabilized in anterior chamber, orientating the haptics at the 3- and 9-o'clock position (Fig. 1, step 2). Corneal endothelium was preserved by a dispersive ophthalmic viscosurgical device (IAL-F<sup>®</sup>, Fidia Oftal S.p.A., Catania, Italy). Double armed 10-0 polypropylene was introduced into the vitreous cavity through the 9-o'clock sclerotomy incision (Fig. 1, step 3); both the needles were passed out of the eye by the 3-o'clock position sclerotomy, guided by a bent 27-gauge needle 1.5 mm from the limbus. The loop of the 10-0 needle was hooked around the haptics of the IOL in the anterior chamber by means of vitreous forceps (Fig. 1, step 4). The same procedure was then performed from the 9-o'clock position to hook the other loop (Fig. 1, step 5). The IOL was finally positioned in posterior chamber by means of vitreous forceps and both the haptics were sutured to the ciliary sulcus by means of a slipknot in the fashion of a mattress suture by passing the needle through the two previously made lamellar scleral incisions so that it

was buried (Fig. 1, step 6). The suture was temporarily tied until the opposite haptic was sutured before positioning the IOL at the center.

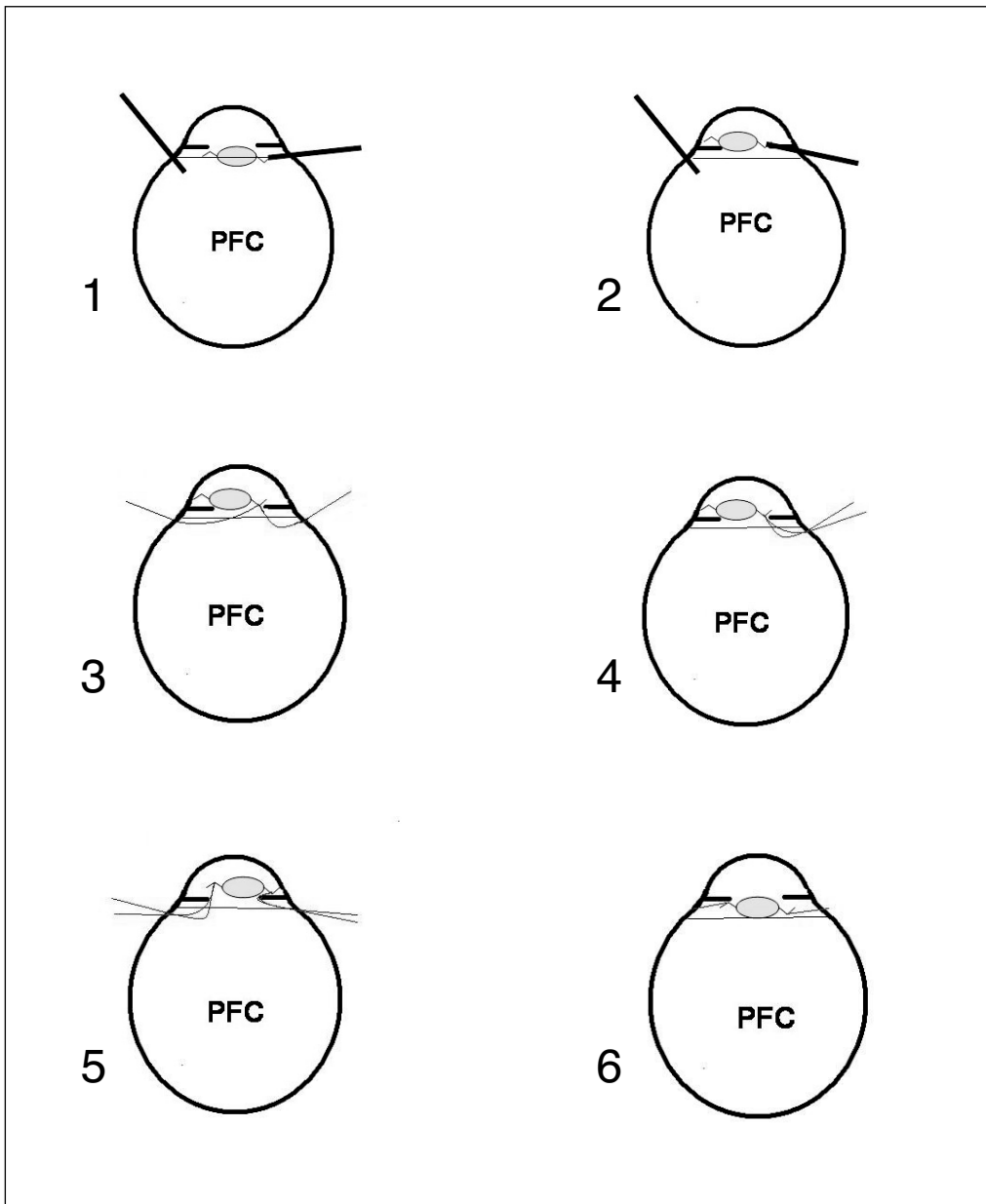
## RESULTS

The results of the four cases are summarized in Table I. The IOL material was polymethyl methacrylate in three cases and silicone in one case. The diameter of the IOL ranged from 5.5 mm to 6.5 mm. Preoperative visual acuity with correction ranged from 20/50 to 20/200; refraction ranged from  $\pm 9$  to  $\pm 11$  diopters. Postoperative visual acuity with correction ranged from 20/20 to 20/63; refraction ranged from  $-3$  to  $-5.25$  diopters at a minimum follow-up of 9 months. Refractive changes of spherical equivalent before and after fixation ranged from  $-0.25$  to  $-1.50$  diopters with a slight myopic shift. None of the four patients complained of any symptoms caused by this myopic shift. The change in the degree of corneal astigmatism before and after fixation ranged from 0.25 to 1.50 diopters by vector analysis using the method of Jaffe and Clayman (16). No trauma to the iris or other complications occurred either intraoperatively or postoperatively in any case.

## DISCUSSION

No consensus currently exists on the optimal method for intraocular implantation without capsular support. In cases with luxated IOL in vitreous cavity, many authors suggest suturing the IOL to the ciliary sulcus without extraction, to maintain postoperative visual acuity and to prevent postoperative astigmatism induced by large scleral incision to extract the IOL.

The literature reports several methods of suturing a luxated IOL without lens extraction, but each has drawbacks: the hooking haptic technique may not securely fixate the IOL because of its single knot; externalizing the haptic through pars plana sclerotomies may damage the ciliary body and retina and extraction of the IOL cannot be performed unless a 360° lens capsule is present; the lens lasso technique may damage the ciliary body and pull out residual vitreous; and the cow hitch (girth) technique may damage



**Fig. 1 - Surgical steps.**

**1.** Intraocular lens (IOL) is rescued from vitreous cavity by means of perfluorocarbon.

**2.** IOL is stabilized in the anterior chamber (coated by viscoelastic) by means of vitreous forceps.

**3.** Armed 10-0 polypropylene is introduced into the vitreous cavity through the 9-o'clock sclerotomy incision.

**4.** Both the needles are passed out of the eye by the 3-o'clock position sclerotomy, guided by a bent 27-gauge needle 1.5 mm from the limbus.

**5.** The same procedure described in step 3 is used for the opposite loop of the IOL.

**6.** IOL is stabilized in posterior chamber.

**TABLE I - PATIENT DATA**

Patient sex (age, yr)	AL, mm	IOP, mm Hg	VA BL	Refraction BL, SE	VA post fixation	Refraction post fixation, SE	Follow-up, mo
F (72)	21.8	13	20/200	+10	20/25	-4	18.9
M (39)	24.7	14	20/50	+10	20/25	-4.125	13.9
M (73)	22.3	12	20/100	+11	20/20	-5.25	27.5
M (55)	25.5	11	20/100	+9	20/63	-3	9

AL = Axial length; IOP = Intraocular pressure; VA = Visual acuity; BL = Baseline; SE = Spherical equivalent

the retina while the girth grasps the haptic of IOL laid down on the retina.

Based on our experience with these four cases, we recommend a total vitrectomy of the base of vitreous, including lens remnant removal, to obtain good fixation to the ciliary sulcus without vitreous pull out. Hooking the IOL haptic with a slipknot in the anterior chamber could be the most difficult part of this technique, but the surgeon can manage it with his or her better hand and by means of harmed vitreous forceps. Perfluorocarbon easily rescues the IOL from vitreous cavity and assists a sure positioning of the IOL in anterior chamber. The refractive changes after surgery were minimal with a slight myopic shift. We could not prevent this shift because of retro-positioning of an IOL originally implanted in the bag. Induced astigmatism did not affect visual acuity, ranging from 0.25 to 1.50

diopters by vector analysis. The relative simplicity and safety of this technique is an advantage, allowing a secure fixation to the ciliary sulcus of the luxated IOL in the vitreous cavity.

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