

The Chronicle of Dislocated ICL V4c- A Case Report and Review of Literature

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DOI: 10.31080/ASOP.2022.05.0465

Received: January 12, 2022

Published: February 09, 2022

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Abstract

To report a case of traumatic repetitious anterior Phakic Intraocular Lens (ICL) dislocation and its review of Literature. Following Blunt trauma in a 31-year-old male, partial, anterior, nasal dislocation of ICL was noted after two years of implantation. Immediately after reposition, spontaneous repeated dislocation was noted during the first postoperative day. The ICL was repositioned twice in our patient. The reasons for the repetitious prolapse of the haptics of ICL were discussed in detail with reference to the review of Literature. The most common complications following ICL implantation are cataracts and Glaucoma, which could be prevented by accurate sizing of the lenses. In addition to wrong sizing, spontaneous ICL dislocations occur due to other factors such as abnormal positioning of ICL in the sulcus, and the size of the pupil during the immediate postoperative period.

Keywords: The Chronicle; Dislocated ICL V4c; Review of Literature

Introduction

Phakic IOLs have revamped the field of refractive surgery, and long-term safety and efficacy have been established in sub-par patients for the LASIK procedure. However, the improper sizing and the type of pIOL used may lead to a few rare complications, such as glaucoma, cataract, pupillary block, and lens dislocation [1,2]. The pIOL dislocation can occur anteriorly or posteriorly. The first report of posterior dislocation was made by Eleftheriadis., *et al.* in 2004. The causes include wrong sizing, preop zonular weakness associated with high myopia, blunt trauma, iatrogenic trauma, pIOL positioning over zonules causing constant friction, and intensive eye rubbing [3]. We report a case of repetitious anterior prolapse of ICL V4c (pIOL) in a 31-year-old male following blunt trauma in scotopic conditions; in addition, a literature review was done for the search of possible causes for recurrent prolapse.

Case Summary

A 31-year-old male presented to us with a sudden onset of blurred vision in the right eye after being hit by his friend's fist while playing football during the day. The patient mentioned that the impact of injury was trivial. Two years prior, he had undergone a bilateral Phakic intraocular lens (pIOL) procedure for high myopia elsewhere. The preoperative data was not available with the patient. The visual acuity in the right eye was 20/50 and in the left eye was 20/20. The intraocular pressure in both the eyes was 14 mmHg and 17mmHg, respectively. In the right eye, slit lamp examination revealed clear cornea, mild anterior chamber (AC) inflammation with iris pigment dispersion, sphincter tear, and nasal superior and inferior haptic of the pIOL and half of the optic was found to be dislocated partially into AC, entrapped within the pupil, without touching endothelium (Figure 1a). The lens appeared clear. In

the left eye, the cornea was clear with normal AC depth, pIOL was well centered with a central hole, the pupil was round and reacting to light, vault height was 0.74mm (Figure 2), the lens was clear. In both eyes, the pIOL mimicked the STAAR Visian ICL V4c model. The fundus examination in the left eye was normal. We performed repositioning of pIOL on the same day under topical and systemic antibiotic cover. The anterior chamber was filled with the visco-elastic after temporal clear corneal incision, with the aid of an ICL manipulator; the haptic was repositioned under the iris. The anterior chamber was well-formed with a balanced salt solution. Postoperatively, he has been prescribed topical Gemifloxacin 0.3% and dexamethasone 0.1% combination; eye drops six times along with

homatropine hydro bromide 5.0% eye drops bidaily. Surprisingly, the next day the patient had a repeat spontaneous partial prolapse of the nasal superior haptic of pIOL (Figure 1b). Immediately, the patient was taken to the operation theatre, and the pIOL was repositioned and this time, 0.1cc of intracameral pilocarpine 2% was used. Postoperatively, homatropine hydro bromide 5.0% was withheld, and the topical antibiotic- steroid was continued. Since the vault height appeared fine in both eyes, probably the unstable sphincter tear and usage of dilating drops allowed the repetitious prolapse of the pIOL for the second time. He was advised regular follow-up; ICL V4c appeared stable with 20/40 visual acuity at one year follow-up (Figure 1c).

Figure 1a: Partially dislocated ICLV4c on presentation

Figure 1b: Recurrent prolapse of the haptic of ICLV4c on the postoperative day one

Figure 1c: After second surgical revision

Figure 2: ASOCT image of the Left eye showing Vault height

Discussion

The first report on anterior dislocation was described by Song, *et al.* in 2005 [4] later by M Connor, *et al.* in 2007 with Fyodorov

type first-generation pIOL in a 56-year-old Russian female. The rationale behind anterior dislocation includes wrong sizing, type of lens used, blunt trauma, and mesopic conditions [5]. In our patient, anterior dislocation of pIOL was noted following trivial blunt trauma despite the ideal vault (as indicated in the fellow eye). Many authors have reported pIOL dislocation in literature (9 case reports till now) (Table 1) [3-8]. Song, *et al.* reported inferonasal anterior dislocation in a 33 year old female following blunt trauma in a dark room after ten months of primary surgery [4]. Kong, *et al.* noted anterior inferonasal dislocation of pIOL in a 31-year-old male following indirect severe occipital trauma in a dark room after four months of surgery [6]. Moshirfar, *et al.* reported superotemporal anterior dislocation in a 44-year-old male after three years of surgery following blunt trauma with a pipe [7]. The uncommon cause for spontaneous dislocation of pIOLs was noted by Wang, *et al.* in 2019 following oral antidepressants in a 26-year-old male after ten months of surgery due to the anticholinergic activity of the drug-

induced pupil dilation and cycloplegia [8]. The additional contributing factors included face-down positioning and dark-induced mydriasis. In contrast, Mc Cauley MB reported stable ICL even after a severe grenade explosion due to the protective effect of glasses worn by the patient [9].

The authors above have immediately repositioned the ICLs and noted improvement in visual acuity. They have strongly proposed that blunt trauma in mesopic conditions predisposes to dislocation of ICL. But, in our case, we noted dislocation in the daytime while playing football and the recurrent prolapse even after repositioning pIOL during the first postoperative day. Hence, we were prompted to analyze the literature for the practical reasons for recurrent prolapse of pIOL in our patient, despite correct vault height and

photopic conditions involved during trivial blunt trauma. Zhang, *et al.* had analyzed the pIOL position in the posterior chamber using UBM; among 134 eyes (72 patients), only 64.9% had an ideal vault. In only 21.6% of eyes, the pIOL was correctly lying in the ciliary sulcus [10]. Shi M., *et al.* observed panoramic UBM image characteristics of ICLs in 127 patients (242 eyes) and noted 11.2% (28 eyes) with abnormal post-op positioning of ICL in the anterior chamber. The authors discussed the rationale behind abnormal positioning of pIOL might be due to incomplete removal of viscoelastic material and inadequate and excess vault [11]. Takagi., *et al.* noted repeated prolapse twice, eleven months and two years after primary surgery in the same eye as the patient was playing a futsal match at the night-time [12]. But, our patient developed repeated dislocation in the immediate postoperative period.

Literature	Age/Gender/ Eye	Type of Phakic Lens	Cause for Dislocation	Time Period after Surgery	Description of Dislocation Anterior/Posterior	Management	Visual Acuity	Follow-Up
1. Eleftheriadis., <i>et al.</i> [3] 2004	36 years/F/ Right Eye	PRL	Spontaneous	Two months	Posterior into Vitreous	Explantation	20/40	NA
2. Kaufer., <i>et al.</i> 2005 [14]	30 years/ M/ Right Eye	ICL	Spontaneous	Five years	Posterior inferior subluxation	Explantation	NA	NA
3. Song., <i>et al.</i> 2005 [4]	33 years/F/ Left Eye	ICL	Blunt trauma	Ten months	Anterior infero nasal	Repositioning done	20/32	NA
4. M Conner., <i>et al.</i> 2007 [5]	56 years/F/ Left Eye	Fyodorov Mushroom lens	Spontaneous	Fifteen years	Anterior and inferior	Corneal endothelial decompensation and cataract - Explanted	NA	NA
5. Kong., <i>et al.</i> 2010 [6]	31 years/M/ Right Eye	ICL	Sudden occiput injury	Four months	Anterior nasal and inferior	Repositioning done	20/20	Three months
6. Espinosa MZ., <i>et al.</i> 2012 [13]	39 years/F/ Left Eye	ICL	Blunt ocular trauma	Six years	Anterior in contact with endothelium	Repositioned after 3 days, later DSAEK done	20/40	NA
7. Schimtz., <i>et al.</i> 2012 [15]	26 years/M/ Left Eye	ICL	Fist injury	Six months	Anterior and temporal	Repositioning done	20/20	NA
8. Moshirfar., <i>et al.</i> 2014 [7]	44 years/ M/ Left Eye	ICL	Blunt trauma	Three years	Superotemporal anterior	Waited for thr hyphema to resolve Repositioning done after 2 weeks	20/20	NA

9. Wang, <i>et al.</i> 2019 [8]	26 years/ M/ Left Eye	ICL	Olanzipine / Buspirone intake	Ten months	Anterior	Repositioned	16/20	One month
10. Takagi, <i>et al.</i> 2019 [12]	39 years/M/ Left Eye	Toric ICL	Futsal match/ injury with fist	Recurrent dislocation, 11 months and two years and two months after implantation	Anterior	Both instances repositioning done	20/10	One year
11. Ravi K Kannaradi, <i>et al.</i> 2020 [16]	32 years/M/ Left Eye	IPCL V2.0	Blunt ocular trauma	Two years	Anterior infero nasal	Repositioning done	20/20	One month
12. Our study 2021	31 years/M/ Right Eye	ICL	Blunt ocular injury with fist while playing football	Two years	Anterior and nasal	Repositioning done immediately , first post-operative recurrent dislocation noted	20/40	One year

Table 1: Shows Literature review of case reports on PIOL Dislocations.

ICL = Implantable Collamer Lens (Staar Surgical, Monrovia, California, USA). IPCL V2.0 = Implantable Phakic Contact Lens (Care group Sight Solutions, India). PRL= Phakic Refractive Lens (PRL; Zeiss Meditec).

The abnormal pIOL positioning in the sulcus, traumatic sphincter tear, postoperative usage of dilating drops, and inadequate removal of viscoelastic might have caused the repetitious dislocation in our patient. Therefore, we recommend, the following preventive measures before pIOL procedures; 1) monitoring ICL positions using UBM and in patients with decentred pIOL, additional counseling can be done to avoid frequent mesopic/scotopic environment while playing sports, 2) Ensuring complete removal of viscoelastic during primary surgery and 3) avoid postoperative dilating eye drops in patients with sphincter tears.

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