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## Case Report

# Management of Anterior Chamber Dislocation of a Fluocinolone Acetonide Implant: A Case Report

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### ARTICLE INFO

#### Article history:

Received: 19 August, 2020

Accepted: 31 August, 2020

Published: 7 September, 2020

#### Keywords:

*Iluvien*

*intravitreal implant*

*cystoids macular edema*

*anterior chamber dislocation*

*surgical technique*

### ABSTRACT

**Background:** Fluocinolone acetonide implant (ILUVIEN) is a non-biodegradable cylindrical polyimide tube that is injected into the vitreous cavity. Migration to the anterior chamber can potentially occur, especially in patients with posterior capsular defects and vitrectomized eyes, although it is considered an uncommon complication. The best surgical technique is still unknown. We describe a simple technique for reinserting the migrated ILUVIEN implant in the posterior cavity without compromising its integrity.

**Case Presentation:** Under topical anaesthesia, a corneal clear beveled limbal incision is made with a 20G angled side port blade. Balanced saline solution is injected with a 27G anterior chamber cannula to mobilize the implant and a reverse sinsky hook is then used to push the implant to the vitreous cavity between the iris and the intraocular lens without the need of viscoelastic.

**Conclusion:** We report a simple and quick technique for surgical repositioning an ILUVIEN implant that required minimal manipulation and resulted in minimal tissue disturbance without compromising implant integrity and effectiveness. It is important to be cautious while using ILUVIEN in patients with capsular defects, zonular weakness, and previous vitrectomy. We recommend using a reverse sinsky hook as a smaller entry incision can be made to maintain the sealing of the anterior chamber.

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## Background

The development of intraocular implants has revolutionized the treatment of retinal and macular diseases in light of the need of reliable sustained delivery systems to avoid repeated injections and fluctuations in steroid concentration. Among them, Ozurdex by Allergan Inc (Dublin, Ireland) and ILUVIEN by Alimera (GA, USA) are widely used and have significantly decreased the incidence of several visual loss caused by diabetic macular edema (DME), retinal vein occlusion and ocular inflammations [1].

Fluocinolone acetonide (FAc) implant is a non-biodegradable cylindrical polyimide tube, loaded with 190 µg of FAc that is injected into the posterior cavity through a 25-gauge applicator in an outpatient setting. Major complications of ILUVIEN implant include glaucoma, conjunctival haemorrhage and induction or worsening of cataract.

Migration of the FAc implant to the anterior chamber (AC) can potentially occur, especially in patients with posterior capsular defects and vitrectomized eyes, although it is considered an uncommon complication. Early removal of AC-dislocated FAc implant is key to avoid corneal edema and damage from raised intraocular pressure (IOP) [2, 3]. However, the best surgical technique is still unknown. Our purpose is to describe a simple technique for reinserting the AC-migrated FAc implant in the vitreous cavity without compromising its integrity.

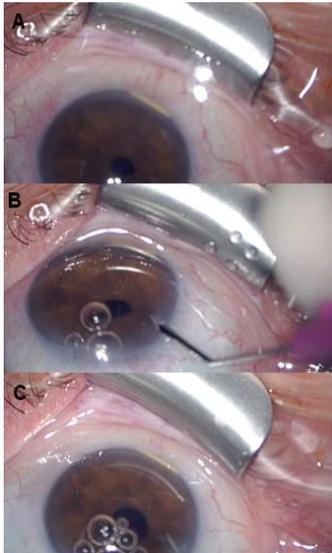
## Case Presentation

A 71-year-old female with a 15-year history of type 2 diabetes had diffuse DME diagnosed in her left eye in February 2012. Previous therapies included panretinal laser photocoagulation, macular grid laser and pro re nata intravitreal ranibizumab injections. In March 2017, the patient developed cataract and had a phacoemulsification with a

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posterior intraocular lens (IOL) complete dislocation onto the retina that required a vitrectomy and the implantation of a retropupillar iris claw lens. After surgery, recurrence of the macular edema was observed and Ozurdex was then administered with reduction in central macular thickness (CMT) and visual acuity (VA) improvement. The patient continued treatment with Ozurdex every 5 months and after 5 implants a new relapse of the macular edema was observed with CMT of 463 $\mu$ m and VA of 55 ETDRS letters. At this point, the macular edema was considered chronic and the patient was treated with intravitreal ILUVIEN which was performed without complication. One week after the procedure CMT decreased to 370  $\mu$ m and VA improved to 60 ETDRS letters. IOP remained within normal limits.

On Day 45 after the intravitreal injection, the patient presented to the Emergency Department with pain-less decreased vision of 44 ETDRS and the slit lamp examination revealed that the ILUVIEN had spontaneously migrated to the AC where it was lying horizontally in the inferior angle (Figure 1A) and causing mild inferior corneal edema. IOP was 22 mmHg. To prevent corneal decompensation, we opted for an implant repositioning.



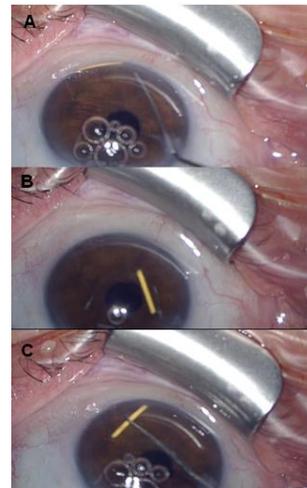
**Figure 1:** A) Anterior segment examination showing the ILUVIEN implant in the anterior chamber; B) Corneal incision with a 20G angled side port blade; C) Implant mobilization with a saline solution injected with a 27G anterior chamber cannula.

### Technique Used to Reposition the Migrated Implant

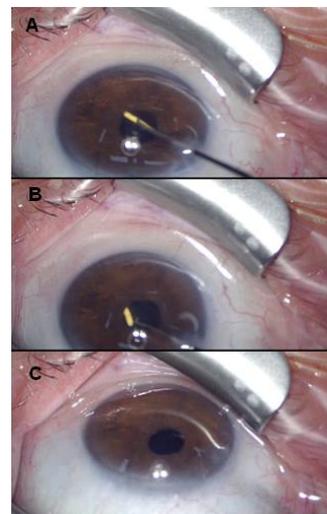
Two days later, the patient was taken to the operating room. Clinical intervention was performed after preparation of the conjunctiva using 5% povidone-iodine solution and under sterile conditions. Under topical anaesthesia, a corneal clear beveled limbal incision into the AC was made with a 20G angled side port blade (Figure 1B) and balanced saline solution was injected with a 27G AC cannula (Figures 1C & 2A), with a successful mobilization of the implant from the inferior angle; at this point, it was floating into the AC (Figure 2B). A reverse sinsky hook was then used (Figures 2C & 3A) to maneuver the ILUVIEN to the posterior cavity between the iris and the IOL successfully (Figures 3B & 3C). Viscoelastic agent was not required and damage to the iris, corneal endothelium and the AC angle was avoided. To prevent re-dislocation of

the implant, she was instructed to avoid, to the extent of possible, prone position and any kind of physical effort.

After repositioning of the ILUVIEN implant, the patient was treated with 0.1% dexamethasone/0.3% tobramycin drop therapy in descending dose and, one week after surgery, she reported an improvement in VA. Anterior segment examination showed an improvement of corneal edema, IOP was 16 mmHg and a funduscopy revealed that the FAc implant was settled in the posterior cavity. One month later, visual acuity remained of 60 EDTRS letters and central macular thickness was 385 $\mu$ m.



**Figure 2:** A) & B) Note the 27G anterior chamber cannula injecting saline solution and the ILUVIEN implant already floating in the anterior chamber. C) A reverse sinsky hook is used to push the implant between iris and intraocular lens.



**Figure 3:** A) & B) Note the reverse sinsky hook successfully pushing the implant between the iris and the retropupillar lens into the vitreous cavity. C) Anterior segment examination showing the result of repositioning of the ILUVIEN implant.

### Conclusion

ILUVIEN sustained release FAc device is an injectable non-biodegradable intravitreal insert devised for sustained release of FAc for up to 36 months (release rate of 0.2  $\mu$ g/day). It is a cylindrical polyimide

tube, 3.5 mm long and 0,37 mm in diameter loaded with 190 micrograms of fluocinolone acetonide. This FAc implant has marketing authorization for chronic DME treatment after an inadequate response to prior therapy and for prevention of relapse in recurrent non-infectious uveitis affecting the posterior segment. The clinical efficacy of ILUVIEN was demonstrated in the FAME clinical trials [2, 4].

The most frequently reported adverse drug reactions in the FAME studies included increased IOP (38% of DME studies subjects required IOP-lowering medication, 4.8% required IOP-lowering surgeries), cataract (incidence of approximately 82%) and conjunctival haemorrhage. More serious adverse reactions although less frequently reported include optic disc haemorrhage and retinal detachment. The long-term safety repercussions of retention of the non-biodegradable device inside the vitreous cavity are not known although ILUVIEN is made of polyimide which is essentially similar to an IOL haptic and, therefore, it is expected to remain inert inside the eye [2, 5].

Emerging real-life data demonstrates that ILUVIEN has shown to have a predictable side effect profile and although uncommon, this implant can potentially migrate into the AC [4]. There are only 3 reported cases in the literature and all of them in vitrectomized eyes (maybe because the device would not be tethered by vitreous) with posterior capsular tears in relation to previous complicated cataract procedures, sulcus or iris clip lens placement and zonular weakness [3, 6]. In these cases, alternative DME treatments should be considered and if ILUVIEN is elected they should be monitored closely.

Compared to ILUVIEN which is a relatively new tool, Ozurdex (6 mm by 0,46 mm, 0,7 mg Ozurdex; Allergan, Irvine, CA) has been widely used and there is extensive experience when referring to implant migration which is, also, a rare complication [7]. It has been associated to vision-threatening complications that involve permanent corneal decompensation and elevation of the IOP and previous series suggests that surgical removal of the implant is mandatory as they may be severe enough to warrant keratoplasty. Corneal endothelial toxicity has been associated to chemical toxicity as well as mechanical trauma from the rigid implant -the corneal edema was noted if the migration occurred in the early postoperative period and decreased in incidence when it occurred later probably due to the implant decreased rigidity. Other studies suggest that steroid implants placed close to the trabecular meshwork or ciliary body turns out in a higher incidence of raised IOP. Current literature regarding ILUVIEN dislocation does not report severe corneal complications possibly due to prompt repositioning together with the smaller size of the FAc implant compared to the Ozurdex.

Multiple surgical techniques have been described to relocate/remove Ozurdex implant including the use of forceps, Nd:YAG laser to fragment the implant, aspiration of the disintegrated device, relocation with a 30-gauge needle, implant suturing to the sclera to prevent remigration or a no-touch techniques for implant removal using viscoelastic [7-10]. Nonsurgical management with supine positioning after pharmacologic pupillary dilation has, also, been described [11]. Khurana *et al.* described unsuccessful attempts to grasp the Ozurdex implant with forceps resulting in disintegration [7].

We report a simple and quick technique for surgical repositioning a fluocinolone acetonide implant that required minimal manipulation and

with minimal tissue disturbance. The non-biodegradable nature of ILUVIEN made the manipulation easier without compromising implant integrity and effectiveness. Mild corneal decompensation completely resolved in a week possibly due to prompt repositioning and IOP decreased within statistically normal limits. However, the risk of remigration into the AC persists as the shell of the implant is nonbiodegradable; the use of miotics and avoiding the prone position could help prevent the recurrence.

In conclusion, we present the fourth case of migration of ILUVIEN into the AC, in our case in the context of a previous iris-claw lens implantation, and a simple technique for ease relocation to the vitreous cavity. It is important to be cautious while using a FAc implant in patients with capsular defects, zonular weakness, and previous vitrectomy; thus, a regular follow-up and early detection of migration may ensure prompt removal which is essential to prevent corneal edema and damage from raised IOP. We recommend using a reverse sinsky hook as a smaller entry incision can be achieved to maintain the sealing of the AC. In conclusion, our technique showed that the implant was relocated into the posterior cavity without compromising the implant integrity and without losing the effectiveness of the drug delivery system.

### Abbreviations

**DME:** Diabetic Macular Edema  
**FAc:** Fluocinolone Acetonide  
**AC:** Anterior Chamber  
**IOP:** Intraocular Pressure  
**OL:** Intraocular Lens  
**CMT:** Central Macular Thickness  
**VA:** Visual Acuity

### Conflicts of Interest

None.

### Funding

None.

### Consent

The authors state that written informed consent for medical information and images to be published was provided by the patient.

### Financial Interest

None.

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