



# Combined Pupilloplasty and Retropupillary Iris-Claw Intraocular Lens Implantation with DSAEK in a Patient with Traumatic Iridoplegia, Aphakia and Corneal Decompensation

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## ABSTRACT

**Purpose:** To report the management of a patient with traumatic mydriasis, aphakia and corneal decompensation with a triple procedure: simultaneous pupilloplasty and retropupillary iris-claw intraocular lens (IOL) implantation combined with Descemet stripping automated endothelial keratoplasty (DSAEK).

**Results:** An 88-year-old woman was referred to our Institute for consultation on her left eye. The patient had undergone surgical removal of

the IOL, without re-implantation, in her left eye 10 months prior to presentation due to traumatic IOL dislocation. At the time of examination, corrected distance visual acuity was counting fingers and intraocular pressure was 10 mmHg. Slit-lamp examination revealed iridoplegia, aphakia and corneal edema. The patient underwent simultaneous pupilloplasty and retropupillary iris-claw IOL implantation combined with DSAEK. Six months postoperatively, the corneal graft was attached and clear, the iris was well reconstructed and almost round, and the iris-claw IOL was in place.

**Conclusions:** Simultaneous pupilloplasty and retropupillary iris-claw IOL implantation combined with DSAEK was shown to be a safe surgical technique in a patient with traumatic mydriasis, aphakia and corneal decompensation.

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## INTRODUCTION

Over the last decade, endothelial keratoplasty (EK) in the form of Descemet stripping automated endothelial keratoplasty (DSAEK) and Descemet membrane endothelial keratoplasty (DMEK) has become the standard of care for the

treatment of endothelial decompensation [1–3]. Several studies have reported the successful combination of EK with cataract surgery or alternatively with iris-claw intraocular lens (IOL) implantation [4–8]. In this report, we present the successful management of a case with coexistent traumatic mydriasis, aphakia and corneal edema with a triple procedure of simultaneous pupilloplasty and retropupillary iris-claw IOL implantation combined with DSAEK.

## CASE REPORT

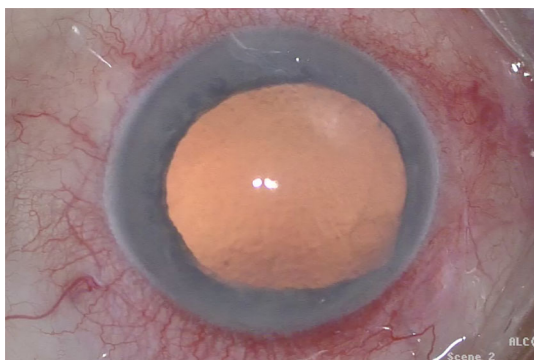
An 88-year-old woman was referred to our institute for consultation on her left eye. She had undergone IOL removal without subsequent IOL implantation in her left eye 10 months ago due to traumatic IOL dislocation. At the time of the examination, corrected distance visual acuity (CDVA) was counting fingers. Intraocular pressure was 10 mmHg. Corneal thickness (CT) using ultrasound pachymetry (Tomey SP-100 ultrasound pachymeter, Tomey Corporation, Japan) was 680  $\mu\text{m}$ . Slit-lamp examination revealed iridoplegia, aphakia and corneal edema (Fig. 1). Fundus examination revealed age-related macular degeneration. The patient underwent simultaneous pupilloplasty and retropupillary iris-claw IOL implantation combined with DSAEK.

The surgery was performed under retrobulbar anesthesia. Bimanual anterior vitrectomy in the

presence of triamcinolone was performed with a vitrector to clear the anterior chamber (AC) and the retropupillary space from vitreous. Siepser slip knot technique was then used for pupil reconstruction as has been previously described [9]. Two clear corneal stab incisions were placed at 5 and 7 o'clock positions along the proposed path of a Prolene 10-0 straight needle, engaging the proximal and the distal iris leaflets. With a Sinskey hook, the distal suture was engaged and pulled out of the proximal incision forming a loop. The free end of the suture was passed twice through the loop, and both ends of the suture pulled so that the knot was created and slid automatically into the eye. The procedure was repeated so that a firm knot was created (inferior iris suturing). The technique was then repeated with two clear corneal stab incisions placed at 11 and 1 o'clock positions (superior iris suturing).

A retropupillary iris-claw IOL for aphakia (Artisan; Ophtec, Groningen, the Netherlands) was inserted through an enlarged 5.5-mm main incision and positioned posterior to the iris. An enclavation needle was used to capture the iris into the IOL haptics at the 3 and 9 o'clock positions, permitting the creation of an almost round pupil without the need of additional suture loops (nasally temporally). The main 5.5-mm incision was then decreased to 3.2 mm by placing two 10-0 nylon sutures for the subsequent DSAEK.

After the AC was filled with cohesive viscoelastic (Provisc; Alcon, Ft Worth, TX), descemetorhexis was followed using an inverted Sinskey hook through the main 3.2-mm incision. A 7.50-mm trephined donor corneal button was inserted into the AC using the Busin glide and left to unfold spontaneously under continuous irrigation with an AC maintainer. Once it had fully unfolded and the corneal wound was closed with another 10-0 nylon suture, a 100% air bubble was injected into the AC and left for 10 min. A 50% air bubble remained after air–fluid exchange. The patient was instructed to lie supine for the next 6–8 h to ensure graft apposition. Postoperative therapy included moxifloxacin (Vigamox, Alcon Laboratories, Inc) four times per day for 1 week and dexamethasone 0.1% (Dexafree, Thea



**Fig. 1** Slit-lamp photo showing the coexistence of iridoplegia, aphakia and corneal decompensation at the time of preoperative examination

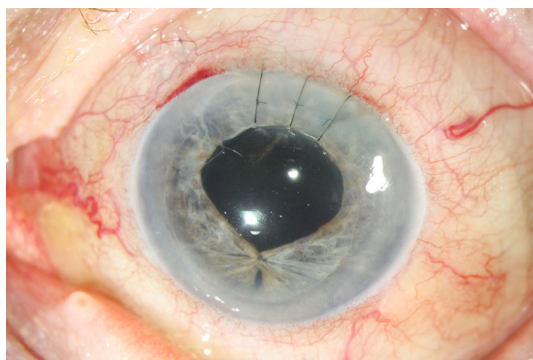
Laboratories, Inc.) four times per day gradually tapered over 6 months.

At the 3- and 6-month postoperative evaluation, the corneal graft was attached and clear, the iris was well reconstructed and almost round, and the iris-claw IOL was in place (Fig. 2). CDVA improved to 20/100 6 months after the triple surgical procedure; CT was 553  $\mu\text{m}$  and endothelial cell density was 1418 cells/ $\text{mm}^2$ .

Written informed consent for publication of the patient's clinical details was obtained.

## DISCUSSION

Previous studies have demonstrated rapid visual rehabilitation after combining DSAEK with phacoemulsification and IOL implantation [4, 5]. Moreover, the combination of EK with iris-claw IOL implantation has also been described [6–8]. Karimian and Sadoughi [6] presented the successful combination of DSAEK with retropupillary iris-claw IOL implantation in patients with corneal edema and aphakia or with AC-IOL; in the pseudophakic case, the AC-IOL was exchanged with the iris-claw IOL. Vélez et al. [7] reported the management of nine cases with aphakia and corneal edema with the combination of DSEK with the implantation of a retropupillary fixated iris-claw IOL. Gonnermann et al. [8] reported good visual outcomes after DMEK and retropupillary iris-claw IOL



**Fig. 2** Slit-lamp photo showing the successfully attached corneal graft, an almost round pupil and the iris-claw intraocular lens 3 months after triple surgery

implantation in eyes without adequate capsular support and bullous keratopathy.

In this report, we present a case of traumatic mydriasis, aphakia and corneal decompensation managed with a triple procedure consisting of pupilloplasty, retropupillary iris-claw IOL implantation and DSAEK. Pupilloplasty was performed first to address the iridoplegia and to repair the traumatic iris. The reconstruction of the iris was considered necessary for the subsequent fixation of the iris-claw IOL. The enclavation of the iris into the IOL haptics at the 3 and 9 o'clock positions permitted the creation of an almost round pupil without the need of additional suture loops. After pupilloplasty, we chose to perform a retropupillary IOL implantation prior to DSAEK to prevent future endothelial damage and avoid angle-related complications. Touriño Peralba et al. [10] have shown that prepupillary iris-claw IOL implantation leads to greater endothelial cell loss compared to retropupillary implantation. Furthermore, the retropupillary iris-claw IOL could better support the maintenance of the air bubble in the AC. Alternatively, in this case, a scleral sutured or fixated retropupillary IOL could have been implanted, but we preferred to avoid scleral fixation sutures and any other scleral manipulations in this severely traumatized eye. Furthermore, patients with scleral sutured or fixated IOLs are at higher risk of intraoperative and postoperative complications, such as bleeding, infection, IOL tilt and pupillary distortion.

## CONCLUSION

Simultaneous pupilloplasty and retropupillary iris-claw IOL implantation combined with DSAEK was shown to be a safe surgical technique in a patient with iridoplegia, aphakia and corneal decompensation. This triple technique could be considered as an alternative option in cases when other combined techniques of EK and IOL implantation cannot be performed or have high risk of complications.

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**Disclosures.** Dimitrios G. Mikropoulos, George D. Kymionis, Michael A. Grentzelos, Nafsika Voulgari, Andreas Katsanos and Anastasios G. Konstas have nothing to declare.

**Compliance with Ethics Guidelines.** Written informed consent for publication of the patient's clinical details was obtained.

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