Case report

EJO European Journal of Ophthalmology

European Journal of Ophthalmology
1–3

DOI: 10.1177/11206721221128669
journals.sagepub.com/home/ejo
SAGE

Carlevale intraocular lens opacification after Descemet stripping automated endothelial keratoplasty

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Abstract

Purpose: To report a case of sutureless scleral-fixated (SSF) Carlevale intraocular lens (IOL) opacification following Descemet stripping automated endothelial keratoplasty (DSAEK) surgery.

Methods: An 82-year-old man underwent combined SSF Carlevale IOL implant and DSAEK surgery for aphakic endothelial decompensation. Surgery was uneventful, while the postoperative period was complicated by multiple graft detachments requiring re-bubbling. After four re-bubbling procedures, the corneal graft attached and cleared over time.

Results: 29 months after combined SSF IOL implant and DSAEK surgery, the patient presented with decreased vision due to IOL opacification affecting the visual axis.

Conclusion: Although combined SSF IOL and DSAEK surgery is an overall safe and effective procedure for aphakic endothelial decompensation, risk of IOL opacification due to anterior chamber air injection is higher when using hydrophilic IOLs and in cases requiring multiple re-bubbling, therefore, intraocular lens material should be chosen after considering the risks and benefits.

Keywords

Sutureless scleral-fixated IOL, SSF IOL, DSAEK, IOL opacification, Carlevale

Date received: 3 May 2022; accepted: 29 August 2022

Introduction

Combined surgery of scleral-fixated (SF) intraocular lens (IOL) and endothelial keratoplasty (EK) is becoming a safe and effective procedure to treat complex cases of aphakic corneal decompensation in the absence of capsular support.[1,2] The advantages of these combined surgeries include the avoidance of multiple procedures, reduced risk of endothelial graft migration in the posterior chamber with better air bubble support and faster visual rehabilitation.[1] When using foldable SF-IOL, the procedure is minimally invasive and can be performed through relatively small corneal incisions. Sutureless SF (SSF) Carlevale IOL (Soleko, Italy) is a hydrophilic single-piece acrylic foldable lens with 25% H_2O which can be injected though a 2.2mm corneal incision (Figure 1). It is designed for SSF, which is achieved by externalization of two T-shaped harpoons which remain covered by a partial thickness scleral flap or scleral pockets.[3]

Combined SSF Carlevale IOL and Descemet membrane endothelial keratoplasty (DSAEK) surgery has been described with good surgical outcomes and significantly

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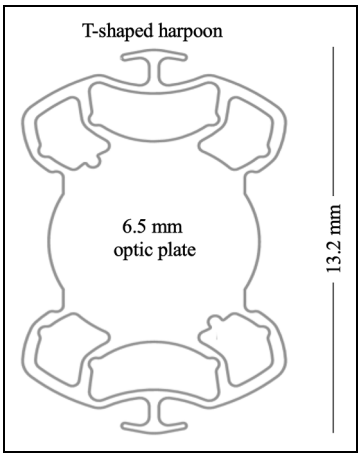

Figure 1. Schematic representation of the sutureless scleral-fixated carlevale intraocular lens.

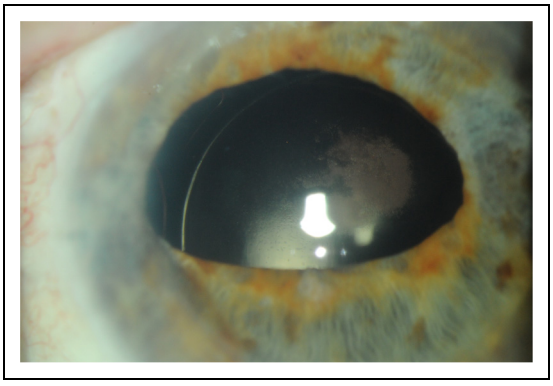

Figure 2. Clinical picture showing the SSF-Carlevale IOL opacification in the visual axis 29 months after combined SSF-IOL and DSAEK surgery. Picture also show a clear corneal graft.

smaller IOL tilting compared to other SSF IOL.[2] It has been previously hypothesized that intracameral gas can be a risk factor for IOL opacification and hydrophilic IOLs have been more commonly associated with this complication.[4] To the best of our knowledge, postoperative Carlevale IOL opacification has never been reported before.

We herein describe the first case of SSF Carlevale IOL opacification 29 months after combined SSF IOL and DSAEK surgery.

Case description

An 82-year-old man was seen in the clinic for decreased visual acuity in the right eye. Past ocular history was of a right eye complicated cataract surgery with dropped nuclear fragments which required pars plana vitrectomy and subsequent iris-claw Artisan lens implant (3 months after). Post-operatively, the operated eye developed cystoid macular oedema (CMO). As the CMO continued recurring after surgery despite treatment, the Artisan IOL was removed, resulting, 2 years later, in aphakic corneal decompensation. For this reason, the patient underwent combined SSF Carlevale IOL implant and DSAEK surgery. The Carlevale IOL was implanted according to the technique described by Barca et al.[5] After the creation of two scleral pockets (4×4mm) along the horizontal meridian at 0° - 180° degrees, a sclerotomy was performed at 1.5 mm from the limbus in the scleral bed on each side. A temporal corneal wound (2.75 mm) was created to inject the Carlevale IOL whose leading harpoon was grasped and externalized using a 25-gauge (G) forceps inserted through a nasal sclerotomy. The handshaking technique was used to grasp the trailing harpoon with two 25-G forceps, the first passed through a nasal paracentesis and the second inserted through the temporal sclerotomy for the final externalization. Finally, descemetorhexis and delivery of a preloaded ultrathin DSAEK using the iGlide were performed (pull through technique).

Surgery was uneventful, while post-operatively, it was complicated by multiple graft detachments requiring re-bubbling with air at day 1, 2, 6 and 14. The DSAEK graft attached and the cornea cleared. Once the cornea cleared, the Carlevale IOL appeared clear and well centered. Best corrected visual acuity (BCVA) recovered to 6/24, partially impaired by recurrence of CMO. However, at last available follow-up at 29 months after surgery, right eye BCVA significantly dropped to 3/60 despite a clear corneal graft and a reasonably dry macula. Slit-lamp examination revealed a large central area of IOL opacity involving the visual axis (Figure 2). Consent to publish this case and related images was gathered from the patient.

Discussion

Intraocular lens opacification has been reported as a complication of DSAEK surgery with a rate ranging from 5% to 9.7% of cases.[6,7] Although rare, it is clinically significant, leading to blurred and decreased visual acuity. The cause of IOL opacification is still unclear, however, several risk factors have been identified including intraocular inflammation due to alteration of blood-aqueous barrier in multiple surgeries, air or gas injection in the anterior chamber (AC), re-bubbling procedures and the use of a hydrophilic IOL.[4] The mean interval between IOL implantation and opacification has been reported at around 26 months.[8] The opacification usually involves the anterior surface or subsurface of the IOL and it is centered in the pupillary area.[4] IOL opacification after DSAEK surgery is likely due to a combination of intraocular air or gas fill with increased IOP. The prolonged contact of air with the hydrophilic lens surface coupled with high IOP can lead to calcium or other substances precipitating

on the anterior surface or subsurface of the IOL.[4] Also, hydrophylic IOL opacification has been reported after pars plana vitrectomy with gas tamponade.[9] Due to its location, this type of opacification can only be managed with IOL exchange.[4]

We described, for the first time, a case of opacification of Carlevale IOL. In our patient, the long exposure to air due to the re-bubbling likely increased the risk of IOL opacification, which appeared evident at 29 months postoperatively. This complication has been associated more frequently with hydrophilic IOLs than with hydrophobic ones.[10,11] Currently, several hydrophobic IOLs are available for sutureless scleral fixation (e.g. Tecnis ZA9003, Acrysof MA60AC, Avansee PN6A).[11] Based on the above-mentioned findings, the use of hydrophobic IOLs has been advocated as preferential in cases of combined IOL implantation and DSAEK.[10]

Given the risk of re-bubbling after posterior lamellar surgery and the possible consequent opacification of hydrophilic IOL, we suggest considering the IOL choice balancing the advantages of a foldable SSF IOL which requires a small corneal incision and has a small predicted postoperative IOL tilting, with the disadvantage of possible IOL opacification due to its hydrophilic nature.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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