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Case report

Corneal graft failure due to migration of Ozurdex™ implant into the anterior chamber

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ABSTRACT

Purpose: We report a case of corneal endothelial graft failure secondary to dexamethasone intravitreal implant (Ozurdex™) migration into the anterior chamber (AC).
Observations: A 53-year-old man with a history of bilateral idiopathic chronic uveitis, had a right anterior vitrectomy and AC intraocular lens (ACIOL) with a peripheral iridotomy. He received an intravitreal Ozurdex™ implant for right cystoid macular oedema (CMO). Three months later he developed pseudophakic bullous keratopathy and underwent a Descemet stripping automated endothelial keratoplasty (DSAEK), combined with IOL exchange (ACIOL explantation followed by scleral fixated posterior chamber IOL). He developed recurrent CMO post-operatively, for which he had a second Ozurdex™ implant. Six weeks following the implant he presented with reduced vision and corneal graft failure with migration of the Ozurdex™ implant into the AC. Despite prompt surgical removal of the implant, the graft did not recover and he underwent a repeat DSAEK.
Conclusions and importance: Ophthalmologists should be aware of this adverse event and the importance of early implant removal to reduce the risk of permanent corneal oedema.

1. Introduction

Ozurdex™ (Allergan, Inc., Irvine, CA, USA) is a biodegradable sustained-release intravitreal implant of 0.7mg dexamethasone in the NOVADUR (Allergan, Inc.) solid polymer drug delivery system, approved for the treatment of cystoid macular oedema (CMO) secondary to retinal vein occlusion, non-infectious uveitis affecting the posterior segment and diabetic macular oedema.[1–4] This rod-shaped implant measures 6mm in length and 0.46mm diameter and is delivered into the vitreous cavity with a 22-gauge needle.[2] There have been reports in the literature of migration of the implant into the anterior chamber (AC) that resulted in corneal decompensation.[5–13] We describe corneal endothelial graft failure secondary to Ozurdex™ implant migration into the anterior chamber, and the subsequent management and outcome.

2. Case report

A 53-year-old man with a history of bilateral idiopathic chronic uveitis and ulcerative colitis underwent complicated right phacoemulsification surgery with anterior vitrectomy and sulcus intraocular lens implant (IOL). The sulcus IOL subluxated inferiorly post-operatively and was exchanged for an anterior chamber IOL (ACIOL) with a peripheral iridotomy (PI) and his visual acuity (VA) improved to 6/9. Two years later, he developed right CMO that although resolved with an intravitreal Ozurdex™ implant his documented VA was 6/30. 3 months later, he developed right pseudophakic bullous keratopathy (PBK) and his VA decreased to 6/60. At this stage, implant migration into the AC had not occurred.

He was referred to a tertiary eye hospital. He had persistent PBK and an unstable ACIOL. A right Descemet stripping automated endothelial keratoplasty (DSAEK) and scleral fixated posterior chamber IOL (PCIOL) was performed 8 months following the onset of PBK. Post-operatively VA was 3/60, graft was clear, PCIOL was central and stable, however, he was noted to have recurrent CMO. His CMO resolved a month after a second intravitreal Ozurdex™ implant and VA improved to 6/36. The endothelial keratoplasty was clear and the poor acuity was attributed to photoreceptor dysfunction following multiple episodes of CMO.

Six weeks following the implant he presented with a 4 day history of reduced vision (VA Count Fingers) and was found to have corneal graft decompensation with no evidence of CMO. He was commenced on topical sodium chloride 5% and dexamethasone 0.1%. On his follow up visit two days later, the corneal haze showed

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only minimal clearance, and the Ozurdex™ implant had migrated into the AC touching the endothelium (Fig. 1). The implant was surgically removed one day later with a Simcoe cannula (video). The graft did not recover and he underwent a successful repeat DSAEK, his VA at the 4 month clinic visit was 6/36 and the graft remained clear (Fig. 2). There is evidence of recurrent perifoveal CMO and he is currently being managed with topical treatment. Intraocular pressure has been normal throughout.

Supplementary video related to this article can be found at https://doi.org/10.1016/j.ajoc.2017.08.002.

3. Discussion

While migration of the Ozurdex™ implant into the AC and subsequent corneal decompensation has been reported, to our knowledge this is the first case report of such a complication in a patient with an endothelial keratoplasty. There have been 29 cases in the literature of Ozurdex™ implant migration into the AC and corneal oedema developed in 24 (83%) of these cases.[5–16] Three risk factors noted for implant migration are a defective or absent posterior lens capsule, history of a prior vitrectomy and presence of a peripheral iridectomy (PI). However, the presence of any of these risk factors does not necessarily mean that migration will occur. In a cases series by Khurana et al.,[5] 33% of their cases had previous uncomplicated Ozurdex™ implants without AC migration while having the same lens and capsular status as when the migration later occurred. In September 2012, Allergan, Inc., modified its package insert reflecting the contraindications for the Ozurdex™ implant in aphakia and ACIOL with rupture of the posterior capsule and warned that it should be used with caution in eyes with a posterior capsule tear and/or an iris opening.

Corneal oedema is the most serious complication of Ozurdex™ implant migration into the AC[1]. Our case presented with corneal graft failure 6 weeks post-Ozurdex™ implant that did not spontaneously resolve despite early implant removal. In the largest series of Ozurdex™ implant migration into the AC involving 18 episodes of implant migration, 89% of cases developed corneal oedema at presentation. Despite implant removal, the corneal oedema did not resolve in 71% of cases, and 43% required a keratoplasty.[5] The mechanism of endothelial decompensation could be due to drug toxicity from any component of the Ozurdex™ implant or direct mechanical trauma from the implant itself.

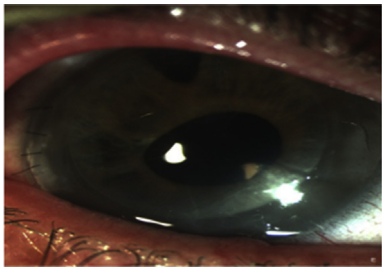
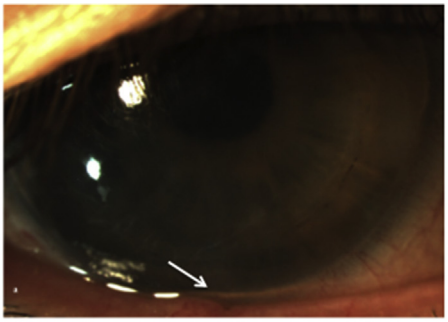


Fig. 2. Slit-lamp photograph of the affected right eye showing the repeat descemet stripping automated endothelial keratoplasty remaining clear at the 4 month clinic visit.

3.1. Management

Regarding of migration of the Ozurdex™ implant into the AC, there are few management options. In patients without anterior segment complications, observation or medical management with supine positioning and pupillary dilatation to allow the implant to migrate posteriorly can be considered.[1,9,12] The Ozurdex™ implant can also be repositioned into the posterior chamber, use of a 30G needle has been reported.[15] Advising patients to avoid the prone position and topical pilocarpine has been tried after repositioning to minimise the risk of the implant re-migrating, but recurrent migration may still occur.[13] Finally, YAG laser fragmentation has been used to dislodge the implant into the vitreous.[5]

Prompt surgical removal of a migrated implant is generally recommended because of the risk of permanent corneal decompensation. In a retrospective cases series, earlier implant removal reduced the likelihood of permanent corneal oedema (0.5 days vs. 5.5 days from diagnosis of migration to surgical removal of the implant, $p = 0.04$)[5]. In this same series, in the cases that did not have resolution of corneal oedema, the duration from Ozurdex™ implant insertion to surgical removal was longer (17.7 vs. 10 days; $p = 0.04$)[5], suggesting that in the cases where the cornea cleared,



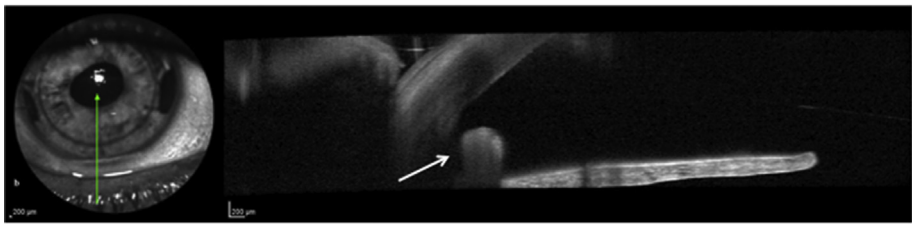


Fig. 1. The affected right eye with the migrated Ozurdex™ implant (white arrow) in the anterior chamber touching the endothelium on (a) slit-lamp photography, (b) anterior segment optical coherence tomography.

the mean time from diagnosis of migration to Ozurdex™ implant removal was shorter. In our case, the implant was removed at day 4 after the initial presentation using a Simcoe cannula. The technique involved opening of the initial temporal corneal wound and then with low flow aspiration the implant was grasped with the tip of the Simcoe cannula and removed from the AC. In our case, the implant did fragment but we successfully aspirated all the fragments with the aid of the cannula. In spite of complete removal of the Ozurdex™ implant in our case, the DSAEK failed and a repeat DSAEK was performed with a successful outcome.

The use of other instrumentation, such as gently grasping it with forceps or aspiration with a vitreous cutter has been described in the literature.[5] Stelton et al. describe grasping the implant along its long axis to reduce the risk of implant fragmentation.[6] Surgeons should bear in mind that the implant is friable and may disintegrate into numerous fragments with minimal manipulation and these fragments may migrate posteriorly requiring vitreoretinal expertise.

In eyes with risk factors for implant migration into the AC, novel techniques described to avoid this complication have included embedding the implant in a residual inferior skirt of vitreous[17] and intravitreally suturing the implant to the sclera at 6 o'clock using 10/0 non-absorbable polypropylene.[18]

4. Conclusions

To the best of our knowledge, this is the first case report of corneal graft failure secondary to Ozurdex™ implant migration into the AC. Our case was successfully treated with a repeat DSAEK. Ophthalmologists should be aware of this potential adverse event in patients with a history of vitrectomy, a breach or absence of the posterior lens capsule and a patent PI. Early removal of the implant is particularly recommended in patients with corneal grafts in the hope of avoiding the risk of permanent corneal decompensation, which is likely to be especially great in such patients.

Patient consent

Consent to publish the case report was obtained in writing. This report does not contain any personal information that could lead to the identification of the patient.

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Conflicts of interest

All authors have no financial disclosures.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

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