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

Haifa A. Madi*, Stephen J. Morgan, Saurabh Ghosh

Sunderland Eye Infirmary, Queen Alexandra Road, Sunderland SR2 9HP, UK

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. This rod-shaped implant measures 6mm in length and 0.46mm diameter and is delivered into the vitreous cavity with a 22-gauge needle. It is delivered into the vitreous cavity with a 22-gauge needle.

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. Three months later he developed pseudophakic bullous keratopathy and underwent a Descemet stripping automated endothelial keratoplasty (DSEA), combined with IOL exchange (ACIOL explantation followed by scleral fixed 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 DSEA.

He was referred to a tertiary eye hospital. He had persistent PBK and an unstable ACIOL. A right Descemet stripping automated endothelial keratoplasty (DSEA) and scleral fixed 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
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. 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., 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. 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. 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.

3.1. Management

Regarding 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. Repositioning the implant into the posterior chamber, use of a 30G needle has been reported. 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. Finally, YAG laser fragmentation has been used to dislodge the implant into the vitreous.

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). 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), suggesting that in the cases where the cornea cleared,
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. Stelton et al. describe grasping the implant along its long axis to reduce the risk of implant fragmentation. 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 and intravitreally sputtering the implant to the sclera at 6 o’clock using 10/0 non-absorbable polypropylene.

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.

Acknowledgements and disclosures

Funding

No funding or grant support.

Conflicts of interest

All authors have no financial disclosures.

Authorship

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

Acknowledgements

None.

References

1. Haller JA, Bandello F, Belfort R, et al, OZURDEX GENEVA Study Group. Randomized, sham-controlled trial of dexamethasone intravitreal implant in patients with macular edema due to retinal vein occlusion. Ophthalmology. 2010;117(6):1134–1146.
2. Lowder C, Belfort Jr R, et al, Ozurdex HURON Study Group. Dexamethasone Intravitreal Implant for noninfectious intermediate or posterior uveitis. Arch Ophthalmol. 2011;129(5):545–553.
3. Tomkins-netzer O, Taylor SRJ, Bar A, et al. Treatment with repeat dexamethasone implants results in long-term disease control in eyes with noninfectious uveitis. Ophthalmology. 2014;121(8):1649–1654.
4. Boyer DS, Yoon YH, Belfort R, et al, Ozurdex MEAD Study Group. Trial of dexamethasone intravitreal implant in patients with diabetic macular edema. Ophthalmology. 2014;21(10):1904–1914.
5. Khurana RN, Appa SN, McCannel CA, et al. Dexamethasone implant anterior chamber migration: risk factors, complications, and management strategies. Ophthalmology. 2014;121(1):67–71.
6. Stelton CR, Townsend J, Peterson LT, et al. Surgical management of anterior chamber migration of a dexamethasone intravitreal implant. Ophthalmic Surg Lasers Imaging Retina. 2015;46(7):756–759.
7. Turaka K, Kwong HM, De Souza S. Intravitreal implant migration into anterior chamber in a post-vitrectomy eye with central retinal vein occlusion and persistent macular edema. Ophthalmic Surg Lasers Imaging Retina. 2013;44(2):196–197.
8. Gullapalli VK, DiLoreto DA. Migration of intravitreal dexamethasone implant to anterior chamber. Retina Cases Brief Rep. 2013;7(1):111–113.
9. Cronin KM, Govind K, Kurup SK. Late migration of dexamethasone implant into anterior chamber. Arch Ophthalmol. 2012;130(6):711.
10. Voskov B, Bartz-Schmidt KJ. Dislocation of dexamethasone intravitreous implant. Arch Ophthalmol. 2012;130(6):706.
11. Pardo-Lopez D, Francés-Muñoz E, Gallego-Pinazo R, et al. Anterior chamber migration of dexamethasone intravitreal implant (Ozurdex®). Graefes Arch Clin Exp Ophthalmol. 2012;250(11):1703–1704.
12. Jonas JB, Schmidbauer M. Steroid implant in anterior chamber of an aphakic vitrectomized eye. Graefes Arch Clin Exp Ophthalmol. 2013;251(1):385–386.
13. Bansal R, Bansal P, Kulkarni P, et al. Wandering Ozurdex® implant. J Ophthalmic Inflamm Infect. 2012;2(1):1–5.
14. Edie JA, Lesser R, Capone A. Migration of ozurdex implant into the anterior chamber. Retin Cases Brief Rep. 2012;6(3):269–270.
15. Vela JJ, Crespi J, Andreu D. Repositioning of dexamethasone intravitreal implant (Ozurdex) migrated into the anterior chamber. Int Ophthalmol. 2012;32(6):583–584.
16. Kishore SA, Schaal S. Management of anterior chamber dislocation of dexamethasone implant. Ocul Immunol Inflamm. 2013;21(1):90–91.
17. Kapoor KG, Shultz RW, Iezzi R. Vitreous pillow for sustained-release intravitreous drug delivery implants. Ophthalmic Surg Lasers Imaging Retina. 2013;44(2):181–182.
18. Mateo C, Alkabes M, Burés-Jelstrup A. Scleral fixation of dexamethasone intravitreal implant (OZURDEX®) in a case of angle-supported lens implantation. Int Ophthalmol. 2014;34(3):661–665.