Management of intravitreal implant migration into the anterior chamber in a patient with a posterior chamber intraocular lens

Vincenzo Marchese, MD, Sergio Piscitello, MD, Ciro Vaccaro, Giuseppe Giunchiglia, MD

We report a case in which an intravitreal implant (Ozurdex) migrated into the anterior chamber in a patient with a sutured scleral-fixated posterior chamber intraocular lens. Nonsurgical repositioning of the implant into the posterior vitreous space was unsuccessful. Surgical removal was then performed. Our purpose is to describe the clinical approach and surgical techniques to remove an anterior chamber–migrated implant.

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Ozurdex (Allergan Retina) is a biodegradable, sustained-release intravitreal implant containing 700 μg of dexamethasone in a solid polymer drug-delivery system (Novadur, Allergan, Inc.). The implant is approved for the treatment of macular edema secondary to branch and central retinal vein occlusion (CRVO) and posterior noninfectious uveitis. It measures 0.46 mm in diameter and 6.0 mm in length and is delivered into the vitreous cavity with a 22-gauge needle. The implant does not rupture into smaller fragments but degrades gradually into carbon dioxide and water inside the vitreal cavity during a period of approximately 6 months. The dexamethasone is delivered to the vitreous gradually over time, providing sustained drug levels to the target areas despite a lower total daily dose.

Although the implant rarely dislocates into the anterior chamber, a few case reports describe this circumstance. The main risk factors are a previous vitrectomy because of the absence of the anterior hyaloid membrane and the absence of the posterior lens capsule. Both represent important anatomical barriers. Intravitreal implant migration into the anterior chamber can result in ocular hypertension and corneal endothelial damage with corneal edema. Early removal of the implant from the anterior chamber may be necessary to minimize the risk for chronic corneal edema. It is therefore a surgical emergency, and an anterior chamber–migrated implant must be surgically removed as soon as possible to prevent corneal decompensation. We describe our management strategy in a case in which the intravitreal implant migrated into the anterior chamber.

CASE REPORT

A 77-year-old man with a history of CRVO developed persistent cystoid macular edema (CME). The ocular
history was significant for anterior vitrectomy via a 23-gauge pars plana vitrectomy (PPV) and implantation of a sutured scleral-fixated posterior chamber intraocular lens (IOL) after capsule rupture during a complicated phacoemulsification and 2 previous intravitreal injections of ranibizumab (Lucentis) for CRVO. The patient had no history of ocular hypertension. The corrected distance visual acuity (CDVA) measured before intravitreal implantation was 20/200 (Snellen chart) and fundoscopic examination showed CME. The central retinal thickness value, measured 2 hours before the intravitreal implantation by optical coherence tomography scan (Stratus, Carl Zeiss Meditec AG), was 383 \( \mu \text{m} \).

The intravitreal implantation was uneventful, and the implant remained in the vitreous cavity for 6 days. The entire implant migrated into the anterior chamber 7 days later, and the patient presented with severe corneal edema and perikeratic injection; the patient denied pain or discomfort. On slitlamp examination, the implant and the corneal edema were immediately evident. The implant did not float into the anterior chamber, but it was near the iridocorneal angle (Figure 1). The intraocular pressure (IOP) measured 37 mm Hg in the affected eye and 13 mm Hg in the fellow eye; corneal endothelial count was attempted (Figure 2), but it was not reliable because of the thick edematous cornea.

The first therapeutic approach was to administer a topical mydriatic (tropicamide 1.0%) every 20 minutes for 3 times with the patient in a supine position. The aim was to produce mydriasis and spontaneously reposition the implant into the vitreous cavity to prevent a surgical approach and to avoid the loss of effectiveness of the drug. The patient remained in the same position for 2 hours, but the implant did not displace back into the vitreous cavity. Therefore, the patient was taken to the operating room the next day. The aim of our surgical approach was to remove the implant and not reposition it in the vitreous cavity. In the operating room, a perlimbal incision was made and

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Figure 2. Endothelial count performed the day before the intervention.

Figure 3. Injection of a dispersive ophthalmic viscosurgical device.

Figure 4. During the attempt to remove the implant using a vitreal forceps, the implant disintegrated into numerous pieces with manipulation.
the anterior chamber filled with a dispersive ophthalmic vis-
cosurgical device (sodium chondroitin sulfate 4%–sodium
hyaluronate 3% [Viscoat]) (Figure 3) to preserve endothelial
cells. Intraocular vitreal forces were unsuccessfully used to
remove the implant from the eye. The implant disintegrated
into numerous pieces with any manipulation (Figure 4), but
none of the fragments migrated back to the posterior cham-
ber. A phaco irrigation/aspiration (I/A) handpiece was then
used to aspirate the fragments (Figure 5). One week later, the
IOP was 28 mm Hg, the corneal edema had not resolved, and
the endothelial cell count (ECC) was 222 cells/mm². The
visual acuity was counting fingers and the macular thick-
ness, 412 µm. Three weeks after the intravitreal implant
injection, the IOP was 26 mm Hg, the CDVA 20/200, and
the ECC 180 cells/mm². The patient is now awaiting corneal
transplantation.

DISCUSSION
Anterior chamber migration of an intravitreal
implant is a rare complication, but it should not be
overlooked in eyes lacking the posterior lens
capsule. The presence of a scleral-fixated PC IOL
could be a relative contraindication to simple
intravitreal implant injection and, at the same time,
an indication for alternative intravitreal implantation
techniques. Intravitreal scleral fixation of the implant
to the pars plana could be recommended as an alter-
native technique to avoid anterior migration of the
device.9 A few cases of anterior chamber intravitreal
implant migration have been reported.3–7 Almost all
illustrate the complication in eyes with a previous
PPV and/or previous complicated cataract surgery
resulting in the absence of the lens capsule or zonular
dehiscence of the posterior lens capsule.3 Anterior
chamber intravitreal implant migration has been
described in aphakic eyes and in eyes with anterior
aracham IOLs3,5,7 Corneal edema is described in all
patients with early migration of the implant (≤19 days),3 and the likelihood of permanent corneal edema is strictly connected to the time between the
diagnosis of migration and surgical removal of the
implant.3

We emphasize that an abnormally low ECC is a fea-
ture of complicated cataract surgery10,11 and 1 cause
of endothelial cell loss is intraoperative trauma to the
endothelium12; this could have made the eye of
our patient predisposed to chronic corneal edema.
In the case of anterior chamber intravitreal implant
migration, a nonsurgical approach is our recommen-
ded first-line intervention. To reposition the implant
in the vitreous cavity avoids the loss of effectiveness
of the drug in a patient with macular edema,
although it carries the risk for another anterior
chamber migration. Moreover, it is a noninvasive
intervention. If this approach does not succeed, we
suggest removing the implant from the eye using an
I/A phaco handpiece and not repositioning it in the
vitreous cavity.

REFERENCES
1. Haller JA, Bandello F, Belfort R Jr, Blumenkranz MS, Gillies M,
Heier J, Loewenstein A, Yoon Y-H, Jacques M-L, Jiao J, Li X-Y,
Whitcup SM, for the OZURDEX GENEVA Study Group.
Randomized, sham-controlled trial of dexamethasone intravi-
treal implant in patients with macular edema due to retinal vein
occlusion. Ophthalmology 2010; 117:1134–1146
2. Lowder C, Belfort R Jr, Lightman S, Foster CS, Robinson MR,
Schiffman RM, Li X-Y, Cui H, Whitcup SM, for the Ozurdex
HURON Study Group. Dexamethasone intravitreal implant for
noninfectious intermediate or posterior uveitis. Arch Ophthalmol
2011; 129:545–553
3. Khurana RN, Appa SN, McCannel CA, Elman MJ, Wittenberg SE, Parks DJ, Ahmad S, Yeh S. Dexamethasone

Figure 5. Aspiration of the implant (A) and wash out of the anterior chamber using a phaco I/A handpiece (B).
implant anterior chamber migration; risk factors, complications, and management strategies. Ophthalmology 2014; 121:67–71
4. Laplace O, Rodallec T, Akesbi J, Sandali O. Migration d’un implant de dexaméthasone en chambre antérieure chez un patient pseudophaque porteur d’un implant de chambre postérieure suturé à la scière [Anterior chamber migration of a dexamethasone implant in a pseudophakic patient with a scleral-fixated posterior chamber intraocular lens]. J Fr Ophtalmol 2013; 36:e59–e61
5. Malclès A, Janin-Manificat H, Yhuel Y, Russo A, Agard E, El Chehab H, Ract Madoux G, Masse H, Burillon C, Dot C. Migration en chambre antérieure de l’implant intravitréen de dexaméthasone Ozurdex® chez le pseudophake: à propos de trois cas [Anterior chamber migration of intravitreal dexamethasone implant (Ozurdex®) in pseudophakic eyes: report of three cases]. J Fr Ophtalmol 2013; 36:362–367
6. Kishore SA, Schaal S. Management of anterior chamber dislocation of dexamethasone implant [letter]. Ocul Immunol Inflamm 2013; 21:90–91
7. Vela JI, Crespi J, Andreu D. Repositioning of dexamethasone intravitreal implant (Ozurdex®) migrated into the anterior chamber. Int Ophtalmol 2012; 32:583–584
8. Bansal R, Bansal P, Kulkarni P, Gupta V, Sharma A, Gupta A. Wandering Ozurdex® implant. J Ophthalmic Inflamm Infect 2012; 2:1–5. Available at: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3302995/pdf/12348_2011_Article_42.pdf. Accessed March 6, 2014
9. Mateo C, Alkabes M, Burés-Jelstrup A. Scleral fixation of dexamethasone intravitreal implant (OZURDEX®) in a case of angle-supported lens implantation. Int Ophthalmol 2013 Aug 9 [Epub ahead of print]
10. Rosado-Adames N, Ashari NA. The changing fate of the corneal endothelium in cataract surgery. Curr Opin Ophthalmol 2012; 23:3–6
11. Schultz RO, Glasser DB, Matsuda M, Yee RW, Edelhauser HF. Response of the corneal endothelium to cataract surgery. Arch Ophthalmol 1986; 104:1164–1169
12. Roper-Hall MJ, Wilson RS. Reduction in endothelial cell density following cataract extraction and intraocular lens implantation. Br J Ophthalmol 1982; 66:516–517. Available at: http://bjo.bmj.com/content/66/8/516.full.pdf. Accessed March 6, 2014

OTHER CITED MATERIAL
A. European Medicines Agency. EMA/457364/2010. Evaluation of Medicines for Human Use. CHMP Assessment report. Ozurdex. Available at: http://www.ema.europa.eu/docs/en_GB/document_library/EPAR_-_Public_assessment_report/human/001140/WC500095503.pdf. Accessed March 6, 2014