

# Surgical removal of inadvertent intralenticular sustained-release dexamethasone implant (ozurdex) and implant one-piece posterior capsule intraocular lens

Abdulrahman Albuainain<sup>1</sup>, Mohanna Al Jindan<sup>2</sup>, Bedoor Al Bloushi<sup>3</sup>

Video Available on:  
www.saudiophthaljournal.com

Access this article online

Quick Response Code:



Website:  
www.saudijophthalmol.org

DOI:  
10.4103/1319-4534.305044

## Abstract:

To report the therapeutic efficacy and results of an accidentally injected intralenticular sustained-release dexamethasone implant (Ozurdex) in a patient with macular edema secondary to diabetic macular edema. Dexamethasone intravitreal implant is an approved formulation in the management of macular edema. The most common adversarial effects are an elevation of intraocular pressure (IOP) and cataract, but the unintentional injection of the dexamethasone implant into the lens is a particularly rare event. We report a case of a 72-year-old man treated for resistant Diabetic macular edema (DME) with dexamethasone intravitreal implant (Ozurdex, Allergan, Inc., Irvine, CA, USA) in which the technique was complicated by accidental implantation into the lens body and review the management. The patient underwent phacoemulsification of the lens, removal of the Ozurdex, intravitreal Avastin injection, and implant of a one-piece lens in the posterior capsule.

## Keywords:

Cataract, diabetic macular edema, intralenticular Ozurdex

## INTRODUCTION

Intravitreal corticosteroids have shown favorable outcomes with macular edema secondary to diabetes and retinal vein occlusion, idiopathic retinal vasculitis, aneurysms, neuroretinitis,<sup>[1]</sup> retinitis pigmentosa,<sup>[2]</sup> radiation macular edema after proton beam therapy for choroidal melanoma<sup>[3]</sup> and Uveitis.<sup>[4]</sup> The corticosteroids are delivered via a single intravitreal injection or by implantation of a sustained-release device.<sup>[4]</sup> Biodegradable, sustained-release dexamethasone implants (Ozurdex) are injected transconjunctivally into the vitreous cavity using preloaded 22-gauge needle delivery systems.<sup>[4-7]</sup>

The corticosteroid released from the implant can suppress inflammation in the eye by inhibiting edema, fibrin deposition, capillary leakage, and phagocytic migration. Corticosteroids also inhibit the expression of vascular endothelial

growth factor, a cytokine that is expressed at increased concentrations in macular edema and is a potent promoter of vascular permeability, and prevent the release of prostaglandins, some of which are mediators of cystoid macular edema. The most common complications are secondary elevation of IOP<sup>[4]</sup> and progression of cataract; these complications have been observed in patients receiving dexamethasone intravitreal implants (Ozurdex), although their rates were lower than those in patients treated with triamcinolone acetonide injections and fluocinolone acetonide implants.<sup>[4,5]</sup> Additional complications related to intravitreal corticosteroid implants include migration of the implant toward the anterior chamber, frequently in patients with an absent or defective lens capsule.<sup>[8]</sup> The accidental injection of a dexamethasone implant into the crystalline lens is a rare, unexpected complication also related to the procedure.<sup>[9-13]</sup> Several cases have been reported, with most showing the cataract progression and requiring cataract surgery.<sup>[9,11,14]</sup> The inadvertent injection of the dexamethasone

<sup>1</sup>Eye and Laser Centre, Bahrain Defence Force Hospital, Royal Medical Services, Military Hospital, Kingdom of Bahrain,  
<sup>2</sup>Department of Ophthalmology, King Fahd Hospital of the University, Imam Abdulrahman Bin Faisal University, Dammam, <sup>3</sup>Dhahran Eye Specialist Hospital, Dhahran, Saudi Arabia

## Address for correspondence:

Dr. Abdulrahman Albuainain, Eye and Laser Centre, Bahrain Defence Force Hospital, Royal Medical Services, Military Hospital, Kingdom of Bahrain.  
E-mail: Asa.albuainain@gmail.com

Submitted: 12-Mar-2019

Revised: 23-Dec-2019

Accepted: 24-Feb-2020

Published: 28-Dec-2020

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Albuainain A, Al Jindan M, Al Bloushi B. Surgical removal of inadvertent intralenticular sustained-release dexamethasone implant (ozurdex) and implant one-piece posterior capsule intraocular lens. Saudi J Ophthalmol 2020;34:145-7.

implant into the capsular bag is an extremely rare event, with very few cases reported in the literature.<sup>[10]</sup>

## CASE REPORT

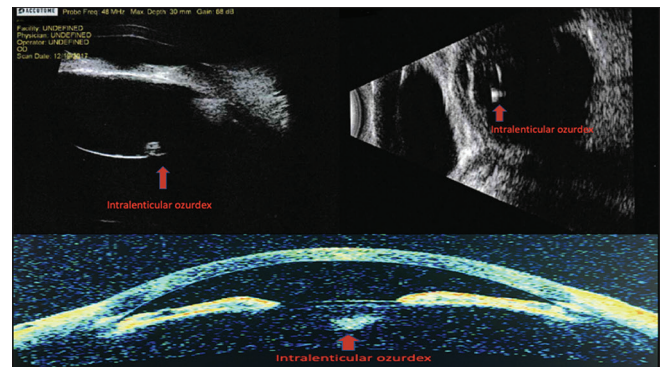
A 72-year-old male with a two days history of dexamethasone implant (Ozurdex, Allergan, Inc., Irvine, CA, USA) for treatment of resistant DME came to us for a second opinion. His corrected distance visual acuity was 0.2 in both eyes. The anterior segment examination showed nuclear sclerosis grade 1 in both eyes. IOP 13 and 10 mmHg with Goldmann Applanation tonometer. The Ozurdex implant was seen lodged inside the posterior cortex of the lens in the right eye [Figure 1]. Dilated Fundus examination showed moderate non-proliferative Diabetic retinopathy in both eyes with macular edema. Optical coherence tomography (OCT) confirmed DME with central subfield macular thickness of 495  $\mu\text{m}$  in the right eye. Anterior segment Optical coherence tomography (AS-OCT), B scan ultrasonography and ultrasound biomicroscopy confirmed the location of the other end of Ozurdex to just anterior to the posterior capsule [Figure 2], the inferonasal capsular entrance at 4o'clock. No improvement of macular edema, and patient developed a cortical cataract subsequently over a period of two months, and was scheduled for a routine cataract surgery in which he underwent a successful phacoemulsification, removal of the dexamethasone implant done by using coaxial irrigation/aspiration handpiece and ophthalmic viscoelastic device to bring the ozurdex to anterior chamber and then retrieved with forceps [Figure 3 and Video 1], one-piece posterior capsule intraocular lens implantation after confirming a stable bag and intravitreal Avastin injection for his DME.

## DISCUSSION

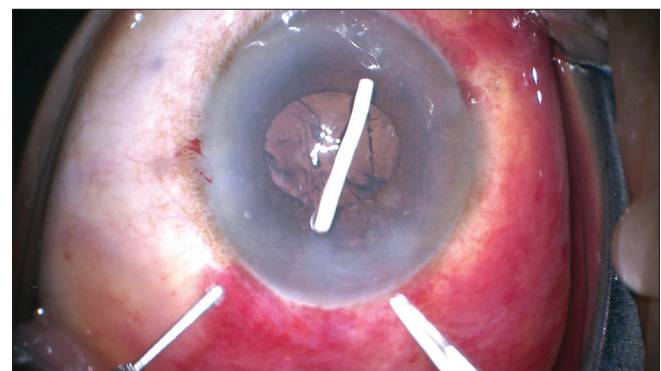
Ozurdex (Dexamethasone Implant; Allergan, Inc., Irvine, CA, USA) is a water-soluble, biodegradable copolymer of lactic acid and glycolic acid enclosing micronized dexamethasone. It has been official by the US Food and Drug Administration for the treatment of macular edema due to retinal vein occlusion.<sup>[15-17]</sup> Several reports have established its efficacy in DME as well.<sup>[18]</sup> It is a rod-shaped (6 mm) implant with 0.7 mg of dexamethasone releasing 100–1000  $\mu\text{g}/\text{ml}$  of the drug per day for the first two months. The concentration of the drug becomes undetectable after 7–8 months.<sup>[19]</sup> Identified complications of the implant include endophthalmitis, glaucoma, and cataract. Lenticular injury of accidental injection of sustained-release intravitreal dexamethasone implant into the crystalline lens is a rare complication but known. The therapeutic effect of intralenticular Ozurdex is controversial. There are a few case reports about this complication.<sup>[20-23]</sup> Lenticular injuries during intravitreal injections were found to be 0.009% in a multicentric case series study.<sup>[24]</sup> Ozurdex implantation is unlike regular intravitreal injections because of the larger (22-gauge) needle used and the speed (0.8 m/s in vitreous),<sup>[25]</sup> by which the pellet is introduced into the vitreous cavity. An inappropriate technique, an inexperienced surgeon, and patient head movement can all lead to inadvertent injection of Ozurdex



**Figure 1:** Anterior segment photograph of right eye showing intralenticular ozurdex



**Figure 2:** upper left, Ultrasound biomicroscopy of the right eye showing location of ozurdex (arrow) pellet inside the lens, Upper right, B-scan ultrasonography of the right eye showing intralenticular location of Ozurdex implant (arrow), bottom picture, Anterior segment optical coherence tomography of the right eye showing intralenticular location of ozurdex implant (arrow)



**Figure 3:** Intraoperative photograph showing the ozurdex implant after explanation

implant into the lens. Trauma to the lens with or without the presence of a foreign body can lead to cataractous changes. There have been reports of intralenticular Ozurdex leading to cataract progression in days or months after injection and rise in IOP requiring intervention.<sup>[11,20,25]</sup> Progression of cataract

might take as long as 11 months after injection and might require a second. Ozurdex injection for macular edema in the presence of intralenticular Ozurdex.<sup>[25]</sup> In our case, there was a progression of cataract, with normal IOP. The Ozurdex end inside the lens could have behaved like a sterile foreign body and did not cause any cataract, or the site of Ozurdex entry might be through the equator of lens preserving posterior capsule or vitreous might have plugged the posterior end this could be the reasons for no rapid progression of cataract. Coca-Robinot *et al.* and Sekeroglu *et al.* observed the therapeutic effect of intralenticular Ozurdex as long as six months in their case reports. Later, there was a progression of cataract requiring intervention.<sup>[12,21]</sup>

In conclusion, accidental intralenticular entry of an Ozurdex implant that entirely located inside the crystalline lens may not have the therapeutic effects. The variable pace of cataract progression underpinning relevant management decisions, clinical management of each case should be individualized and based on concomitant findings, and the development of side effects. The injection of an intravitreal dexamethasone implant (Ozurdex) into the lens body is a rare complication that can be effective and successfully managed with the surgical extraction of the implant from the lens body and implant of a one-piece intraocular lens in the posterior capsule.

### [Appendix A]: Supplementary material

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.sjopt.2020.02.001>.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

### REFERENCES

- Empeslidis T, Banerjee S, Vardarinos A, Konstas AG. Dexamethasone intravitreal implant for idiopathic retinal vasculitis, aneurysms, and neuroretinitis. *Eur J Ophthalmol* 2013;23:757-60.
- Saatci AO, Selver OB, Seymenoglu G, Yaman A. Bilateral intravitreal dexamethasone implant for retinitis pigmentosa-related macular edema. *Case Rep Ophthalmol* 2013;4:53-8.
- Baillif S, Maschi C, Gastaud P, Caujolle JP. Intravitreal dexamethasone 0.7-mg implant for radiation macular edema after proton beam therapy for choroidal melanoma. *Retina* 2013;33:1784-90.
- Kiddee W, Trope GE, Sheng L, *et al.* Intraocular pressure monitoring post intravitreal steroids: a systematic review. *Surv Ophthalmol*. 2013;58:291-310.
- Haller JA, Bandello F, Belfort Jr R, *et al.* Dexamethasone intravitreal implant in patients with macular edema related to branch or central retinal vein occlusion twelve-month study results. *Ophthalmology* 2011;118:2453-60.
- Lowder C, Belfort Jr R, Lightman S, *et al.* Dexamethasone intravitreal implant for noninfectious intermediate or posterior uveitis. *Arch Ophthalmol*. 2011;129:545-53.
- Gillies MC, Lim LL, Campain A, *et al.* A randomized clinical trial of intravitreal bevacizumab versus intravitreal dexamethasone for diabetic macular edema: the BEVORDEX study. *Ophthalmology* 2014;121:2473-81.
- Khurana RN, Appa SN, McCannel CA, *et al.* Dexamethasone implant anterior chamber migration: risk factors, complications, and management strategies. *Ophthalmology* 2014;121:67-71.
- Koller S, Neuhann T, Neuhann I. Conspicuous crystalline lens foreign body after intravitreal injection. *Ophthalmology* 2012;109:1119-21.
- Ram J, Agarwal AK, Gupta A, Gupta A. Phacoemulsification and intraocular lens implantation after inadvertent intracapsular injection of intravitreal dexamethasone implant. (bcr2012007494). *BMJ Case Rep* 2012;2012.
- Berarducci A, Sian IS, Ling R. Inadvertent dexamethasone implant injection into the lens body management. *Eur J Ophthalmol* 2014;24:620-2.
- Coca-Robinot J, Casco-Silva B, Armada-Maresca F, Garcia-Martinez J. Accidental injections of dexamethasone intravitreal implant (Ozurdex) into the crystalline lens. *Eur J Ophthalmol* 2014;24:633-6.
- Fasce F, Battaglia Parodi M, Knutsson KA, *et al.* Accidental injection of dexamethasone intravitreal implant in the crystalline lens. *Acta Ophthalmol* 2014;92:e330-1.
- Kocak N, Ozturk T, Karahan E, Kaynak S. Anterior migration of dexamethasone implant in a pseudophakic patient with intact posterior capsule. *Indian J Ophthalmol* 2014;62:1086-8.
- Kupperman BD, Blumenkranz MS, Haller JA, *et al.* Dexamethasone DDS Phase II Study Group. Randomized controlled study of an intravitreal dexamethasone drug delivery system in patients with persistent macular edema. *Arch Ophthalmol* 2007;125(3):309-17.
- Williams GA, Haller JA, Kupperman BD, *et al.* Dexamethasone DDS Phase II Study Group. Dexamethasone Posterior-Segment Drug Delivery System in the treatment of macular edema resulting from uveitis or Irvine-Gass syndrome. *Am J Ophthalmol* 2009;147(6):1048-54.
- Haller JA, Bandello F, Belfort Jr R, Blumenkranz MS, Gillies M, Heier J, *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):1134-46.
- Boyer DS, Yoon YH, Belfort Jr R, *et al.* Three-year, randomized, sham-controlled trial of dexamethasone intravitreal implant in patients with diabetic macular edema. *Ophthalmology* 2014;121:1904-14.
- Chang-Lin JE, Attar M, Acheampong AA, *et al.* Pharmacokinetics and pharmacodynamics of a sustained-release dexamethasone intravitreal implant. *Invest Ophthalmol Vis Sci* 2011;52:80-6.
- Sekeroglu MA, Anayol MA, Koc F, Tirhis H, Ozkan SS, Yilmazbas P. Intralenticular sustained-release dexamethasone implant: Is it still effective on macular edema? *Case Rep Ophthalmol* 2016;7:85-9.
- Chhabra R, Kopsidas K, Mahmood S. Accidental insertion of dexamethasone implant into the crystalline lens—12 months followup. *Eye (Lond)* 2014;28:624-5.
- Chalioulias K, Muqit MMK. Vitreoretinal surgery for inadvertent intralenticular Ozurdex implant. *Eye* 2014;28(12):1523-4.
- Meyer CH, Rodrigues EB, Michels S, *et al.* Incidence of damage to the crystalline lens during intravitreal injections. *J Ocul Pharmacol Ther* 2010;26:491-5.
- Meyer CH, Klein A, Alten F, *et al.* Release and velocity of micronized dexamethasone implants with an intravitreal drug delivery system: Kinematic analysis with a high-speed camera. *Retina* 2012;32:2133-40.
- Chhabra R, Kopsidas K, Mahmood S. Accidental insertion of dexamethasone implant into the crystalline lens-12 months followup. *Eye (Lond)* 2014;28:624-5.