Successful phacoemulsification with intravitreal relocation of an intralenticular dexamethasone implant

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We report a case in which a dexamethasone implant (Ozurdex) that had been injected by accident was recovered and relocated from the crystalline lens to the vitreous. Low-vacuum low-infusion phacoemulsification was performed to prevent posterior capsule rupture. An intraocular lens was placed in the bag. The fragments of the dexamethasone implant were inserted intravitreally via the pars plana through a 23-gauge microcannula. Vitrectomy was not required. The therapeutic effect of the relocated implant was noted after the procedure.

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Intravitreal delivery of drugs is a common ophthalmic procedure for a variety of vitreoretinal diseases.1,2 Iatrogenic posterior lens capsule penetration during intravitreal injection is a rare complication (0.009%) that may lead to significant anatomical and visual consequences.3 Technical modifications for effective cataract surgery in cases of inadvertent capsule penetration have been described; however, in most of the cases, intraoperative posterior capsule disruption with vitreous presenting in the anterior chamber was noted.4–9 Moreover, incorrect administration of the drug into the lens capsular bag may decrease the therapeutic effect of these expensive drugs, and thus recovery and repositioning of the implant into the vitreous cavity in the same session has been attempted.9 We report the recovery and relocation of a dexamethasone implant from the crystalline lens to the vitreous via the pars plana, maintaining the posterior lens capsule integrity.

CASE REPORT

An 81-year-old woman was referred to our center after failed intravitreal dexamethasone (Ozurdex) injection in the right eye 5 days earlier. The medical history was unremarkable. The ophthalmic report from the patient’s ophthalmologist indicated that the right eye had been treated with panretinal laser photocoagulation and a previous injection of dexamethasone for an ischemic central retinal vein occlusion with cystoid macular edema (CME); the response had been good. In the seventh month of follow-up, an increase in central macular thickness from 295 μm to 515 μm and a decrease in corrected distance visual acuity (CDVA) from 20/160 to 20/200 were noted and a second dexamethasone injection was therefore indicated. During the injection, the surgeon noticed that the implant was inserted into the lens.

At the initial examination in our center, the CDVA was 20/200 in the right eye and 20/30 in the left eye. Slitlamp examination of the right eye showed a quiet anterior segment with a dense white intralenticular implant inside the lens body (Figure 1). The lens opacity was nuclear opalescence (NO) 3, cortical cataract (C) 3 in the right eye and NO2, C2 in the left eye (Lens Opacities Classification System III). Fundoscopy of the right eye showed a pre papillary vascular anastomosis, panretinal laser photocoagulation, and CME. Optical coherence tomography (OCT) showed right macular cysts.
with a central macular thickness of 521 μm (Figure 2). The intraocular pressure (IOP) was 14 mm Hg in both eyes. The left-eye examination was consistent with the patient’s age.

Four weeks later, the CDVA in the right eye remained 20/200 and a slight fibrosis was detected around the posterior capsule tear, but the macular status had not changed. One month later, the patient complained of subjective vision loss in the right eye and the CDVA was counting fingers at 1 meter. Dense nuclear and cortical lens opacities disturbing the macular OCT scan and fundoscopy were noted. Cataract surgery in the right eye was proposed.

**Surgical Technique**

A 23-gauge vitreoretinal microcannula was inserted at the temporal inferior pars plana. Gentle in situ low-vacuum low-infusion phacoemulsification was performed. Vancomycin and gentamicin were added to the intraocular irrigating solution. Hydrodelamination was performed carefully to reduce the risk for posterior capsule blowout after gentle decompression. The dexamethasone implant was thinned and fragmented into 3 pieces without direct manipulation. Special care was taken to avoid aspiration of the dexamethasone implant pieces during the procedure. Gentle depression of the posterior lip of the main incision while the ophthalmic viscosurgical device was injected led to expression of the dexamethasone pieces without direct manipulation. The lens remnants were aspirated, and a foldable single-piece intraocular lens (IOL) was implanted in the capsular bag. Each of the 3 implant pieces was inserted easily through the microcannula and pushed into the vitreous with air (Figure 3; Video 1).

One month later, the CDVA had improved to 20/80. Pseudophakia with a well-centered IOL and a clear central posterior capsule was observed. The CME had lessened, with a central macular thickness of 240 μm (Figure 2). It was noted that the implant pieces in the peripheral vitreous were disintegrating. At 3 months, small recurrent macular cysts were noted and the CDVA had decreased to 20/100. The implant pieces had almost completely disappeared, and the IOP was 12 mm Hg. At 4 months, the macular cysts were slightly enlarged and the CDVA was 20/120. A dexamethasone injection was performed uneventfully.

The patient has been followed for 12 months. At the last examination, OCT showed the macula was dry and the CDVA was 20/100. Posterior lens capsule opacification had not developed.

**DISCUSSION**

Lens injury during intravitreal injections may be inadvertent. Thus, the rate of posterior capsule injury with intravitreal injections may be higher than expected.3 Accelerated cataract formation with a visible tear or the track of the needle may be noted on the posterior...
lens capsule. Surgical technique modifications similar to those in traumatic cataract or capsule blowout have been reported in those circumstances.

The accidental injection of steroids in the crystalline lens may be noticed immediately in the operating room and may result in cataract and ocular hypertension. In the case we present, IOP increase was not detected, probably because the dexamethasone had not spread into the anterior chamber.

Unsuccessful administration of a corticosteroid implant means not only significant crystalline damage, but also significant economic waste (roughly $1300 per single dose). The dexamethasone implant undergoes only slight biodegradation inside the lens. It is unlikely that the dexamethasone molecule crosses the posterior lens capsule, and thus the effect on macular edema when the dexamethasone implant is inside the lens seems negligible. In this scenario, the main decisions are when to perform cataract surgery and when to administer another retinal treatment.

In cases with traumatic disruption of the posterior lens capsule, phacoemulsification can be performed more safely when fibrosis appears, covering the defect. This takes roughly 2 months. We believe that in cases in which the dexamethasone implant is placed in the lens body and there is no need for early surgery (eg, uncontrolled ocular hypertension or inflammation, retinal detachment, no fundus view), it is preferable to wait 1 to 2 months to reinforce the posterior capsule. However, if the posterior capsule is weak, low-flow parameters should be used for phacoemulsification and vitrectomy should be considered.

In a previous report, the dexamethasone implant was recovered from the crystalline lens and relocated to the vitreous, as in our case. The therapeutic effects were preserved, but the fragmented implant pieces may dissolve faster.

To our knowledge, this is the first case in which posterior capsule integrity could be maintained and the IOL placed in the bag without requiring an anterior vitrectomy. This may be significant in eyes with macular edema or uveitis because posterior lens capsule rupture is associated with a higher risk for macular edema to develop or worsen. Also, placing an IOL in the sulcus instead of in the capsular bag may lead to a refractive shift and the risk for uveitis.

Initial insertion of a 23-gauge vitreoretinal microcannula facilitates a posterior vitrectomy approach in cases of posterior capsule blowout with lens fragments posteriorly dislocated. The dexamethasone implant fits through a 23-gauge microcannula. For easy insertion of implant pieces, the valves can be removed or nonvalved microcannulas used. Air injection can be used to keep the pieces inside the vitreous cavity.

In conclusion, we present a case of successful phacoemulsification with relocation of an intralenticular dexamethasone implant from the crystalline lens to the vitreous cavity. Fibrosis occurred at the posterior lens capsule and enabled uneventful cataract surgery. The relocated dexamethasone implant maintained the

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**Figure 3.** Surgery for recovery and relocation of an intralenticular dexamethasone implant. A: A 23-gauge microcannula is inserted via the pars plana. B: Low-vacuum low-infusion phacoemulsification is performed to avoid aspirating the implant fragments. C: Gentle depression of the posterior lip of the main incision while the ophthalmic viscosurgical device is injected leads to expression of the implant pieces. D: The pieces are inserted through the microcannula.
therapeutic effects, although the effects decreased more quickly than expected.9,14

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