Case Report

Case of Reposition of an Intralenticular Dexamethasone Implant into Berger’s Space

We report the case of a 70-year-old woman who underwent treatment in our clinic and who complained of a severe decrease in vision in her right eye. Five days earlier, an intravitreal dexamethasone implant (Ozurdex) had been injected for the treatment of a central vein occlusion. The slit-lamp examination showed the implant had penetrated the posterior lens capsule and was located in the nucleus of the lens. Cataract removal, repositioning of the implant into Berger's space through posterior capsulorhexis are described. Also, cases of repositioning of the dexamethasone intralenticular implant into Berger's space are described.

Ozurdex (Allergan, Inc.) is an intravitreal implant containing 0.7 mg of dexamethasone; it is 0.46 mm in diameter and 6.0 mm in length. The intravitreal injection of Ozurdex is an increasingly popular solution to treat macular edema secondary to retinal vein occlusion, diabetic macular edema, postsurgical macular edema and uveitis [1]. It is usually implanted into the vitreal space through the wall of the eye. This biodegradable device is indicated for the treatment of noninfectious uveitis, occlusion of central retinal vein or its branch, and diabetic macular edema. An Intravitreal Injection (IVI) can be used to treat complications. The most common adverse effects of IVIs include discomfort or pain at the injection site, subconjunctival hemorrhage, and temporarily elevated IOP. Other ocular complications include the development of floaters, vitreous or subretinal hemorrhage, retinal toxicity, retinal detachment, central artery occlusion, corneal abrasion, subconjunctival bleb, uveitis, and lens opacification due to corticosteroid injection. The most serious complications of IVI include endophthalmitis, which can result in visual loss and even the need for enucleation [2].

Case Report

A 70-year-old woman attended our clinic complaining of a severe vision decrease in her right eye. She made it clear that she started to experience a decrease in vision six weeks ago, which was associated with central vein occlusion. One week earlier, an intravitreal dexamethasone implant had been injected. No complications were reported.

On presentation, visual acuity was 4/200 in the right eye and 120/200 in the left eye. Intraocular pressure (IOP) was 15.0 mm Hg in the right eye and 16.0 mm Hg in the left eye, respectively. There were no changes in the anterior segment of the eye: the cornea was clear, the depth of the anterior chamber...
of the eye had an average value; the pupil was of normal size, round and reactive to light. The slit-lamp examination of the lens showed the presence of the dexamethasone implant in the space of the lens. There was no trauma observed regarding the capsular bag of the lens; however, we supposed that it was implanted in the lens through its equator or the posterior capsule (Figure 1A). Ophthalmoscopic examination showed changes in the retina and retinal vessels associated with central vein occlusion (Figure 1B). Optical Coherent Tomography (OCT) showed features of central vein occlusion and macular edema (Figure 1C).

We supposed that a cataract had developed and decided to perform phacoemulsification and repositioning of dexamethasone implant into the vitreous space through any posterior capsule rupture of the lens.

**Patients and Methods**

Combined surgical procedure – phacoemulsification with implantation of Ozurdex into Berger’s space – was performed in 18 patients.

**Surgery Stages**

We performed anterior capsulorhexis and hydrodissection of the nucleus of the lens. We performed hydrodissection very gently and slowly to avoid any rupture of the posterior capsule.
capsule of the lens. After nucleus mobilization, we performed phacoemulsification with low parameters of irrigation and vacuum on the stable parameters of IOP to maintain a stable anterior chamber and avoid stress and rupture of the posterior capsule of the lens. Special attention was paid to preventing aspiration of the dexamethasone implant during phacoemulsification; we tried to keep it at a suitable working distance of the phaco machine handpiece, but when the implant became mobile, it was unexpectedly aspirated into the phaco machine handpiece. When we turned on reflux, it exited and was split into three pieces (Figure 2, A,B). We finished the aspiration of cortical masses. Examining the posterior capsule of the lens did not show any injury to the posterior capsule of the lens (Figure 2C), that is why posterior capsulorhexis was performed (Figure 2 D). Through posterior capsulorhexis, three pieces of Ozurdex were implanted into Berger's space without any damage to the anterior hyaloid membrane (Figure 2E). The IOL was then fixed in the capsular bag without any complication (Figure 2F).

On postoperative day 1, the IOL remained well centered in the capsular bag, the anterior segment was quiet, and visual acuity was 10/100. The dexamethasone implant was visualized in Berger's space, behind the IOL, and the patient did not report a decrease in vision. For a period of 3 weeks after surgery, the anterior segment of the eye remained quiet, the IOL position was stable, IOP was 14-16 mm Hg. Within six weeks, ophthalmoscopy showed a decrease in retinal hemorrhage, the OCT examination showed reduction in macular thickness and macular edema (Figure 3A).

Discussion

Injury to the crystalline lens and repositioning of the dexamethasone implant Ozurdex in it had been reported as a complication of intravitreal injection. Risk of injury of crystalline lens during intravitreal injection was 0.009% [3]. We report a rare case of dexamethasone implant injection, a common procedure in ophthalmic practice. Both in Ukraine...
and Europe, the dexamethasone implant injection is usually used for the treatment of macular edema secondary to retinal vein occlusion, diabetic macular edema, postsurgical macular edema and uveitis [1]. The main reason for the development of the complication that we reported was that the applicator needle was not perpendicular to the scleral surface during injection, so the dexamethasone implant was injected into the crystalline lens [4]. Our decision to perform early phacoemulsification allowed preventing opacification of the lens of the eye and cataract development. Posterior capsulorhexis and injecting pieces of the dexamethasone implant into Berger's space allowed obtaining a good result in the treatment of retinal complications. There was a risk of a negative treatment effect of dexamethasone implant injection caused by the wrong position of the implant in Berger's space (the correct position of it is in the intravitreal space) and splitting the implant into three pieces during cortical mass aspiration. However, repositioning of the implant into Berger's space resulted in a favorable therapeutic effect with a good anti-inflammatory and anti-edema response. Some authors have described the efficacy of Ozurdex even in cases with its intralenticular position [5].

A few authors have described accidental intralenticular injection as a complication of Ozurdex implantation. In most cases, surgeons performed intravitreal implantation through the injured posterior capsule of the lens [4,6,7]. Occasionally, it is possible to leave Ozurdex in the crystalline lens intact [8]. In some cases, if the posterior capsule is undamaged, it is possible to leave Ozurdex intralenticular intact, and remove it within a period of 85 days after injection [5]. In our opinion, there is a need to perform phacoemulsification as soon as possible.

Gaining such a practical experience allowed us to perform Ozurdex implantation into Berger's space under general conditions.

In patients with cataract associated with posterior segment pathology of the eye such as noninfectious uveitis, occlusion of retinal vein and diabetic macular edema, combined phacoemulsification with traditional Ozurdex implantation is usually performed [9,10]. Using our experience, we performed combined surgical procedures -phacoemulsification with posterior capsulorhexis and repositioning of the dexamethasone implant into Berger's space. We have thus performed 18
Patients and Methods

All patients who underwent combined phacoemulsification with Ozurdex implantation into Berger’s space from September 7, 2017 through November 27, 2018 in Visiobud-Plus Clinic were engaged in the study. The study was conducted following the recommendations of the Declaration of Helsinki. The surgical pathway from preoperative assessment to the day of surgery and postoperative visits was standardized for all patients.

Surgical Technique

After standard phacoemulsification, we performed posterior capsulorhexis (Figure 4A). We then inserted the injector and implant Ozurdex into the anterior chamber (Figure 4B).

Very gently, using heavy viscoelastics, we administer the implant into Berger’s space. The next step is IOL implantation within the capsular bag (Figure 4C).

| Case N | Gender | Diagnosis | Macular thickness (μm) | Corrected visual acuity | IOP |
|--------|--------|-----------|------------------------|------------------------|-----|
|        |        |           | Preop | Postop | Preop | Postop | Preop | Postop |
| 1       | F      | DME       | 597   | 398    | 10/200 | 40/200 | 13    | 16     |
| 2       | F      | RVO       | 712   | 561    | 20/200 | 40/200 | 19    | 15     |
| 3       | F      | RVO       | 947   | 498    | 5/200  | 20/200 | 17    | 16     |
| 4       | F      | RVO       | 950   | 445    | Pr.l.certa | 5/200 | 21    | 20     |
| 5       | F      | DME       | 587   | 287    | 10/200 | 80/200 | 12    | 17     |
| 6       | F      | DME       | 350   | 280    | 80/200 | 140/200 | 17    | 21     |
We did not detect any complications during or after surgery, including vitreous loss. It was described by incidences of Ozurdex migration into the anterior chamber of the eye [2]. In all cases, we made small posterior capsulorhexis (less than 3 mm) and performed IOL implantation. We did not observe migration of the implant into the anterior chamber when such a technique was used. The implant position remained stable and did not cause visual disorders. The implant position was in the inferior segment of Berger’s space and it was not visible on the narrow pupil. Mostly, patients did not notice their implant in the visual field. The treatment effect in all cases was similar to that of the traditional method of implant injection.

Our method of implantation has some advantages over the traditional one. The scleral wall remains undamaged; lens extraction prevents cataract development; there was no secondary ophthalmic hypertension and glaucoma development.

Surgeons should be informed about the risk of injury of the capsule of the lens if the dexamethasone implant is injected. In cases of damage to the capsule of the lens, early phacoemulsification is considered the best choice. The dexamethasone implant can be injected repeatedly into the vitreous space through the posterior capsulorhexis. Our decision in such cases is to try to implant the device into Berger’s space.

Combined surgical procedure – phacoemulsification and injecting the dexamethasone implant Ozurdex through posterior capsulorhexis into Berger’s space is the operation of choice for patients with cataract. It allows keeping the scleral wall of the eye undamaged and reduces risks of endophthalmitis and complications of the vitreous.

References

1. Macles A, Dot C, Voirin, N, Vie AL, Agard E, et al. (2017) Safety of intravitreal dexamethasone implant (Ozurdex).

Retina 37: 1352-1359.

2. Peyman, GA, Lad EM, Moshfeghi DM (2009) Intravitreal injection of therapeutic agents. Retina 29: 875-912.

3. Khurana RN, Appa SN, McCannel CA (2014) Dexamethasone Implant Anterior Chamber Migration. Ophthalmology 121: 67-71.

4. Munteanu M, Rosca C (2013) Repositioning and follow-up of intralenticular dexamethasone implant. J Cataract Refract Surg 39: 1271-1274

5. Kurt A, Durukan AH, Kucukevilioglu M (2019). Accidental intralenticular injection of Ozurdex for branch retinal vein occlusion: intact posterior capsule and resolution of macular edema. Case Rep Ophthalmol Med 23:8630504

6. Meyer CH, Rodrigues EB, Michels S, Menzel S, Schmidt JC, et al. (2010) Incidence of damage to the crystalline lens during intravitreal injection. J Ocul Pharamacol Ther 26: 491-495.

7. Koptun MI, Klymenko VV, Sardaryan VV, Koptun NM (2018). Accidental intralenticular injection of dexamethasone intravitreal implant during the treatment of refractory diabetic macular oedema. J Ophthalmol (Ukraine) 481: 67-69.

8. Poomachandra B, Kumar V, Jayadev C, Dorelli SY, Yadav NK, et al. (2017) Immortal Ozurdex: a 10-month Follow-up of an intralenticular implant. Indian J Ophthalmology 65: 255-257.

9. Agarval A, Gupta V, Ram J, Gupta A (2013) Dexamethasone intravitreal implant during phacoemulsification. Ophthalmologica 120: 211-211.

10. Calvo P, Ferreras A, Al Adel F, Bangsboon W, Brent M (2018) Effect of an intravitreal dexamethasone implant on diabetic macular edema after cataract surgery. Retina 38: 490-496.