Acta Scientific Ophthalmology (ISSN: 2582-3191)

Volume 5 Issue 9 September 2022

Case Report

Urrets Zavalia Syndrome and Cataract After Implantable Collamer Lens Implant in Previous Posner-Schlossman Syndrome

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DOI: 10.31080/ASOP.2022.05.0571

Received: August 11, 2022

Published: August 24, 2022

Abstract

Introduction: Implantable collamer lens (ICL) implantation is a predictable type of refractive surgery to moderate to high refractive errors. Urrets-Zavalia Syndrome (UZS), first described as a fixed and dilated pupil following penetrating keratoplasty in patient receiving atropine, is now considered a complication of any surgical manipulation of anterior segment.

Patient and Clinical Findings: We reported a case of a female patient affected by bilateral high myopia, who developed UZS and subcapsular cataract after ICL implant in her left eye (LE). This last suffered of Posner-Schlossman syndrome (PS) 6 years before without sequelae.

Diagnosis, Intervention, and Outcomes: A fixed dilated pupil not responsive to dapiprazol was noted in absence of corneal edema or rise of IOP in LE after uncomplicated ICL implant; UZS was therefore diagnosed. Two months later, a second surgery for ICL removal, phacoemulsification and artificial intraocular lens implant was performed for cortical cataract development. The uncorrected distance visual acuity (UDVA) one month after surgery was of 20/20.

Conclusions: Very few cases of UZS have been described after ICL implantation. We supposed a mechanism of a suffering iris tissue from the previous PS and inflammatory reaction to the intraoperative fluid exchange which lead to cataract development as well.

Keywords: Urrets-Zavalia Syndrome; Posner-Schlossman Syndrome; Implantable Collamer Lens; Refractive Surgery; Cataract Surgery

Introduction

Urrets-Zavalia syndrome (UZS) was initially described as a fixed and dilated pupil following penetrating keratoplasty (PKP) for keratoconus in patients who received mydriatics. Etiopathogenesis is still not clear, but it can be due to an acute increase of intraocular pressure and iris ischemia and atrophy. Fixed and dilated pupil also occurs in association with other ophthalmic surgery, as well as in patients who didn't receive mydriatics or not affected by keratoconus. UZS is so nowadays considered as a spectrum goes from an isolated dilated pupil to multiple posterior synechiae and secondary glaucoma after ocular surgeries [1].

Posterior chamber intraocular lens (P-IOL) implantation is a refractive surgical technique to manage moderate to high refractive errors. It's considered a safe and predictable intervention, and complications as subcapsular anterior cataract, Toxic Anterior Segment Syndrome (TASS) or UZS are relatively uncommon. Implantable collamer lens (ICL) technology is available since 1993 and the last generation, available since 2011, is actually the only

P-IOL approved by FDA [2,3]. The collamer is a synthetic material made of 60% poly-hydroxymethylmethacrylate (HEMA), water (36%), and benzophenone (3.8%) and 0.2% porcine collagen. Last generation lenses have a central hole (KS-Aquaport) to allow physiologic aqueous circulation, avoiding so the need for a prophylactic Nd:YAG laser iridectomy [4].

Case Report

A 26-years-old woman affected by high myopia in both eyes was keen for refractive surgery. Her refraction was of -10.75 in right eye (RE) and -9.25 in left eye (LE). Corrected distance visual acuity (CDVA) was 20/20 for each eye before surgery. Her central corneal thickness (CCT) was 513 micron in RE and 514 micron in LE; pupil size was 6.5 mm in scotopic and 4 mm in fotopic condition in both eyes; IOP was 14 mmHg in both eyes. The patient suffered from Posner-Schlossman Syndrome in her LE 6 years before, treated with topical therapy and resolved without sequelae. No other ocular or systemic problems was noted in her medical history. There were no contraindications to plan bilateral ICL implant, in two different surgical times. The right eye was the first undergone to surgery: we used intraoperatively solution of tropicamide, phenylephrine and lidocaine (Mydrane) for pupil dilatation and for its anesthetic properties. The surgery was performed under topical anesthesia. The surgery was carried out using the standards materials recommended by STAAR manufactures (Metilcellulosa viscoelastic and 3.2 mm knife). After pupil dilatation the P-IOL was implanted through a 3.2 mm temporal incision. After viscoelastic removal and cefuroxime (Aprokam) injection into anterior chamber the surgery was ended checking the keratocentesis leakage and the intraocular pressure. The surgical procedure was uncomplicated. The post-operative period was regular and uncomplicated as well, and the uncorrected distance visual acuity (UDVA) was 20/20 after two post-operative days.

Left eye, operated after 15 days using the same surgical protocol of the RE, had regular intraoperative course. Nevertheless, was noted a fixed and dilated pupil 24 hours after surgery (Figure 1 a,b).

The IOP was in the normal range of 16 mmHg, and the patient did not refer any pain or blurred vision but only photophobia. The autorefractometry was +0.25; UDVA was 20/25; CDVA was 20/20 with pinhole. The pupil of her LE was unresponsive to light and to dapiprazole 0.5% eye drops (Glamidolo) twice daily.

Figure 1: a, b. Fixed and dilated pupil 24 hours after ICL implantation in left eye. Note the correct lens vault.

6 weeks after surgery, the pupil was still fixed and dilated and unresponsive to dapiprazole, but the patient referred worsening of the blurred vision: an anterior and posterior cortical cataract was diagnosed (Figure 2 a,b). The UDVA was 20/30 unimprovable with glasses or pinhole.

Figure 2: a, b. Development of anterior and posterior subcapsular cataract 6 weeks after surgery.

For the blurring of the vision, we decided to perform a second surgery, with ICL removal and the phacoemulsification of the cataract with IOL implantation in the bag. Surgery was made 8 weeks after first surgery. Two service access of 1.2 mm superior and inferior and a 2,2 mm temporal corneal incision in clear cornea were performed. The ICL was first dislocated into the anterior chamber and grabbed by one tip. Then it was explanted with the use of two Kelman - Mcpherson forceps (bimanual technique). Then the phacoemulsification was performed after methylene blue - assisted capsulorhexis (brio blue dye). The capsulorhexis was particularly complicated due to the swelling of the lens, in fact we had a rhexis escape which did not prejudiced the rest of the surgery. Posterior capsule was present even if it was difficult to recognize for its transparency at the end of the cataract removal, so an acrylic one-piece IOL was implanted in the bag and the viscoelastic material was accurately removed with infusion of balanced salt solution (Figure 3). After one month, the UDVA of the patient was 20/20 and the pupil size was slowly returning regular and responsive.

Figure 3: Correct IOL implantation demonstrated by AS-OCT.

Discussion

The pathogenetic mechanism of UZS is still undefined. Two possible mechanism have been proposed: iris ischemia and increase of IOP. The absence of IOP rise after surgery and the history of previous Posner-Schlossmann syndrome reported by the patient, lead us to hypotize iris ischemia as the main mechanism involved.

Moreover, our case seems to confirm the Jastaneiah theory who described two different manifestations of UZS: a fixed and dilated pupil in a quiet eye with or without a documented rise of the IOP, or on the other hand in an eye with congested conjunctiva and inflammatory reaction in anterior chamber [5].

For the best of our knowledge, only 7 case of UZS after phakic intraocular lens implantation have been described, 5 of whom implanted in posterior chamber.

Only one of these seven cases showed a normal IOP, like our case, while 6 of these 7 showed a rise of IOP, 4 of whom in the first postoperative day and one of seven even in the first hour post-operative, with a complete normalization of the IOP in the first 24 hours. It's furthermore the first association between cataract and UZS reported after ICL implantation [6].

As far as we know our case is the first to describe a suspected UZS development in eye previously affected by PS syndrome after P-IOL implant.

The develop of subcapsular anterior cataract is a rare but well-described complication after ICL implantation, due to the contact of lens or intraoperative touch when the ICL vaulting is inferior to 150 micron [7]. However, in our case, the vaulting of the ICL was 284 micron (Figure 1).

Nevertheless, we found an anterior and posterior subcapsular cataract that could be related to an oxidative unknown origin [8]. Our hypothesis can be a greater oxidative stress due to an incorrect aqueous humor circulation leading to a staining of toxic metabolite that can be greater in eyes which suffered of PS Syndrome.

Conclusion

In conclusion, although the absence of a clear direct cause, a suffering iris tissue derived from a previous Posner-Schlossman syndrome, can explain the onset of syndrome.

Patients affected by PS Syndrome and who think to have p-IOL implant should be so carefully informed of such a complication, that could be resolved only performing a second surgery of ICL removal and phacoemulsification with IOL implant.

Conflict of Interest

The Authors declare that there is no conflict of interest.

Acknowledgements

The Authors thank Ministero della Salute – Ricerca Corrente 2022 for the financial support as open access.

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