



Case Report

Chronic Deposits on Implantable Collamer Lens after Surgery

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Abstract

Introduction: we reported a rare case involving chronic ICL V4c deposits after surgery without any other clinical manifestations. The deposits was found one month after surgery, and last about six weeks. After using topical steroid, the deposits were removed gradually. **Patient and Clinical Findings:** A 24-year-old female presented with granular opacity of implantable collamer lens (ICL) from one month after surgery (OS). There were no other inflammatory responses in the anterior segment of the eye. **Diagnosis, Intervention, and Outcomes:** The patient was diagnosed as chronic deposits on implantable collamer lens after surgery. After using 1% Prednisolone Acetate Eye Drop, the deposits were removed gradually. **Conclusions:** After ICL surgery, it is very uncommon for the chronic deposits to form on the ICL surface. Topical steroids was effective to help eliminate the deposits.

Keywords: ICL; Chronic; Deposits

Abbreviations

ICL: Implantable Collamer Lens

OVD: Ophthalmic Viscoelastic Device

VA: Visual Acuity

AS-OCT: Anterior Segment Optical Coherence Tomography

IOP: Intraocular Pressure

HPMC: Hydroxy Propyl Methyl Cellulose

IOL: Intraocular Lens

TASS: Toxic Anterior Segment Syndrome

Introduction

After implantable collamer lens (ICL) surgery, it is very uncommon for the deposits to form on the ICL surface. To the best of our knowledge, this is the first case report involving chronic ICL V4c deposits after surgery without any other clinical manifestations.

Patient Consent Statement: patient herself provided consent and that consent was obtained in writing.

Case Report

Preoperatively, her uncorrected distance visual acuity (UCVA) was left eye (OS) 1/100, which improved to 20/20 with a refractive correction of OS $-9.00DS/-0.50 DC \times 170^\circ$. The examination of the anterior segment and fundus showed normal results. The patient underwent uneventful implantation of ICL-V4c (Staar company). The surgical procedure was smooth with a type of ophthalmic viscoelastic device (OVD) known as iviz, which is 1.7% medical sodium hyaluronate gel (Bausch & Lomb Surgical, PH 6.8 to 7.6) used.

One day after surgery, the visual acuity (VA) was 30/50 in the left eye. There were no conjunctival congestion or corneal edema. The anterior chamber was clear. The patients experienced diffuse corneal epithelial punctate erosion all over the cornea. The vault measured on an anterior segment optical coherence tomography (AS-OCT) was $240\mu\text{m}$ for the left eye. The intraocular pressure (IOP) on non-contact tonometry was 11mmg (OS). The patient was prescribed Tobramycin and Dexamethasone Eye Drops (gradually stopped within one week), Dextran and Hypromellose Eye Drops, and Diauafosol Dodium Eye Drops.

One month after surgery, the VA was 30/50. Corneal epithelial punctate erosion still existed, and mild ICL opacity occurred.

Two months after surgery, the VA declined to 20/50. The granular opacity dispersed throughout the ICL on both the anterior and posterior surface. There were no conjunctival or ciliary congestion. The assessment of the anterior segment and fundus revealed unremarkable findings.

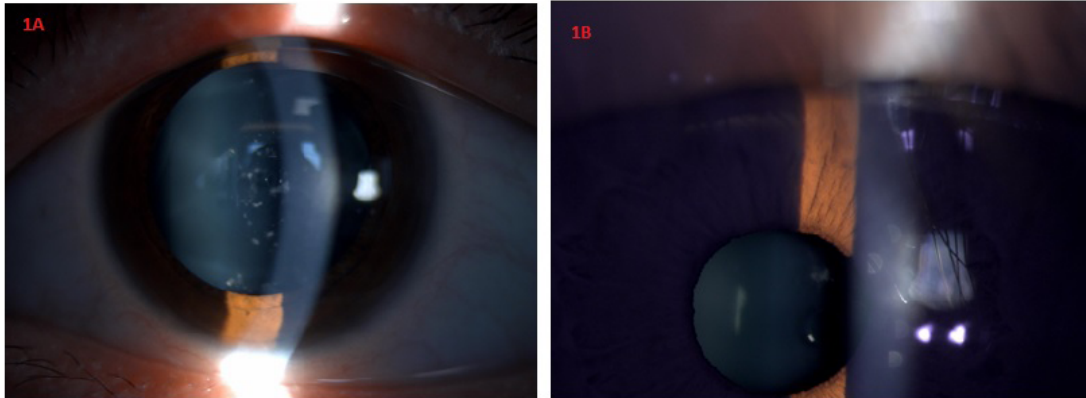


Figure 1: A) Slitlamp photography of the left eye showing granular opacity throughout the ICL; B) Pentacam Scheimpflug image of the left eye showing the granular opacity dispersing on the anterior and posterior surface of ICL.

Diagnosis, Intervention, and Outcomes

The patient was diagnosed as chronic ICL deposits. Topical steroids was used (1% Prednisolone Acetate Eye Drop three times a day, and tapered slowly within one month). After using the 1% Prednisolone Acetate Eye Drop, the deposits were removed gradually. Six weeks later, the UCVA OS was 20/20, cornea was clear, IOP was 14mm Hg. The granular opacity on the ICL surface disappeared completely and ICL regained transparency completely.

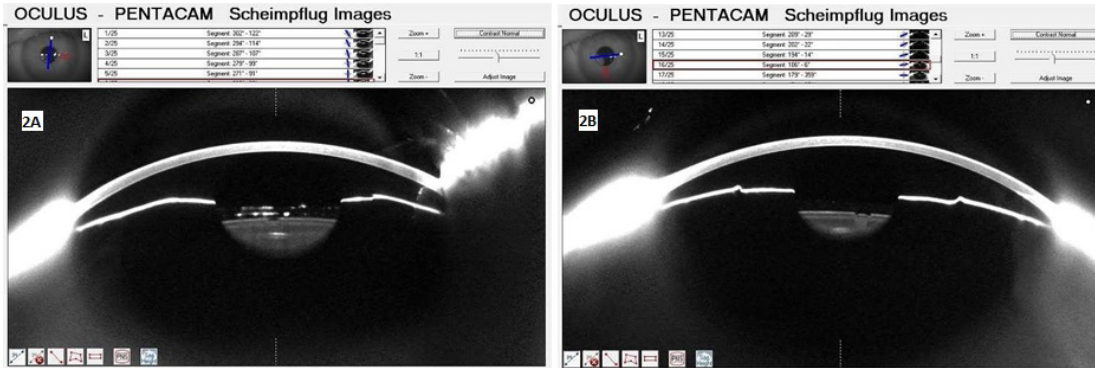


Figure 2: The Slitlamp photography; A) and Pentacam Scheimpflug image; B) of the left eye showing transparent ICL.

Case summary

A patient with a refractive correction of OS $-9.00DS/-0.50 DC \times 170^\circ$ underwent uneventful ICL surgery. One month after surgery, the deposits accumulated on the surface of the ICL, both anterior and posterior. The VA decreased. The 1% Prednisolone Acetate Eye Drop was used, and the deposits were removed gradually.

Discussion

Upon thorough review of literature, only one study reported ICL (V4) inflammatory deposits one month after surgery, where all patients underwent peripheral iridectomy intraoperatively, and Hydroxypropyl methylcellulose (HPMC) was used as OVD. The authors suggested that the form of the deposits was related to the use of HPMC, and that the peripheral iridectomy increased the anterior reaction, which contributed to the formation of the ICL inflammatory deposits [1].

The differential diagnosis for the ICL deposits included the possibility of the ICL becoming opaque due to mechanical injury to the lens during surgery. If the lens was damaged, the opacity would be more likely to occur at the site of the damage (usually the location

where forceps were applied). However, in this particular case, the opacity did not follow this pattern. Therefore, we ruled out the possibility of ICL damage and decided to defer the operation for ICL extraction or exchange.

The diagnosis of a chronic infection was also ruled out. In the majority of cases, chronic infections are caused by *Cutibacterium acnes* [2], which typically present with floaters, blurry vision, redness, ocular pain, and prolonged anterior chamber cells [3]. However, in this case, there were no signs of infectious inflammatory response in the anterior segment structure of the left eye during the entire course of the illness. Therefore, postoperative infectious complications were also ruled out.

The exact cause of the fibrinous reaction that occurs after surgery is not well understood, but it appears to be related to inflammation and impairment of the coagulation and fibrinolytic processes, which leads to the disruption of the blood-ocular barrier [4]. This fibrinous exudation occurs in less than 3% of cases after a regular cataract extraction and intraocular lens (IOL) implantation, but in the pediatric age group, the percentage rises to approximately 30% [5]. In comparison to cataract surgery, the ICL surgery method has a minimal effect on the anterior chamber and induces a milder anterior chamber response.

Only very few cases of Toxic Anterior Segment Syndrome (TASS) involved fibrinous exudation in the anterior chamber after ICL surgery [6-9]. TASS frequently developed one day after the procedure. Li L [6] reported two rare cases of late-onset TASS, which occurred one week after V4c ICL implantation. The most commonly reported signs were decrease of vision, corneal edema, anterior chamber reactions and hypopyon with a rise of IOP. In our case, there were no anterior chamber reaction, no cornea edema, no IOP rise throughout the disease period, and the onset time point was one month after the surgery, which ruled out the diagnosis of TASS.

Regarding the corneal epithelial defects observed in the first month, it is possible that they were caused by the use of Povidone-iodine. In our procedure, we performed conjunctival sac irrigation using 5% Povidone-iodine for 20 seconds while the cornea was covered by OVD. We then washed away the Povidone-iodine with a significant amount of Balanced Salt Solution. It is possible that the corneal epithelial cells were damaged during this stage.

After ICL surgery, it was possible for the chronic deposits to form on the ICL surface even from one month after the surgery on. Topical steroids was effective to help remove the deposits.

Ethical Approval

The procedures of this study followed the tenets of the Declaration of Helsinki. This retrospective analysis of patient data was deemed exempt from the need for ethical approval, in line with both local and national regulations.

Consent

The patient has given her written informed consent to publish this case report.

Data availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Conflicts of interest

There were no financial and proprietary interest to disclose, and there were no public and private support to disclose.

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Authors' Contribution

Xia Li prepared the manuscript and was the corresponding author. Jinfeng Cai was the co-author.

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