Acute anterior uveitis in a patient with a phakic intraocular lens

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A 23-year-old woman presented with sudden-onset redness, pain, and diminution of vision in her right eye 1 year after implantation of an Implantable Collamer Lens phakic intraocular lens (pIOL) in both eyes. Anterior chamber reaction (3+), an inflamed membrane on the anterior surface of the pIOL, and filliform posterior synechiae were present. Idiopathic acute anterior uveitis was diagnosed after systemic association was ruled out. The patient was started on topical steroids and cycloplegics every 2 hours. On day 3, the inflammation had progressed (anterior chamber cells 4+) despite treatment and the patient presented with a pupillary membrane and miosis. The frequency of topical steroids was increased to hourly and a mydriatic was added to break the pupillary membrane. Resolution began within 3 days of treatment intensification and was complete in 4 weeks.

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Moderate to high myopia (−6.0 to −20.0 diopters [D]) can be surgically corrected by phakic intraocular lens (pIOL) implantation or laser corneal ablation. A recent review of 3 randomized controlled trials concluded that pIOL implantation caused less loss of corrected distance visual acuity at 12 months postoperatively and appeared to produce better contrast sensitivity than did laser excimer surgery in patients with moderate to high myopia.1–3 The Implantable Collamer Lens (Staar Surgical Co.) is a soft, flexible, single-piece design that rests in the posterior chamber sulcus. It is made of a hydrophilic porcine collagen (0.1%)/hydroxyethyl methacrylate copolymer; an ultraviolet light-filtering chromophore is incorporated in the polymer chains. This material is thought to be highly biocompatible and tissue friendly. The combination of the biocompatibility and the lens softness, flexibility, and immobility within the posterior chamber largely explains the minimal inflammatory response observed after implantation of this posterior chamber pIOL.4

Anterior uveitis is the most common form of intraocular inflammation, and its incidence varies in the general populations of countries. Anterior uveitis can be benign at presentation but can also lead to severe morbidity if not treated appropriately.5 The presence of a pIOL in an eye with acute anterior uveitis can further complicate the management. We describe a rare case of idiopathic acute anterior uveitis in a patient with a pIOL, along with the related anterior-segment optical coherence tomography (AS-OCT) findings, and its successful management.

CASE REPORT

A 23-year-old woman who had had bilateral implantation of a pIOL (V4, Staar Surgical Co.) a year earlier at our center presented with symptoms of pain, redness, and blurred vision in her right eye. Before the bilateral procedure, both eyes had had laser peripheral iridectomy. The preoperative refraction was −8.0 −0.5 × 180 in the right eye and −14.0 −0.5 × 180 in the left eye. Ocular and systemic histories were negative for episodes of and risk factors for acute anterior uveitis. The postoperative period was uneventful. Anterior-segment OCT showed vaulting of 452 μm in the right eye and 490 μm in the left eye. On presentation 1 year later, the uncorrected distance visual acuity (UDVA) was 20/120 in the right eye and 20/30 in the left eye. Slitlamp examination of the right eye showed circumciliary congestion, fine keratic precipitates, 3+ anterior chamber cells, an

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inflamed membrane on the anterior surface of the pIOL, and posterior synechiae superonasally (Figure 1). Anterior-segment OCT showed an inflamed membrane on both surfaces of the pIOL with vaulting of 261 μm (Figure 2). The fundus examination was suggestive of myopic changes, as mentioned in the previous records. The chest and sacroiliac joint X-rays were normal; the erythrocyte sedimentation rate was 24 mm/hr (Westergren method).

Prednisolone acetate 1.0% eyedrops were started every 2 hours along with homatropine 2.0% 4 times a day. On the third day of treatment, the patient presented with increased photophobia and congestion in the right eye. On slitlamp examination, 4 anterior chamber cells, a pupillary membrane, and miosis of the pupil were noted (Figure 3). A patent peripheral iridectomy was noted at the 10 o’clock position, and the intraocular pressure (IOP) was 14 mm Hg. The frequency of prednisolone acetate 1.0% eyedrops was increased to every hour along with homatropine 2.0% continued at 4 times a day. In addition, phenylephrine 2.5% was prescribed every 5 minutes for half an hour twice a day. On day 14, the anterior chamber cells had decreased to 1+ and the pupillary membrane started to retract (Figure 4). The dosage of steroids was tapered subsequently. On day 28, the pupillary membrane had disappeared (Figure 5), the UDVA was 20/20, and AS-OCT showed 451 μm vaulting.

DISCUSSION

Anterior uveitis is the most common type of intraocular inflammation and often presents unilaterally with pain or photophobia, circumciliary redness, and anterior chamber cells and flare, as in our patient. A complete history is crucial for correct diagnosis and effective management. Anterior uveitis normally causes reduced vision in its acute stages, but it is the sequelae that have a long-lasting impact.

Our patient had a pupillary membrane known as oclussio pupillae, with formation of synechiae between the iris and the pIOL. Because a patent peripheral iridotomy was performed before implantation of the pIOL, there was no obstruction to aqueous-humor flow and therefore no rise in IOP and no risk for iris bombe formation. The current Visian pIOL model (V4C) has a central hole, which eliminates the need for preoperative iridotomy or intraoperative iridectomy. A similar occurrence of acute anterior uveitis in a patient with an implanted V4C pIOL might have led to different consequences and the need for an emergency peripheral iridectomy.
Phakic IOLs have been associated with surgical complications such as IOP elevation, cataracts, pigment deposits, pupil ovalization, and chronic anterior segment inflammation, but to our knowledge not with acute anterior uveitis. A presentation similar to that of our patient in the immediate postoperative period should raise suspicion of toxic anterior segment syndrome, a sterile inflammation associated with photophobia, pain, and decreased visual acuity. Toxic anterior segment syndrome presents with postoperative inflammation with no obvious cause. It is commonly caused by nonphysiologic factors and often stems from the patient’s reaction to intraocular solutions with abnormal PH, osmolarity or ionic composition and contaminated equipment and/or devices.

In our case, with the intensified treatment, the pupillary membrane disappeared and the pIOL did not adhere to its surroundings despite multiple pigments on its surface. These findings suggest that the collamer material is biocompatible. In the acute inflammatory stage, the vaulting decreased to 261 μm on AS-OCT. This may be attributable to intense miosis and formation of the pupillary membrane on the anterior surface of the pIOL. On remission, the vaulting returned to the original value of 451 μm.

This case highlights that in a pIOL patient presenting with redness or pain, the risk for anterior uveitis (acute or chronic) should always be considered. Detailed review of the medical history and examination of the anterior chamber must be performed. Early diagnosis, quick initiation of treatment, and close follow-up can prevent the patient from long-term sequelae of acute anterior uveitis.

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