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SHORT COMMUNICATION

Spontaneous fracture of an implanted posterior chamber intraocular lens

I. ÇAÇA[1], K. ÜNLÜ[1], Ş. ARI[1], İ. AKŞİT[2]

[1]Department of Ophthalmology, Dicle University Faculty of Medicine, Diyarbakýr
[2]Technological Research and Developing Center, Erciyes University, Kayseri - Turkey

PURPOSE. Spontaneous fracture of an intraocular lens (IOL) haptic is a rare complication of cataract surgery. The authors report a case of spontaneous fracture of an implanted posterior chamber IOL.
CASE. Five years ago, a 12-year-old patient underwent linear lens extraction, posterior capsulotomy, and anterior vitrectomy due to traumatic cataract and received a polymethyl methacrylate (PMMA) biconvex posterior chamber IOL implanted in ciliary sulcus. Five years later, IOL optic was found in anterior chamber with its haptics broken from the optic-haptic junction.
DISCUSSION. The broken haptic was examined with scanning electron microscopy. The fracture site of the haptic was on the optic-haptic junction. The fractured surface had a regular appearance.
CONCLUSIONS. To our knowledge, this is the fourth report of spontaneous fracture of an implanted posterior chamber IOL. (Eur J Ophthalmol 2005; 15: 507-9)

KEY WORDS. Spontaneous fracture, Posterior chamber intraocular lens

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INTRODUCTION

Polymethyl methacrylate (PMMA) posterior chamber intraocular lenses (IOL) have been widely used for years in ophthalmology.

Spontaneous fracture of an IOL haptic is a rare complication of cataract surgery. There are many reports of a spontaneous fracture of anterior chamber PMMA IOL haptics (1-3).

Because of their close proximity to the ocular wall, anterior chamber IOLs are subjected to external forces induced by eye rubbing, eyelid squeezing, and external injury (4, 5), causing microflexions and extensions of the haptics that may result in IOL breakage (6). However, spontaneous posterior chamber IOL haptic breakage is a rare complication and to our knowledge, three cases have been reported in the literature (6-8).

We present a 12-year-old patient who underwent an operation due to traumatic cataract and had spontaneous IOL haptic breakage 5 years later.

Case report

A 12-year-old patient underwent linear lens extraction, posterior capsulotomy, and anterior vitrectomy because of right traumatic cataract and received a PMMA biconvex posterior chamber IOL of 6 mm optic diameter and 13.5 mm overall diameter, which was implanted in ciliary sulcus 5 years ago at our clinic. The patient's visual acuity was 12/20 during the follow-up. IOL was centralized and anterior and posterior segment structures were normal in the postoperative controls. The patient presented to our clinic 3 days ago with visual loss and erythema. There was no history of ocular trauma or excessive physical activity. Ocular examination revealed that visual acuity was counting fingers and intraocular pressure was 13 mmHg. Conjunctiva was hyperemic, cornea was minimally edematous, and endothelial pigment dispersion was present in the biomicroscopic examination. IOL optic with the fracture of both haptics from the optic-haptic junction was found in the anterior chamber. The haptics were not seen

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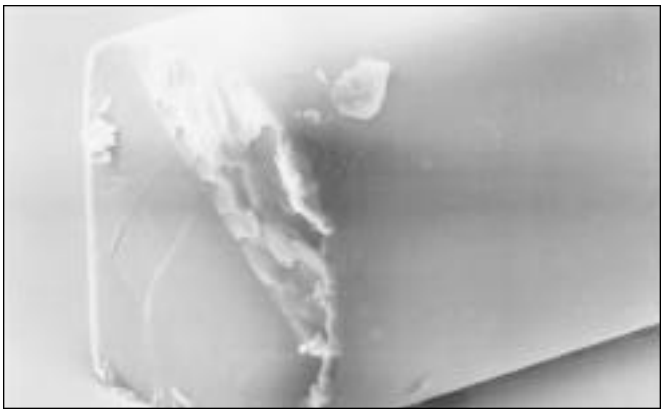

Fig. 1 - Scanning electron microscopic photograph of the broken end of the haptic showing a regular appearance of the fractured surface.

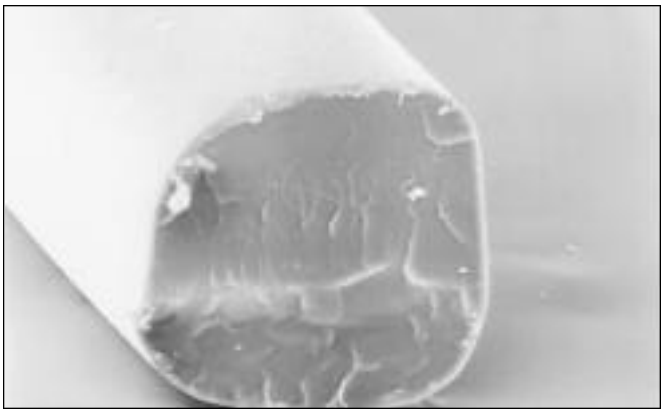

Fig. 2 - Scanning electron microscopic photograph of the second broken haptic, showing a regular appearance of the fractured surface.

in pupillary area. The optic was free in the anterior chamber and moving with the patient's position. Pupil was regular and direct and indirect light reactions were positive. Fundus could not be illuminated and pathology was not determined in ultrasonography.

The broken IOL was removed and a secondary IOL was implanted under general anesthesia. Anterior chamber was reached through scleral tunnel and the broken IOL optic was extracted with the aid of viscoelastic. Haptics were seen under iris, with the view aided by spatula Haptics were extracted with forceps. Posterior capsule was clear at the center and dense at the periphery. Optic axis was open. A PMMA posterior chamber IOL of 6 mm optic diameter and 13.5 mm overall length was implanted. Corticosteroids and mydriatics were used after operation. Corneal edema was resolved 1 week later. The corrected visual acuity was 12/20 1 month after operation.

The broken haptic was examined with scanning electron microscopy. The fracture site of the haptic was on the optic-haptic junction. The fractured surface had a regular appearance (Figs. 1 and 2).

DISCUSSION

Posterior chamber IOLs implanted within capsular bag are well protected against ocular damage (6). Nevertheless, capsular contraction in these IOLs may lead to haptic deformation and IOL decentralization. Some experimental studies in monkeys report haptic fracture of PMMA posterior chamber IOLs due to this compression (9).

Haptic fracture after posterior chamber IOL implantation has been defined in three cases reported in the literature (6-8). Fujishima et al reported haptic fracture 1 week after implantation of foldable IOL in the bag. They related the cause of this complication to defective production of the lens (7). Por and Chee reported spontaneous breakage 3 months after operation in foldable IOLs implanted in ciliary sulcus and a year after operation in foldable IOLs implanted in the bag (8). Eleftheriadis et al detected haptic fracture in a 66-year-old patient who developed corneal decompensation 7 years after PMMA posterior chamber IOL implanted in the bag (6). Haptic breakage occurred in our case 5 years after linear lens extraction, posterior capsulotomy, anterior vitrectomy, and PMMA posterior chamber IOL implanted in ciliary sulcus due to traumatic cataract.

Haptics are affected by forceps used during IOL implantation. Eleftheriadis et al asserted that the cracks due to excessive flexion might then cause spontaneous haptic breakages (6). We did not consider this because we did not encounter any problem related to IOL position during 5 years of follow-up.

In several studies on trauma-related IOL breakages, serious damage has been defined in the ocular structures (5, 10). Finding no serious damage in the patient's intraocular structures led us not to consider a trauma.

A scanning electron microscopy image of the broken haptic shows the swollen appearance of the haptic seen by Park et al (1) in experimentally surgically cut haptics, as well as fine cracks such as the ones seen by Ainsworth and Spencer (11) in a broken haptic caused by excessive flexion. Spontaneously broken haptics of anterior chamber PMMA IOLs studied with scanning electron

microscopy by Park et al (1) and Craig et al (2) have a clear break or sheared appearance. Unlike the appearance of their haptic, Eleftheriadis et al showed multiple facets (6). In our patient, the fractured surface had a regular appearance.

This complication could be related to the accommodative effort, especially when the other eye is phakic. Ciliary muscle activity can cause micromovement at the haptic-optic junction. According to Coleman and Fish's (12) model of accommodation, ciliary muscle contraction generates a pressure gradient between the aqueous and vitreous, causing anterior movement of the lens zonule diaphragm. In a group of pseudophakic patients, it has been shown that the MA60BM posterior chamber IOLs implanted within the capsular bag after capsulorrhexis moved a mean distance of 0.37 mm during the accommodative effort (13). This kind of repetitive motion could cause mechanical fatigue and contribute to haptic disinsertion (8). Haptic breakage occurred in our patient, who underwent linear lens extraction, posterior capsulotomy, and anterior vitrectomy due to traumatic cataract and received posterior chamber IOL implanted in ciliary sulcus. Some movement could have occurred through direct contact with the ciliary body.

It is possible that in scotopic conditions the pupillary diameters were large enough to permit movement of the posterior chamber IOL optic through the pupillary plane. In younger patients without complete optic fixation in the capsular bag, transient increases in vitreous pressure from exertion or external ocular pressure may be enough to result in anterior translational movement of the optic through relatively dilated pupils in the dark (8).

It is known that in children the amount of fibrosis around the IOL could be asymmetric, and there is a higher mitosis rate in the equator (E-cells), where the proliferation could possibly be asymmetric, creating a torsion in the haptic/disk portion. The degree of this movement, defects arising from IOL production along with existing intrinsic weakness, or haptic-optic junction fatigue may be sufficient to cause fracture of the haptic from the optic.

Reprint requests to:
Ihsan Çaça, MD
Dicle Üniversitesi
Tıp Fakültesi Göz Hastalıkları ABD
21280 Diyarbakýr, Turkey
ihsancaca@mynet.com

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