

Access this article online

Quick Response Code:



Website:
www.e-tjo.org

DOI:
10.4103/tjo.tjo_12_18

Lens exchange for management of accommodative intraocular lens tilting

Masoumeh Mohebbi, Ali Banafsheh Afshan, Bahman Inanloo, Amin Nabavi

Abstract:

Accommodative intraocular lens (IOL) tilting, the so-called Z syndrome, is a rare complication of Crystalens (Bausch and Lomb) implantation. We report a significant IOL tilting and subsequent high lenticular astigmatism due to posterior capsular fibrosis 2 months after uncomplicated cataract surgery and Crystalens (AT50AO) implantation. The attempt to correct IOL position with neodymium-yttrium-aluminum garnet laser was unsuccessful, and Crystalens exchange with in-the-sulcus, three-piece monofocal IOL was performed. Accommodative IOL tilting could occur early after the surgery. Laser capsulotomy may be the first intervention to restore IOL position, but patients with a higher amount of lenticular astigmatism may require surgical intervention and IOL exchange.

Keywords:

Accommodative intraocular lens, intraocular lens exchange, intraocular lens tilting

Introduction

Cataract surgery or clear lens extraction in combination with accommodative posterior chamber intraocular lens (IOL) is among the viable options to retain near vision in presbyopic patients.^[1,2] The Crystalens (Bausch and Lomb) is a multi-piece accommodative IOL made of silicone with hinged plate haptics which improves vision at near, midrange, and distance. Decentration and IOL tilting as a result of capsular fibrosis, so called Z syndrome, is a rare and visually significant complication of Crystalens implantation which usually responds to neodymium-yttrium-aluminum garnet (Nd:YAG) laser.^[3-6] Herein, we report a case of Z syndrome required IOL exchange with monofocal three-piece IOL.

Case Report

A 47-year-old female underwent uneventful phacoemulsification with Crystalens

AT50AO (Bausch and Lomb, Rochester, NY, USA) implantation in her left eye due to posterior subcapsular cataract in our clinic. Her uncorrected distance visual acuity (VA) improved from 20/200 (manifest refraction: +2.75–0.25 × 10; corrected distance VA: 20/40) to 20/20 (manifest refraction: –0.25–0.25 × 5) at 1 week postoperatively. Uncorrected near VA was J2 using Birkhäuser reading chart at a distance of 40 cm. She visited our clinic 2 months later with complaints of visual glare and decreased visual acuity. The corrected distance VA decreased to 20/63 with a manifest refraction of –0.75–7.00 × 35 and uncorrected near VA decreased to J5. Slit-lamp examination revealed posterior capsular striae, IOL tilting, and rotation of IOL haptics in about 30 degrees [Figure 1a]. An Nd:YAG laser posterior capsulotomy was performed at the area of posterior capsule striae [Figure 1b]. However, corrected distance VA only mildly increased (20/40) and –4.5 D lenticular astigmatism was remained (manifest refraction: –0.75–4.50 × 25). After consulting

How to cite this article: Mohebbi M, Afshan AB, Inanloo B, Nabavi A. Lens exchange for management of accommodative intraocular lens tilting. *Taiwan J Ophthalmol* 2019;9:46-8.

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com

Eye Research Center,
Farabi Eye Hospital,
Tehran University of
Medical Sciences, Tehran,
Iran

Address for correspondence:

Dr. Amin Nabavi,
Eye Research Center,
Farabi Eye Hospital,
Tehran University of
Medical Sciences,
Qazvin Square,
Tehran, Iran.
E-mail: nabavi16230@
yahoo.com

Submission: 01-02-2018
Accepted: 04-06-2018

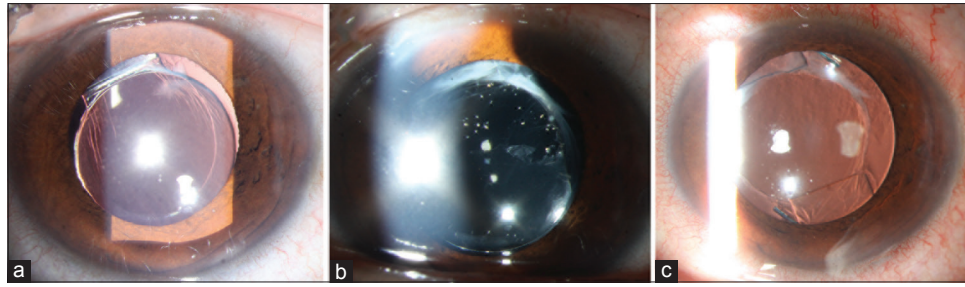


Figure 1: Accommodative intraocular lens tilting. (a) Slit-lamp photograph 2 months after intraocular lens implantation shows posterior capsule striae around the superior intraocular lens haptic. (b) Slit-lamp photograph after neodymium-yttrium-aluminum garnet posterior capsulotomy. (c) Slit-lamp photograph after intraocular lens exchange shows remained accommodative intraocular lens haptics in the capsular bag and three-piece monofocal intraocular lens in the ciliary sulcus

with the patient, it was planned to exchange the Crystalens with a monofocal IOL.

During the surgery, the first gentle attempt to separate the IOL haptics from capsular bag using balanced salt solution and viscoelastic material was unsuccessful. Hence, decision was made to cut IOL haptics with intraocular scissors. Then, the optic segment was removed and haptics were left in the capsular bag. Anterior vitrectomy was performed, and monofocal three-piece IOL (AcrySof MA60AC; Alcon, Fort Worth, TX, USA) was implanted in the ciliary sulcus [Figure 1c]. At 1 month, postoperatively, the uncorrected distance VA and corrected distance VA were returned to 20/20 with manifest refraction of $-0.5-0.5 \times 15$.

Discussion

The Crystalens is a Food and Drug Administration-approved accommodative IOL for treatment of presbyopia. This accommodative silicone IOL has a 4.5–5-mm biconvex optic plate and hinged haptics which allow optics to move forward during accommodation. Two flexible polyamide loops are specifically designed at the end haptics to maintain the IOL centration within capsular bag.^[7]

The Crystalens implantation usually resulted in a desirable visual outcome with probably fewer visual symptoms than multifocal IOLs.^[8] However, accommodative IOLs may be associated with higher rate of capsular phimosis and fibrosis which could interfere with accommodative properties.^[9] Asymmetric capsular fibrosis and subsequent tilting of the IOL in a Z-shaped configuration, which is called Z syndrome, is an uncommon complication of Crystalens implantation.^[3,5] Meticulous cortical cleanup, polishing the posterior capsule and underneath of remaining anterior capsule, and prolonged use of topical corticosteroids postoperatively could reduce the chance of this complication.^[3] Z syndrome has been reported between 2 weeks and 6 months postoperatively with various designs of Crystalens including AT45,

AT50SE, and AT52SE.^[3-6] Our case was presented with this phenomenon 2 months after Crystalens AT50AO implantation.

Various interventions have been proposed to return the Crystalens to its proper position and retain the accommodative properties after capsular fibrosis. Nd:YAG laser capsulotomy is usually performed to release anterior and posterior capsular bands which is successful in most of the cases.^[3-5] Recently, Page and Whitman^[3] described a stepwise approach for the management of capsular contraction after accommodative IOL implantation. They suggest that the management of Z syndrome should be based on the amount of induced lenticular astigmatism; YAG capsulotomy should be considered in up to 1 D lenticular astigmatism; and viscodissection of fibrosis and IOL repositioning should be performed in higher amount of astigmatism. However, this classification may not be true in all cases, as there are reports of successful laser capsulotomy in cases with higher astigmatism and IOL tilting.^[4,5] Furthermore, laser capsulotomy is a simpler technique and do not impose the risk of additional intraocular surgery. On the other hand, failed laser capsulotomy may cause vitreous prolapse during the subsequent surgical intervention. Anyway, we first tried to release the capsular fibrosis using Nd:YAG laser which was unsuccessful and then IOL exchange was considered. An important point during IOL exchange procedure is that making powerful attempt to pull polyimide footplates should be avoided. As these segments are strictly attached to the capsular bag, uncontrolled maneuvers result in zonular trauma and bag dialysis. The best approach is to cut and remove the optic segment and leave the haptics in their positions.^[3]

Accommodative IOL tilting could occur early after the surgery. Patients should be visited at regular intervals for early identification of this complication. Laser capsulotomy may be the first intervention to restore IOL position, but patients with higher amount of lenticular astigmatism may require surgical intervention and IOL exchange.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

The authors declare that there are no conflicts of interests of this paper.

References

1. Pepose JS, Qazi MA, Davies J, Doane JF, Loden JC, Sivalingham V, *et al.* Visual performance of patients with bilateral vs. combination crystalens, ReZoom, and ReSTOR intraocular lens implants. *Am J Ophthalmol* 2007;144:347-57.
2. Cumming JS, Colvard DM, Dell SJ, Doane J, Fine IH, Hoffman RS, *et al.* Clinical evaluation of the crystalens AT-45 accommodating intraocular lens: Results of the U.S. Food and drug administration clinical trial. *J Cataract Refract Surg* 2006;32:812-25.
3. Page TP, Whitman J. A stepwise approach for the management of capsular contraction syndrome in hinge-based accommodative intraocular lenses. *Clin Ophthalmol* 2016;10:1039-46.
4. Yuen L, Trattler W, Boxer Wachler BS. Two cases of Z syndrome with the crystalens after uneventful cataract surgery. *J Cataract Refract Surg* 2008;34:1986-9.
5. Jardim D, Soloway B, Starr C. Asymmetric vault of an accommodating intraocular lens. *J Cataract Refract Surg* 2006;32:347-50.
6. Casal J, Lavin-Dapena C, Marín J, Vergés C. Accommodative intraocular lens tilting. *Am J Ophthalmol* 2005;140:341-4.
7. Doane JF. Accommodating intraocular lenses. *Curr Opin Ophthalmol* 2004;15:16-21.
8. Pepose JS, Qazi MA, Chu R, Stahl J. A prospective randomized clinical evaluation of 3 presbyopia-correcting intraocular lenses after cataract extraction. *Am J Ophthalmol* 2014;158:436-60.
9. Mastropasqua L, Toto L, Nubile M, Falconio G, Ballone E. Clinical study of the 1CU accommodating intraocular lens. *J Cataract Refract Surg* 2003;29:1307-12.