

Late Dislocation of an IOL

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CASE PRESENTATION

A patient presents years after previously successful cataract extraction and in-the-bag implantation of a three-piece PCIOL. He complains of new-onset monocular diplopia. An examination shows fibrosis of the lens within the intact capsular bag, the margin of which is easily visible in the superior pupillary space (Figure 1). Scant Soemmering's ring is present. The IOL's edge bisects the pupil. There is no vitreous prolapse.

How would you manage this patient?



Figure 1. This view of the globe demonstrates PCIOL/bag subluxation. The tip of the haptic is within the fornix of the bag (white arrow). The superior cornea is located at the left. The pupillary space in this photograph has been digitally enhanced for contrast and brightness only.

CHRISTOPHER KHNG, MD

Late in-the-bag decentration of the lens affords a unique opportunity for suture fixation. In such a case, the anterior and posterior capsular leaflets will have fused around the superior haptic to result in a structure strong enough to hold a suture without tearing.

If the patient's right eye is described, I would seat myself in the temporal position (bottom of Figure 1), whereas a superior position might be more appropriate for a left eye. In either case, I would create a partial-thickness scleral flap just behind the limbus after taking down conjunctiva at the 11-o'clock position in Figure 1. I would fill the anterior chamber with a dispersive viscoelastic through a paracentesis. To avoid vitreous prolapse, the viscoelastic first must be injected internal to the paracentesis, then over the open hyaloid face.

I would secure the lens with a 10-0 Prolene suture (Ethicon Inc., Somerville, NJ), double armed with CTC-6L needles (Ethicon Inc.). Using a paracentesis positioned at the 6:30-o'clock position, I would pass the first needle through the fused capsular membranes, into the opening of a sharp, 25-gauge docking needle placed underneath the scleral flap, and out into the pupillary space. For security reasons, the CTC needle should puncture the membranes in an area adjacent to the concave aspect of the haptic some distance from the tip. I would then bring the needle to the surface by retrieving the docking needle. If puncturing the membranes were difficult, a Kelman-McPherson forceps placed through an incision made at 9 o'clock could stabilize the lens-bag complex.

Taking care not to catch corneal fibers, I would introduce the second CTC needle through the same paracentesis at the 6:30-o'clock position. Placed directly into the docking needle, the second CTC needle would be retrieved under the scleral flap, approximately 1.5mm from the first pass. Tying the knot would cause the suture to loop around the lens' haptic, draw it toward the sclera at 11 o'clock, and recenter the lens.

After closing the scleral flap and conjunctiva, I would aspirate viscoelastic from the chamber and instill carbachol (Miostat; Alcon Laboratories, Inc., Fort Worth, TX) to constrict the pupil. Next, I would hydrate the paracentesis incisions and reform the anterior chamber with balanced salt solution.

Another option would be to dissect the anterior rim of the capsulorhexis off the IOL's optic with a sharp,

27-gauge needle on a syringe of viscoelastic. If successful in opening the bag, the ophthalmologist could introduce an Ahmed capsular tension segment (not available in the US; Morcher GmbH, Stuttgart, Germany) into the bag with a preplaced 8–0 Goretex suture (W.L. Gore & Associates, Inc., Newark, DE) tied to the fixation element and secured to the sclera in a similar manner as described earlier. US surgeons may fashion the segment out of a Modified Capsular Tension Ring (model 1-L; Morcher GmbH; distributed in the US by FCI Ophthalmics, Inc., Marshfield Hills, MA) by cutting the ring to the appropriate length.

ALAN N. CARLSON, MD

Symptomatic, inferior decentration of the IOL in this case is most likely the result of poor zonular support, based on the absence of zonular attachment to the superior capsule and the overall contour of the unsupported superior capsular fornix. IOL decentration in the setting of (1) capsular bag fixation, (2) zonular weakness, (3) poor pupillary dilation, and (4) an iris that appears somewhat atrophic with a loss of peripupillary iris ruff suggests pseudoexfoliation. This condition has been associated with late IOL dislocation in the literature.¹ Additional considerations for any patient presenting with late decentration of an IOL include trauma before, during, or after previous eye surgery as well as genetic and metabolic disorders such as homocystinuria and Marfan's, Weill-Marchesani, and Ehlers-Danlos syndromes.

Barring a contraindication, I would recommend surgery rather than observation or medical management of the pupil's size with pilocarpine or Alphagan (Allergan, Inc., Irvine, CA). Opening the capsular bag and inserting a standard endocapsular tension ring would not sufficiently support the IOL due to the severity and possible progression of zonular weakness. Also, it would be technically challenging to reopen a poorly supported capsular bag in order to implant a Modified Capsular Tension Ring designed for transscleral support.² This type of manipulation could cause the IOL to dislocate completely.

Removing the PCIOL and exchanging it for an ACIOL is technically the simplest option. Patients with pseudoexfoliation or previous ocular trauma often have reduced aqueous outflow, however. Glaucoma, if present, is a relative contraindication for angle-supported IOLs. Suturing a PCIOL to the iris or using transscleral fixation are options, so long as they provide adequate support and the surgeon safely and completely manages the vitreous so that there is no traction.

Because the lens power is correct and the IOL has thin loops, the most appropriate option would either be to reposition and fixate the IOL with a McCannel suture or

to exchange the lens for a Kelman-type ACIOL. The former approach could be challenging due to in-the-bag fixation, capsular contraction, diffuse zonular weakness, and iris atrophy, however. Two-point fixation is usually required in patients lacking sufficient sulcus support, as occurs in cases with extensive zonular weakness. The decision to remove or exchange an IOL has been published in general terms.³ The choice should be based on the techniques' risks and benefits for this particular patient as well as the surgeon's skill set, experience, and comfort level.

BASEER KHAN, MD, FRCS, AND ROSA BRAGA-MELE, MD, MED, FRCS

First, the surgeon should confirm the absence of vitreous in the anterior chamber with either triamcinolone or trypan blue prior to proceeding. There are three options for management. The first is to explant the lens and secondarily implant an ACIOL. This approach runs the risk of disrupting the anterior vitreous face, which currently appears intact, and thereby potentially inducing a whole host of adverse outcomes. Furthermore, the removal and reimplantation of a lens and the presence of an ACIOL itself potentiate endothelial cell loss. The approach also requires a 6-mm incision.

The second option involves repositioning and refixating the subluxated PCIOL with iris sutures. The additional bulk of the capsular-zonular complex, along with the PCIOL, would increase the area of the lens in contact with the posterior aspect of the iris and thus increase the likelihood of pigment dispersion, uveitis, hyphema, and secondary glaucoma. Iris fixation would have been our preferred technique if the PCIOL had been initially implanted in the sulcus and then subluxated.

In this case, our choice would be the *ab externo* scleral fixation of the PCIOL/capsular complex in the following manner. The midpoint of the arc of the haptics (approximately at 7:30 and 1:30 o'clock) are ideally where the sutures should be placed. We would first suture the haptic that has subluxated toward the visual axis. After performing a peritomy from the 6:30- to the 8:30-o'clock position, we would perform cautery to achieve hemostasis. Using a guarded diamond blade or a reasonable substitute, we would make a 50% thickness vertical and circumferential scleral incision, 1.5mm posterior to the surgical limbus and 1.5mm in length.

After creating a paracentesis at 1:30 o'clock, we would inject viscoelastic material into the anterior chamber and, particularly, the posterior chamber in the area where the haptic is to be sutured. Doing so would create the necessary space between the capsule and the iris. Either a double-armed, 10–0 polypropylene suture on a CIF-4 needle (Ethicon Inc.) or a PC-7 needle (Alcon Laboratories, Inc.)

or a 9–0 polypropylene suture on a CTC-6L needle would be appropriate. The latter suture represents a lower risk of late breakage and is therefore our preference. The needle is passed into the anterior chamber, over the optic, and under the haptic so that it penetrates the capsule. A second instrument (ideally, an Ahmed microforceps [Microsurgical Technology, Redmond, WA]) that supported the IOL/capsule complex through a second paracentesis would facilitate this maneuver. The needle must pass through the paracentesis, or a false passage will capture corneal tissue in the suture and prevent the loop from entering the anterior chamber.

After the successful passage of the suture under the haptic, we would place a 26-gauge needle, bent at the hub, into the posterior chamber at either of the lateral edges of the partial-thickness scleral incision. The tip of the suture needle is then captured in the lumen of the 26-gauge needle and externalized through the sclera. We would repeat the process with the other end of the 10–0 polypropylene suture, this time passing it over the haptic and externalizing the suture on the other lateral edge of the scleral incision.

We would tie the suture ends in a releasable fashion to allow for the titration of tension following the placement of the second suture. The applied tension on the suture would center the capsule/IOL complex, thereby facilitating visualization of the second haptic for suturing. After titrating both sutures for tension and tying them in the usual fashion, we would rotate the knots so that they were located in the posterior chamber. This technique minimizes the risk of conjunctival erosion over the knots as well as erosion of the suture through the sclera. We would close the peritomies in our usual fashion.

GUILLERMO ROCHA, MD, FRCSC

This patient presents with a dislocated IOL implant in the bag. Significant features are the absence of vitreous prolapse and the lack of a YAG laser posterior capsulotomy (Figure 1). This case is simple in concept but challenging in practice. There are two basic possibilities for management: (1) to remove the dislocated lens and exchange it for a new IOL or (2) to reposition the lens implant.

Important principles in the management of such a case include the maintenance of a pressurized globe, manipulation of the lens through as closed a system as possible, and perhaps the provision of a pars plana access to facilitate maneuvering the lens.

A surgeon who decides to exchange the implant should create a clear corneal paracentesis with a super blade. He can then inject a cohesive viscosurgical device behind the lens so as to displace it anteriorly through the pupil. Once the optic and haptics are in the anterior

chamber, the surgeon can remove the lens implant through a clear corneal incision. If the implant happens to be foldable, one made of silicone could be cut with scissors, whereas an acrylic lens could be refolded and extracted through a 3-mm incision. A PMMA lens would require a 5-mm incision.

There will be no capsular support. The next decision, therefore, would be whether to insert an ACIOL or a PCIOL, be it sutured to the iris or sclerally fixated. As a group, ophthalmologists are abandoning scleral fixation for either an ACIOL with a peripheral iridectomy or a hydrophobic acrylic MA60 lens (Alcon Laboratories, Inc.) with its haptics opening in the posterior chamber and the optic remaining in the anterior chamber.

The aforementioned technique for an MA60 is accomplished by ensuring proper loading of the lens and inserting a spatula posterior to the optic as it unfolds to prevent its displacement through the pupil. The surgeon can then insert a modified lens glide between the optic and the iris to provide further support. The ophthalmologist should constrict the pupil with acetylcholine. Because the haptics will be visible as an outlined indentation on the iris, the surgeon can suture them to the iris using 10–0 Prolene on a curved needle with either a Siepser⁴ or McCannel type of technique. After placing the two sutures, the ophthalmologist pushes the optic through the pupil, aspirates the viscoelastic, and completes the surgery.

An alternative approach involves repositioning (without explanting) the lens by suturing the haptics to the iris in one of two ways. Either the surgeon repositions and sutures the entire capsular bag/lens complex to the iris, or he cleans the capsular bag from the lens and then places the sutures. The second approach is more elegant, because it eliminates a scarred, phimotic, or opaque capsular bag. Using a pars plana approach, the surgeon pushes the lens/capsular bag complex through the pupil and into the anterior chamber under the protection of a viscoelastic. He uses a posterior vitrector via the pars plana incision (3mm posterior to the limbus) with irrigation from a 23-gauge cannula inserted through an anterior paracentesis. The lens is completely cleaned off of the residual capsule. The surgeon then constricts the pupil while repositioning the haptics posteriorly. The pupil “catches” the optic, and the surgeon sutures the lens to the iris as described earlier. Passing both needles first, before securing the knots, adds a significant amount of stability to the lens.

All of the techniques described have advantages and disadvantages. The surgeon’s decision of which method to employ will depend both on the clinical situation and on his comfort level. ■

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