

Subluxated IOL After Pupillary Dilation

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CASE PRESENTATION

A 59-year-old man presents for a routine yearly follow-up visit 2 years after undergoing cataract surgery on both eyes. He has 20/20 UCVA OU and no major complaints. After pupillary dilation, he returns to the examination room, and you notice that the pupil has anteriorly captured the IOL-bag complex in his left eye. Looking back at the surgical report, you read that an inferior dehiscence was noted at the conclusion of the case but stabilized after the insertion of a three-piece IOL. No capsular tension ring was used.

You explain what occurred to the unsuspecting, still asymptomatic patient. You lay him back in the examination chair and try to massage the eye to no avail. Finally, you ask him to return in 24 hours, after the effect of the dilating drops wears off, and hope for self-resolution.

When the patient returns the next day, he reports no problems. His UCVA measures 20/25 OS, and the chamber is quiet. The optic and haptic of the three-piece IOL are still captured anteriorly (Figure 1) within the somewhat fibrosed capsular bag. How would you proceed?



Figure 1. After routine dilation, the pupil anteriorly captures part of the optic-IOL-capsular bag complex.

DAVID F. CHANG, MD

Because the subluxation happened for the first time after the previous day's dilation, I would make at least one more attempt to reposition the IOL in the posterior chamber. I would use 0.5% tropicamide combined with 2.5% phenylephrine to redilate the pupil. Then, I would attempt to displace the IOL posteriorly at the slit lamp with a handheld gonioscope lens. If this were successful, I would instill topical 2% pilocarpine and ask the patient to recline for the rest of the day and return the following morning. If the IOL remained well positioned, I would recommend against routine pupillary dilation in the future. I would explain that a surgical suture-fixation procedure might be necessary at some future time.

Surgical 9-0 polypropylene scleral suture fixation of the subluxated haptic would be my preferred approach if the IOL could not be successfully repositioned in the

office. Whether symptomatic or not, I would not want my own IOL to be left subluxated in this position. I would plan to tie the knot so that it lay buried at the base of a half-thickness scleral groove made parallel to the limbus and approximately 1.5 mm posterior to the limbus. Each of the double-armed straight transscleral needles (FCI Ophthalmics, Inc., Marshfield Hills, MA) can be passed through a clear corneal incision made 180° opposite to the problematic haptic. One will pass above and one below the haptic, which will remain encased in the capsular bag. To guide out each of the 9-0 Prolene needles (FCI Ophthalmics, Inc.), I would pass a 25-gauge disposable needle ab externo through the base of the scleral groove, behind the iris, and into the pupillary space. The first straight 9-0 Prolene needle is threaded into the lumen of a 25-gauge needle, which can then guide the Prolene needle out through

the base of the groove. This maneuver is repeated for the second Prolene needle so that it exits adjacent to the first needle pass.

D. MICHAEL COLVARD, MD

The question is whether to intervene surgically now or just to carefully monitor the situation. If the patient were free of symptoms during the next few weeks, I would favor continued observation.

He might do well without intervention for quite a while. The iris is brown, so the pupil's irregularity will be hard to notice. The IOL is now supported inferiorly by the iris, which will reduce gravitational stress on the remaining superior zonules. The IOL is covered by the capsule, which will reduce chafing of the iris. I would not intervene if the patient retains good visual acuity; he is happy and comfortable; and there is no evidence of inflammation, cystoid macular edema, or IOP elevation with pigment dispersion or corneal decompensation. (Figure 1 seems to suggest iris depigmentation, so dispersion may become a problem sooner rather than later.)

Sutured IOLs tend to have a relatively short lifetime. Not all do well, and those that do often become unstable again after 6 to 8 years, requiring a third intervention. This patient is only 59 years old, so it would be nice to help him borrow some time. Having said this, I would act quickly if things began to head south. The position of the IOL is advantageous. It would be relatively easy to place a Prolene loop through the capsule and the IOL's inferior loop and then fix it either to the peripheral iris or sclera.

ALAN S. CRANDALL, MD

Although the patient's visual acuity is good and he is asymptomatic, the lens and bag are unstable. If he were older, one could explain the situation to the patient and observe him. In this situation, however, the lens' position could cause uveitis and pigment dispersion with glaucoma, and the tilt might lead to decreased visual acuity. I would therefore suggest surgical intervention.

In cases like this one, I have a game plan with at least two backups, depending on what I find. If the dehiscence noted at the original surgery existed preoperatively (ie, previous trauma), then the superior zonules might be normal. If so, one could use a lasso technique to fixate the lens to the sclera. If the lens were less stable than expected, my next choice would be to raise the optic and then use iris fixation (Siepser knot technique). Another option would be an IOL exchange for an ACIOL or for a PCIOL fixated to the iris or sclera.

I would prefer one of the first two options and using the existing lens, because both can be performed

"Although the patient's visual acuity is good and he is asymptomatic, the lens and bag are unstable."

— Alan S. Crandall, MD

through small incisions. I always stain the vitreous to ensure that none is presenting forward. I would perform a bimanual vitrectomy and use 23-gauge high cutting (2,500 cuts/min), which can be performed through a standard clear corneal stab incision. I use 10-0 or 9-0 Prolene (Ethicon, Inc., Somerville, NJ) for iris fixation and 9-0 Prolene or 8-0 Gore-Tex (W. L. Gore & Associates, Inc., Newark, DE; off-label use) for scleral fixation.

MATTHEW D. KUHNLE, DO, AND ALAN N. CARLSON, MD

Anterior displacement of this patient's capsular bag-IOL complex that is causing optic tilt and pupillary capture will certainly require intervention despite his relative absence of symptoms. A slit-lamp examination, including gonioscopy of both eyes, will help the surgeon to assess the angle structures and will provide other clues to the eye's predisposition. It will also indicate whether or not this situation resulted from a single event (surgical or preexisting trauma) or an ongoing process weakening zonular integrity (pseudoexfoliation, Marfan syndrome). In addition, we would investigate the status of the anterior hyaloid face, vitreous, and remaining capsule superiorly.¹

Repositioning the IOL and securing it with either a transscleral or McCannel iris suture would be our first choice, provided the patient has a correctly powered IOL that does not compromise the health of his eye.² Unfortunately, our experience in similar cases is that longstanding capsular contraction has permanently distorted the loop haptics and asymmetrically shortened the IOL. Capsular fibrosis would likely prevent us from opening the capsule to insert a capsular tension ring. Attempts to secure this IOL in a transscleral fashion would require meticulous attention to the anterior peripheral vitreous. Mismanagement could lead to chronic cystoid macular edema or worse problems such as anterior vitreous loop traction that can lead to a retinal detachment and proliferative vitreoretinopathy.^{3,4}

If the IOL could be surgically moved to a reasonably normal position (ideally with zonular support evident superiorly and without vitreous entanglement), we would favor securing the inferior loop with a McCannel-style suture (Ethicon STC-6 needle [Ethicon, Inc.], 10-0 poly-

propylene suture). A second suture might be needed superiorly to ensure stability, as assessed by the Osher bounce test.⁵

If the IOL were clearly distorted or the zonular support were extremely limited, an exchange would be a reasonable choice. ACIOLs fell out of favor in the 1980s, but work by the late David Apple, MD, supports the use of a Kelman-style multiflex ACIOL. The angle must otherwise be normal, however, and the patient must have an adequate corneal endothelial cell count and no history of glaucoma.⁶

SAMUEL MASKET, MD

Cases such as this one are amenable only to surgery. I have managed several and varied my approach according to the status of the capsule and remaining zonular fibers. Most often, I attempt a minimally invasive procedure, eschewing IOL exchange in favor of suture fixation of the existing IOL. I employ the following options.

First, if the anterior capsular remnant is not fibrotic or phimotic and the posterior capsule is intact, I attempt to reopen the capsular bag by blunt and viscodissection. Next, I place an Ahmed Capsular Tension Segment (Morcher GmbH, Stuttgart, Germany; distributed in the United States by FCI Ophthalmics, Inc.) with a pre-loaded suture and anchor it through a Hoffman scleral pocket. I have used both 10–0 polyester and 8–0 Gore-Tex. Once the bag is open, I evaluate the status of the zonular fibers and consider the need for a second Ahmed segment or a sutured Cionni Ring for Sclera Fixation (Morcher GmbH; distributed in the United States by FCI Ophthalmics, Inc.).

My second option is suturing the haptic(s) to the sclera. Should the condition of the capsular bag render its opening undesirable, I would perform a lasso suture of the haptic through the peripheral capsule, again with use of a Hoffman pocket. I would evaluate the support for the opposing haptic and place an additional scleral suture as needed (Figures 2 and 3).

Finally, if scleral suturing is contraindicated (coagulopathy, extensive previous glaucoma filtration surgery, massive scleral scarring or thinning, etc.), the bag-IOL complex may be sewn to the iris with 10–0 polyester or polypropylene suture material. One must be certain to incorporate the IOL's loops with the suture. Either a McCannel or a Siesper method of tying the suture may be employed, and a peripheral iridectomy is performed.

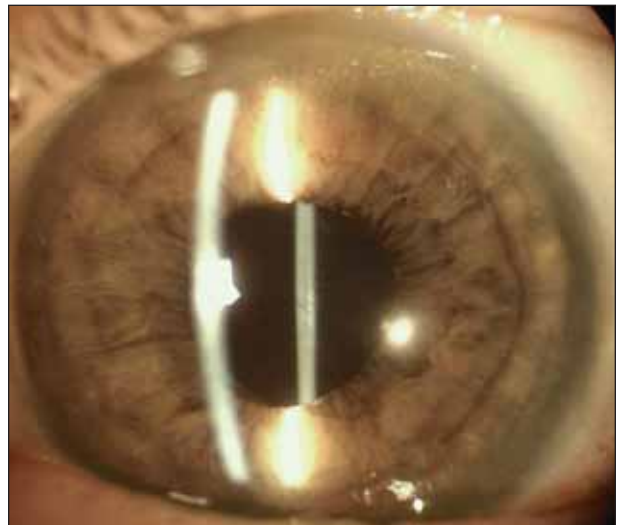
STEVEN G. SAFRAN, MD

This relatively young patient has extensive zonular weakness and prolapse of the IOL-bag complex through the pupillary aperture. The inferior zonules are com-



(Courtesy of Samuel Masket, MD)

Figure 2. A prolapsed loop-bag complex before surgical intervention. Note the fibrotic anterior capsule.



(Courtesy of Samuel Masket, MD)

Figure 3. The eye after the surgeon used a lasso suture of the inferior loop-bag complex for scleral fixation via a Hoffman pocket.

pletely absent, and the remaining areas of zonular attachment must be considered suspect at best. The multiple options for repairing this problem include lassoing of the IOL-bag complex and suturing it to the sclera, an IOL exchange for an anterior chamber lens, an IOL exchange for an iris-fixated or sclera-fixated posterior chamber lens, or removal of the current implant from the bag with intraocular gymnastics and then suturing it to the iris (or to the sclera with sequential haptic externalization). This would require removal of the bag and, most likely, a vitrectomy as well.

In my experience, the most reliable option in cases

“The most reliable option in cases such as this one is to remove the bag-IOL complex.”

— *Steven G. Safran, MD*

such as this one is to remove the bag-IOL complex via a scleral tunnel incision made on the steep axis. Next, I suture a single-piece PMMA implant (eg, P366UV [Bausch + Lomb, Rochester, NY] or CZ70BD [Alcon Laboratories, Inc., Fort Worth, TX]) to the sclera with 9-0 Prolene sutures placed under scleral flaps. The scleral tunnel incision used for an IOL exchange can be used as one of the scleral flaps to cover a 9-0 Prolene suture. I would combine this procedure with a pars plana vitrectomy, and I would take advantage of the pars plana infusion to give myself better control throughout the procedure. A video of the type of IOL exchange I would prefer in this situation may be found at <http://www.youtube.com/watch?v=lsdo0Ca5Lvw>. I have observed my patients for as long as 19 years after the scleral suturing of PCIOLs without seeing the sutures break or the IOL dislocate. In fact, after performing hundreds of these procedures, I have observed only one dislocation (occurring during vitreoretinal surgery), so I believe that this is a long-term rather than a temporary fix.

Another option would be to replace this lens with a three-piece IOL with its haptics placed within the sclera in a scleral groove (or within a groove under the flap), but I do not yet have personal experience with this technique. The approach has inherent advantages, including a smaller incision (associated with a foldable implant) and the avoidance of suture material. I have some concerns, however, about placing the haptics under so much tension in certain eyes. I am also a bit worried that placing a forceps externally through the ciliary sulcus to externalize a haptic for this technique might increase the risk of cyclodialysis, bleeding, and wound leaks. If other surgeons continue to report positive experiences with this technique, I will likely try it in the near future. ■

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