

Aphakia in a Glaucoma Patient

**BY MICHAEL E. SNYDER, MD; RICHARD S. HOFFMAN, MD;
AND AUDREY TALLEY ROSTOV, MD**

CASE PRESENTATION

A 64-year-old man is referred to you for an evaluation of aphakia.

He had cataract surgery 20 years earlier with resultant iris sector iridectomy and aphakia, and 15 years ago, he underwent penetrating keratoplasty with a scleral-sutured IOL. The patient had an Ahmed Glaucoma Valve (New World Medical, Inc.) placed 4 years ago, and his BCVA was 20/25 with $-1.50 +0.75 \times 75$.

Four months ago, the patient presented with a sudden decrease in vision, a floater, and was found to have a dislocated IOL in the vitreous. The patient was referred to a retina surgeon who performed an uneventful pars plana vitrectomy with removal of the IOL, leaving him aphakic. He was very happy with his previous vision before the IOL dislocated, and he would like to have another lens implanted. Although he can achieve good BCVA with a contact lens, he has dry eye disease and cannot comfortably wear the lens. In addition, his glaucoma drainage device makes the fit of a contact lens difficult.

On examination, the corneal graft is clear, there is a glaucoma drainage tube at 2 o'clock, with a functioning bleb, and the anterior chamber is quiet (Figure 1). There is iris present from 4 o'clock to 8:30. The retinal examination is normal as is optical coherence tomography of the macula. The patient's optic nerve has a cup-to-disc ratio of 0.8, unchanged from previous examinations.

How would you proceed? What type of IOL would you offer to this patient, and how would you secure it without a capsule?

—Case prepared by Audrey Talley Rostov, MD.

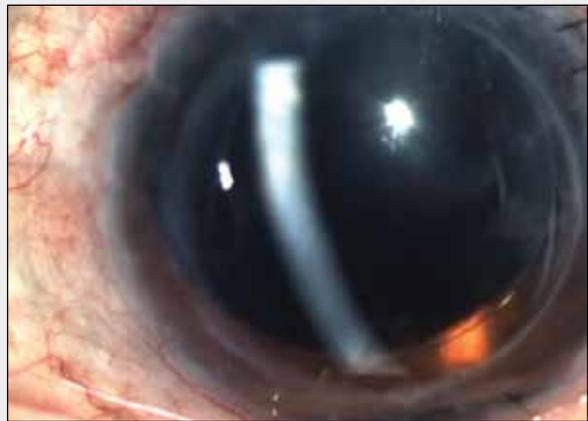


Figure 1. The initial slit-lamp examination shows a clear corneal graft, aphakia, a glaucoma drainage tube at 2 o'clock, and minimal residual iris.

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In this increasingly contact lens-intolerant aphake with subtotal iris loss, any secondary implant lens would require fixation to the scleral wall. His first sclerally sutured IOL dislocated, likely as a result of polypropylene degradation over time. The long-term fixation by haptic incarceration within the scleral wall (glued IOL) has yet to be established. I would favor scleral fixation using a GoreTex suture (off label for ophthalmic use; W. L. Gore & Associates, Inc.) in such a case. In this challenged anterior segment, even with perfect centration of the IOL,

the optic's margins would be exposed for at least 8 clock hours and may induce photic glare, arcs, or even multiple shadow images from the defocused light through the aphakic space. The residual iris tissue is inadequate for suture repair.

Outside the United States, one could consider an iris prosthesis to be placed at the same time as the implant lens. Currently in the United States, no iris prostheses whatsoever are available. No device is FDA approved, the FDA is no longer permitting compassionate use exemptions, and there are no active iris prosthesis investiga-

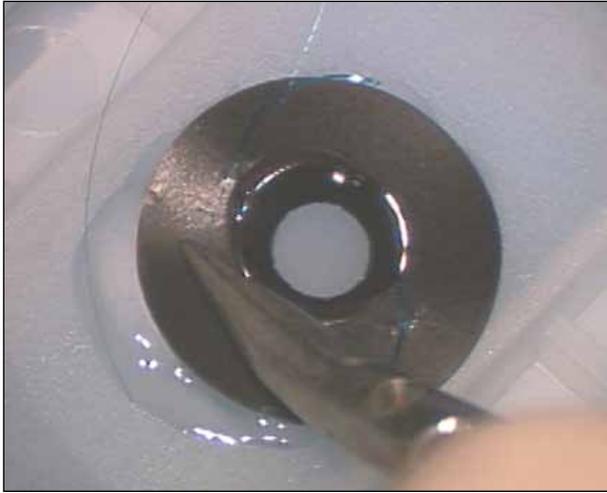


Figure 2. A PCIOL on the back of the iris prosthesis.

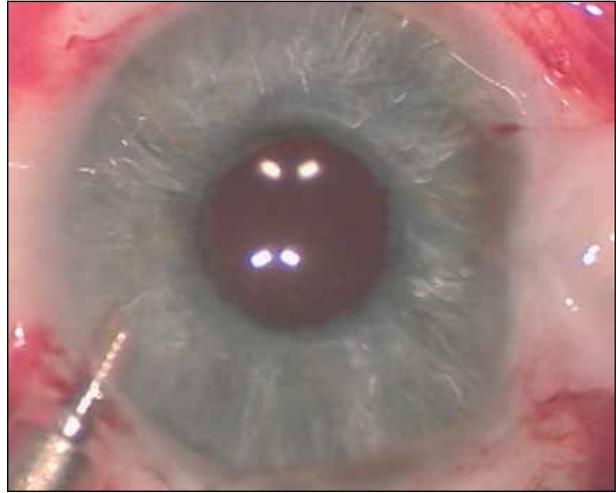


Figure 4. The iris prosthesis in situ.

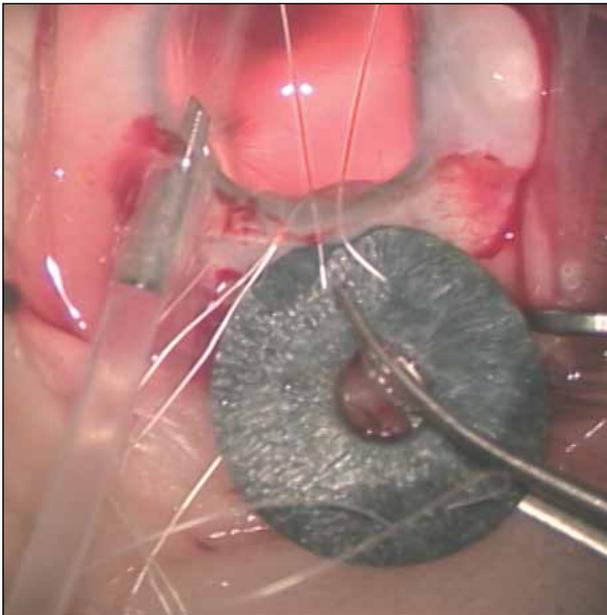


Figure 3. Implantation of the device and a PCIOL.

tional device exemptions in this country. Accordingly, the patient could choose to travel abroad. It is hoped that the FDA's investigational device exemption study of HumanOptics' custom flexible iris device will soon launch, after 2 years of protocol negotiation.

Under the presumption that the study opens and the patient chooses to participate, the CustomFlex device (HumanOptics), manufactured to match an index photograph taken of the fellow eye, can be ordered with an embedded polyester mesh. A three-piece PCIOL could be secured to the device (Figure 2) with both a 9-0 polypropylene suture and also by passing the haptics

through small "tunnels" placed in the midperiphery of the device (Figure 3). The device could then be sutured to the sclera with GoreTex using two horizontal mattress sutures, thus reestablishing an acceptable lens-pseudoiris diaphragm, which will restore pseudophakic vision while minimizing unwanted optical phenomena (Figure 4).

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Before proceeding, it would be helpful to know if the patient was symptomatic from his iris defect before the IOL's dislocation. If not, a simple scleral-fixated secondary IOL would be the easiest approach and would be the least likely to aggravate his glaucoma. If he was significantly symptomatic, then fixation of a PCIOL, in addition to a foldable iris prosthesis (CustomFlex) under an FDA compassionate use exemption might be his best solution. I am going to assume that the pupil in the photograph is dilated and that the patient is mostly asymptomatic from his sector iridectomy.

The most likely cause for the original IOL's dislocation is probable use of 10-0 Prolene (Ethicon Inc.) for the original fixation. These sutures have been shown to degrade and break 7 to 15 years after implantation. Currently, 9-0 Prolene or 8-0 GoreTex sutures are recommended for scleral fixation and should allow for secure placement throughout the remainder of the patient's life. Although incarceration of the IOL's haptics is an option for this patient, the best approach would be to avoid dissection of the conjunctiva. This is especially true in eyes with previous filtering blebs and possibly true in eyes with shunts.

It is probably best to avoid the sclera that was used for the previous fixation. Two corneoscleral pockets dissected at 12:00 and 6:00 would allow for scleral fixation without the need for conjunctival dissection. The

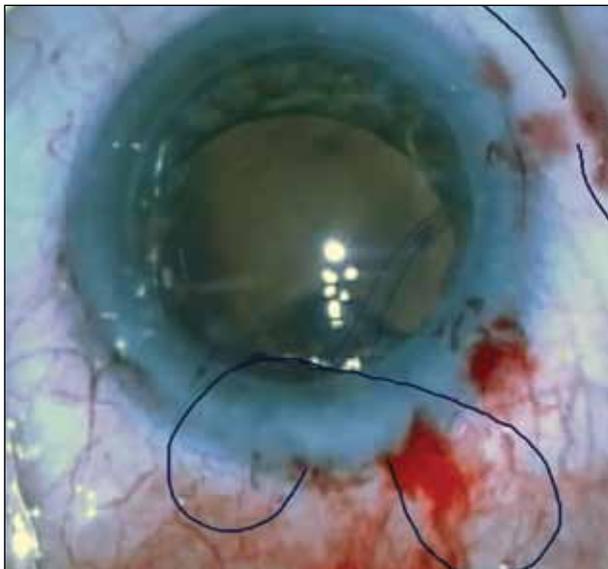


Figure 5. The suture loop is folded over onto itself in order to create a cow-hitch knot.

pockets start in a 350- μ m-deep limbal groove and are dissected posteriorly within the plane of the sclera for approximately 3 mm. Due to the patient's previous vitrectomy, it will be necessary to place either an anterior chamber infusion or a 25-gauge pars plana infusion. A 3.5-mm temporal clear corneal incision is created, and a 9-0 double-armed Prolene suture is then passed through the incision and docked into a 27-gauge needle that is passed through the full thickness of the globe, 2 mm posterior to the surgical limbus, corresponding to the superior scleral pocket. This is repeated for each suture needle, leaving a loop of Prolene outside of the temporal incision. A small dollop of viscoelastic is then placed on the cornea, and the suture loop is folded over onto itself in order to create a cow-hitch knot (Figure 5).

A foldable acrylic IOL such as an AcrySof MA60AC (Alcon Laboratories, Inc.) is then placed into a cartridge injector, and the leading haptic is extruded slightly to attach the cow-hitch knot to the haptic. The lens is then injected into the anterior chamber keeping traction on the suture so that it does not slide off of the haptic. The trailing haptic is left outside of the incision so that another cow-hitch knot can be created using the inferior scleral pocket for fixation. After the suture is attached to the trailing haptic, the latter is inserted into the sulcus. Both sets of sutures are tightened, and the needles are removed from the sutures. The suture ends are then retrieved through the scleral pocket using a Sinsky hook, tightened again, and tied. The suture ends are trimmed, and the knot is allowed to slide under the protective roof of the scleral pocket.

WHAT I DID: AUDREY TALLEY ROSTOV, MD

Because this patient had previous good BCVA with no complaints of glare before his scleral-sutured IOL had dislocated, I was not overly concerned about glare issues from his large iridectomy and loss of iris tissue. He was eager to have a secondary IOL implanted. As I did not have access to an iris prosthesis, and due to the failure of his previous scleral-sutured IOL, I elected to use a transscleral glued IOL. I discussed with the patient preoperatively that there is not a long track record with glued IOLs, and there is a possibility of its late dislocation. I reminded him that the risk for the IOL's dislocation exists with any scleral-fixated IOL.

I made scleral pockets at the 10:30 and 4:30 positions because these areas were the least scarred from previous surgeries. I placed the AQ2010 IOL (STAAR Surgical Company) in a transscleral fashion via the previous clear corneal incision that was created for the old IOL's explantation. I used an anterior chamber maintainer and a combination of a cohesive and a dispersive ophthalmic viscoelastic device utilizing the technique popularized by Amar Agarwal, MD. I employed Tisseel fibrin sealant (Baxter Healthcare Corporation) and additional glue for the conjunctiva overlying the scleral flaps.

Postoperatively, the patient did well, regaining a BCVA of 20/50 due to some mild corneal edema. ■

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