

# UNABLE TO DRIVE AT NIGHT

Surgeons discuss how to manage visual symptoms in an eye with a large iris defect, mild pseudophacodonesis, and retinal comorbidities.

BY BRANDON D. AYRES, MD; MEGAN HAGHNEGANDAR, MD; KEVIN M. MILLER, MD; AND MICHAEL E. SNYDER, MD

## CASE PRESENTATION

An 82-year-old man presents with reduced vision and severe glare in his left eye approximately 6 months after cataract surgery. The patient states that the cataract procedure on the right eye was uneventful but that high pressure in the left eye caused the iris to bulge intraoperatively. He says the vision in his left eye is stable but hazy, and he is unable to drive at night owing to the glare. His history is significant for dry age-related macular degeneration (AMD). His glasses have a mild prism correction.

Upon examination, the patient's UCVA is 20/40 OD and 20/50 OS. His manifest refraction is  $-0.25 +0.25 \times 005^\circ = 20/40+$  OS. Pupil motility appears to be full. No afferent pupillary defect is detected in either eye, but the pupil in the left eye is irregular.

A slit-lamp examination of the right eye is essentially normal and reveals a well-positioned toric IOL in the capsular bag. The left eye has a clear cornea, a quiet conjunctiva and anterior chamber, a large temporal iris defect, and a toric IOL in the capsular bag (Figure 1). Mild pseudophacodonesis is evident, but there is no vitreous prolapse into the anterior chamber. Topography is shown in Figure 2.

A posterior examination of both eyes is normal except for mild drusen in the macula and a mild epiretinal membrane (ERM; Figure 3). Optical biometry measurements are shown in Figure 4.

How would you manage the patient's visual symptoms?

— Case prepared by  
Brandon D. Ayres, MD

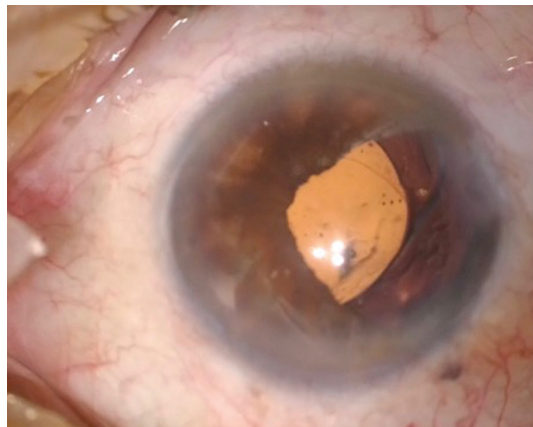


Figure 1. The left eye has a large temporal iris defect. A toric posterior chamber IOL is visible in the capsular bag.

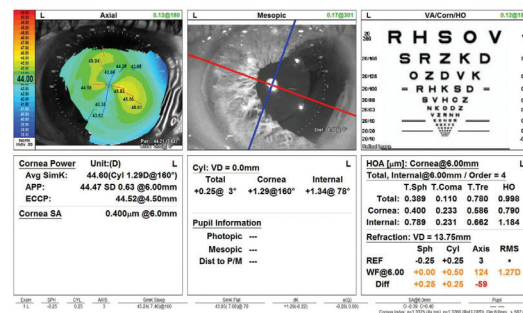


Figure 2. Topography of the left eye shows against-the-rule astigmatism.

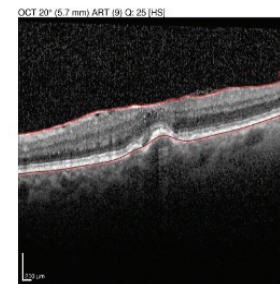
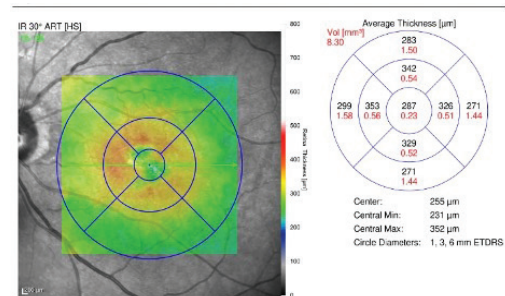


Figure 3. Macular OCT of the left eye shows drusen and a mild ERM.

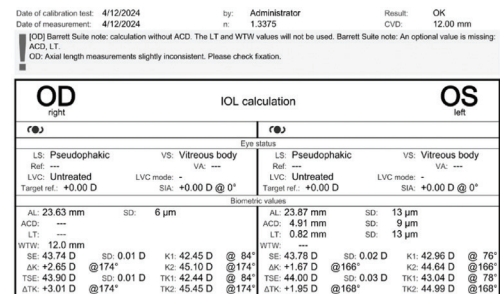


Figure 4. Optical biometry of both eyes.

**MEGAN HAGHNEGAMDAR, MD**

Based on the postoperative refraction, topography, and correct orientation of the toric IOL, I suspect the patient's symptoms are caused by the large iris defect, although AMD and the ERM might have contributed to a reduction in his baseline visual acuity. OCT scans of the optic nerve would be obtained to determine if glaucomatous changes are present.

A trial of colored contact lenses that mimic the natural appearance of the iris would be conducted. If the patient's symptoms improve, he could continue wearing the contact lens or undergo the implantation of an artificial iris. Less conventional alternatives, such as a large corneal tattoo over the iris defect, could also be considered. I do not feel that iris repair would be a feasible option because too much tissue is missing.

If the patient elects to receive an artificial iris, the pseudophacodonesis is mild, and capsular support is adequate, passive sulcus fixation of the device would be performed. Placement in the ciliary sulcus with suture fixation could also be considered. Before proceeding to surgery, an endothelial cell count would be obtained, and the risk of postoperative endothelial compromise would be discussed.

If a trial of colored contact lenses produces no improvement, AMD and

the ERM are likely contributing to the patient's symptoms. Iris procedures would be put on hold, and he would be referred to a retina specialist for further evaluation.

**KEVIN M. MILLER, MD**

I had a similar case in 2009. At the time, I was implanting HumanOptics artificial irises on a case-by-case compassionate use basis. As a child, the patient had accidentally stabbed herself with scissors, rupturing the globe and causing iris prolapse. Years later, as an adult, she underwent cataract extraction with a toric IOL implanted in the bag. Although her postoperative UCVA was 20/20, she experienced severe glare, especially at night, and could no longer drive a car. She saw tall streaks of light through every distant light source at night. The iris defect was too large to close with sutures, and she found an artificial pupil contact lens too uncomfortable to wear (Figure 5). A custom, fiber-free HumanOptics artificial iris was implanted and passively fixated between the native iris and anterior capsule. After surgery, the patient's uncorrected distance visual acuity was 20/20, and she experienced no light or glare sensitivity (Figure 6). She was satisfied with her visual and cosmetic results.

**MICHAEL E. SNYDER, MD**

This patient's visual issues are multifactorial. Most important is his inability to function at night due to the iris defect. With roughly 4 clock hours of iris tissue missing, suture repair would be challenging, especially temporally, where an incomplete repair could result in monocular diplopia. The capsular bag appears to be intact, so the placement of a custom iris prosthesis, preferably within the capsular bag, would be ideal.

The IOL–capsular bag complex appears to be nasally decentered by roughly 1.5 mm, allowing more light to pass around rather than through the implant. The defocused light is likely reducing the patient's BCVA and exacerbating the reduction in contrast sensitivity caused by AMD.

A Cionni capsular tension ring (CTR; Morcher) would be placed in the capsular bag to recenter and fixate the IOL–capsular bag complex. Although placing an iris device in the bag-CTR complex would cause a mild hyperopic shift (due to a change in the effective lens position), the patient's prism-dependent strabismus necessitates spectacle wear regardless. Moreover, I wonder about the refraction's accuracy because there is a significant discrepancy between the keratometric astigmatism and the apparent axis of the toric IOL. A more accurate refraction might be possible after the

Figures 5 and 6 courtesy of Kevin M. Miller, MD

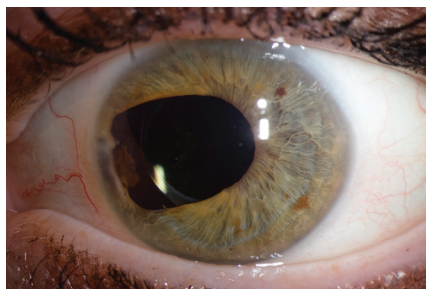


Figure 5. Preoperatively, prior iris damage exposes the edge of the toric IOL.

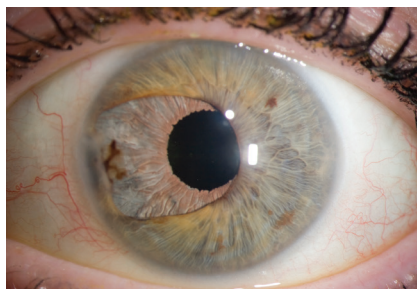


Figure 6. A custom artificial iris implanted passively in the ciliary sulcus completely eliminates the patient's glare disability.

defocused light coming though the aphakic space is eliminated. Although the toric IOL could be rotated during placement of a CTR and iris prosthesis, realignment is less important because of the patient's prism dependence. Fortunately, the fixed aperture of a custom iris prosthesis would not impede AMD monitoring and treatment.<sup>1</sup>

Although no vitreous is currently visible in the anterior chamber, with an exposed hyaloid face, prolapse could occur during surgery. I would therefore be prepared to manage this possible eventuality.

Lastly, OCT imaging suggests that macular edema may overlie the large pigment epithelial detachment. This could signal a tiny underlying choroidal neovascular membrane that is not evident on the scan provided. Fluorescein angiography would be obtained to detect active leakage, which should be ruled out or treated before surgery.



**WHAT I DID: BRANDON D. AYRES, MD**

After a lengthy and candid discussion with the patient about the health of his eyes and potential for better vision, we decided to reduce the amount of glare he was experiencing. We also discussed an IOL exchange, but multiple attempts with a manifest refraction achieved little to no improvement in his BCVA. We therefore agreed to leave the IOL in place, and he expressed a willingness to wear glasses if necessary. The patient was counseled on the options of an iridoplasty, contact lens wear, and placement of an iris prosthesis. He chose to proceed with iris prosthesis surgery. Photographs were taken of both eyes and the nasal bridge and sent for color matching. Informed consent was obtained for the surgical procedure.

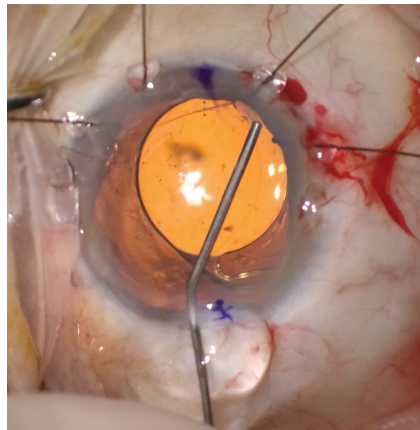


Figure 7. The iris is retracted to expose the capsular bag. A dispersive OVD is injected to open 360° of the bag.

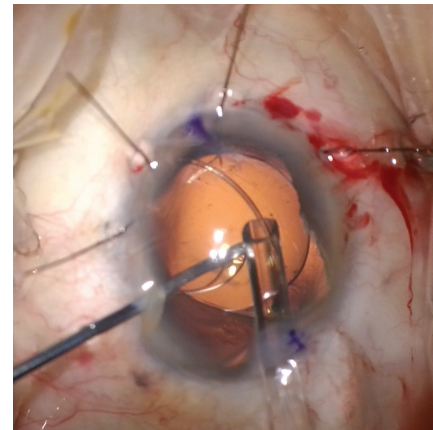


Figure 8. A CTR is placed in the bag and rotated counterclockwise to help prevent movement of the toric IOL.

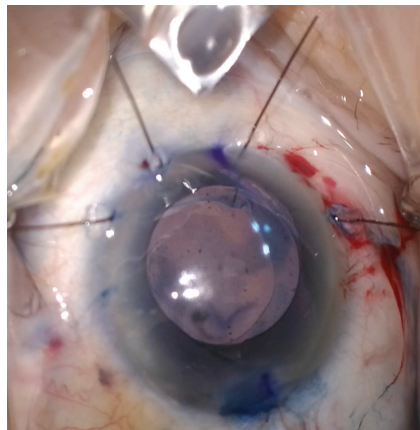


Figure 9. The capsular bag is stained with trypan blue dye to facilitate visualization of the capsule during placement of the iris prosthesis.

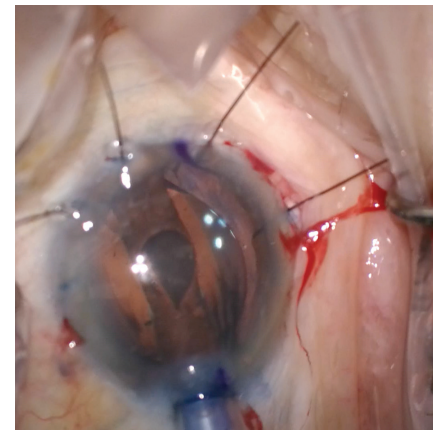


Figure 10. An iris prosthesis is placed in the capsular bag.

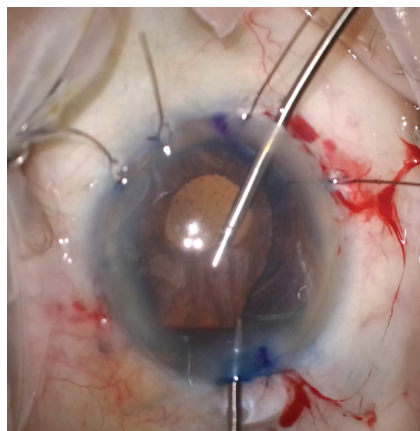


Figure 11. Microforceps are used to unfold and place an iris prosthesis in the capsular bag.

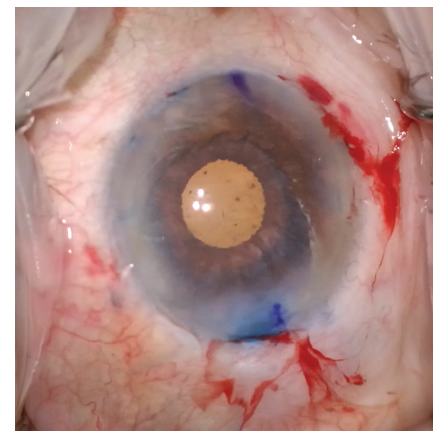


Figure 12. Final result after prosthesis placement and OVD removal.

In the OR, the irregular iris was retracted with flexible iris retractors, and the capsular bag was opened with an

OVD (Figure 7). Care was taken to avoid rotating the IOL because the toric axis seemed to be reasonable. After 360° of

Figures 7-12 courtesy of Brandon D. Ayres, MD

the capsular bag was open, the optic portion of the IOL was repositioned into the bag (the inferior portion seemed to have prolapsed out of the bag). A CTR was then inserted into the capsular bag without disturbing the axis of the IOL (Figure 8).

The open portion of the capsular bag was measured with an intraocular ruler and found to be approximately 10 mm. A custom-made, silicone, fiber-free artificial iris was trephined to 9.5 mm, carefully folded, and placed in an IOL inserter. The capsule was then stained with trypan blue dye, and the iris prosthesis was injected into the capsular bag (Figures 9 and 10). The prosthesis was carefully positioned in the capsular bag using two microforceps (Figure 11). The OVD was then removed, and the wounds were hydrated (Figure 12).

The patient tolerated surgery well. Immediately postoperatively, he noticed an improvement in his glare symptoms, and his UCVA was 20/40 OS. At the 1-month visit, he reported a poor quality of vision, but a manifest refraction produced no improvement. A comparison of pre- and postoperative macular OCT scans demonstrated stability. The patient was referred to a retina specialist, who thought the retina did not require intervention. ■

1. Blankshain KD, Snyder ME, Miller DM, Khatana AK. Clinical imaging of the fundus and optic nerve in eyes with an indwelling custom iris prosthesis. *J Cataract Refract Surg.* 2022;48(4):502-503.

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