

Cataract/IOL Surgery in a Significantly Hyperopic, Glaucomatous Eye

BY ROBERT J. CIONNI, MD

When David Chang, MD, invited me to share the details of my most challenging case ever, I was at a loss to select just one. After much consideration, however, I was at last able to narrow the field to my toughest case this year and the lessons I drew from it.

CASE PRESENTATION

A 53-year-old white male was referred to me by his glaucoma specialist for possible cataract surgery. The motivation for the referral was the patient's significant degree of hyperopia and likely need for a high-powered PCIOL versus a piggyback-IOL solution. He had required thick glasses all of his life and typically wore rigid gas permeable contact lenses. The patient had previously undergone laser iridotomy in both eyes, but his referring doctor was concerned about the continued phacomorphic component to his narrow angle anatomy.

The patient's refractions were $+13.50 +0.50 \times 135 = 20/30$ glare $20/60$ - OD and $+14.75$ D sphere = $20/50$ glare $20/80$. Examination revealed crowded orbits and anterior segments, a patent laser peripheral iridectomy in both eyes, posterior synechiae in the left eye, and a mild-to-moderate nuclear sclerotic cataract in the patient's left eye to a greater degree than in his right eye. Additionally, there were some mild disturbances in the macular pigment in both eyes. The axial lengths, as measured by the IOLMaster (Carl Zeiss Meditec, Inc., Dublin, CA), were 17.28 mm OD and 17.22 mm OS. Figure 1 shows the anterior segment anatomy as demonstrated by ultrasound biomicroscopy (UBM).

My impressions were as follows:

- Nuclear sclerotic cataract formation to a greater extent in the left than right eye
- Bilateral nanophthalmos
- Bilateral phacomorphic induced narrow angles despite laser peripheral iridectomy
- A high degree of hyperopia in both eyes.

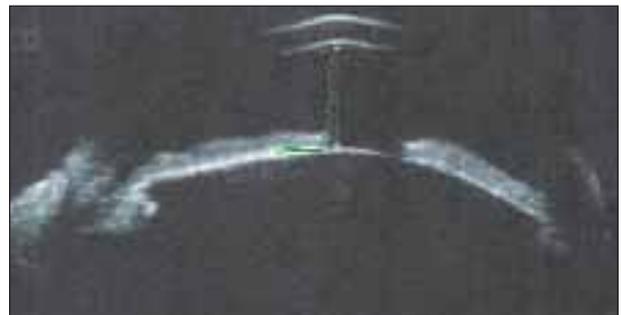


Figure 1. A UBM still photograph of the patient's right eye shows lens-induced bowing of the iris and narrow angles.

SURGICAL COURSE

The patient was strongly motivated to proceed with a surgical solution. Multiple methods of IOL power calculation estimated a need for powers of 46.50 to 47.50 D. I gave the patient the options of (1) delaying surgery until a specially ordered IOL (not available in the US; Acri.Tec GmbH, Berlin, Germany) could be obtained or (2) receiving two PCIOLs, one in the bag and one in the sulcus, to avoid the possibility of intralenticular fibrosis syndrome.¹

The patient was anxious for a resolution and selected the second option, with surgery on his left eye first. After consulting with several experts in the field of IOL calculation, I chose to implant a 30.00 D AcrySof MA50BM lens (Alcon Laboratories, Inc., Fort Worth, TX) in the bag and a 16.00 D STAAR AQ2010UV (STAAR Surgical Company, Monrovia, CA) in the ciliary sulcus.

The patient had a significant blepharospastic reaction requiring a regional block. Despite a tendency toward iris prolapse and positive pressure, surgery proceeded without significant difficulty.

OUTCOME

One week after surgery, the patient had a visual acuity of $+3.00 +0.75 \times 25 = 20/50$, and the IOP measured 15 mm Hg. The anterior IOL showed some pigmentary



Figure 2. UBM shows the acrylic IOL within the capsular bag and the marked anterior displacement of the silicone IOL in the ciliary sulcus.

deposition on its anterior surface.

Two weeks postoperatively, the visual acuity measured plano + 2.00 X 75 = 20/100, and the pigmentary deposition was more significant. I also noted possible early intralenticular fibrosis. The iris appeared to have vaulted forward, and the angles were nearly closed. The IOP, however, remained normal. I decided to attempt an Nd:YAG laser disruption of the intralenticular membrane. The procedure was successful, but it resulted in some pitting of the IOL.

One day following the Nd:YAG laser procedure, the patient's UCVA measured 20/60, which did not improve with refractive correction. He stated, however, that he was satisfied with his result, because he had never previously experienced visual acuity better than approximately 20/60 in that eye with contact lenses.

The patient's visual acuity remained approximately the same during the next year, but the IOP slowly rose into the range of 30 mm Hg. Clearly, the sulcus-placed IOL continued to be in broad contact with the iris, and it was causing pigmentary dispersion and progressive anterior synechial closure of the angle. UBM demonstrated the anterior position of the sulcus-fixated IOL (Figure 2).

I decided to remove the sulcus-fixated IOL in an attempt to prevent complete angle closure. I informed the patient that he would again have to wear contact lenses for best visual acuity.

Explanting the IOL from the sulcus proved to be quite challenging. The eye exhibited positive pressure and relentless iris prolapse each time I attempted to bisect the silicone-style IOL's optic (Figure 3).

One week following the explantation procedure, the patient's vision measured 20/100 with pinhole. Refraction showed no significant improvement. The IOP had decreased to 22 mm Hg, and the cornea remained somewhat edematous with 1+ to 2+ folds. The iris had developed a few isolated posterior synechial adhesions to the anterior capsular rim,



Figure 3. The iris prolapses each time the author attempts to bisect or remove the IOL's optic.

and there was a significant amount of pigment present on the IOL positioned in the bag. As a result, the fundus could not be visualized in clear detail. With the patient's ongoing use of topical steroid drops, I expect continued yet slow improvement and anticipate that, eventually, he will again wear a rigid gas permeable contact lens.

LESSONS LEARNED

I learned several lessons from this difficult case. First, severely hyperopic eyes with nanophthalmos do not typically have the space required for two IOLs. Second, placing one IOL in the capsular bag and one in the ciliary sulcus does not eliminate the possibility of intralenticular fibrosis, even if the IOLs are made of different materials. Third, although the Nd:YAG laser can disrupt an early intralenticular membrane, significant pitting of the IOL is likely. Fourth, explanting a piggyback IOL from a nanophthalmic eye can be quite challenging, and positive pressure and iris prolapse are likely. Intravenous mannitol or a limited, prophylactic, pars plana vitrectomy might have decreased the extent of positive pressure in this case. Finally, it is important to strongly consider a specially ordered IOL for cases such as this one—even if it may take months for the lens to be manufactured and for the FDA to issue an exemption for compassionate use.

With proper management and effective patient counseling, it is my opinion that satisfactory results can be achieved in the most difficult and challenging cases. ■

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1. Werner L, Mamalis N, Stevens S, et al. Interlenticular opacification: dual-optic versus piggyback intraocular lenses. *J Cataract Refract Surg.* 2006;32(4):655-661.