

Dense Cataract in an Extremely Shallow Anterior Chamber

BY THOMAS NEUHANN, MD; MARK F. PYFER, MD; AND MICHAEL E. SNYDER, MD

CASE PRESENTATION

A 59-year-old man is referred to you for cataract surgery. He was without insurance coverage until recently and presents with a BCVA of 20/400 OU. The examination reveals a 4+ brunescent lens (Figure 1) and an extremely shallow anterior chamber centrally in each eye. A slit-lamp examination of his eyes after pupillary dilation shows nearly 360° of irido-corneal touch around the pupillary margin (Figure 2). Gonioscopy confirms a centrally protruding iris that deepens peripherally (Figure 3). These findings are symmetrical in both eyes. Tonometry measures 14 mm Hg OU. The restricted retinal view is within normal limits, and a B-scan performed by a retinal colleague is negative for any mass or retinal detachment. How would you proceed?

—Case prepared by Tal Raviv, MD.



Figure 1. A 4+ brunescent lens.



Figure 2. Almost 360° of irido-corneal touch around the pupillary margin.

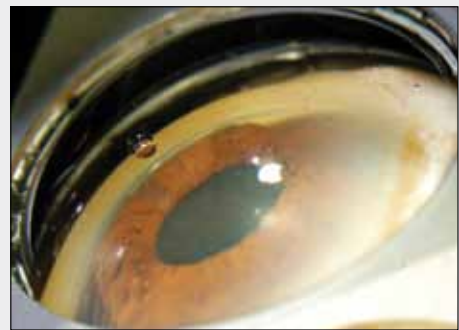


Figure 3. A centrally protruding iris deepens peripherally.

THOMAS NEUHANN, MD

The differential diagnosis for the extremely narrow anterior segment is mainly idiopathic—possibly with a very short axial length, aqueous misdirection syndrome, or anterior subluxation by loose zonules and possibly with pseudoexfoliation, since the entire lens has moved forward. An axial length measurement would be informative.

Cataract surgery is indicated both for the progressed cataract and restoration of the best-achievable anterior

segment space. After my usual preparation and extra intensive cycloplegia, I would fill the anterior chamber with an ophthalmic viscosurgical device (OVD); my preference here would be Healon5 (Abbott Medical Optics Inc.). This should lyse the central anterior synechiae and deepen the anterior chamber as much as possible.

If there is anterior subluxation, it should now be possible to diagnose this condition: the chamber would deepen, the pupil would probably dilate enough to exhibit any pseudoexfoliation, and the mobility of the

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—Mark F. Pyfer, MD

lens (phacodonesis) should become apparent. If I detected anterior subluxation, I would not employ acrobatic measures but simply perform an intracapsular cataract extraction and implant a lobster-claw IOL with retro-pupillary enclavation.

Owing to the slightly elevated IOP, if the chamber deepened insufficiently, I would perform Chandler’s deep vitreous puncture to aspirate any free aqueous trapped in the vitreous. If this technique were successful, the anterior segment should immediately deepen, allowing me to perform phacoemulsification. If the puncture could not aspirate trapped aqueous, however, I would perform a vitrectomy through the pars plana puncture, preferably with a small-gauge vitrector to achieve the same effect. In either of these scenarios, I would prescribe atropine for 1 to 2 weeks postoperatively. If, after the agent’s discontinuation, a new aqueous misdirection occurred, a pars plana vitrectomy with iridectomy would be necessary, as is usual in malignant glaucoma.

MARK F. PYFER, MD

This is a challenging case. It is not stated if phacodonesis is present. A detailed history should include any prior injury such as from boxing, but bilateral symmetry makes trauma as a cause of the shallow chamber less likely. I would obtain complete biometry, including the lens’ thickness. Is this a relatively nanophthalmic eye or a case of microspherophakia?

Untreated or recently treated metabolic disorders such as diabetes could result in acute osmotic swelling of the lens, leading to a shallow anterior chamber centrally, as in this patient. In this situation, medical treatment to normalize the blood chemistry and time for equilibration of the lens osmotic pressure would deepen the anterior chamber.

Gonioscopy indicates reverse pupillary block, with peripheral iris bowing posteriorly. The angle is open with a normal IOP, but there is a risk of closure in the future.

To safely proceed with phacoemulsification, it would be necessary to deepen the anterior chamber. A preoperative laser peripheral iridotomy might allow the lens-iris diaphragm to move posteriorly and improve pupillary

dilation. Intravenous mannitol instilled 30 minutes prior to surgery and even a Honan balloon should help to soften the eye and decrease vitreous pressure. The use of a cohesive OVD would be essential. Pars plana vitreous decompression might be required. It would be prudent to be prepared. I call these “kitchen sink” cases, because multiple devices are often needed, including an instrument to expand the pupil, a capsular stain, capsular support hooks, a capsular tension ring, and/or a capsular tension segment.

Finally, in the setting of a dense lens and a very shallow anterior chamber, the likelihood of corneal endothelial damage with phacoemulsification is increased. If the aforementioned measures failed to produce a safer situation, the patient might be best served by manual extracapsular cataract extraction.

MICHAEL E. SNYDER, MD

This is a rare case of a dense cataract in a nearly non-existent anterior chamber. I believe that Figure 3 is a bit artifactual, as gonioscopy indents the cornea slightly, even when performed by the gentlest of hands. In this case, gonioscopy would have forced the peripheral iris more posteriorly than the central iris, because the iris tissue follows the contour of the anterior surface of the lens. The sphincter muscle is thicker than the stroma, giving this peculiar appearance of anterior tenting, especially when viewed at the highly tangential angle of the gonioprism.

Cataract surgery is indicated for the patient’s visual symptoms, the surgeon’s view, and the prevention of acute angle closure. The surgical challenges are posed by the density of the lens, the extraordinarily shallow chamber, and the poorly dilating pupil. I would obtain a full medical workup, because a healthy 59-year-old is unlikely to present with such a dense, thick lens. I would approach this case surgically, beginning with preoperative intravenous mannitol to reduce vitreous volume. I would select general anesthesia with a paralytic to reduce posterior pressure from muscular actions on the globe from either resting muscle tone or inadvertent lid or muscle action sometimes seen in topical cases. An orbital block would add undesired fluid volume to the retroseptal space.

The initial paracentesis should be tangential so as to avoid inadvertently passing the superblade through the iris and into the peripheral capsule. After achieving access to the anterior chamber, I would apply trypan blue stain for several seconds and then instill a maximally cohesive OVD. If this approach did not achieve an adequate working space, then I could perform a very limited one-port pars plana vitrectomy to remove a bit more vitreous volume.

Expecting a poorly dilating pupil, in this rare case, I would prefer flexible retractors to a ring dilating device because of the limited antero-posterior working space. The capsulorhexis would be best accomplished using a 23- or 25-gauge microforceps, because a Utrata-like instrument would allow too much OVD to escape, leading to the chamber's collapse.

I would prefer a phaco chop technique for emulsification. I would add a dispersive OVD once some of the lens volume had been removed and more as needed for adequate endothelial protection. I would anticipate possible zonulopathy, commonly associated with similar cases. I would have available capsular tension rings, including the Cionni Rings for Sclera Fixation or Ahmed Capsular Tension Segments (both products from Morcher GmbH and distributed in the United States by FCI Ophthalmics, Inc.). I would also have at the ready an implant suitable for scleral fixation (or, less desirably, an ACIOL). I have seen very rare cases like this one in which maximal phaco power, even modulated, fails to scratch the nucleus. Thus, my backup plan would be extracapsular extraction.

Useful lessons from the first eye would guide my technique for the fellow cataract. ■

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