

Iridodialysis, Corectopia, and Mature Cataract

BY RICHARD E. BRAUNSTEIN, MD; D. MICHAEL COLVARD, MD; KEVIN M. MILLER, MD;
KENNETH J. ROSENTHAL, MD; AND AUDREY R. TALLEY ROSTOV, MD

CASE PRESENTATION

A 33-year-old woman who works in the biotechnology industry suffered trauma to her left eye from a BB gun at age 12. She states that her vision has become considerably worse over the past few years. She reports that she is experiencing glare and double vision and that she is having difficulty seeing fine detail.

On examination, the patient's UCVA measures 20/20 OD and 20/300 OS. She has a BCVA of $-1.75 +2.50 \times 124 = 20/100$ OS. No afferent pupillary defect is present. An evaluation of the anterior segment of her left eye reveals

a normal cornea, a quiet anterior chamber, a large iridodialysis from 7 to 10 o'clock nasally, and a temporally displaced pupil that does not dilate well (Figure 1). An examination of the lens shows a dense white cataract. Optical coherence tomography of the retina is normal. Keratometry readings for the patient's left eye are 42.87/44.75 \times 114.

How would you proceed with cataract surgery for this patient?

—Case prepared by Audrey R. Talley Rostov, MD.

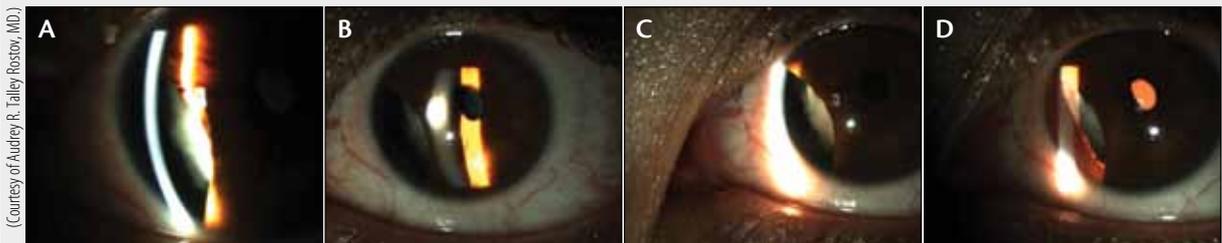


Figure 1. Traumatic white cataract and iridodialysis (A-D).

RICHARD E. BRAUNSTEIN, MD

This woman has traumatic iridodialysis, cataract, and likely zonular damage with reduced vision necessitating surgical intervention. In addition to the normal workup and testing prior to cataract surgery, gonioscopy should be performed to check for angle recession, and an attempt should be made to test for phacodonesis at the slit lamp.

I would begin by performing a peribulbar block and gently softening the eye with digital pressure. I would make four sideport incisions at 1:30, 4:30, 7:30, and 10:30 o'clock to place iris hooks to expand the pupil and limit its movement. I would then stain the anterior capsule with trypan blue dye and fill the anterior cham-

ber with a dispersive ophthalmic viscosurgical device (OVD) while taking care not to overpressurize the eye and thus put additional stress on the zonules. After creating a standard temporal clear corneal incision, I would place a fifth iris hook subincisionally to tether the iris posteriorly and peripherally.

I would perform a continuous curvilinear capsulorhexis and assess zonular integrity in each quadrant during the tear. I would initiate the capsulorhexis by pulling away from the area of "good" zonules. If diffuse laxity were present, I would advance the iris hooks to secure the anterior capsule and transfer forces to the limbus rather than to the zonules. I would perform gentle hydrodissection followed by slow-motion phaco-

emulsification of this likely soft lens, thereby minimizing zonular trauma. If hydrodissection resulted in anterior prolapse of the lens, it could be emulsified in the anterior chamber.

A capsular tension ring (CTR) could be placed before or after I/A depending on zonular integrity. If there were gross zonular laxity (greater than 3 clock hours), I would suture a Cionni Ring for Scleral Fixation (Morcher GmbH, distributed in the United States by FCI Ophthalmics, Inc.). I would place the suture temporarily and create a scleral flap to cover it in addition to the iridodialysis repair sutures.

I would implant a single-piece hydrophobic acrylic IOL with a refractive target of -0.50 D. Prior to removing the viscoelastic, I would withdraw the iris hooks and repair the iridodialysis using a closed-eye technique with a double-armed 10-0 Prolene suture on a long, straight needle (Ethicon, Inc.) passing through a corneal sideport incision 180° away. The needle would be passed through peripheral iris and out through sclera approximately 1 mm posterior to the limbus with the knots buried or, if a Cionni Ring were used, beneath a scleral flap. The suturing technique could be repeated once or twice to achieve the desired iris appearance.

Postoperatively, I would prescribe an aggressive regimen of topical corticosteroids and a nonsteroidal antiinflammatory drug, because the uveal surgery will increase inflammation and the risk of cystoid macular edema. When the patient's BCVA and refraction stabilized off antiinflammatory agents, I would determine the necessity of correcting her astigmatism with spectacles, a contact lens, or, if desired, excimer laser PRK.

D. MICHAEL COLVARD, MD

This case presents the surgeon with a number of concerns: an iridodialysis; a poorly dilating, eccentric pupil; a high astigmatic error; and a mature cataract in a young patient with possible zonular weakness in the area of the iris injury.

First, I would choose a single-piece toric IOL in case the capsule proved to be stable. I would have a three-piece backup lens ready for placement in the sulcus or for suturing in the posterior chamber if necessary.

I would mark the cardinal axes of the cornea before entering the OR, and I would mark the deep axis at 124°. I would make the primary incision at 34°, opposite the iridodialysis, so that the forces of the phaco tip during lens extraction would not tend to stretch the zonules in the area of presumed weakness.

I would use iris hooks, not an iris ring, to create a wide, controlled, central pupillary opening, and I would be sure that capsular hooks were in the room as well

as a Cionni Ring. I would stain the anterior capsule with trypan blue dye and carefully decompress the capsular bag in an effort to avoid the Argentinian flag sign. I would perform the capsulorhexis with great care, regrasping frequently, because the capsule of this young patient will be springy and tend to extend peripherally.

After implanting the IOL, I would repair the iridodialysis by suturing the torn margin of the iris to the sclera.

KEVIN M. MILLER, MD

Care for this eye should be relatively straightforward, and the patient should do well. In her favor are the normal optical coherence tomography of the retina, lack of an afferent pupillary defect, absence of vitreous in the anterior chamber, no mention of phacodonesis, and a small pupil. Vitreous in the anterior chamber

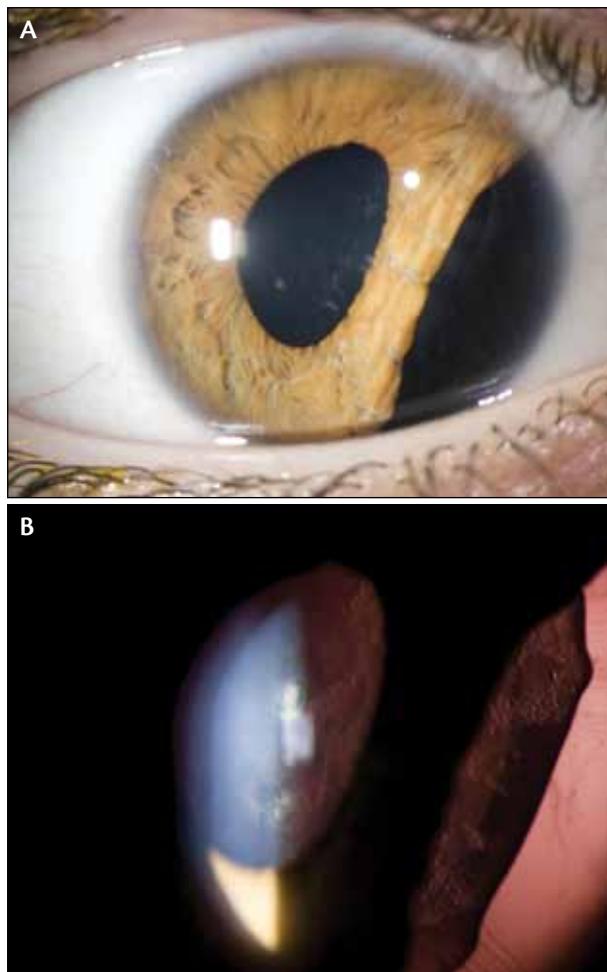


Figure 2. This eye suffered a 3- to 4-clock hour traumatic iridodialysis and cataract after blunt trauma (A). Retroillumination reveals zonular loss in the area of the iridodialysis (B). Vitreous gel prolapsed into the anterior chamber through the zonular defect.

(courtesy of Kevin M. Miller, MD)

(Courtesy of Kevin M. Miller, MD.)

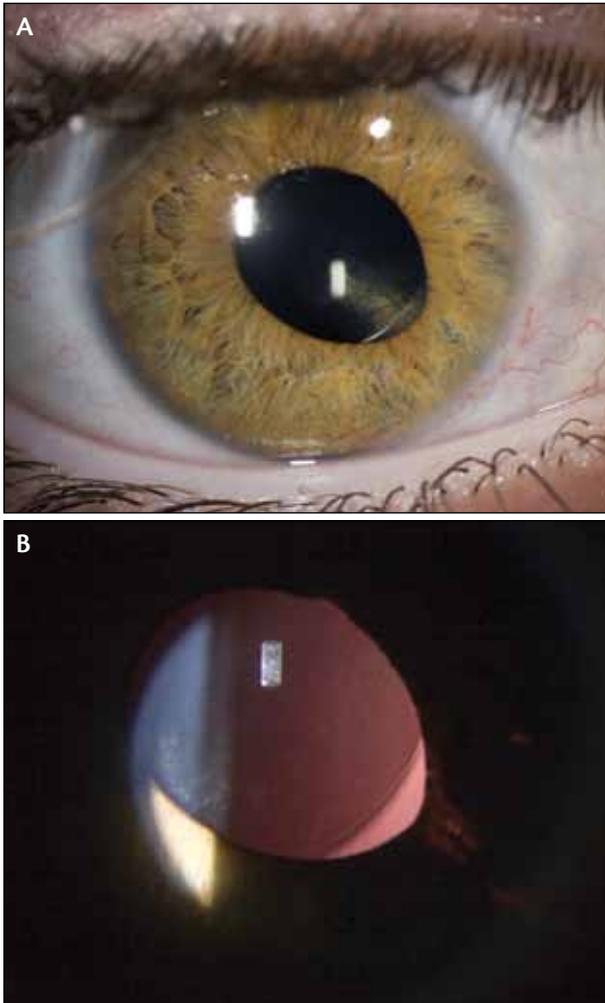


Figure 3. The same eye as shown in Figure 2 had a displaced, oval-shaped pupil postoperatively (A). The pupillary deformity exposed the edge of the IOL, as shown with retroillumination (B).

and phacodonesis, if present, would indicate complete dehiscence of zonules in the area of the iridodialysis. Phacodonesis would suggest widespread zonular laxity. A large or oval-shaped pupil, often present in these cases, would indicate segmental denervation of the iris sphincter muscle. Figure 2 shows an eye with a large iridodialysis and definite damage to the pupil sphincter, zonular dehiscence, and vitreous migration.

The surgeon will have to anticipate the possibility of vitreous prolapse through the iridodialysis and the possibility of widespread zonular laxity. He or she should be prepared to handle these situations.

I would begin surgery by making a large Hoffman pocket peripheral to the iridodialysis. The pocket will facilitate the iris repair later in the operation. I would

make the phaco incision in the superotemporal quadrant and inject a dispersive OVD over the iridodialysis to keep back the vitreous. Next, I would perform a routine phacoemulsification, sculpting toward the area of zonular weakness or dehiscence so as to put stress on the healthier zonules. After completing cortical removal, I would completely fill the capsular bag and anterior chamber with a cohesive OVD and inject a large CTR to distend the capsular bag. After implanting the IOL, I would evacuate most of the OVD, inject a miotic agent, and then reform the eye with additional cohesive OVD. If vitreous came forward through the iridodialysis before I had a chance to reform the anterior chamber, I would perform a two-port anterior or posterior vitrectomy to remove it.

I would repair the iridodialysis by passing two, possibly three, double-armed 10-0 Prolene sutures in a horizontal mattress fashion through the phaco incision, across the anterior chamber, through the far peripheral iris in the area of the iridodialysis, and out through the Hoffman pocket at the site of the former iris attachment to the sclera. I would be careful not to incorporate too much iris in the suture bites; otherwise, corectopia and elongation of the pupil in the direction of the iridodialysis would occur.

Figure 3 shows the final results of surgery on the eye shown in Figure 2. Postoperatively, there was corectopia, elongation of the pupil, and exposure of the edge of the IOL. The pupil was segmentally denervated, and the suture bites could not be taken more peripherally, because there was peripheral iris tissue loss.

KENNETH J. ROSENTHAL, MD

Where there is smoke, there is fire, as the saying goes. One must assume zonular weakness underlying, and adjacent to, the area of iridodialysis. In Figure 1D, the capsular contour is flattened, which indicates zonular damage. The keratometry readings and the refraction are in concert with one another, suggesting that the patient's astigmatism is primarily corneal and that the crystalline lens is not torqued.

I would instill triamcinolone acetonide (Triesence; Alcon Laboratories, Inc.) to detect vitreous prolapse at the area of zonular dialysis. If I found this problem, I would perform a conservative 25-gauge pars plana vitrectomy, with infusion through the anterior chamber so as to avoid removing vitreous support from the already weakened lens. Restaining the capsule with triamcinolone would help me to determine the endpoint for adequate vitrectomy. I would immediately instill a dispersive or viscoadaptive OVD over the area of zonular weakness to tamponade the vitreous face.

Next, I would fashion a scleral groove in the area of the zonular dialysis and iridodialysis. The groove would begin 2.5 to 3 mm posterior to the limbus and reach completion 1.5 to 2 mm from the limbus. The internal extent of the groove would be at the plane of the ciliary sulcus.

Two double-armed 9-0 polypropylene sutures would then be passed through the edge of the iris adjacent to the iridodialysis and docked using a bent 25- or 26-gauge hypodermic needle passed ab externo through the scleral groove. I would tighten the suture to center the pupil and temporarily tie it. The repair of the iridodialysis might improve pupillary dilation, but iris hooks or a Malyugin Ring (MicroSurgical Technology) might be required.

The capsulorhexis might prove challenging because of the zonular loss, but the tear could be facilitated by capsular hooks. One should always try to tear toward the zonular weakness initially and begin a capsulorhexis in the opposite direction to meet at the area of zonular weakness, if necessary. A retentive OVD (such as Healon5 [Abbott Medical Optics Inc.]) can be used to inflate and support the capsular bag.

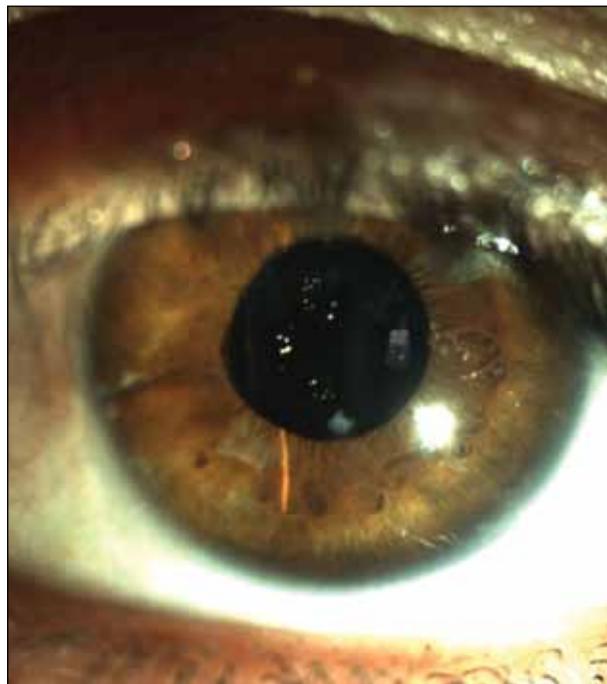
As I have advised for years, my approach is to insert a CTR as late as possible (to avoid cortical entrapment) but as early as necessary. In this case, early support of the zonule would facilitate the case and discourage vitreous prolapse. To avoid cortical entrapment, I would instill a retentive viscoelastic between the capsule and the cortex, retroplacing the anterior and equatorial cortex and nucleus, posteriorly, to discourage entrapment of the CTR. An Ahmed Capsular Tension Segment (Morchner GmbH, distributed in the United States by FCI Ophthalmics, Inc.) or Cionni Ring might be needed and could be sutured using the same scleral groove already fashioned for the iris repair.

The cataract surgery could then proceed in a relatively normal fashion, using the low-flow, slow-motion technique recommended by Robert Osher, MD, to avoid “trampolining” of the lens.

Alternatively, an iris prosthesis could be placed to cover the area of iris defect. In this case, however, I would prefer the iris repair technique because of the cost issue and the limited availability of iris prostheses. Also, the suture repair would actually work better to center the pupil.

WHAT I DID: AUDREY R. TALLEY ROSTOV, MD

After peribulbar anesthesia, I created a scleral Hoffman pocket nasally in preparation for the iridodialysis repair. Next, I created two bimanual clear corneal incisions temporally and inferotemporally with a diamond blade and injected a dispersive OVD. I placed a



(Courtesy of Audrey R. Talley Rostov, MD)

Figure 4. Postoperative appearance of the eye shown in Figure 1.

Malyugin Ring and then performed a routine capsulorhexis, hydrodissection, and phacoemulsification of the lens nucleus. I used an additional dispersive OVD during cortical cleanup, after which I inflated the capsular bag with a cohesive-dispersive OVD and placed a 13-mm CTR. I enlarged the temporal incision to 2.8 mm and implanted a single-piece acrylic IOL in the capsular bag. I used I/A to remove the OVD and injected a miotic.

To visualize vitreous strands, I performed an intracocular injection of a steroid. After performing a very limited anterior vitrectomy, I re-injected a dispersive OVD. Next, I passed two double-armed 10-0 Prolene sutures in a horizontal mattress fashion through the phaco incision, across the anterior chamber, through the far peripheral iris in the area of the iridodialysis, and out through the Hoffman pocket at the site of the iris' former attachment to the sclera. The knots were cut short and buried. I sealed the scleral pocket and the conjunctiva with fibrin glue. Additional I/A removed residual OVD, and the corneal incisions were sealed using balanced salt solution (Figure 4).

I performed a YAG capsulotomy 3 months after the initial surgery. The patient's current visual acuity is -1.00 +0.50 × 100 = 20/50+2. ■

Section Editor Thomas A. Oetting, MS, MD, is a clinical professor at the University of Iowa in Iowa City.

Section Editor Tal Raviv, MD, is an attending cornea and refractive surgeon at the New York Eye and Ear Infirmary and an assistant professor of ophthalmology at New York Medical College in Valhalla.

Section Editor Audrey R. Talley Rostov, MD, is in private practice with Northwest Eye Surgeons, PC, in Seattle. She acknowledged no financial interest in the products or companies she mentioned. Dr. Talley Rostov may be reached at (206) 528-6000; atalleyrostov@nweyes.com.



Richard E. Braunstein, MD, is a professor of ophthalmology, Hofstra North Shore-LIJ School of Medicine, and vice president of ophthalmology, North Shore-LIJ Health Care System, in New York. He acknowledged no financial interest in the products or companies he mentioned. Dr. Braunstein may be reached at (212) 702-7300; rbraunstein@nshs.edu.



D. Michael Colvard, MD, is a clinical professor at the Doheny Eye Institute, University of Southern California School of Medicine, Los Angeles. He acknowledged no financial interest in the product or company he mentioned. Dr. Colvard may be reached at (818) 906-2929; mike@mcolvard.com.



Kevin M. Miller, MD, is the Kolokotronis professor of clinical ophthalmology, David Geffen School of Medicine at UCLA, Jules Stein Eye Institute. He acknowledged no financial interest in the product or company he mentioned.

Dr. Miller may be reached at (310) 206-9951; kmiller@ucla.edu.



Kenneth J. Rosenthal, MD, is the surgeon director at Rosenthal Eye Surgery, an attending cataract and refractive surgeon at the New York Eye and Ear Infirmary, and an associate professor of ophthalmology at the John A. Moran Eye Center, University of Utah School of Medicine, Salt Lake City. He acknowledged no financial interest in the products or companies he mentioned. Dr. Rosenthal may be reached at (516) 466-8989; kr@eyesurgery.org.



SHARE YOUR FEEDBACK

Would you like to comment on an author's article? Do you have an article topic to suggest? Do you wish to tell us how valuable *Cataract & Refractive Surgery Today* is to your practice? We would love to hear from you. Please e-mail us at letters@bmctoday.com with any thoughts, feelings, or questions you have regarding this publication.