

The Case of a Sinking IOL

BY UDAY DEVGAN, MD

Experienced cataract surgeons know that, despite having performed thousands of procedures over the years, every case is unique, and challenges can present suddenly. When a complexity is recognized preoperatively, the surgeon can prepare for it. The most difficult cases are those that involve a surprise. Like a good pilot, a surgeon desires an uneventful course, but he or she is always on the lookout for signs of danger. The surprises I encountered during surgery made the case I describe herein particularly difficult.

BACKGROUND

A local retinal specialist referred a woman with macular degeneration to me. His view of the retina was becoming increasingly blurred due to the development of a cataract. Upon initial examination at my clinic, everything seemed normal. The patient's biometric measurements were normal for her emmetropic eye, her pupils dilated well, and she had a cataract of moderate density in the right eye. With the goal of a plano result, I selected a single-piece monofocal IOL. The patient was nervous, because the surgery was to be performed on her better-seeing eye, on which she relied for performing daily activities. I wanted to perform an elegant and uneventful surgery to make the patient and the referring retinal physician happy.

SURGICAL COURSE

After the topical and intracameral administration of anesthesia, I created a 0.8-mm paracentesis incision and a 2.8-mm temporal phaco incision with diamond blades. I carefully created a 5-mm round capsulorhexis that I centered on the visual axis. I extracted the nucleus during phacoemulsification and performed coaxial I/A to remove the cortex. A small amount of subincisional cortical material remained, which I planned to clean up after the IOL's insertion (Figure 1A). By implanting the IOL first, I reasoned, the posterior capsule would be protected during aspiration of the remaining cortical fragment.

After confirmation of its power, the IOL was loaded into the injector. The implant began to unfold as I inserted it directly into the capsular bag (Figure 1B and 1C). I used the

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chopper to center the lens, and I watched as the haptics unfolded into position (Figure 1D). Something was not right. The IOL began to descend posteriorly toward the retina (Figure 2A). The posterior capsule should have been securely holding the lens in place, but it was not. I had to think fast. I used the chopper to bring the IOL up toward the

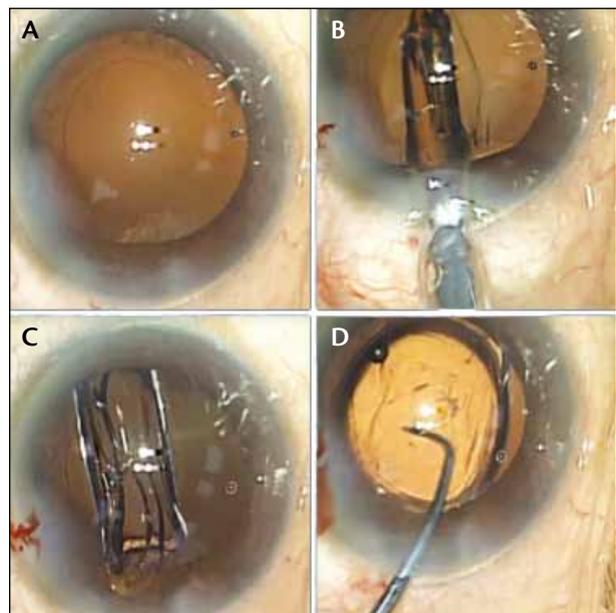


Figure 1. The capsulorhexis is well centered, and the capsular bag is empty except for a small fragment of subincisional cortical material that the surgeon plans to remove after inserting the IOL (A). The single-piece acrylic IOL is placed in the anterior chamber (B) and then guided into the capsular bag (C). The chopper is used to center the optic as the haptics unfold (D).



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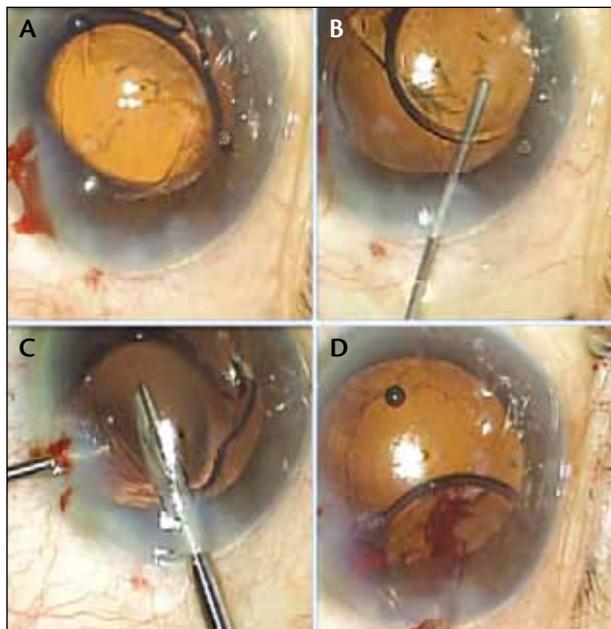


Figure 2. After insertion, the IOL descends into the vitreous (A). Viscoelastic is injected under the optic to raise the IOL and to create a barrier in front of the vitreous (B). The IOL's optic is bisected (C), and bleeding is induced during its removal (D).

anterior chamber, and I injected viscoelastic under the optic to help support it (Figure 2B). Viscoelastic is also helpful to compartmentalize the eye and prevent vitreous prolapse. At this point, I was tempted simply to dial the IOL into the ciliary sulcus, but I knew I had to avoid this approach, because the thick, nonangulated haptics of a single-piece acrylic IOL placed in the sulcus will eventually induce iris chafing, uveitis, and possibly glaucoma and hyphema.¹ I decided to explant the IOL and replace it with a three-piece lens.

Using a microscissors and forceps, I grasped the IOL and cut it to facilitate its explantation. The technique that I prefer is to bisect most of the optic, pull it toward the incision, and rotate the optic out of the eye (Figure 2C). This method allows an IOL with a 6-mm optic to be removed through an incision that is half that size. In this case, however, I was in for another surprise: when I was removing the IOL, I inadvertently nicked an iris vessel and induced bleeding (Figure 2D). I injected more viscoelastic to push the iris away from the IOL, administered intracameral epinephrine to stop the bleeding, enlarged the incision, and finally removed the entire IOL.

I carefully examined the eye and studied the open posterior capsule. Rather than a small rent or break, a large opening extended the entire width of the posterior capsule. I can only speculate as to the cause of this cap-

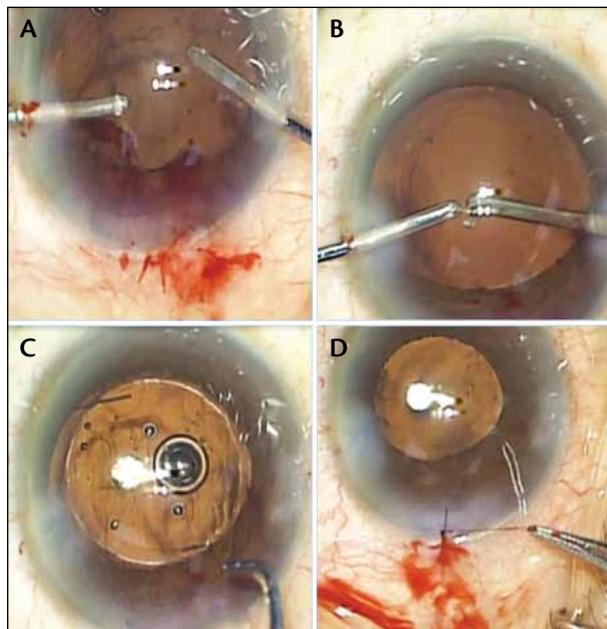


Figure 3. The surgeon uses a 23-gauge bimanual vitrectomy system to remove prolapsed vitreous and blood (A), resulting in a clean anterior chamber (B). The three-piece IOL is inserted into the ciliary sulcus with the optic captured through the capsulorhexis (C). A suture is placed to ensure the watertight closure of the main incision (D).

sular break, because even after repeatedly watching the video, I was unable to identify the exact moment when the capsule ruptured. It seems most logical that the IOL itself may have had a sharp or irregular edge that literally cut the capsule as the lens was being inserted. Because posterior capsules are less than 10 μm thick, they are susceptible to damage.

Fortunately, there was only a small amount of prolapsed vitreous in the anterior segment. To remove it and the last piece of subincisional cortical material, I used a 23-gauge bimanual vitrectomy system through two limbal paracentesis incisions (Figure 3A and B). I placed a three-piece IOL in the ciliary sulcus and oriented the lens vertically at the 12- and 6-o'clock meridians to achieve centration and a good fit (Figure 3C). Using the existing 5-mm capsulorhexis, I captured the 6-mm optic via a buttonhole technique to maximize long-term stability. With the bimanual 23-gauge vitrectomy system, I removed the viscoelastic. I then placed a 10-0 nylon suture to ensure a watertight closure of the main incision, which was particularly important for this case (Figure 3D). If the incision leaked and the anterior chamber collapsed, the IOL could become dislodged, causing more vitreous to prolapse forward.

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OUTCOME

Cases of posterior capsular rupture carry an increased risk of complications such as endophthalmitis, cystoid macular edema, and retinal detachment. My patient's postoperative course was prolonged, but the healing progressed nicely. The extended surgical procedure induced a higher degree of inflammation than usual, which required a longer course of postoperative steroids and nonsteroidal anti-inflammatory drugs. Care was coordinated with the patient's retinal specialist, who examined her retinal periphery in detail to ensure that the IOL exchange and anterior vitrectomy did not induce a retinal break or detachment. The patient recovered good vision and was very happy.

LESSONS LEARNED

This case taught me several important lessons. First, surgeons must remain focused and vigilant even during seemingly routine procedures, because complications can present as surprises. For this case, everything looked great until the IOL started to sink into the vitreous. Second, ophthalmologists must do what is best for the patient in the long term. I am happy that I did not take the shortcut of simply dialing the existing single-piece IOL into the sulcus, which would have led to future problems and the need for another surgery. Third, more than one surprise can arise during surgery. When I encountered the ruptured posterior capsule, I did not expect also to face a bleeding iris during explantation of the IOL. Lastly, surgeons must take their time to resolve problems. The question I ask myself is, what would I want done if this were my eye? ■

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1. Chang DF, Masket S, Miller KM, et al. Complications of sulcus placement of single-piece acrylic intraocular lenses: recommendations for backup IOL implantation following posterior capsule rupture. *J Cataract Refract Surg.* 2009;35(8):1445-1458.