

Surgery in a Small Pupil

BY ROBERT M. KERSHNER, MD, MS, FACS

CASE PRESENTATION

A 78-year-old white woman with longstanding uveitis due to previous Crohn's disease, which was in remission, presented with a dense cataract and a scarred irregular pupil (Figure 1). Her symptoms were glare during the day, light sensitivity, and difficulty driving at night. This pupil (less than 3 mm in diameter) could have impeded visualization and complicated the capsulorhexis, phacoemulsification, and placement of instrumentation within the eye. It also presented a risk of an iris sphincter tear, bleeding, iris emulsification, a posterior capsular rupture, and a loss of the nucleus into the vitreous. Preoperatively administered eye drops proved fruitless in dilating the bound-down and scarred pupil.

HOW WOULD YOU PROCEED?

1. Would you attempt to enlarge the pupil mechanically?
2. If you chose to mechanically enlarge the pupil, which devices and techniques would you use?
3. What type of ophthalmic viscosurgical device (OVD) would you choose?
4. How would you prevent postoperative IOP surprises when using an OVD?

SURGICAL COURSE

After instilling dilating drops, administering a topical anesthetic, and completing a surgical prep, I created a clear corneal incision with a BD Clear Corneal Blade (BD Ophthalmic Systems, Waltham, MA). I inserted a small bolus of Healon5 (Pfizer Inc., New York, NY) into the center of the pupil. Using directed injection, I then lysed the synechiae and pushed the pupillary margin out of the way. As a viscoadaptive, Healon5 works ideally to enlarge the space, and, with purposeful injection it can be used much like an instrument to manipulate tissues.

Next, I created a 5-mm, round, central capsulorhexis using the bolus of Healon5 as a template. I performed phacoemulsification with a single-instrument, single-incision technique. I selected a modified-prolate anterior surface IOL, the Tecnis Z-9000 (Pfizer Inc.), which has been

shown to improve patient safety and functional visual performance.¹ I injected the Tecnis lens with an injection system of my own design (Kershner FrictionFree IOL Injection System; Mastel Precision, Fargo, SD).

In cases such as this one, the surgeon may attempt to enlarge the pupil mechanically with devices such as a blade, needle, or scissors and to make multiple iris sphincter tears using retractors, mechanical stretching devices, or pupillary retainers.² I have found that the use of Healon5 can effectively dilate the pupil, thus allowing surgery to proceed without compromise.

OUTCOME

On the first postoperative day, the patient's vision was 20/20 uncorrected. Slit-lamp examination showed a round central pupil, clear cornea, centered IOL, and clear capsule. The patient's IOP was 20 mm Hg, and there was minimal cell and trace flare. The patient continued using topical prednisolone acetate drops six times per day and a topical fluoroquinolone q.i.d. Her follow-up evaluation at 1 and 2 weeks showed excellent visual acuity and nor-

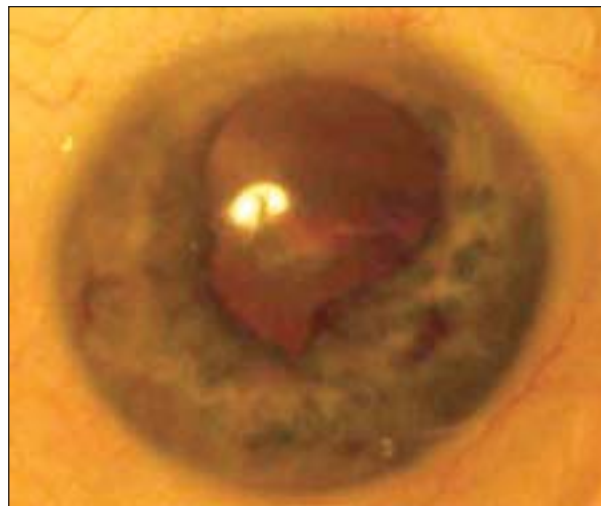


Figure 1. The patient's pupil was small, scarred, and irregular prior to cataract surgery.

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Robert Lehmann, MD

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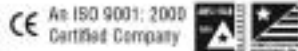
—Takayuki Akahoshi, MD, Tokyo, Japan

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CATARACT SURGERY CHALLENGING CASES

mal IOP. The patient reported a full restoration of her activities and markedly improved functional visual acuity. She was able to drive at night and tolerate direct sunlight without problems.

DISCUSSION

The modified-prolate anterior surface IOL enhanced this patient's visual outcome by modulating her postoperative contrast acuity difficulties. The Tecnis IOL, which has been shown to improve driving safety and functional visual performance, was an ideal choice for this patient.³ Many surgeons fear using a dense OVD in a compromised eye with the high risk of a postoperative IOP rise, which did not happen in this case. Whatever I put into the eye, I make sure to remove. The secret in a case such as this one is never to place a device where you cannot extract it. Because a viscoadaptive will remain where placed, I could carefully inject the OVD onto the center of this patient's pupil, where I could directly visualize its removal following lens implantation.

If used sparingly and only where needed, an OVD can be effectively and completely removed at the end of the case.

Less than 3 decades have passed since cataract surgeons performed surgery with a BSS infusion or, even worse, a bolus of air. The introduction of OVDs has unquestionably made cataract surgery more predictable, quicker, and less traumatic to the patient's eye. The single greatest advantage of OVDs is that they have allowed eye surgeons to tackle surgical cases today that they would never have attempted a few years ago. Literally dozens of OVDs are now on the market, most of them the grandchildren of the original 1% hyaluronate solution (Pfizer Inc.). This new generation of products, however, is much more dynamic and represents a broader selection, including dispersives, cohesives (such as Healon and Healon GV; Pfizer, Inc.), and viscoadaptives (such as 2.3% hyaluronate or Healon5), which are the latest tool to assist with the challenging cataract case. ■

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