

# Managing Challenging Cataract Cases

How to take your surgical skills from advanced to expert.

BY ROBERT J. CIONNI, MD

Undoubtedly, the best preparation for the challenging cataract is experience. Sage advice for approaching a particularly difficult upcoming case early in your career, then, is to swallow your pride and refer the patient to a more experienced surgeon. If possible, plan to observe the surgery to better learn how to manage such a case. As you gain experience, you will begin to feel comfortable in the eye, better understand the stress that the capsular bag and zonules can withstand, and feel more confident about your abilities. At that point, you should plan to manage difficult cases yourself.

Challenging cases come in many forms, but this article focuses on a few with similar issues of management. The common goal is to completely remove the cataract while preserving the zonules and capsular bag for the placement of an IOL. Small pupils, significant zonular dialysis, or a posterior capsular tear threatens your ability to achieve this goal. The insights provided by the authors of the other articles in this cover series will help prevent you from creating these difficulties out of otherwise routine cases. If you find yourself in a situation where the capsule or the zonules are damaged, however, the following general surgical principles will help you to prevail.

## KEEP THE CHAMBER DEEP

Never let the anterior chamber shallow to prevent the forward presentation of vitreous. First, the incisions need to be properly sized to prevent the excessive egress of fluid. Too much fluid moving out of the eye almost ensures vitreous prolapse when the natural barriers are compromised. Next, minimize flow rates, lower the vacuum level, and maintain a reasonable bottle height.

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Specifically, keeping the flow rate lower than 25 mL/min, the vacuum lower than 250 mm Hg, and the bottle height lower than 100 cm will improve your odds of successfully managing the challenges with which you are faced. Finally, when removing the infusion device from the eye, be certain first to fill the eye with an ophthalmic viscosurgical device (OVD) to prevent the chamber's collapse. In these cases, my OVD of choice is a dispersive agent such as Viscoat (Alcon Laboratories, Inc., Fort Worth, TX), because it is not aspirated in one massive piece. If some of the OVD remains at the end of the case, it usually does not lead to a significant IOP rise.

## MANAGE THE VITREOUS

If vitreous is already present, manage it properly. First, you must learn to recognize vitreous prolapse as soon as it occurs. Some of the signs are a peaked pupil, a flattened capsular bag equator, anterior billowing of a posterior capsular opening, or a refusal by nuclear material to come into the aspiration port (this may be a sign that the port is clogged with vitreous). The newer microscopes that provide excellent detail and a robust red reflex will sometimes allow you to visualize anterior traction on the vitreous before it reaches the incision site. This traction is noted as vitreous “striae” behind the cap-

sule oriented toward the zonular or posterior capsular defect. Injecting purified triamcinolone, commercially available as Triescence (Alcon Laboratories, Inc.), will help you to visualize prolapsed vitreous and simplify its complete removal. I prefer to dilute Triescence with balanced salt solution to a ratio of at least 1:3, because the stock solution is thicker than needed and can limit my view.

Never use the coaxial infusion sleeve with the vitrectomy cutter and never perform the vitrectomy through the main cataract incision. The large incision combined with the narrow shaft of the cutter will guarantee worsening of the vitreous prolapse. Instead, use the sideport incision for the infusion cannula. Make a separate, snug incision for the vitrectomy cutter, either at the limbus or through the pars plana. If you are using a 23-gauge or smaller vitrectomy cutter, the pars plana incision may not even require sutures. Always set the cutter at its highest rate, and whenever engaging vitreous, set the instrument to cut first, aspirate second. The 23-gauge cutter available on the Infiniti Vision System (Alcon Laboratories, Inc.), for example, can now reach cutting rates as high as 2,500 cuts/min.

To prevent the loss of nuclear chips, place a generous amount of dispersive OVD across the zonular dialysis or posterior capsular opening. This barrier can be bolstered by a Sheets-style glide, if desired. You can aspirate cortex with the vitrectomy cutter by disabling the cutting function to transform it into an I/A tip. Restore cutting if more vitreous presents itself.

### SUPPORT THE IOL

Provide adequate, long-term support for the IOL. This means limiting the defect, be it a posterior capsular tear or a zonular dialysis. The first step in preventing worsening of the defect is to follow the advice already given and prevent forward movement of the vitreous. The streaming of vitreous through a posterior capsular opening guarantees enlargement of the defect.

When managing a zonular defect, begin the continuous curvilinear capsulorhexis (CCC) by tearing away from the region of the strongest remaining zonules. Use a dull second instrument such as a Kuglen hook or iris hooks to provide countertraction. Make the CCC larger than usual to facilitate nuclear manipulation. Do not make the CCC too large, however, or placing and maintaining a capsular tension ring (CTR) will become challenging. Generous hydrodissection will usually allow the nucleus to move through the CCC and into the anterior chamber, where further manipulation will not stress the remaining zonules. Expand the capsular bag with a dispersive OVD behind the prolapsed nucleus to keep it away from the phaco tip and prevent vitreous prolapse.

I have become a huge fan of torsional phacoemulsification to decrease chatter.<sup>1</sup> Haphazard chattering, common with longitudinal-style phacoemulsification, can increase the chance of losing nuclear pieces through the zonular defect. A more constant flow of material into the phaco tip should decrease this risk.<sup>2</sup> You can intermittently re-expand the capsular bag with an OVD while proceeding with phacoemulsification to prevent vitreous prolapse or movement of the bag toward the phaco tip (<http://eyetube.net/?v=githi>). Alternatively, or in conjunction with OVD expansion, you can stabilize the bag during phacoemulsification and cortical aspiration with a CTR, Ahmed Capsular Tension Segment (CTS; Morcher GmbH, Stuttgart, Germany; distributed in the United States by FCI Ophthalmics, Inc., Marshfield Hills, MA), or iris retractor.<sup>3</sup> Place these devices as soon as you feel they are needed. Remember, however, that they are easier to visualize during implantation and that they are less likely to stress the zonules if the lenticular debris can first be removed or displaced with an OVD to prevent cortical entrapment. The Henderson CTR (Morcher GmbH; distributed in the United States by FCI Ophthalmics, Inc.) allows for easier removal of entrapped cortical debris.<sup>4</sup>

CTRs are contraindicated when an anterior or posterior capsular tear is present. In this instance, a CTS often may be used.

In eyes with significant decentration or marked zonular loss, a Cionni Ring for Sclera Fixation (Morcher GmbH; distributed in the United States by FCI Ophthalmics, Inc.) will likely be required. I prefer to suture this device through the scleral wall with 8-0 Gore-Tex (W.L. Gore & Associates, Inc., Newark, DE)—an off-label use (<http://eyetube.net/?v=mifed>).

After the capsular bag has been stabilized with a CTR or a CTS, cortical aspiration will be easier. Even so, using an OVD to visco-dissect cortex away from the bag's periphery will simplify its aspiration and ease the stress on the remaining zonules. This technique is also valuable in eyes with a posterior capsular tear. Aspirate the cortex farthest from the defect first and near the defect last. Never strip cortex away from the posterior capsular tear to prevent extension of the tear.

Once a CTR, Cionni Ring, or CTS is in place, implanting the IOL becomes easier. With a zonular dialysis, in-the-bag placement is desirable. The single-piece acrylic IOL design is the easiest to place due to its "Gumby-like" haptics. If a small posterior capsular defect is present centrally, convert it into a posterior CCC under the protection of an OVD. After completing the posterior CCC, you may place the single-piece acrylic IOL in the bag without fear of enlarging the opening. Do not use a plate-style silicone or Collamer (STAAR Surgical Company, Monrovia, CA)

IOL in these cases for fear of the IOL's popping through the defect as the bag fibroses.

In an eye with a larger defect, place the IOL—preferably a large, three-piece lens—in the sulcus. If the anterior CCC is intact and central, placing the haptics in the sulcus while prolapsing the optic through the CCC will provide excellent centration and stability as well as create a seal between the anterior and posterior chambers. If you are faced with both a significant zonular dialysis and a large posterior capsular defect, it may be best to suture an IOL in place or use an ACIOL.

### CONCLUSION

At the conclusion of the case, make certain that vitreous is absent from the incision and anterior chamber. Constrict the pupil with Miochol-E (Bausch + Lomb) or Miostat (Alcon Laboratories, Inc.). Any peaking of the pupillary margin is an indication of vitreous prolapse. As mentioned earlier, Triescence can help you to visualize residual prolapsed vitreous. A well-sealed incision will prevent postoperative vitreous prolapse and decentration of the IOL.

Do not attempt to aspirate the dispersive OVD completely, or you will risk late vitreous prolapse. A small residual amount of a dispersive OVD, unlike a cohesive agent, does not typically lead to a significant IOP spike.

Still, I prefer to check the patient's IOP a few hours after surgery to intercept potential rises in IOP. Such eyes can be expected to exhibit significant inflammation postoperatively. Therefore, a powerful steroid such as Durezol (Alcon Laboratories, Inc.), combined with a nonsteroidal anti-inflammatory drug, tapered over a longer period than normal is recommended. ■



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