

# STRATEGIES FOR MANAGING A TORN ANTERIOR CAPSULE



These five tips can help prevent further complications and achieve a favorable outcome.

BY ALLISON RIZZUTI, MD

The incidence of a torn anterior capsule ranges from 0.8% to 5.6% during manual cataract surgery and 0% to 5.3% during laser cataract surgery.<sup>1</sup>

When these tears occur, proper management is essential for preventing further complications, including extension to the posterior capsule, vitreous loss, dropped lens fragments, and IOL dislocation. Five strategies can help you avoid tearing the anterior capsule and prevent additional complications when a tear occurs.

## FUNDAMENTAL 1 CREATE A PERFECTLY ROUND CAPSULORHEXIS

Creating a well-sized, continuous curvilinear capsulorhexis (CCC) is the single best way to avoid tearing the anterior capsule. To prevent the tear from running out to the periphery, ensure that the anterior chamber remains filled with an OVD and the anterior capsule stays flat. If the tear begins to extend radially, employing a rescue maneuver described by Brian C. Little, FRCOphth, may save the day.<sup>2</sup> In this technique, backward traction is placed on the capsule.

Sometimes, the capsulorhexis runs out to the equator despite attempts to rescue it. In this case, a new flap can be cut with microscissors and used to complete the capsulorhexis in the opposite direction. If the anterior capsule tears during the capsulorhexis, hydrodissection should be performed gently or avoided

altogether because it can extend the tear to the posterior capsule.

## FUNDAMENTAL 2 CAREFUL LENS REMOVAL

The anterior capsule can tear during lens removal. This happens most often when the CCC is too small, which can put the edge of the capsule in contact with the phaco tip or other instruments. Improving visualization by painting the anterior capsule with trypan blue dye is a useful preventive strategy, particularly when managing a white cataract because it can be difficult to distinguish the capsule from anterior cortex.

If you notice an anterior capsular tear during lens removal, attempt to prevent the tear from extending to the posterior capsule. Techniques include lowering the infusion pressure and avoiding frequent lens rotation during nuclear disassembly. Perform hydrodissection or viscodissection after central debulking of the nucleus in order to reduce stress on the capsule. Lens cortex should be removed carefully and by pulling the aspiration handpiece toward rather than away from the location of the tear. Before removing irrigating instruments from the eye, refill the anterior chamber with an OVD to prevent collapse and subsequent stress on the capsule.

## FUNDAMENTAL 3 PROPER IOL IMPLANTATION

If the anterior capsular tear does not extend beyond

the equator, a one- or three-piece IOL may be placed in the capsular bag. A three-piece lens theoretically may be more likely to cause the tear to extend. It may also, however, be easier to suture to the iris or sclera if the IOL becomes dislocated. It is advisable to place a three-piece IOL in the ciliary sulcus if the integrity of the posterior capsule is in doubt. If enough of the anterior capsule is intact, optic capture can be performed for added stability by gently pressing the optic posteriorly into the capsular bag.

After the IOL is injected either into the capsular bag or the ciliary sulcus, it should be rotated so that the haptics are oriented 90° away from the tear. Instilling acetylcholine chloride intraocular solution (Miochol-E, Bausch + Lomb) can help prevent the IOL from prolapsing forward into the anterior chamber.

## FUNDAMENTAL 4 AVOID DEVELOPMENT OF THE ARGENTINIAN FLAG SIGN

The Argentinian flag sign occurs when intralenticular pressure from a white intumescent cataract causes spontaneous radial extension of the CCC after the capsule is punctured. The appearance of the white lens through the posterior capsule stained with trypan blue dye resembles Argentina's national flag. Recognizing in which eyes the Argentinian flag sign is most likely to occur is key to preventing it. At the slit lamp, the white intumescent cataract has water clefts, and the

anterior capsule may bulge slightly under pressure from liquefied cortex. In my experience, the risk of the Argentinian flag sign is also high in eyes with a lens that is thicker than 6 mm and an anterior chamber depth that is less than 2 mm.

Performing an intravenous injection of mannitol preoperatively can decrease posterior pressure in eyes at risk of developing the Argentinian flag sign. The use of Healon GV (Johnson & Johnson Vision) is advantageous in these eyes because of its greater viscosity and ability to maintain the anterior chamber. When performing the capsulotomy, a mini-3-mm can-opener capsulotomy can be helpful, and a 27-gauge needle on an empty syringe can be used to aspirate lenticular fluid. The flap from the can-opener capsulotomy can then be

pulled in a spiral to slowly increase the size of the capsulorhexis with each turn. Hydrodissection can be avoided in these cases. Attempt to minimize stress on the capsular bag during cataract removal.

## FUNDAMENTAL 5 DOUBLE-CHECK LASER CAPSULOTOMIES

As noted earlier, the incidence of anterior capsular tears is similar with manual and laser cataract surgery. If the laser leaves microadhesions or the capsulotomy is incomplete, the risk of tearing the anterior capsule increases. Irregularities in the capsulotomy and tags can predispose the anterior capsule to tear. Carefully identify and detach microadhesions by tearing the flap circumferentially in the direction of the capsulotomy. Tearing adhesions

centrally or cutting them with scissors can produce capsular irregularities. Always ensure that the capsular flap is completely detached before removing it from the eye. ■

1. Moshirfar M, Skanchy DF, Shah T. Intraoperative management of anterior capsular tear. *Curr Opin Ophthalmol*. 2017;28(1):42-48.
2. Little BC, Smith JH, Packer M. Little capsulorhexis tear-out rescue. *J Cataract Refract Surg*. 2006;32(9):1420-1422.

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