Posterior Capsular Rupture

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CASE PRESENTATION

A 46-year-old man was happily pseudophakic in his left eye with 20/20 UCVA. Cataract surgery in his right was routine until the surgeon discovered a posterior capsular rupture (Figure 1) during aspiration of cortex.

How would you manage this case?

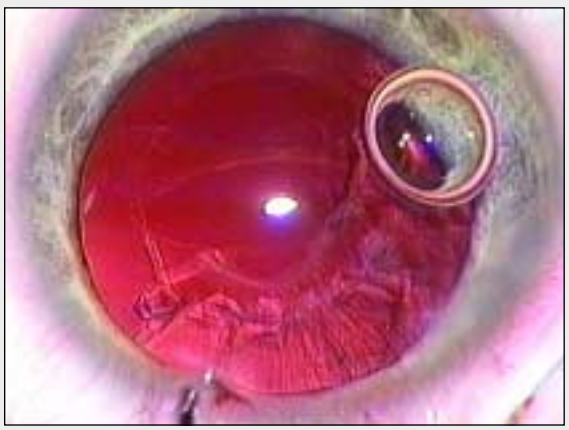

Figure 1. The posterior capsule ruptured during cataract surgery.

INTRODUCTION

Whenever a surgeon discovers a posterior capsular tear during routine cataract surgery, an immediate rush of adrenaline occurs. If he maintains his composure and thinks through his management options, a successful outcome is still likely, however. The following comments by Drs. Yung, Packer, and Rosenthal provide valuable insight into the successful management of this complication.

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In the photograph, the anterior capsulorhexis is intact, and residual cortical material is present. I cannot tell whether the anterior hyaloid has been violated or if vitreous is present in the anterior chamber. Nevertheless, the surgeon's objective at this point is to remove as much cortical material as possible and to turn the posterior capsular rupture into a more controlled posterior capsulorhexis.

I would first use a dispersive viscoelastic such as Viscoat (Alcon Laboratories, Inc., Fort Worth, TX) to push back the vitreous and enable me to determine if the ruptured posterior capsule can be converted into a posterior capsulorhexis. Remaining cortical material can be loosened and then manually removed safely with a J or a straight cannula attached to a syringe of BSS. The advantages of using the cannula are that the surgeon has absolute control and can direct vacuum suction at the cortical materials without disturbing other structures such as the posterior capsule. Also, the surgeon can use the cannula to manually deliver limited irrigation to flush and loosen any cortical adhesions. Because there is no continuous irrigation or high vacuum, as in the case of I/A, the anterior chamber is stable, and the dispersive viscoelastic holds back the vitreous. After loosening and removing the cortical material, the surgeon can use a cohesive viscoelastic such as ProVisc (Alcon Laboratories, Inc.) to gently deepen the anterior chamber and posterior capsule.

If the posterior capsular opening is relatively small and regular, in-the-bag placement of an IOL is desirable. In that case, I would choose a one-piece acrylic implant such as the SA60AT or SN60AT (both from Alcon Laboratories, Inc.). These IOLs unfold gently in a controlled fashion, a quality that would be ideal in this situation. Once the implant is in the bag and helping to prevent the vitreous from prolapsing into the anterior chamber, the surgeon may safely remove the viscoelastic with mechanical I/A.

If the posterior capsular opening is relatively large and irregular, sulcus fixation of the IOL is preferable. A three-piece foldable implant such as the MA60 lens (Alcon Laboratories, Inc.) should work well in such a case. I would place the haptics in the sulcus and capture the optic through the anterior capsular opening. This maneuver will ensure implant stability and achieve the desired postoperative refraction.

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The principles of management include preventing lens material from descending into the vitreous, preventing vitreous prolapse into the anterior chamber, and securely fixating the IOL. The surgeon's first action, therefore, is to instill a dispersive viscoelastic over the area of the rupture in order to sequester the vitreous. Next, he should fill the bag and anterior chamber with a cohesive viscoelastic to push the vitreous posteriorly. Removing the remaining cortical material is the next priority. Bimanual I/A is extremely useful in this situation, because irrigation can be maintained anterior to the iris plane while the surgeon uses the aspirator from the left to remove the cortex. By contrast, coaxial I/A will likely flush irrigation fluid downward into the vitreous and cause further vitreous prolapse. A low infusion rate may be achieved by lowering the irrigation bottle.

After completely removing the cortex, the surgeon should inspect the capsule. It appears likely that the capsulorhexis in this case is intact. If so, the surgeon's best option is to implant a three-piece foldable IOL such that the haptics remain in the sulcus and the optic is captured posterior to the capsulorhexis. Implantation with a shooter through an adequately enlarged incision is desirable to minimize pressure on the eye. The capsulorhexis will assume a football shape when the optic is tucked beneath it. The IOL power should be that calculated for in-the-bag implantation. This positioning maintains not only the separation of the anterior and posterior segments but also the centration of the IOL. Even a multifocal or modified prolate IOL, each of which requires excellent centration, can function successfully after this type of implantation.

After IOL insertion, I would instill a dilute 10% Kenalog solution through a filter needle into the anterior chamber in order to stain any residual vitreous strands. If present, they can be removed by means of bimanual vitrectomy. The surgeon should employ a miotic to constrict the pupil and check the incisions with a Seidel test to ensure their ability to self-seal. I would have a low threshold for placing a suture to prevent postoperative hypotony. The surgeon may leave a 10–0 VICRYL (Ethicon Inc., Somerville, NJ) suture to dissolve or remove a 10–0 nylon suture within 1 to 2 weeks.

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First, it is important to bear in mind that, if the phaco probe is still in the eye when the tear is discovered, the probe should remain in the incision with the infusion level minimized to keep the anterior chamber formed and the pressure constant. With his nondominant hand, the surgeon should place a dispersive viscoelastic over the tear to tamponade the vitreous and maintain the anterior chamber depth. When it can be safely accomplished, the remaining cortex should be elevated with a viscoelastic so that it is separate from the posterior capsule. Because the tear in this case appears to have a discontinuous edge, I would try to convert it to a continuous curvilinear capsulorhexis. The long-handled microincision capsulorhexis forceps are particularly good at reaching the posterior capsule. The surgeon may then remove the remaining cortex while using low vacuum and low flow-rate settings (the slow-motion concept of Robert Osher, MD,[1] of Cincinnati applied to I/A) to minimize trampolining as well as turbulence or hydration of the vitreous. If the surgeon suspects vitreous prolapse, he can use the vitrectomy handpiece with the Irrigate/Aspirate/Cut sequence to allow effective cortical stripping while he cuts any insinuated vitreous strands.

Because the anterior capsular rim is intact, the IOL may be placed in the bag. If the continuity of the posterior capsulorhexis is in doubt, the surgeon may place the IOL in the sulcus and then capture the optic behind the anterior capsular rim, in the bag. This maneuver will ensure refractive predictability and good IOL centration. One-piece IOLs without sturdy haptics (eg, plate lenses or one-piece acrylic lenses) should be avoided in these cases. ■

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