

# Cataract and a Tube Shunt

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## CASE PRESENTATION

A 65-year-old woman presents with decreased vision due to cataracts. She relates a past ocular history of glaucoma surgery several years ago on her left eye. She also has a history of trauma to that eye.

The patient's BCVA is 20/50 OD and 20/70 OS with a -1.00 D refraction. The slit-lamp examination is significant for 3+ nuclear sclerotic cataracts in both eyes. A tube shunt is visible in the anterior chamber of her left eye, with tube-lens contact. The IOP measures 13 mm Hg OU on Xalatan (Pfizer Inc.).

Figure 1 shows the slit-lamp examination after dilation of the pupil in the patient's left eye. Her optic nerves have a cup-to-disc ratio of 0.75, and her visual fields have general depression but no focal deficits.

How would you approach cataract surgery for this patient? How does your cataract technique or approach differ for patients with prior glaucoma surgery (trabeculectomy or tube shunt)? Would you consider a presbyopia-correcting IOL for such a patient?

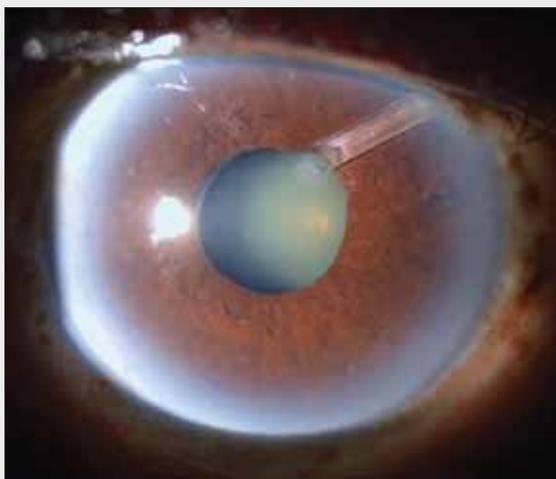


Figure 1. The end of the tube shunt is in contact with the anterior lens capsule, exacerbating the cataract.

## RICHARD A. LEWIS, MD

The slit-lamp photograph reveals poor pupillary dilation, crowding of the anterior chamber, and a tube touching the crystalline lens. Information is not available on corneal topography or axial length, but it would strongly influence my choice of IOL, especially in regard to the possible use of a toric lens. Given the patient's history of ocular trauma, my final decision on the type of IOL would depend on the stability of the zonules and capsular bag. I would recommend against using a presbyopia-correcting IOL due to the patient's advanced glaucoma and prior trauma.

I would plan on entering the eye initially with a paracentesis, then a temporal clear corneal 2.2-mm incision. After deepening the crowded anterior chamber with viscoelastic, I would trim the tip of the tube back to the middle of the iris. I would then enlarge the pupil with two Sinsky hooks. If this step did not provide sufficient pupillary dilation, I would place iris hooks or a Malyugin Ring (MicroSurgical Technology, Redmond, WA). Caution would be necessary with the capsulorhexis due to (1) the contact of the tube's tip against the capsular surface and (2) possible zonular weakness from old ocular trauma. Support from a capsular tension ring (CTR) might be necessary, and I would have a device available in case it were needed. If the bag were stable following phacoemulsification, I would place a single-piece acrylic IOL (perhaps a toric IOL) in the bag. Depending on the quality of the corneal wound and the function of the tube shunt, I would consider placing a corneal suture to prevent leakage at the site of the incision.

Postoperatively, this patient will require enhanced anti-inflammatory treatment.

## JAY LIPPMAN, MD

The combination of glaucoma, cataract, suboptimal pupillary dilation, and pigmentary loss at the pupillary margin is suggestive of pseudoexfoliation. The patient's history of trauma is more difficult to assess. I would proceed in a timely fashion, because dense cataracts in the presence of small pupils and compromised zonules increase the risk of complications.

Preoperatively, I would assess the degree of zonular weakness (shallow or super deep chamber, phacodonesis, obvious subluxation, etc.). After administering non-steroidal drops preoperatively, I would attempt to stabilize the iris with “epi-Shugarcaine”<sup>1</sup> in hopes of a salutary effect on the iris sphincter and dilator. Both are compromised in pseudoexfoliation.

A dispersive viscoelastic might help to mechanically dilate the pupil. Techniques for stretching the pupil are quick and easy to perform. Iris retractors might be necessary and should be applied in a diamond rather than a square configuration for maximal effect. Pupil expander rings could be used as well. The goal would be to avoid an overly small (or too large) continuous curvilinear capsulorhexis. The end of the shunt might have to be trimmed to facilitate the process. Lack of zonular countertraction might necessitate the use of hooks or capsular retractors during the capsulotomy. Hydrodissection and viscodissection would help minimize stress on the zonule. A zonule-sparing phaco technique would be advisable; vertical chopping would work well.

Removal of the nucleus often causes the capsular bag to collapse. For safer cortical removal, a bimanual technique using a 23-gauge cannula might be necessary in addition to a carefully monitored vacuum level, aspiration rate, and bottle height. I would be vigilant for infusion misdirection syndrome and treat it accordingly. I would place a CTR or capsular tension segment, if needed, as late as possible in the case but as soon as necessary, because the devices might trap cortex and traumatize the zonule during their insertion.

A lens implant with rigid haptics and a broad arc of contact such as the Hoya iSymm (Hoya Surgical Optics, Inc., Chino Hills, CA) might help to maintain the capsular fornice and avoid phimosis of the anterior capsular rim. A single-piece acrylic lens would unfold more gently with minimal zonular stress. I would avoid the Crystalens (Bausch + Lomb, Rochester, NY) as well as multifocal IOLs in this case for myriad reasons. Postoperatively, I would monitor the patient for early IOP spikes and inflammation.

### **SUNG CHUL PARK, MD, AND CELSO TELLO, MD**

Phacodonesis associated with ocular trauma should be checked preoperatively. We would use iris hooks to dilate the pupil and carefully perform the capsulorhexis, because microtears might exist in the anterior lens capsule due to tube-lens contact. We usually inject viscoelastic into the tube to temporarily block it and keep lenticular material from entering it. We prefer horizontal chopping with torsional phacoemulsification and a low vacuum/flow rate in cases with possible preexisting zonular dehiscence. Surgeons should check any tilting or lateral movement of the lens during the injection of the viscoelastic, any wrinkling of the lens capsule during the capsulorhexis, an unstable capsular

bag during phacoemulsification, and any decentration of the IOL. A CTR or capsular tension segment could be used in case of significant zonular weakness or an unstable capsular bag. At the end, we would flush the viscoelastic from and trim the tube. If it were touching the cornea, we would move the tube to the sulcus.

If we found any sign of zonular instability pre- or intraoperatively, we would not use a presbyopia-correcting IOL that requires good centration. Also, we would recommend against a diffractive multifocal IOL in an eye with an advanced visual field defect.

When an eye has undergone glaucoma surgery, we try to minimize phaco time in order to avoid stimulating fibrosis of the bleb or blockage of the tube. Eyes with traumatic, exfoliative, or angle-closure glaucoma require the surgeon to watch carefully for hidden zonular or capsular instability.

### **THOMAS W. SAMUELSON, MD**

There are several points to address in this case, some of which are germane to all patients undergoing cataract surgery and others that are unique to this patient. The general issues include a discussion of the risks, benefits, and alternatives to surgery as well as of the IOL options and target refraction. Given her well-controlled IOP and lack of definitive visual field defects, I would describe all IOL options to this patient, including aspheric monofocal and multifocal IOLs. Neither corneal topography nor keratometry readings were included in the case history, yet it would be important to address any preexisting corneal astigmatism if the patient desires either emmetropia or a multifocal IOL. The lack of refractive astigmatism on the preoperative refraction does not rule out corneal astigmatism. The patient's history of trauma would also stimulate a discussion of her slightly increased risk of capsular instability with cataract extraction.

My surgical approach would be pretty straightforward in this case. I would operate on the patient's left eye first and perform surgery on her right eye approximately 2 weeks later, assuming a routine postoperative course in her first eye. The iris in Figure 1 looks a bit atrophic, and the pupil does not dilate widely. I do not perceive exfoliative material in the photograph, however, and the patient's gender suggests that she is not using tamsulosin (Flomax; Boehringer Ingelheim Pharmaceuticals, Inc.). I would therefore expect that simple viscodilation of the pupil with a dispersive-retentive viscoelastic would be adequate. I would not rule out the need to stretch the pupil or to use iris rings or hooks if I encountered capsular instability related to the prior trauma. If it became necessary to enlarge the pupil mechanically, the brown iris would significantly reduce the cosmetic concern of any resulting anisocoria.

Although the intraocular portion of the tube is a bit long,

its trajectory looks fine, so I would not reposition the tube. I would, however, probably trim it slightly. Doing so early in the case would facilitate the capsulotomy, although the tear could easily be performed without trimming the tube. The region of tube-lens touch is of little concern, but I would swing the capsulotomy out peripheral to the scar that is evident in Figure 1. Finally, I would thoroughly remove the viscoelastic material at the end of the case and monitor the IOP carefully postoperatively. ■

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