

Preventing Complications in Patients With PXF Syndrome

Tips for overcoming the intraoperative and postoperative challenges associated with this rare condition.

BY ALAN S. CRANDALL, MD

Pseudoexfoliation (PXF) syndrome is a systemic and ocular condition in which hyaline material of unknown etiology is deposited onto structures in the eye's anterior segment. The presence of this debris can create problems during phacoemulsification, but surgeons can reduce the risk of complications through a few preventative measures.

WHAT TO LOOK FOR

Telltale signs of PXF syndrome include a classic deposition pattern on the lens (Figure 1) and pigment in the angle on gonioscopy. The most common challenges surgeons face when performing phacoemulsification on affected patients are managing small pupils and maintaining zonular stability.

Patients should undergo a slit-lamp evaluation to rule out zonular instability, phacodonesis, or subtle asymmetry in the depth of their anterior chambers (Figure 2). Any of these abnormalities could portend zonular problems and complicate cataract surgery. Patients with PXF syndrome can experience sudden IOP spikes after pupillary dilation, so surgeons should take steps to avoid this complication.

DILATING THE PUPIL

Patients' pupils must be large enough to permit the safe creation of the capsulorhexis. Surgeons may use topical mydriatics or mechanical means such as Lester hooks (Katena Products, Inc., Denville, NJ), the Beehler pupil dilator (Moria, Antony, France), the Morcher Pupil

Dilator (Morcher GmbH, Stuttgart, Germany; distributed in the US by FCI Ophthalmics, Inc., Marshfield Hills, MA), and the Perfect Pupil Injectable (PPI; Milvella Ltd, Sydney, Australia).

I create my preferred 5.5-mm central capsulorhexis in eyes with PXF through a combination of an adaptive ophthalmic viscosurgical device, such as Healon5 (Advanced Medical Optics, Inc., Santa Ana, CA) or Discovisc (Alcon Laboratories, Inc., Fort Worth, TX), and the Morcher Pupil Dilator. I use the pupil dilator versus a two-handed



Figure 1. The patient's eye shows a classic deposition of abnormal extracellular tissue. Note the central plaque surrounded by a clear zone and further deposition around the pupillary margin.

stretching method, because the device remains in the eye until the end of the procedure and does not tear the iris.

PHACO TECHNIQUES

The phaco techniques I use on patients with PXF syndrome are designed to place minimal stress on weak zonules. I use a Chang Hydrodissection Cannula (Katena Products, Inc.) on a gentle wave setting to dissect the nucleus away from the capsular bag with cortical cleaving hydrodissection. After I rotate the nucleus to ensure it is completely free, I divide it into quadrants with a prechopper. If the nucleus is too hard for prechopping, or if I am working through a particularly small pupil, I use a zonule-friendly vertical chopping technique.

In cases in which debulking or divide-and-conquer is appropriate, I use enough energy to prevent the nucleus from moving during the phaco passes. Choosing the proper duty cycle reduces the amount of energy delivered to the eye and can prevent corneal damage. The surgeon must use enough power to prevent nuclear movement but employ a pulse or burst mode to prevent corneal burns.

The I/A phases of phacoemulsification can be tedious in eyes with PXF and, if not performed carefully, can strip away weak zonules. A bimanual technique may be useful, especially if the patient's pupil is relatively small, because it is easier to get to the subincisional cortex through two sites. Another option is to insert a capsular tension ring (CTR), although there is some debate as to whether the device is necessary in all cases of PXF. CTRs can decrease capsulophimosis and distribute forces to the zonules more equally. Although the devices do not protect against the late dislocation of an IOL, their presence may make it easier to suture the IOL to the sclera if necessary. The placement of these devices can exert stress on the zonules, however, and CTRs can complicate I/A if they are inserted too early. I do not use CTRs in all eyes with PXF syndrome, only in those with clear evidence of zonular weakness. Even then, I only place CTRs as late as safely possible.¹

POSTOPERATIVE MANAGEMENT

To prevent postoperative IOP spikes, I carefully remove all lenticular fragments and viscoelastic from the eye at the end of surgery. I also start patients on 500 mg of oral acetazolamide for 3 days and, when necessary, release pressure from their eyes through the sideport incision on the day of surgery.

A long-term complication associated with PXF is the spontaneous subluxation of implanted IOLs.² This problem can arise any time between 2 months and 16 years



Figure 2. Asymmetric anterior chamber depths on slit-lamp examination suggest zonular weakening in eyes with PXF syndrome.

postoperatively, with most cases occurring an average of 8.5 years after the IOL's implantation.

I use several strategies to correct IOL subluxation in patients with PXF. If the patient has plate IOLs, I remove the lenses and replace them with a haptic design. For example, three-piece lenses may be sutured to the sclera or the iris. If the patient does not have glaucoma, and I have to make a large incision to remove his original lens, I may consider implanting ACIOLs, PCIOLs, or foldable IOLs. In general, however, I prefer to use a foldable, iris-fixated, three-piece lens, which I suture to the sclera if the iris is missing or torn. I find that an iris fixation is technically easier, however, and allows me to keep the incision small.

CONCLUSION

When operating on patients with PXF, surgeons should be aware of strategies they can use to prevent IOP spikes after phacoemulsification. Gentle nuclear disassembly, careful cortical cleanup, and the use of devices such as CTRs can reduce the risk of immediate postoperative complications. Fixating nonplate IOLs to the sclera or the iris may help prevent subluxation. ■

Reprinted with permission from Glaucoma Today's January/February 2007 edition.

Alan S. Crandall, MD, is Professor and Senior Vice Chair of Ophthalmology and Visual Sciences and Director of Glaucoma and Cataract for the John A. Moran Eye Center at the University of Utah in Salt Lake City. He acknowledged no financial interest in the products or companies mentioned herein. Dr. Crandall may be reached at (801) 585-3071; alan.crandall@hsc.utah.edu.



1. Ahmed I, Cionni R, Kranemann C, Crandall A. Optimal timing of capsular tension ring implantation: a Miyake-Apple video analysis. *J Cataract Refract Surg.* 2005;31:1809-1813.
2. Jehan F, Marmalis N, Crandall A. Spontaneous late dislocation of intraocular lens within the capsular bag in pseudoexfoliation patients. *Ophthalmology.* 2001;108:1727-1731.