

October 2014

**COVER  
FEATURE**

## ***Complex cataract cases*** **Cataract surgery in pseudoexfoliation syndrome cases**

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by Lauren Lipuma EyeWorld Staff Writer



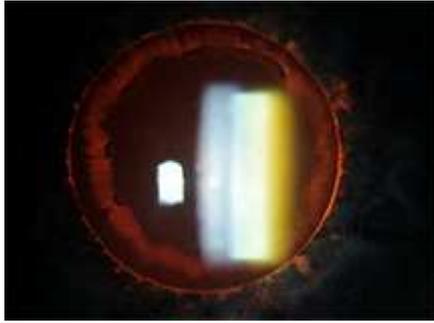
**Figure 1: Pseudoexfoliation material visible on the anterior lens capsule**



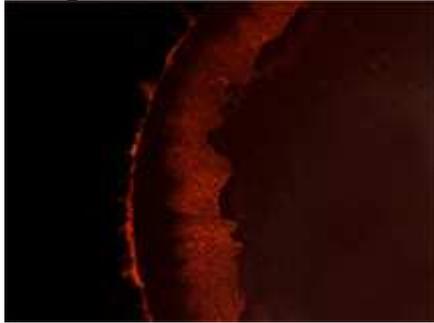
**Figure 2: Close-up of Figure 1**



**Figure 3: Pseudoexfoliative material adherent to the corneal endothelium**



**Figure 4: Low power photo of the lens against the red reflex showing the pseudoexfoliation material on the anterior lens capsule and transillumination defects in the peripheral iris margin**



**Figure 5: Photo of the lens against the red reflex, highlighting the pattern of pseudoexfoliation material on the anterior lens capsule (close-up of Figure 4) Source (all): David G. Heidemann, MD**

#### **AT A GLANCE**

- If phacodonesis or lens subluxation is present at the slit lamp exam, experts recommend sending the patient to a retina specialist for pars plana vitrectomy and lensectomy.
- Three-piece IOLs are easier to refixate than 1-piece IOLs.
- Accommodating, toric, multifocal, and aspheric monofocal IOLs are contraindicated in patients with pseudoexfoliation.

*Unique challenges can be managed with the appropriate surgical tools and techniques, experts say*

**T**he deposition of extracellular protein on the structures of the anterior segment puts patients with pseudoexfoliation syndrome at a higher risk for complications both during and after cataract surgery. Zonular weakness, due to deposition of pseudoexfoliative material on the zonular fibers, and poor pupil dilation, due to infiltration of material into the iris stroma, are the factors that most increase patients' risk for complications. Steven Gedde, MD, professor of ophthalmology, Bascom Palmer Eye Institute, Miami, stressed the importance of assessing for zonular weakness and poor pupil dilation preoperatively to guide intraoperative management. Iridodonesis, phacodonesis, asymmetry of anterior chamber depth, and lens subluxation are manifestations of zonular weakness, but

these signs may or may not be present preoperatively depending on the severity of the disease. Observing phacodonesis or lens subluxation at the slit lamp is a sign of severe zonular weakness, indicating that “all the zonules are near death or pretty much gone,” said John Hart, MD, FACS, co-chief of anterior segment surgery, William Beaumont Hospital, West Bloomfield, Mich. In those cases, Drs. Hart and Gedde send the patient directly to a vitreoretinal specialist for a pars plana lensectomy and vitrectomy with a sclerally fixated IOL. If zonular weakness is mild, signs of it can be subtle, but the fact that pseudoexfoliation tends to be asymmetric helps produce these signs, said JoAnn Giaconi, MD, associate clinical professor of ophthalmology, Jules Stein Eye Institute, Los Angeles. Poor pupillary dilation in one eye indicates a greater risk for zonular weakness on that side, as well as a shallow or deep anterior chamber or a depth that fluctuates based on patient position. Gonioscopy and ultrasound microscopy are useful techniques for assessing asymmetry of anterior chamber depth prior to surgery, Drs. Gedde and Giaconi said.

### **Intraoperative**

### **management**

Poor pupillary dilation can be managed with mechanical pupil expanders, such as iris retractors or a Malyugin ring (MST, MicroSurgical Technology, Redmond, Wash.). Drs. Hart and Gedde prefer iris retractor hooks because they can be repositioned to the edge of the capsulorhexis to provide support for the capsule and counter tension for the capsulorhexis. “I like MST iris retractors for supporting the capsule because they’re double-stranded, so the part that contacts the capsule is very smooth and won’t break it,” Dr. Hart said. Once the pupil has been sufficiently expanded, minimizing stress on the zonules is the main objective during surgery. “Avoid overfilling the eye with viscoelastic, as excessive deepening of the anterior chamber can place undue stress on the zonules,” Dr. Gedde said. To prevent the mechanical stress of phaco from being transferred to the capsule or the zonules, Dr. Hart recommends fully hydrodissecting the lens so that it is spinning freely inside the capsule and using a chopping technique rather than divide-and-conquer. During cortex removal, Dr. Giaconi recommends stripping the cortex tangentially toward the area of weakness, rather than away from it, which will tear more zonules. Patients with zonular dialyses are also at risk for posterior fluid misdirection, said Dr. Gedde, which increases vitreous pressure and decreases the depth of the anterior chamber during surgery. “Use of a capsular tension ring, a lower irrigation rate, and a viscoelastic barrier in the area of zonular dialysis can serve to avoid this intraoperative complication,” he said.

### **Capsular**

### **tension**

### **rings**

Capsular tension rings (CTRs) are often used to manage zonular instability in pseudoexfoliation patients, but surgeons differ in their opinions on whether or not to insert them universally in all

pseudoexfoliation patients. Drs. Hart, Gedde, and Giaconi agreed that CTRs do not eliminate the risk of late dislocation, but do provide other intraoperative and postoperative advantages. Dr. Hart chooses to place CTRs in all of his pseudoexfoliation patients. Dislocations are impossible to predict, he said, and with a CTR in place, the surgeon has 360 degrees of access to refixate the lens if that happens. This is especially helpful when considering that many pseudoexfoliation patients are at risk of developing glaucoma—ideally, the lens repair should allow the patient to undergo glaucoma surgery later if it is needed, he said. A CTR also keeps the capsular bag open if the lens dislocates, so it is much less likely that the vitreous will prolapse during the lens repair, he added. Dr. Gedde, on the other hand, is selective in the use of CTRs in pseudoexfoliation patients, as there is potential for iatrogenic capsule and zonule injury with CTR insertion. He will use a CTR if there is less than or equal to 4 clock hours of zonular dialysis and/or mild phacodonesis, and a sutured modified CTR or capsule tension segment for more severe dialysis. CTRs redistribute stress among all the zonules and reduce rates of asymmetric capsular contraction, said Dr. Giaconi, but not all pseudoexfoliation patients have weak zonules and not all will end up with a dislocated lens. She will place a CTR if she sees zonular dialysis in one quadrant or if she suspects mild phacodonesis. Surgeons also face the challenge of determining the optimal time to insert the device during the procedure. “A CTR may impede cortical removal, and I prefer to delay implantation as long as possible during the case for this reason,” said Dr. Gedde. “I generally put them in after I’ve taken the lens and the cortex out,” said Dr. Hart.

## **IOL**

## **choice**

Since accommodating lenses depend on normal capsule-zonule function and multifocal, toric, and aspheric monofocal lenses depend on good centration, these lenses are contraindicated in pseudoexfoliation patients, said Drs. Hart, Gedde, and Giaconi. The surgeons also tend to use 3-piece IOLs more often than 1-piece IOLs because they are more rigid and can be more easily fixated if the lens dislocates. One-piece lenses tend to tilt and torque when sutured into place, said Dr. Hart, which can cause vision problems later on for the patient. “Soft 1-piece acrylic lenses are easy on the zonules during lens placement intraoperatively so they avoid additional stress on the zonules, but they don’t resist capsular contraction very well,” Dr. Giaconi said. “The 3-piece lenses can resist capsular contraction, at least in the areas of the haptics, more than the 1-piece lenses.”

## **Postoperative**

## **implications**

“These patients can have great vision postoperatively, but one must be aware that this can change over time since the zonulopathy is progressive,” Dr. Giaconi said. As a result, pseudoexfoliation patients

must be followed closely to monitor IOL position as well as to check for inflammation and elevations in IOP—often for life. “Complaints of decreased vision after cataract surgery in pseudoexfoliative eyes aren’t always due to posterior capsule opacity, as they are in many pseudophakic eyes,” Dr. Giaconi said. If the patient has vision problems, the surgeon must look specifically for lens subluxation or dislocation and correct the problem as soon as possible. Dr. Gedde uses topical steroids more frequently and for a longer duration in pseudoexfoliation patients, as abnormalities in the blood-aqueous barrier make them more prone to postoperative inflammation. Pseudoexfoliation is a risk factor for glaucoma, so IOP should also be monitored after surgery. “Combined cataract and glaucoma surgery may be indicated in select patients with pseudoexfoliation, depending on the IOP level, medication tolerance, stability of glaucoma, and degree of glaucomatous damage,” Dr. Gedde said. With these considerations, close monitoring of the patient after surgery is essential to track the progress of the disease and address any complications that may arise. EW

*Editors’ note: The physicians have no financial interests related to their comments.*

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