

# consultation section

## cataract surgical problem

edited by Samuel Masket, MD

A growing body of evidence suggests that late dislocation of the capsular bag/intraocular lens (IOL) complex may occur in eyes with pseudoexfoliation several years after uneventful cataract surgery. This phenomenon has become more prevalent since the advent of capsulorhexis and complete encasement of the IOL in the capsular bag.

Given this issue, what would you suggest as the best cataract surgical method in a relatively young, healthy individual with signs of pseudoexfoliation?

■ In their series of 9 pseudoexfoliation patients with spontaneous capsular bag/IOL dislocations, Jehan and coauthors<sup>1</sup> highlight the surprising delay in the onset of this complication—5 to 10 years postoperatively. This raises the concern that additional patients will have dislocations even later because of continued, progressive zonular weakening. The younger the patient, the more the risk of this late complication should be considered.

The delay in onset makes it difficult to determine the true incidence of this complication. An informal survey taken during a course on complications showed that nearly 20% of the audience (approximately 60 surgeons) had seen this complication personally (M. Kraff, MD, “Clinical Decisions in the Management of Complications of Cataract and IOL Surgery,” presented at the American Academy of Ophthalmology annual meeting, New Orleans, Louisiana, USA, November 2001). Most had seen it in eyes with silicone IOLs, and only a minority had seen it with acrylic IOLs.

The primary causative factors are open to speculation. Possibilities include patient factors, operative factors, capsulorhexis size, and the IOL design and material. The rarity of crystalline lens subluxation with pseudoexfoliation suggests that progressive, age-related zonular weakening alone is not responsible. If intraoperative zonular damage were the primary factor, one would expect the dislocation to occur much sooner. That this complication has not occurred with canopener capsulotomies suggests that a capsulorhexis and bag fixation are prerequisites. Capsulorhexis fibrosis and shrinkage would presumably exert centripetal traction on the zonules.

Finally, what about IOL-related factors? The 9 published cases included 8 poly(methyl methacrylate) (PMMA) IOLs and 1 plate-haptic silicone IOL. However, 2 of my patients with a 3-piece SI-40 silicone IOL (Allergan) had spontaneous dislocation 3½ and 5 years postoperatively. In these 2 cases, the capsulorhexis had contracted to a diameter of 3.0 mm and 3.5 mm. What is unclear is whether the capsulorhexis contraction weakened the zonules or whether preexisting zonular weakness allowed the shrinkage to occur.<sup>2–4</sup> In other words, was capsulorhexis contraction the cause or the effect?

Based on these observations, I would make 3 recommendations for a younger pseudoexfoliation patient.

1. I would choose a 3-piece, 6.0 mm acrylic IOL with PMMA haptics such as the AcrySof® (Alcon) or Sensor® (Allergan). Hydrophobic acrylic material is associated with less anterior capsule fibrosis and contraction than silicone, PMMA, and hydrogel materials.<sup>5–7</sup> Jehan and coauthors<sup>1</sup> theorize that a capsular tension ring (CTR) might reduce zonular tension from bag contracture. Until such devices are approved by the U.S. Food and Drug Administration (FDA), selecting rigid haptics with maximally broad capsular contact might be advisable. Compared with the single-piece, flexible acrylic haptic, the longer PMMA haptics are more likely exert centrifugal tension on the capsular fornices.
2. Although a capsulorhexis slightly overlapping the optic diameter helps prevent posterior capsule opacification (PCO), I would avoid too small a diameter. This might require secondarily enlarging the capsulorhexis after IOL insertion by incising and retearing it.
3. I recommend checking the capsulorhexis diameter 1 to 2 months postoperatively. If the capsulorhexis is already constricting or becoming fibrotic, relaxing “sphincterotomies” to the edge could be performed with a neodymium:YAG (Nd:YAG) laser.<sup>8</sup> This would prevent vision-impairing capsulophimosis

and might mitigate progressive zonular traction from further capsulorhexis contraction.

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#### References

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■ There is an increasing prevalence of pseudoexfoliation syndrome as life expectancy increases. This syndrome is both an ocular and generalized disease, but it is distinct from normal aging.<sup>1</sup> A definite clinical diagnosis can be made only in the late stage of manifest pseudoexfoliation and in the stage of mini-pseudoexfoliation showing early rub-off of the material from the anterior lens capsule, typically and characteristically in the upper nasal quadrant. Additional subtle clinical signs include loss of melanin from the peripupillary pigment epithelium of the iris (producing transillumination defects in the sphincter area), anterior chamber melanin dispersion after pupil dilation, melanin deposition on anterior segment structures (particularly the trabecular meshwork), and insufficient mydriasis. The existence of circular or segmental posterior synechias without any other

obvious cause or in cases of asymmetric findings should alert one to suspect pseudoexfoliation syndrome.

The presence of pseudoexfoliation presents unusual challenges, and special care should be exercised before, during, and after surgery.<sup>2</sup> There is a higher risk of intraoperative complications in eyes with pseudoexfoliation, especially with an anterior chamber depth less than 2.5 mm.<sup>3</sup> Preoperative zonule weakness seems to lead to anterior movement of the lens.

There are several considerations when selecting a surgical technique for patients with pseudoexfoliation.

#### *Glaucoma*

In pseudoexfoliation eyes with glaucoma that do not need filtration surgery at the time of cataract surgery, a temporal clear corneal incision is preferred because it will not hinder future filtration surgery in a superior location.<sup>4</sup> The primary cause of intraocular pressure (IOP) elevation in pseudoexfoliation glaucoma is obstruction of the intertrabecular spaces by exfoliative material. In cases of increased IOP, trabecular aspiration is performed with a suction force of 150 mm Hg under light tissue–instrument contact using a modified intraocular aspiration probe (Geuder). Bimanual trabecular aspiration is safe and efficacious in decreasing IOP in cases of pseudoexfoliation.<sup>5</sup> However, there is a slight regression in effect after about 3 years that is attributed to undisturbed liberation of exfoliative debris.

#### *Small Pupil*

Highly viscous ophthalmic viscosurgical devices (OVDs) such as sodium hyaluronate 2.3% (Healon5®) are suitable to widen a small pupil and simplify capsulorhexis.<sup>6</sup> Care should be taken not to overexpand the anterior chamber with the OVD as this might challenge the zonular integrity in eyes with pseudoexfoliation. The Beehler pupil dilator helps stretch the pupil while creating tiny microsphincterotomies circumferentially. Pupils enlarged to about 6.0 mm in this manner maintain a good cosmetic appearance. The small pupil can also adequately be managed by iris hooks, iris rings, and pupil stretching with 2 hooks.

#### *Capsulorhexis*

Traction on the capsule can unzip weakened zonules. Centripetal traction on the capsular flap damages the