

# Cleaning the Anterior Capsule

BY WILLIAM J. FISHKIND, MD; NICK MAMALIS, MD; ROBERT H. OSHER, MD;  
AND WILLIAM B. TRATTLER, MD

## WILLIAM J. FISHKIND, MD

In the last installment of the “Phaco Pearls” column, I mentioned that a common topic of discussion among anterior segment surgeons is the cleaning of the anterior and posterior capsules. There appears to be a debate as to how best to accomplish this goal, how aggressive to be, and whether performing this task is required and beneficial to patients’ outcomes. This month’s column explores the need to clean the undersurface of the anterior capsule.

With the increasing popularity of aspheric, toric, and multifocal lenses, the long-term centration of the IOL has become important. It has been shown that anterior capsular fibrosis results from anterior lens epithelial cell metaplasia, which develops into myofibroblasts. These contract as well as produce collagen. Sacu et al found that removing these cells decreases the amount of anterior capsular fibrosis, phimosis, and posterior capsular opacification (PCO).<sup>1</sup>

I therefore propose reducing the number of these cells by quickly and simply employing a 0.3-mm I/A tip turned up so that its opening is located under the anterior capsule. By using low vacuum, the surgeon can effortlessly debulk 270°. The subincisional material is excessively difficult to remove, and consequently, its evacuation should not be attempted.

With this technique, the possibility of late capsular contraction and movement is, to some extent, ameliorated.

## NICK MAMALIS, MD

Anterior capsular contraction can occur in any patient with potential zonular problems such as pseudoexfoliation and myotonic dystrophy. In addition, age and instability of the blood aqueous barrier in patients with uveitis and diabetes can also put patients at higher risk for anterior capsular contraction. Silicone IOLs, especially the plate-haptic type, are prone to have anterior capsular opacification and anterior capsular contraction.

Preventing anterior capsular opacification is important in patients receiving premium IOLs. In the case of multifocal IOLs, capsular contraction syndrome may decenter or tilt the IOL, which could affect its efficacy. Capsular contraction syndrome can also have a deleterious effect on the efficacy of dual-optic silicone IOLs such as the Synchrony IOL (not available in the United States; Abbott Medical Optics Inc., Santa Ana, CA).

There are many techniques for polishing the anterior capsule in order to reduce contraction. They eliminate the lens epithelial cells by means of rings, curettes, and aspiration curettes. In addition, my colleagues and I have performed laboratory work with a modified Nd:YAG laser to remove lens epithelial cells from the anterior capsule. In situations when it is important to prevent anterior capsular opacification and anterior capsular contraction, I prefer to remove as many anterior lens epithelial cells as possible at the conclusion of cortical aspiration. This can be accomplished in a very efficient manner with bimanual irrigation and aspiration. This method successfully removes 360° of lens epithelial cells from the anterior capsule. A caveat is that anterior capsular polishing does not prevent PCO.

## ROBERT H. OSHER, MD

I was never a fan of polishing the undersurface of the anterior capsule, because I did not want to interfere with the rapid fibronectin bioadhesion that locks the IOL into position. My thinking changed with the introduction of two products—the AcrySof IQ Restor IOL (Alcon Laboratories, Inc., Fort Worth, TX) and the OPMI Lumera microscope (Carl Zeiss Meditec, Inc., Dublin, CA). I have always believed in refractive cataract surgery, and emmetropia has been my mantra. Although emmetropia is a noble goal, it just cannot be achieved in every case. Sometimes, the patient has an abnormally long or short eye, or perhaps he or she has undergone previous corneal refractive surgery. Other times, the cataract is too dense to allow accurate axial length measurements with the

IOLMaster (Carl Zeiss Meditec, Inc.) or Lenstar LS 900 (Haag-Streit AG, Köniz, Switzerland). The patient who is paying for a premium lens is essentially purchasing emmetropia, and therefore, a significant postoperative refractive error should be corrected by laser corneal surgery, piggybacking, or an IOL exchange.

Although I prefer an IOL exchange, it is sometimes difficult and often intimidating to reopen the capsular bag, a procedure that I first reported many years ago.<sup>2</sup> While there are a number of tricks, such as dissecting the anterior capsule off the IOL with a 30-gauge needle before injecting an ophthalmic viscosurgical device (OVD), the best strategy is to delay the bioadhesion and shrink-wrapping of the capsular bag around the IOL. Richard J. Mackool, MD, taught me to polish the undersurface of the anterior capsule in all cases involving presbyopia-correcting IOLs in order to facilitate an exchange if one is indicated. By simply vacuuming off the lens epithelial cells from the 180° of anterior capsule opposite the incision, the surgeon enjoys the security of knowing that, if necessary, the capsular bag can be more easily reopened in the postoperative period.

The other development that greatly improved the visualization of these cells was stereo coaxial illumination, a startling concept introduced by Carl Zeiss Meditec, Inc. The brilliant red reflex in combination with exquisite detail makes the vacuuming of these cells a piece of cake!

Finally, it should be mentioned that the silicone I/A tip provides an extra measure of safety when aggressively polishing either the anterior or posterior capsule. Scanning electron microscopy has revealed irregular edges and shards within the opening of the 0.3-mm hole in the metal I/A tip. In contrast, the inner edge of the silicone or polymer tip appears perfectly smooth.<sup>3</sup>

In summary, although I do not routinely vacuum the undersurface of the anterior capsule, I believe that it is a useful maneuver in any patient who is more likely to require an IOL exchange.

**WILLIAM B. TRATTLER, MD**

Modern cataract surgery provides wonderful visual results, and patients typically report high satisfaction after surgery. However, it is not uncommon for patients to return months or years later with complaints that their vision has worsened. The most common cause is the development of PCO. Research has explored various means of preventing this condition, with the most effective appearing to be the use of IOLs with square-edged designs.

Is cleaning the undersurface of the anterior capsule during cataract surgery beneficial? An evaluation of the

medical literature finds mixed results. For the most part, however, studies have failed to find a benefit in terms of reducing or delaying the development of PCO, regardless of whether the IOL has a round or square edge.<sup>4,5</sup>

Based on this lack of scientific evidence to support routine polishing of the anterior capsule, I have opted not to perform this step during surgery. Rather, I routinely use aspheric monofocal and multifocal IOLs with square edges to help reduce the chance of PCO. This design feature is especially important for multifocal IOLs, because even mild PCO can decrease visual quality.

I would, of course, be interested in evaluating new techniques that are found to lower the rate of PCO, because they might improve patients' short- and long-term satisfaction with cataract surgery. ■

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