New Techniques for Managing IFIS

Practical tips for preventing iris prolapse during cataract surgery.

BY I. HOWARD FINE, MD; RICHARD S. HOFFMAN, MD; AND MARK PACKER, MD

Intraoperative floppy iris syndrome (IFIS) has introduced challenges into cataract surgery,[1] but new tricks are helping us manage this intraoperative complication. Per advice received in a personal communication from Samuel Masket, MD, of Los Angeles, our patients do not discontinue tamsulosin HCL (Flomax; Boehringer Ingelheim Pharmaceuticals, Inc., Ridgefield, CT) before surgery. Instead, they instill one drop of atropine 0.1% q.i.d. for 1 week before cataract removal. In addition, we avoid stretching patients' pupils during surgery, because doing so seems to exacerbate the iris' floppiness and tendency to prolapse. This article describes several strategies for managing IFIS during cataract surgery.

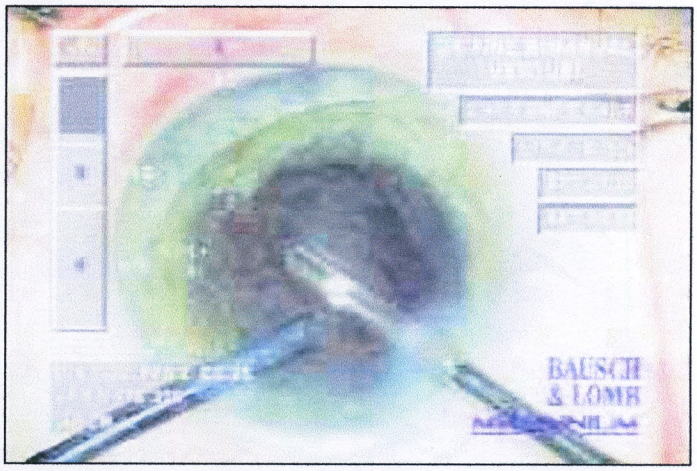

Figure 1. The epinuclear shell holds the iris back from the incision and helps keep the pupil dilated adequately.

PREVENTING PROLAPSE

Bimanual microincisional phacoemulsification offers some advantages over coaxial phacoemulsification for removing soft or moderately dense nuclei from eyes with IFIS, because the small size of the incisions reduces the risk of iris prolapse. This technique involves performing cortical cleaving hydrodissection, hydrodelineation, and hydroexpression of the lens into the plane of the iris.

The surgeon should keep the unsleeved phaco needle in the right-hand incision with its bevel turned toward the cataract, while holding the irrigator in his left hand. The irrigator should remain high in the anterior chamber above the lens, which keeps the iris deep in the chamber. Maintaining the irrigation anterior to the iris tamponades the iris and prevents it from billowing.

The surgeon can remove the endonucleus with very little ultrasound energy and high vacuum by carouselling the nuclear complex in the plane of the iris. One can then see how the remaining epinuclear shell holds back the iris (Figure 1). Next, the surgeon removes the epinuclear shell with the phaco needle while the anteriorly positioned irrigator keeps the iris taut and posteriorly located to prevent billowing with the pupil's constriction.

VISCOADAPTIVE DEVICES

Injecting Healon 5 (Advanced Medical Optics, Inc., Santa Ana, CA) into the anterior chamber during bimanual phacoemulsification can facilitate the removal of hard nuclei from eyes with IFIS. We use Healon 5 to manually dilate the pupil before creating a slightly larger capsulorhexis than usual. Next, we break up the endonucleus with one endolenticular horizontal chop.

Keeping the irrigating chopper high in the anterior chamber for the rest of the procedure, we mobilize the nuclear material from the endolenticular space and

bring it to the chopper for further disassembly. We try to keep the phaco tip occluded as much of the time as possible. If the occlusion clears, we switch directly to foot position 1 and bypass position 2 to avoid evacuating Healon 5 from the eye. The irrigating chopper's position in the anterior chamber tamponades the iris, which prevents billowing, maintains pupillary dilation, and lets us mobilize nuclear material from the endolenticular space with a bevel-down tip.

Although we do lose some Healon 5 and pupillary dilation as we evacuate the epinucleus in our usual manner, we never allow the iris to billow or become floppy. During cortical cleanup, we redilate the pupil maximally with Healon 5 and perform aspiration along the capsulorhexis in a circumferential pattern. This step helps us remove cortical material from the capsular fornices without allowing occlusion to clear, thereby preventing the mobilization of Healon 5 and maintaining pupillary dilation. The result is a very clear, trauma-free iris.

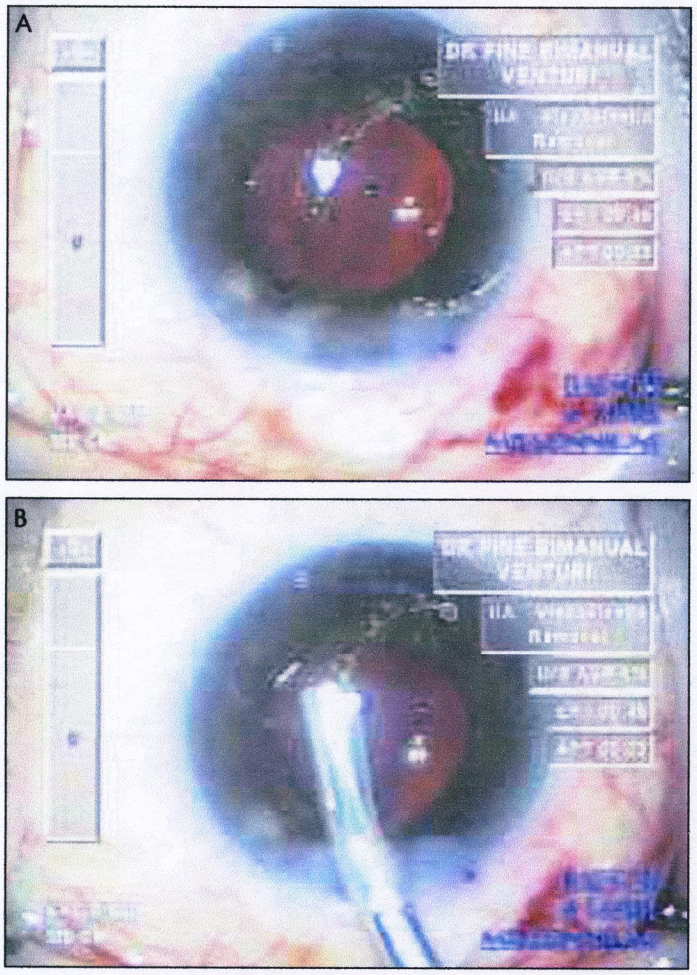

Figure 2. The Morcher Pupil Expander ring (A) is perfectly positioned for retrieval from the eye with the injector (B).

ADJUNCTIVE DEVICES

When used in conjunction with coaxial phacoemulsification, capsular tension rings (CTRs) such as the Morcher Pupil Expander Ring (type 5S; Morcher GmbH, Stuttgart, Germany; distributed in the US by FCI Ophthalmics, Inc., Marshfield Hills, MA) can prevent iris prolapse in patients with IFIS. This 1-mm tall PMMA device can be inserted into the capsule through a 2.5-mm incision with the Geuder Pupil Dilator Injector (No. G-32970; Geuder AG, Heidelberg, Germany; distributed in the US by FCI Ophthalmics, Inc.).

We typically insert the ring into the capsule after we fill the anterior chamber with a dispersive viscoelastic. Once the device is in place and its flanges engage the pupil, we use the holes in the flanges to adjust the pupil's position. Then, we perform the capsulorhexis, the hydrosteps, phacoemulsification, cortical cleanup, and the IOL's implantation.

To remove the pupillary ring, we disengage the flanges from the pupil and move the device to the extreme right side of the anterior chamber. At this point, the leading edge of the open ring should confront the incision (Figure 2A). Using the injection system, we engage the ring's leading eyelet and draw the device into the syringe with the spring-loaded plunger (Figure 2B).

It is important to position the ring properly before removing it with the injector. If the ring enters the injector at an angle, a piece of the ring's positioning hole can break off, and the surgeon may have difficulty removing the transparent fragment from the eye. Using the injector to remove the ring, however, dramatically reduces the potential for any injury to the intraocular contents or to the incision itself.

COMPLEX CASES

Occasionally, we encounter patients in whom surgical cataract removal is complicated by combined IFIS, pseudoexfoliation, and shallow anterior chambers. In these cases, we prefer to perform an initial pars plana, transscleral, 25-gauge vitrectomy with a CX5825 25-gauge Lightning Cutter Tip (Bausch & Lomb, Rochester, NY) to deepen the chamber, facilitate the retroplacement of the iris, and create adequate room for further manipulations.[2] One should maintain tactile feedback during the vitrectomy. The high-speed cutter can overly soften the eye, thus causing the lens to move posteriorly, and challenge the already weakened zonular apparatus. The conjunctival and

scleral incisions do not need to be sutured after the transscleral vitrectomy is complete.

Next, we fill the anterior chamber with viscoelastic, inject the pupil expander ring, and perform the capsulorhexis. Gentle cortical cleaving hydrodissection facilitates later cortical cleanup. Injecting a CTR into the capsular fornix stabilizes the lens during the extraction procedure and provides some additional long-term centration of the IOL. Horizontal chopping is preferable, because it avoids downward pressure on the lens that could challenge the weakened zonules.

It is very important to be aggressive during cortical cleanup in the presence of a CTR, because this device can hide substantial amounts of cortex from view. Going behind the iris with an aspirator and stripping the cortex circumferentially facilitates its removal from around the ring. In contrast, a central approach can engage the anterior and posterior leaves of the cortex and trap the CTR.

> "Injecting a CTR into the capsular fornix stabilizes the lens during the extraction procedure."

OTHER PEARLS

Performing hydrodissection and hydrodelineation in eyes with IFIS can be difficult due to the increased risk of iris prolapse. When these maneuvers are inadequate, it may not be possible to rotate the cataract. Instead, we will use a vertical chopping technique to create thin, small, pie-shaped segments distally. Removing three or four of these segments will leave enough room within the capsular bag to rotate the cataract and perform circumferential chopping, after which we can flip and mobilize the epinucleus.

If the prolapse of the iris prevents any hydrodissection or hydrodelineation, we carve a bowl out of the central endonucleus and perform hydrodelineation from the inside out, as first described by Vasavada and Raj.[3] This approach allows us to rotate the endonucleus, chop the residual endonuclear bowl, and flip the epinucleus in our usual manner.

During coaxial phaco surgery, it may be useful to remove subincisional cortex from the eye through a small (1.1mm) microincisional aspirator that enters the eye through a small paracentesis opposite the incision. We can use the coaxial handpiece as an irrigator and a tool to hold the iris back from the subincisional area. We have found this trick useful in many cases.

When using an injection system to insert IOLs into eyes with floppy irides, it is important to introduce the IOL cartridge into the incision bevel up. Although the surgeon may turn the cartridge bevel down to deliver the lens as usual, he should rotate it bevel up again so that the cartridge will act as a shoehorn as it enters and exits the eye. This action prevents the iris from prolapsing out of the eye or into the cartridge.

CONCLUSION

All phaco surgeons can easily perform the maneuvers described herein to reduce the challenge of operating on patients with IFIS. We have found that using these techniques has reduced our rate of complications among IFIS cases to levels usually seen in routine cases without IFIS. ■

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