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Managing IFIS With Microincisional Cataract Surgery

Sub–1-mm incisions and a Malyugin ring improve this procedure's safety and efficacy.

BY ROBERT J. WEINSTOCK, MD

As much as I love to perform cataract surgery, I occasionally encounter a case that I don't look forward to. The following case is of a very challenging cataract surgery involving intraoperative floppy iris syndrome (IFIS) with a very small pupil.

PRESENTATION

This gentleman had IFIS secondary to the use of Flomax (Boehringer-Ingelheim Pharmaceuticals, Inc., Ridgefield, CT), a 3-mm pupil, a narrow angle status after laser peripheral iridotomy with discrete shallowing of his anterior chamber, and pseudoexfoliation syndrome. My surgical plan for this case, as with all cases, was to remove the cataract and place a PCIOL in a safe and efficient manner. I have been working with different techniques and instrument designs for removing cataracts from eyes with very small pupils, narrow angles, and floppy irides. I have found that the smaller I can make the incision, the less chance I have of encountering complications during the case. For this reason, I use sub–1-mm clear corneal microincisions and a bimanual surgical technique.

After making the initial two microincisions and injecting Amvisc cohesive viscoelastic material (Bausch & Lomb, Rochester, NY) into the eye, I inserted a Malyugin ring (MicroSurgical Technology, Redmond, WA) to expand the pupil and hold it in place so I could safely and comfortably proceed with removing the cataract (Figure 1). The injector system for the Malyugin ring is great, but it cannot pass through a microincision, so I had to use a creative technique to get the ring into the eye and properly position it. This involved placing the injector up against one of the microincisions and gently delivering the Malyugin ring into the anterior chamber. With a little patience, it is possible to manipulate this ring through a sub–1-mm microincision with a Kuglen or a Sinskey hook and to capture the iris to mechanically dilate it. Once a Malyugin ring is in place, it improves the surgeon's view of the cataract tremendously.

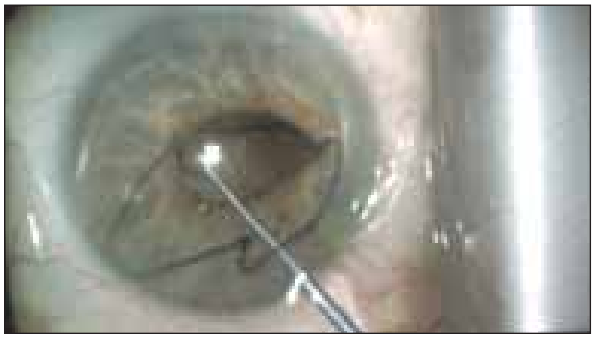

Figure 1. The author gently manipulates the Malyugin ring with a Kuglen hook to capture the iris and expand the pupil.

Figure 2. The microcapsulorhexis forceps (MicroSurgical Technology) passes easily through the microincision.

Figure 3. For nuclear extraction, a soft sleeve on the 700-µm phaco needle blocks the iris from exiting the eye.

Figure 4. To protect the iris, the author brings nuclear fragments to the central safety zone for emulsification.

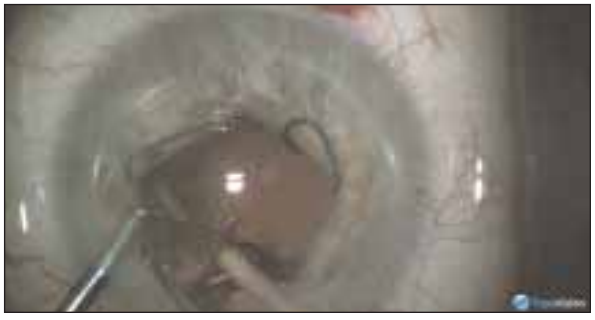

Figure 5. The author uses a 700-µm aspiration handpiece and tip to remove the cortex.

INSTRUMENTATION

I have been working with MicroSurgical Technology to develop instrumentation for removing cataracts with a bimanual technique through sub–1-mm incisions (Figure 2). This is a concept pioneered by Amar Agarwal, MD, in India. I use 700-µm instruments: an irrigating chopper in my left hand and a sleeveless phaco needle in my right. I use a sleeve over the phaco needle that acts like an accordion as I sculpt, preventing the iris from prolapsing through the wound (Figure 3). I have done enough of these types of cases with coaxial phacoemulsification and even bimanual phacoemulsification through larger wound sizes to know that, no matter what I do, the iris seems to somehow work its way out of the eye. It is frustrating to see pieces of iris underneath the instrumentation and iris pigment epithelium floating on the conjunctiva, because I know that the iris will be compromised at the end of the case. It may even mean the loss of the pupillary sphincter's function and an ectopic configuration of the iris postoperatively. Again, especially with very difficult, uncooperative iris formations caused by medications, I am finding that microincisions create a much safer operating environment for removing cataracts.

CATARACT EXTRACTION

I do not use a particular technique for cataract extraction in compromised eyes. Instead, I concentrate on removing the lens safely. I try to extract the nuclear quadrants very gently, and I keep the instruments in the center of the eye as much as I possibly can with good visibility of what I am doing (Figure 4). I avoid the iris and maintain a constant stream of irrigation in the anterior chamber. I do not use high vacuum because it can lead to iris purchase, nor do I use high irrigation flow rates because they too cause iris instability. Also, it is key to prevent high IOP intraoperatively, because it tends to prolapse a floppy iris out of the wounds. Fortunately, with 1-mm incisions, the iris has difficulty escaping from the anterior chamber.

For I/A, the sub–1-mm incision works very well. It sometimes takes me a couple of extra minutes to perform this step in IFIS eyes, because I use slower forces than usual. With these delicate eyes, you have to be more patient and allow the phaco machine to do the work in order to avoid complications. It is often impossible to see the cortex hiding under the iris, and I use the irrigating chopper to gently retract the iris to improve my view of what is hiding underneath (Figure 5).

Using a combination of a microincisions and lower I/A rates keeps the anterior chamber deep and stable. Compared with coaxial phacoemulsification, in which larger instruments and higher flow rates may cause parts of the iris to move around, the bimanual technique allows me to maintain a constant stream of irrigation

Figure 6. The wound is enlarged to 2.7 mm, and the author uses a conventional injector system to deliver the IOL into the capsular bag.

Figure 7. A 19-gauge aspiration instrument with irrigating sleeve removes residual viscoelastic. The larger instrument and sleeve prevent iris prolapse through the wound.

Figure 8. The author uses the Kuglen hook to disengage the Malyugin ring from the iris and remove it from the eye.

Figure 9. At the end of the case, the iris sphincter is intact with minimal evidence of trauma.

into the anterior chamber. This controlled, circular flow of fluid then allows the case to proceed as expected.

IOL IMPLANTATION

Because I used a Malyugin ring, I did not have to make four extra paracentesis incisions to insert iris retractors, and I was able to remove the entire cataract and cortex with a great view. I also like to leave the Malyugin ring in place to facilitate the lens' insertion. This allows me to easily see that the implant is delivered completely into the capsular bag (Figure 6). The widely dilated pupil with the help of the Malyugin ring is especially needed for implanting a presbyopia-correcting lens, such as the Crystalens accommodating IOL (Bausch & Lomb), where you really need to ensure the IOL's placement. The 1-mm wound then needs to be enlarged to approximately 2.5 mm.

With the IOL in place, I began closing the eye (Figure 7). Malyugin rings are not robust, but they are very flexible and can easily distort for extraction through the microincision. I used a modified Kuglen hook (a Sinskey hook also works) to release the ring's grip on the iris. Then, I used the hook to gently pull the Malyugin ring through the microwound (Figure 8). The ring collapses easily to be removed from the eye. Finally, I hydrated the wound to help keep the cotton-candy–like iris inside the eye as much as possible (Figure 9). In fact, the hardest part of this case was trying to seal the wound and keep the iris in the eye. It required a couple sutures.

Although this difficult case took some extra planning and required some specialized devices, it was well worth the trouble. The patient had a speedy recovery, regained functional vision quickly, and experienced no complications.

DISCUSSION

Using sub–1-mm wounds during phacoemulsification does not completely eliminate the chance of unwanted phenomena, such as damage to the iris and contact with the vitreous, but it can add a margin of safety compared with larger instrumentation in complicated cases. Additionally, surgeons should strongly consider using iris stabilizing and dilating devices such as the Malyugin ring in small-pupil and IFIS cases to proactively avoid complications and reduce the complexity of certain surgeries. ■

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