

Expansion Devices for Cataract Surgery

These options are particularly important upon the recognition of IFIS.

BY ROBERT J. CIONNI, MD

In the past, managing small pupils was much more of a challenge than it is today. Years ago, enlargement techniques meant incising the pupillary margins, stretching the pupil with one or two instruments, performing sector iridectomies, and so forth. These techniques worked well until the advent of tamulosin and the ever-increasing epidemic of intraoperative floppy iris syndrome (IFIS).

IRIS RETRACTION DEVICES

Around the same time that David Chang, MD, was uncovering the etiology of IFIS, iris retraction devices began to emerge. Iris hooks have been around the longest and, to this day, still work well to expand the pupil for intraocular surgery. If using a polypropylene iris retractor, my advice is to bend the hook backward on itself and hold it in that position for about 15 seconds. This maneuver allows the device to shape itself more appropriately so that the iris is not tented to the cornea once expanded. MicroSurgical Technology (MST) introduced a doubled nylon loop that is more appropriately shaped right out of the box. There are no sharp edges anteriorly, which means that it can also be used to stabilize the capsular edge with less chance of damaging the capsule. Iris retractors are my primary pupillary expander when the pupil needs to be very large, such as during a zonular dialysis case or IOL exchange or when I need to visualize only one quadrant. Otherwise, I prefer to use an expansile ring, especially when dealing with IFIS.

The Malyugin Ring (MST) has become the most popular device for this purpose worldwide for several reasons. Each ring comes with its own disposable injector, is easy to implant and remove, comes in two sizes, and works beautifully. Insertion through an incision sized 2.4 mm or smaller may be easier if the injector is placed upside

down and then rotated right-side up once through the incision. The three anterior-most loops are positioned at the pupil-margin plane and slowly advanced to engage the pupillary margin. The final, subincisional loop is placed with a Cionni Nucleus Manipulator (Duckworth & Kent Ltd. or Crestpoint Management Ltd) or Osher/Malyugin Ring Manipulator (MST).

MORE ON RINGS

Usually, the 6.25-mm ring is all that is required (and it is easier to place); however, some surgeons prefer the 7-mm version, especially in cases of midpupil IFIS. The Malyugin Ring has four easily identifiable iris margin retraction loops. The device actually fixates the pupillary margin in eight locations, because it angles from the posterior plane of the iris to the anterior plane halfway between these fixation loops. This setup provides stable expansion, particularly in IFIS cases. Occasionally, the fixation loops will grasp the pupillary margin more firmly than desired, making the device's removal slightly more challenging. I have never found this to be a significant problem unless the surgeon is cavalier about its removal.

I suggest removing a couple of the loops first and then watching carefully to ensure that the remaining loops disengage while slowly explanting the device. The ring can be reintroduced into the insertion portion inside the anterior chamber. Alternatively, the subincisional loop can be externalized, where it is easily engaged by the insertion device, and then reintroduced into the anterior chamber as taught to me several years ago by Joshua Sands, MD. The Malyugin Ring is then drawn into the insertion device and explanted. Often, one of the side loops will hang up on the mouth of the insertion device. The surgeon can still carefully explant the ring with it in this position, or a second instrument can be used to manipulate the loop into the mouth of

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the device. Finally, the device can be explanted manually by externalizing the subincisional loop and then cautiously continuing to pull the ring until it is externalized completely. Care needs to be taken to be certain that none of the loops damages the pupillary margin when performing manual extraction.

NEWER DEVICE

Another pupillary expansion device that is gaining traction is the Oasis Iris Expander (Oasis Medical). I have recently used this device a few times, so my experience is not as extensive as with iris hooks or the Malyugin ring. The included injector and the ring's injection into the anterior chamber are similar to what I have found with the Malyugin Ring. The four fixation elements are not loops like with the Malyugin Ring but are cup-like pockets. I found them a little more challenging to place, but on the plus side, they do not seem to hold the pupillary margin aggressively, making them easier to remove for explantation. Despite releasing easily, they do not seem to release prematurely, which would be problematic in an IFIS case. Because the entire ring is in the iris plane, there are only four fixation points, yet the device seems to stabilize the pupil adequately for IFIS cases. During explantation, the fixation points are moved anteriorly, and using an Osher Underhook (Duckworth & Kent USA Ltd. or Crestpoint Ophthalmics), the surgeon grasps the ring halfway between two of the fixation elements and then simply pulls it out of the incision.

CONCLUSION

One last bit of advice: when placing any of these devices after the capsulotomy has been completed, either manually or by a femtosecond laser, the surgeon must be careful to avoid catching the fixation element on the capsulorhexis' edge, which could damage the capsulotomy. To prevent this problem, I place an ophthalmic viscosurgical device between the anterior capsule and the posterior surface of the iris before inserting the expansile device.

The advent of pupillary and iris expansion devices came just in time to help surgeons manage the tough IFIS cases. Not a week goes by when I do not rely on these devices to save the day. ■

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