How to manage surgical difficulties when using the Malyugin Ring

Device comes with small learning curve that must be mastered to avoid complications

By Cedric Schweitzer, MD, PhD; *Special to* Ophthalmology Times

THOROUGH VISUALIZATION of the lens is important for safe and effective cataract surgery. This is best achieved when pupils are adequately dilated throughout surgery.

While mydriatic eye drops produce the required dilation in most cases, mechanical intervention—namely, hooks and additional incisions—is required when these pharmacological agents fail.

The Malyugin Ring (MST) was developed as a safe pupil expansion alternative to traditional approaches. A stand-out advantage of the device is the manner in which the 6.25-mm or 7-mm diameter ring can be inserted through main corneal incisions as small as 2 mm—a feature that enables its use at anytime during the surgery and eliminates the need for additional incisions.

However, while the ring offers such advantages and makes operating on eyes with small pupils less challenging, it comes with a small learning curve, which must be mastered to avoid difficulties or complications during surgery.

AVOIDING COMPLICATIONS

The square-shaped device has four circular scrolls with eight points of fixation that ensure an evenly dilated circular pupil is achieved. The latest version is composed of 5.0 polypropylene.

> 'Just as care needs to be taken to correctly insert the ring . . . , the iris also can be damaged while removing the ring.'

The ring has been designed to make minimal contact with the iris during insertion and removal. Specifically, the ring is inserted through the primary corneal incision at the start of the phacoemulsification. Although designed for eyes that experience unexpected intraoperative pupillary constriction, such as in intraoperative floppy iris syndrome (IFIS), the ring can be safely inserted at a later stage.

The ring is introduced into the eye using its own injector. This injector must be used to move the ring forward and engage its distal scroll with the iris.

It is important to continue inserting the ring while moving the injector in a backward direction towards the primary incision. Once the lateral scrolls emerge from the injector, they will latch onto the edge of the iris and the proximal scroll will smoothly emerge from the injector.

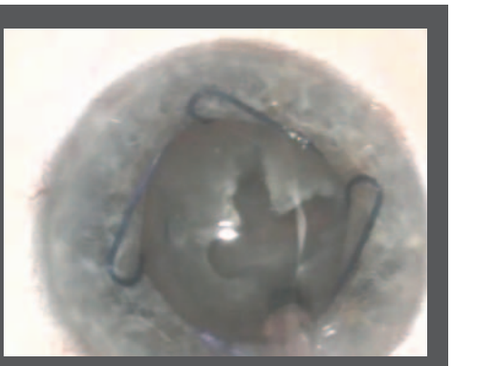
The injector can then be completely removed from the eye in a quick and smooth motion.

I have used the ring for about three years and have operated on many eyes with conditions like pseudoexfoliative syndrome, traumatic iris and IFIS, in which it is difficult to maintain pupillary expansion throughout surgery. I have found that although the ring is easy to insert, care must be taken when attaching the proximal scroll, as its correct engagement with the iris is important for avoiding complications.

Failure to do so creates a small risk of iris damage if the ring disengages during surgery. Furthermore, an accompanying device, called the Malyugin Ring Manipulator (designed specifically to assist placement of the ring) or a Lester Hook, should be used in conjunction with the injector to ensure correct attachment of the fourth edge. The injector alone will not suffice.

Once the ring is correctly attached, the next challenge to a surgeon new to the Malyugin Ring is removal of the injector from the eye. While the injector usually exits from the eye with no problem, sometimes, resistance may be felt. If this happens, the surgeon simply needs to move the ring to the side a little to overcome the resistance.

Just as care needs to be taken to correctly insert the ring to avoid ocular tissue damage, the iris also can be damaged while removing the ring if this is not performed with proper care.



(FIGURE 1) The ring in situ, which allowed a quick and safe phacoemulsification procedure. *(Image courtesy of Cedric Schweitzer, MD, PhD)*

The Malyugin Ring is removed from the eye in the opposite order to which it was inserted, with a Malyugin Ring Manipulator or Lester hook required to lift the disengaged proximal and lateral scrolls from the iris.

The injector can then be inserted through the main corneal incision and hooked onto the proximal scroll. Once the injector and the scroll are firmly attached, the surgeon simply has to push the injector's button backward to start retracting the ring into the injector.

Iris damage can occur at this stage if the ring is removed too quickly and without checking that the last scroll is fully disengaged before you begin retraction. To avoid this, a Malyugin Ring Manipulator or Lester hook must be used to disengage the ring edges that lie at 12 o'clock and 9 o'clock.

Once these are free, the ring can be retracted with complete confidence that the iris edge will not be caught and pulled during retraction. As soon as the ring is fully retracted into the injector, the injector can be completely removed from the eye.

CASE STUDY

Here is a case of a 72-year-old male patient with exfoliative glaucoma and a medical his-

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RING

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tory of tamsulosin intake. Given his history of tamsulosin use, he was identified as being at high risk of IFIS. A Malyugin Ring would be required for his surgery.

Indeed, a poor level of pupil dilation was achieved preoperatively and a Malyugin Ring was used to produce sufficient dilation to proceed with surgery as safely as possible. Insertion and removal of the ring was performed following standard protocol and no iris damage occurred.

The Malyugin Ring is an effective pupil expansion device with minimal risk of intraoperative damage, no need for additional corneal incisions, and highly predictable behaviour throughout surgery.

Its injector facilitates non-traumatic introduction and removal of the ring. Its square layout ensures that once engaged, the pupil remains adequately dilated without being overstretched to a level that causes iris sphincter damage.

CARE AND SKILL

By maintaining dilation, even in cases of IFIS, the device provides the necessary room for a surgeon to complete phacoemulsification and fragment removal.

Despite these advantages, skill, experience, and care are required to use this ring in a manner that ensures iris damage is not caused by incorrect scroll engagement during insertion or scroll disengagement prior to removal of the ring.

However, having used this ring for several years without incident, it is clear that the risk of iris damage is minimal if care is always taken and a specific hook is used in conjuction with the injector during insertion and removal. ■

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MEDICATIONS

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pounded topical medication comprised of prednisolone acetate, gatifloxacin, and bromfenac. The combination of the injection and the drops allows for a simple-dosing schedule once daily for one month following surgery.

For my LASIK patients, I give them Pred-Gati-Brom for two weeks after surgery, starting four times per day and tapering to once per day. For both my cataract and refractive patients, the LessDrops formulations are an excellent alternative to multiple bottles of drops with differing dosing schedules.

In my practice, patients may choose between the compounded drops protocol or filling prescriptions on their own for three individual medications. The vast majority opt for a simple-to-administer and affordable compounded route.

> ‘Purchasing coumpounded medications through a 503B pharmacy ensure that surgeons distribute the highest quality.’

VIGILANCE ENSURES QUALITY

With or without the injection at the time of cataract surgery, one bottle is an adequate supply for a typical dosing frequency of once or twice daily for a month and provides the medical necessity for my patient’s compliance.

Where we buy medications is important. The more invasive the medication, the more vigilance we exercise to ensure quality. Anything going inside the eye should carry utmost scrutiny and concern because the risk-reward is very serious at that point.

PURCHASING OPTIONS

There are options for purchasing compounded formulations, such as a local compounding pharmacy, a national center, 503A facility, or a 503B pharmacy, which is the safest option. A 503B pharmacy operates under the highest level of scrutiny (comparable to commercial drug facilities) from the FDA and must meet current Good Manufacturing Process (cGMP) requirements.

The compounds can only be manufactured with components of FDA-registered manufacturers and release and stability testing is performed at FDA-registered labs.

Purchasing compounded medications through a 503B pharmacy ensure that surgeons distribute the highest quality medications and permits the convenience of bulk ordering, as compared to a traditional compounding or 503A pharmacy, which requires medication to be ordered on a per-patient basis.

With a 503B pharmacy, medication is ordered and distributed as needed and a small stock is kept for emergencies. This eases the burden off the patients since they won't need to worry about dropping off and picking up their prescriptions, insurance coverage (or lack of coverage), or receiving a poor quality product.

As a practice, we can better serve patients if a replacement is needed when they lose or damage a bottle, or we need an urgent add-on and cannot wait for it to be formulated. Furthermore, knowing patients have the medications they need at a price they can afford and with a level of quality I can trust is invaluable.

Cataract and refractive surgeries are the most successful surgical procedures performed. Tremendous strides in technology and technique guarantee a perfect or near-perfect outcome.

Now, it is time to improve the postsurgical phase of surgery. With injectable formulations ensuring medication delivery when the eye is vulnerable and a compounded formulation of topical drops administered with a simple, once-a-day dosing schedule, we are continuing to improve our patients’ outcomes and lives. ■

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