

Ophthalmology

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Simplifying cataract surgery in patients with complex pathology

Ring device can be used to stabilise the capsule and dilate the small pupil

By Prof. Boris Malyugin

Modern cataract surgery is generally a successful procedure. Recent advancements—which involve the use of pre- and intraoperative pharmacological protocols combined with optimal instrumentation—allow for well-tolerated and effective procedures in the vast majority of patients.¹

However, there are certain preoperative factors that increase the likelihood of complications in cataract surgery. These need to be managed effectively if we want the capsule to remain intact at the completion of surgery.

The small pupil presents one such challenging case for the ophthalmologist. When it is combined with the pathology of the zonular apparatus, the risks during and after cataract surgery increase even further.

Several techniques have been described in the literature for the management of insufficient mydriasis combined with zonular pathology, ranging from pharmacological to surgical strategies involving mechanical pupil dilation.² To avoid complications in patients, it is essential to enlarge the pupil while also stabilising the capsule to maintain its integrity.

IN SHORT:

The Malyugin Ring 2.0 simplifies challenging cases of small pupils with zonulopathy by both stabilising the capsular bag and dilating the pupil.

Another option

When dealing with patients who present with inadequate mydriasis as well as compromised zonules, in recent years I have come to rely on the Malyugin Ring (MicroSurgical Technology; MST) together with the MST capsule retractors, Chang modification. I find the capsule retractors to be very useful in overcoming zonular weakness and giving support to the equator of the capsular bag.

However, in some cases it is possible to use the ring to simultaneously address the small pupil and stabilise the capsular bag, giving us yet another option in treating these cases. Let me demonstrate my clinical reasoning and surgical technique with the help of a case study, as follows.

To avoid complications, it is essential to enlarge the pupil.

Complicated cataract

A 75-year-old patient had a cataract complicated by pseudoexfoliation syndrome with sub-optimally dilated pupil. The patient has been taking the drug tamsulosin for several years to treat benign prostate hyperplasia.

Because the patient's zonules were loose and the lens was mobile during the capsulorhexis procedure, my strategy was to use the ring to address the small pupil and to stabilise the capsular bag. To perform the continuous curvilinear capsulorhexis, I used the 23G Seibel

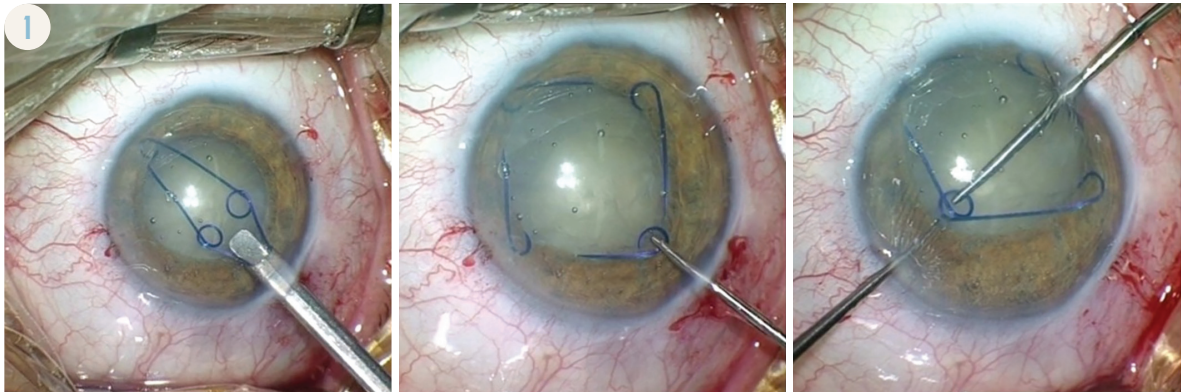


FIGURE 1. Insertion and positioning of the Malyugin Ring 2.0.

capsulorhexis forceps (MST), which feature a sharp tip and a rhexis ruler to allow for visibility and control during the procedure.

In many cases associated with a weak zonular apparatus, the lack of counter-traction on the capsule could unintentionally result in a smaller rhexis diameter. A smaller rhexis may not only increase the risk of damage to the capsular edge during the procedure but may also

cause capsular phimosis in the postoperative period.

My approach was to use the ring to both stabilise the capsular bag and dilate the pupil, so I enlarged the rhexis to prevent the damage to the capsule that may occur while engaging the scrolls with the capsular edge. The lens nucleus was fixed with the chopper to avoid excessive movement during the enlargement of the capsulorhexis.

A 7.0 mm ring was inserted into the anterior chamber. I engaged the iris to support and enlarge it while simultaneously catching the edge of the anterior capsule with the scrolls of the device.

This was done bi-manually with the ring manipulator in one hand and the micro-hook retracting the capsular edge in the other hand (Figure 1). In these cases, you only need up to three scrolls for the fixation: if you try to use four scrolls, there might be too much stress placed on the capsule.

Because I was using the ring alone, I did not have the same stability at the capsular bag equator as with capsular hooks. Therefore, the area with the loose zonules needed to be carefully monitored. One option is to continuously inflate the capsular bag with dispersive ophthalmic viscosurgical devices to create a viscoelastic cushion and prevent the aspiration of the capsule equator.

I then inserted the conventional capsular tension ring and was able to safely remove the last fragments of the lens by stabilising the capsular bag equator. After removing the

MALYUGIN RING 2.0

Good visualisation remains one of the critical aspects of cataract surgery. In 2007, I started working with MST to develop the Malyugin Ring, and later, the Malyugin Ring 2.0. These microtools enable gentle, stable expansion of the iris during cataract surgery.

The ring is known for its flexibility and can be implanted through a 2.0 mm incision. The flexibility allows for a gentler touch to the intraocular tissue, and the scroll gaps are larger, allowing for easier engagement.

Research shows that the ring is not only as effective as traditional pupil-expansion devices (such as iris hooks) but also offers some additional benefits compared with iris hooks, such as faster initial visual recovery³ and reduced operating time.⁴ The ring is manufactured in two sizes: 6.25 mm and 7.0 mm. I like to use the 6.25 size for almost any case with a small pupil, whereas the 7.0 works best in patients with intraoperative floppy iris syndrome.

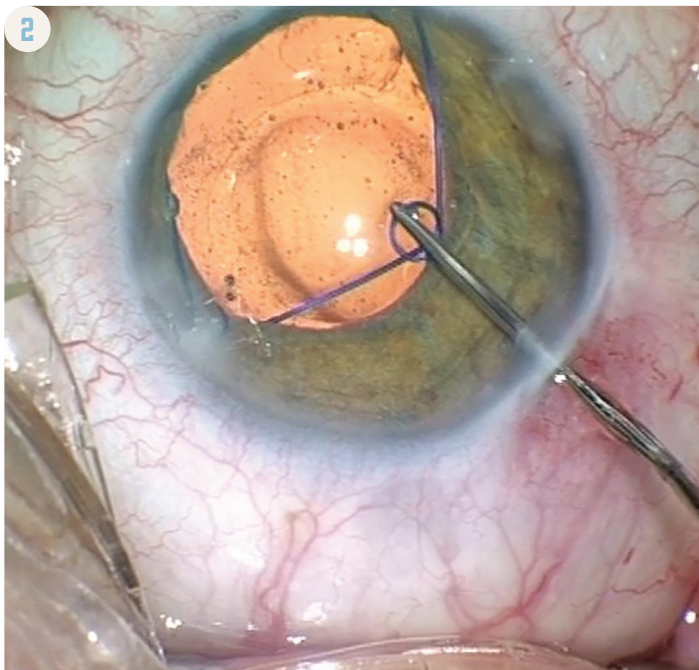


FIGURE 2. Repositioning the ring after removal of the cortical material. (Photos courtesy of Prof. Boris Malyugin)

cortical material, I disengaged the scrolls of the ring from the rhexis and repositioned them to the iris to maintain pupil dilation (Figure 2).

When the anterior capsule was released, I could implant a single-piece IOL in the capsular bag. Finally, the ring was removed from the eye and triamcinolone acetate suspension was injected into the anterior chamber to check

for the possible presence of the vitreous strands.

Conclusion

Cases of complex small pupil cataract complicated by zonulopathy are particularly challenging. Surgeons need to carefully evaluate multiple factors, such as pupil size, rigidity of the iris, sphincter fibrosis and level of zonular weakness, among other considerations, to

choose their strategy. The Malyugin Ring 2.0 alone or in combination with capsule retractors helps alleviate complexities in these cases. ■

TAKEAWAY POINTS

- It is essential to base your choice of instruments for small pupil cataract surgery on the characteristics of the iris (e.g., floppiness or stiffness of the stroma, sphincter fibrosis).
- To enlarge a small pupil and stabilise the capsule, the ring can be used alone if the iris has sufficient flexibility.



Boris Malyugin, MD, PhD

E: boris.malyugin@gmail.com

Prof. Malyugin is professor of ophthalmology and deputy director general, S. Fyodorov

Eye Microsurgery State Institution, Moscow, Russia. He receives royalties from MST.

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