

Time to update the endocapsular device toolbox

Dr. Malyugin—[Cataract surgeons](#) in Moscow have several tools to help them manage the challenges presented by cases with zonular pathology. However, consideration should be given to the Malyugin modified [capsular tension ring](#) (Morcher GmbH), according to Botis Malyugin, MD, PhD.

Femto-created incision woes solved

“It is time for cataract surgeons to consider cleaning house in their endocapsular device toolbox and update it with the latest generation,” said Dr. Malyugin, professor of ophthalmology, S. Fyodorov Eye Microsurgery Complex State Institution, Moscow, Russian Federation. “The Malyugin modified capsular tension ring (CTR) can be safely and easily implanted through a microincision with an injector, and it reliably secures the subluxated lens capsule to the scleral wall, enabling safe surgery and long-term IOL stability.”

MALYUGIN MODIFIED CTR



Noting that the Cionni modified CTR (Morcher) is probably the most widely used device for stabilizing the capsular bag during surgery in eyes with moderate to more advanced zonular dialysis, Dr. Malyugin explained that in his modification, the fixation element is moved to the very tip of the ring. This change allows the device to be completely retractable into the injector tube, facilitating very safe and controlled injection into the capsular bag.

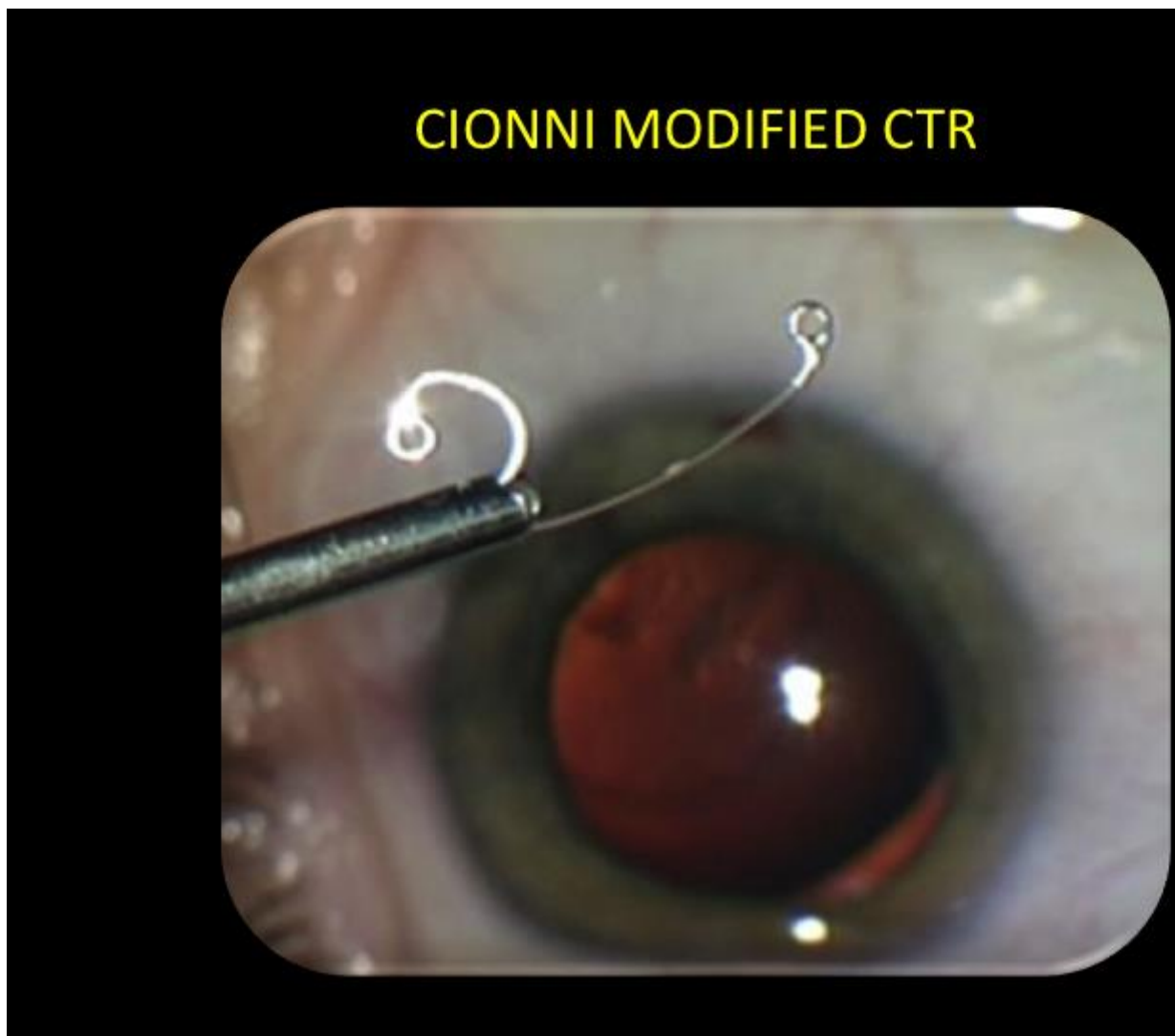
In addition, the curved portion of the CTR now easily slides along the capsular equator as the device is injected.

“My concern with the Cionni modified CTR was the risk for capsular damage by the portion of the device protruding from the injector that hits the equator of the bag at almost the right angle,” he said. “Forceps insertion can avoid that problem,

but insertion with a forceps instead of an injector requires much more manipulation, is less comfortable for surgeons, and less controlled.

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“The Malyugin modified CTR maintains the advantages of injector insertion and eliminates the risk of capsular fornix perforation by the CTR tip,” Dr. Malyugin continued.



Giving a step-by-step description for his approach to cataract surgery using the Malyugin modified CTR in eyes with compromised zonules, Dr. Malyugin said he

prefers to initiate the capsulorhexis with a sharp bent needle and then complete it using a capsulorhexis forceps to grasp the flap and tear the capsule circularly.

[Watch the CTR in action](#)

Temporary stabilization of the capsular bag is achieved during capsulotomy and latter steps with the help of double-threaded capsular hooks (MST), which Dr. Malyugin said he prefers over iris hooks.

“Flexible iris hooks have a tendency to slip off and cause too much stress on the capsulorhexis margin, increasing the risk of the anterior capsulorhexis tearing,” he said. “Capsular hooks specifically designed to support the equator of the capsular bag create less stress on the capsulorhexis edge, and are a better choice for temporarily fixating the capsular bag to the limbal area.”

To use the Malyugin modified CTR, Dr. Malyugin said he first retracts it only partially into the injector cartridge and then passes a 9/0 polypropylene suture through the protruding eyelet. After eyelet suture fixation, the device is retracted completely into the injector before introducing it into the eye.

The delivery is done by aiming the direction of the ring progress toward the area of the zonular defect.

“This technique allows the residual zonules keeping the capsular bag in place and will avoid their being unzipped by the force of the injection,” he said.

While gently pushing on the injector plunger, the CTR’s curved fixation element slides across the equator of the capsular bag, and the trailing end of the device is guided under the fixation element and released from the injector with the aid of a side port instrument. Then, the CTR is rotated using a reversed Sinsky hook so that the fixation element is positioned at the very center of the zonular defect.

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After creating a fornix-based conjunctival flap and cauterizing the episcleral vessels, an ophthalmic viscosurgical device (Healon 5, Abbott Medical Optics) is injected to lift the iris and expand the ciliary sulcus area. A needle is passed ab

interno through the ciliary sulcus and out of the eye. Then, the needle is passed intrasclerally with the direction parallel to the limbus in a zig-zag fashion, making 4 to 5 suture bites.

“The zig-zag suturing works very well, and it eliminates the necessity of using partial thickness superficial scleral flaps,” Dr. Malyugin said.

An alternative to that technique is the use of Hoffman pockets, where the surgeon buries the knot of the scleral suture inside the partial thickness scleral pocket created from the limbus toward the fornix without dissecting conjunctiva.

After repositioning and suturing the conjunctival flap, Dr. Malyugin performs very gentle multiple-quadrant hydrodissection. Then he completes phacoemulsification using a quick chop technique to disassemble the nucleus.

“Rotation of the nucleus should be avoided so as not to compromise the residual intact zonules, and lower vacuum settings are also quite helpful in these cases because it affords a very stable environment,” Dr. Malyugin said.

He noted that cortical aspiration could also be challenging with the CTR, inside because when implanted early during the case, the device compresses the cortical material toward the equator of the capsular bag. Consequently, surgeons should be prepared to spend a little more time than usual evacuating the cortical material.

Instead of implanting the Malyugin modified ring at the very beginning of the case (after capsulorhexis), surgeons may prefer late implantation, ie., when the capsular bag is cleaned of the lens matter. This technique relies on the lens bag support with the 3 to 4 capsular hooks.

Prior to injecting the CTR in some cases, it may be necessary to reposition the lens, moving it more centrally to expose the area of the capsular bag hidden under the iris. Opening the capsule and placing 1 or more capsular hooks do this, and it is very helpful in enabling proper centering of the anterior capsulorhexis opening, Dr. Malyugin said.

In addition, if the capsular bag is too small as happens in some hereditary syndromes, Dr. Malyugin will use a multistep approach, first creating the capsulorhexis and then aspirating some of the bag contents prior to injecting the ring. This is done in order to expand the equator of the capsular bag by reducing the lens contents volume.