Loose IOL/CTR/Capsular Bag Complex

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CASE PRESENTATION

Now 53 years old, a female with Marfan's syndrome underwent bilateral phacoemulsification/IOL surgery with a Cionni Ring for Scleral Fixation (type 1-L; Morcher GmbH, Stuttgart, Germany; distributed in the United States by FCI Ophthalmics, Marshfield Hills, MA) for subluxated cataracts in 1998. The results were excellent. Calculations for her left eye indicated a 34.00 D IOL power, which was not available in a foldable format at the time. Accordingly, the surgeon placed two 17.00 D three-piece AcrySof MA60BM IOLs (Alcon Laboratories, Inc., Fort Worth, TX) in the bag along with the Cionni capsular tension ring (CTR). The ring was fixated with a 10–0 polypropylene suture. A subsequent YAG capsulotomy opened the posterior capsule to between 5 and 6 mm and the anterior capsular rim to just larger than 6 mm.

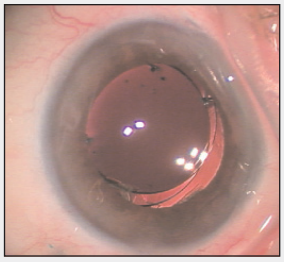

Figure 1. An operative microscopic view demonstrates the appearance of the two piggyback IOLs in the capsular bag.

The patient returned recently with a manifest refraction of -0.50 +2.75 X 166 = 20/20 OS. A slit-lamp examination showed the fixation element of the CTR captured on the inferior iris margin. No suturing material was present on the fixation element or the eyelet. A mild iritis was evident, and the IOL/bag complex showed mild pseudophacodonesis. The piggyback IOLs were oriented orthogonally to each other, and they were still apparently fused together and to the remains of the capsular bag (Figure 1).

How would you proceed?

UDAY DEVGAN, MD

This is an unusual and particularly challenging case because of the Marfan's syndrome, which affects fewer than one in 5,000 people. This patient was fortunate to delay her initial lens implant surgery until the age of 41, whereas most patients with Marfan's syndrome tend to experience significant dislocation of the crystalline lens earlier in life. She is also lucky that her first surgery was beautifully performed and gave her good vision for more than a decade, with both acrylic IOLs in their orthogonal orientation and no interlenticular opacification.

With sutured IOLs, there is always a risk of future erosion of the suture material, the scleral tissue to which it is fixated, or both.[1] Patients should expect that, within 10 years of their original surgery, they will need to return to the OR for refixation of the IOL. This patient has some zonular support and a single-eyelet 1-L Cionni Ring, which was previously sutured in an area of zonular loss. The surgical problem is likely twofold. First is the loss of the suture that was fixating the CTR in place. Second, because Marfan's syndrome is a progressive disease, it is likely that, in the decade since her first surgery, the remaining zonules have weakened further. This situation is in contrast to zonular loss from trauma, which tends to be very stable as long as future trauma is avoided.

The surgical options are either to (1) "refixate" the double-IOL/CTR/bag complex or (2) to remove it and replace it with a single IOL. The less invasive and thus preferable approach would be resuturing the eyelet transsclerally. Using a larger-bore material such as 9–0 polypropylene might provide extra strength, but it still will not guarantee permanence. Similarly, using a scleral groove or flap might help to prevent the long-term erosion of the suture.

If suturing the single eyelet of the CTR to the sclera cannot achieve stability of the current double-IOL/CTR/bag complex, the surgeon can pass another suture around one of the IOL's haptics in an area of zonular weakness and fixate it to

the adjacent sclera. These are complex and often difficult maneuvers, and plenty of time should be allotted in the OR.

If the decision is made to explant the double-IOL/CTR/bag complex, it can be replaced with a single IOL sutured to the back of the iris[2] or again transsclerally. The PCIOL power for emmetropia is likely to be about +35.00 D, so the choice of FDA-approved IOLs is somewhat limited. Other options such as an iris-fixated three-piece PCIOL,[3] an iris-claw ACIOL, or an angle-positioned ACIOL are not readily available in the correct power. For these reasons, my strong preference would be to refixate the current double-IOL/CTR/bag complex. In challenging cases like this one, less invasive surgery is not only simpler for the surgeon, but it is also better for the patient.

ROBERT KAUFER, MD

A major concern with scleral fixation is the longevity of the 10–0 polypropylene sutures. Apparently, the suture in this case gave out and let the complex loose.

I would resuture the CTR/IOL complex to the sclera, this time using a 9–0 polypropylene suture on a double-armed CTC-6L needle (Ethicon, Inc., Somerville, NJ). Surgery would begin with the administration of topical and intracameral anesthesia or peribulbar anesthesia. I would inject a dispersive ophthalmic viscosurgical device such as Viscoat (sodium hyaluronate 3.0%, chondroitin sulfate 4.0%; Alcon Laboratories, Inc., Fort Worth, TX) over the area of missed zonules.

I would create a wide fornix-based conjunctival flap and perform careful cautery. Next, I would suture the ring by passing the 9–0 suture through a paracentesis 180º away, through the eyelet of the CTR, and then through the sclera so that the suture came out 1.5 mm behind the limbus. I would do the same with the other extreme of the suture. I would zigzag four or five throws in partial-thickness sclera that were parallel to and away from the limbus. I would then tie the suture approximately 10 to 12 mm away from the limbus in order to avoid its protrusion through the conjunctiva. With this approach, a scleral flap would be unnecessary.

Once the suture and the CTR/IOL complex were in place, I would make sure no vitreous remained in the anterior chamber. After introducing a miotic agent, I would inject triamcinolone acetonide intracamerally in order to visualize any vitreous strands, which I would carefully remove by means of a two-port anterior vitrectomy.

ROBERTO PINEDA, MD

This patient's iritis should be addressed prior to surgical intervention. Topical corticosteroids and nonsteroidal anti-inflammatory agents are often effective. Her pseudophacodonesis should also be addressed due to the progressive nature of Marfan's syndrome. The 10–0 polypropylene has proven inadequate for the fixation of the CTR and IOL due to hydrolysis of the suture material over time with eventual breakage.

The displacement of the IOLs is not extreme, because the CTR's eyelet was captured by the pupillary margin at the 4:30-o'clock position (likely accounting for the iritis). Surgical fixation of the eyelet or the IOLs' haptics is therefore possible despite the previous YAG procedure. The haptics of the IOLs are orthogonal to each other and form a ring in addition to the CTR already in place. Iris capture of the CTR would allow refixation of the CTR's eyelet with 9–0 polypropylene, which is about twice the thickness of 10–0 polypropylene and much less likely to break.

For scleral fixation of the CTR's eyelet, I would sit temporally and prepare the scleral bed slightly anterior to the previous site with a scleral groove or pocket. Next, I would create three paracenteses at 3, 7, and 11 o'clock. I would inject a cohesive viscoelastic to fill the anterior chamber and tamponade areas at risk of vitreous prolapse. Using a McCannel needle (CIF-4; Ethicon, Inc.) on 9–0 polypropylene, I would attempt to pass the suture from the 7- to the 3-o'clock position through the CTR's eyelet (the 3-o'clock site might need to be enlarged). If I were successful, the threaded eyelet suture and needle could be brought back through the paracentesis (at 3 and 7 o'clock) and externalized. Next, I would pass both needles through the 7-o'clock wound and under the iris margin, with a target of the sulcus for scleral externalization at 4:30 o'clock, anterior to the previous location. I would position the CTR's eyelet behind the iris prior to tightening the suture. Ideally, this procedure would stabilize the CTR and IOLs.

If threading the eyelet were too difficult, I would consider scleral fixation of the IOLs' haptics in the same area through the sulcus. I would pass the needles from the 7- or 11-o'clock paracentesis while trying to provide some fixation or counter pressure through the 3-o'clock paracentesis during the posterior needle's pass (under the haptics). The superior needle's pass does not require structural stabilization (above the haptics). After the needles' passage, the suture would be cinched but not too tightly, a situation that should work as effectively as the eyelet's fixation.

DAVID S. ROOTMAN, MD, FRCSC

I presume that the Cionni CTR was transsclerally fixated with 10–0 Prolene (Ethicon, Inc.). Now, the eyelet suture has eroded or dissolved, and fortuitously, the eyelet has been captured by the iris. In the absence of symptoms or signs, one could contemplate leaving the eye alone and avoiding dilation of the pupil in the future. The patient has iritis, however, likely from the chafing of the iris, and it probably is not a good idea to leave the IOLs

partially attached. I would therefore consider repair.

It would be very difficult to thread another suture through the eyelet. Doing so might be possible with a fine 23- or 25-gauge forceps, but tying the knot could be a challenge. I would therefore create a slipknot using 10–0 Prolene on a CIF-4 long, curved needle. I would use a fine forceps to loop the Cionni CTR's eyelet with the slipknot such that tension on the needle end would close the loop. Next, I would pass the single-armed needle through a cut-down at the limbus or under a modified flap. Numerous techniques to cover the suture have been described and work well. Pulling the suture on the external surface would close the slipknot. I could then reposition the eyelet behind the iris where it belongs, tie the knot, and close.

The entire procedure could be performed with one or two small incisions in the eye. My hope is that this approach would be a simple fix for the problem. ■

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