“Subluxated cataract is probably the only type of cataract that still poses a challenge to the experienced phaco surgeon. Techniques and instrumentation have evolved to effectively deal with this problem. However, the outcome is still unpredictable in more advanced subluxations,” said Ashu Agarwal MS.

He presented a prospective, randomised, interventional study that involved 30 eyes of 30 patients with subluxated cataracts that were divided into two groups. The first group was treated with phacoemulsification and a combination of endocapsular ring (ECR) and iris hooks and the second group was treated with only phacoemulsification and ECR.

“In cases of extension of dialysis or an unstable lens/bag, an ACIOL was implanted if capsular support was found to be inadequate” Ashu Agarwal MS

Patients had subluxated cataracts from 45-125 degrees and moderate hardness up to nuclear sclerosis grade 2/3. Patients with generalised zonular weakness and vitreous strands in the anterior chamber were excluded from the study.

The surgeons used capsulotomy starting with cystitome away from dialysis and completed with capsulorhexis forceps.

“It was ensured that an adequate rim of anterior capsule was left in the area of dialysis,” said Dr Agarwal, senior consultant for cornea and anterior segment at the Centre For Sight, New Delhi, India.

In addition, the surgeons maintained the capsulorhexis centration with respect to the lens diameter instead of the pupil using gentle hydrodissection, hydrodelineation and iris hooks that were placed after capsulorhexis.

“In cases of extension of dialysis or an unstable lens/bag, an ACIOL was implanted if capsular support was found to be inadequate,” he said.

New improvements and uses for capsular tension rings

A new version of the CTR

A new modified version of the Morcher capsular tension ring that is currently under FDA-review may solve one of its most often cited disadvantages say its creator Bonnie An Henderson MD, FACS, a professor at the Massachusetts Eye and Ear Infirmary at Harvard Medical School in Boston, Massachusetts.

“When I discuss the use of capsular tension rings with colleagues, one of the most difficult parts about using the ring is actually that once you put it in, it’s really hard to remove the cortex and fragments that are still in there,” she said.

Trying to solve this problem, Dr Henderson created a new ring called the Henderson Capsule tension ring (HCTR) with eight equally spaced indentations of 0.15mm that allow for easier cortex removal. Aside from

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After the surgery, the researchers evaluated the successful completion with IOL implantation and the surgeons’ comfort score based on their impression on a scale from one (for least comfortable) to 10.

The surgery was completed successfully in 86.7% of the group that received ECR combined with iris hooks, and the surgeons’ mean comfort score was 5.53. In the second group, the surgery succeeded in 66.7% of people and the surgeons’ mean comfort score was 4.27, significantly lower than in the first group.

“The comfort level for the surgeon was low irrespective of the technique used and indicates the degree of difficulty in such surgeries,” noted Dr Agarwal.

Iris hooks have been used for capsular support in part because they are locally available and less expensive than dedicated capsular support systems. But, iris hooks are not the ideal capsular support system because of a shorter return of the hook and angulation of the hook relative to the capsule plane, he said.

**CTRs for dislocated cataracts**

Two additional studies found that modified capsular tension rings with scleral suture or sutured capsular tension segments (CTS) utilised during dislocated cataract surgery with zonular absence improve best-corrected visual acuity and remain stable without causing any changes to iris anatomy.

In another study presented at the meeting, researchers used ultrasound biomicroscopy (UBM) for a retrospective analysis of eight eyes of seven patients who received sutured capsular tension devices implanted (modified CTR by Cionni CTR Type1-L) during dislocated cataract surgery. The patients’ age ranged from 33 to 75 years, with a mean of 52.9 years. Follow-up ranged from six to 26 months.
Two surgeons performed the procedures using a commercial version of the ultrasound biomicroscope operating at 50 MHz with a resolution of approximately 40 μm. The UBM revealed that the suture position was 54.5% in the sulcus and 45.5% in the CP.

All patients improved their best-corrected visual acuities. The mean preoperative BCVA was 1.2 1.2 logMAR but after surgery the mean BCVA was 0.2 0.1 logMAR (20/32).

In addition, the researchers did not find any alteration in iris anatomy or any degree of angle closure and all IOls were in a straight position. The researchers also did not find any sign of synchiae or vitreous incarceration.

“In the mid-term, the CTS appears to maintain stability and achieve proper anatomical position”

Juan Mura MD

“In the mid-term, the CTS appears to maintain stability and achieve proper anatomical position,” said Juan Mura, MD from the University of Chile in Santiago, Chile.

Cataract surgery in zonular defects often results in an unstable lens, an increase of vitreous presentation or sometimes even loss of the lens in the vitreous cavity, according to Dr Mura. In cases of extensive zonular absence or damage, the scleral suture fixation of CTR or capsular tension segments permit the optimal positioning and stability of the IOl in selected cases.

The permanent scleral suture fixation over the area of the zonular weakness is usually around the ciliary sulcus. The surgeon also has the option to place the capsular tension segment into the bag over an area of zonular weakness after rhexis and prior to the phacoemulsification. To minimise the risk for dislodgement or a capsular tear during lens removal, the surgeon uses an iris retractor through the hook eyelet, explained Dr Mura.

“The capsular bag is the best site for this implantation because it simulates the optics of the crystalline lens, avoids contact of the lens with uveal structures and reduces the IOl decentration. The capsular stability also permits use of devices to correct associated problems in these patients,” said Dr Mura.

In a third study, a retrospective analysis of 22 eyes of 22 patients with traumatic cataract evaluated the effectiveness of the modified Cionni capsular tension ring in cases of severe zonular dialysis.

One surgeon performed all operations on 10 women and 12 men with a mean age of 48.8 years ranging between three to 80 years. The interval between trauma and surgery was on average 15 years ranging from 0.25 months to 31 years and the mean follow-up was 15.8 months ranging from four to 38 months.

Patients with zonular dialysis from ocular trauma which had cataract, CCC, and intact posterior capsule during surgery were included in the study. Patients with posterior capsule rupture during surgery or incomplete CCC and congenital zonular dialysis were excluded.

“The surgical technique used was phacoemulsification or aspiration with slow-motion technique using the MCTR 1-L, IOl model MA 60BM and prolene 10.0 to suture the MCTR to the sclera. Zonular dialysis extension and the need to do vitrectomy were analysed during the procedure,” said Daniela Marques MD.

The postoperative examination revealed that 20 eyes (91%) had a best-corrected visual acuity of 20/40 or better compared to three eyes (13.6%) before the surgery. Before surgery, 50% of the patients had phacodonesis and 45% had decentration, but after surgery none did.

“IOL centration and stability of the capsular bag are crucial for a good post-op visual acuity. In our study, we chose the CTR with one point of suture due to the large area of zonular dialysis (60 to 320 degrees),” said Dr Marques.

“The capsular bag is the best site for this implantation because it simulates the optics of the crystalline lens, avoids contact of the lens with uveal structures and reduces the IOL decentration”

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The study’s results are similar to a previous study published by the same group of researchers (Cionni et al; JCRS 2003; 29 (9):1668-73), where 87.7% of the patients showed improvement. In addition, 43.5% had decentration before surgery but after the procedure all of the patients had IOL centration.

“With the MCTR, the anatomical barrier zonular/capsule is partially restored, then the intraoperative vitreous prolapse is reduced or prevented,” said Dr Marques.