

## Management of Severly Subluxated Crystalline Lens Equal to or More Than 6 Clock Hours with Capsular Tension Ring Scleral Fixation at One Point

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**Abstract: Aim of the Work:** Non comparative study involving severely subluxated crystalline lens with 6 clock hours or more subluxation by removal of cataract and implantation of scleral fixated standard type capsular tension ring providing good stability and centration to the bag and preventing capsular phimosis and reducing the incidence of PCO. **Materials and Methods:** A 20 eyes of 16 patients with 6 clock hours of zonulysis, underwent lens extraction, capsular bag fixation with standard CTR, and in-the-bag single-piece eyecryl intraocular lens (IOL) implantation. Main outcome measures were intraoperative performance and postoperative best-corrected visual acuity (BCVA), IOL centration, and complications. **Results:** The mean ages was  $27.46 \pm 15.25$  years (6-61 years). Mean extent of subluxation was  $7.5 \pm 1.0$  clock hours. Preoperatively, vitreous was detected in the anterior chambers of 4 eyes (20%). Anterior chamber vitrectomy was performed in 4 eyes. Mean follow-up was  $10.8 \pm 1.8$  months. Preoperatively only 2 of the 20 eyes (10.0%) had a BCVA of 20/40 or better, as compared to 18 eyes at the last visit (90%). Posterior capsule rupture occurred in 2 eyes, which occurred during fixation of the CTR. In 2 eyes (10%) IOL decentration was noted and repositioning was required in 1 eye. Posterior capsule opacification developed in 6 eyes (30%); 4 eyes (20%) required Nd:YAG capsulotomy. Other complications included posterior synechiae in 2 eye (10%), and retinal detachment in 0 eye (0%). **Conclusion:** In-the-bag implantation of a standard CTR with IOL appears to be a safe with subluxated cataract, ensuring a stable IOL with few complications. [Gamal Mostafa Abo Elmaaty; Mahmoud Rabea; Abd Al Magid M Tag Eldin; Mohamed Al-Taher Abd El-Wahab; and Ehab Abd El Samea AL-Azab. **Management of Severly Subluxated Crystalline Lens Equal to or More Than 6 Clock Hours with Capsular Tension Ring Scleral Fixation at One Point?** *J Am Sci* 2014;10(2):1-3]. (ISSN: 1545-1003). <http://www.jofamericanscience.org>. 1

**Keywords:** Management; Subluxat; Crystalline Len; Capsular Tension; Ring Scleral Fixation

### 1. Introduction

The major problem of severely subluxated crystalline lens is instability of the bag endangering cataract removing and may lead to disasters such as dropped fragments or whole bag and its contents to drop. Postoperative challenges with large subluxation may lead to lens decentration, lens instability, posterior subluxation or dislocation of the bag and IOL, PCO and capsular phimosis(1). Reconstruction of the laking area of the zonular support and stretching the capsular bag with fixation to the sclera aims to mimic the original shape and position of the capsular bag allowing easy surgery with minimal complications intra and postoperatively(2). Scleral fixation of the standard CTR allowing this requirements to complete surgery with micro incision with less surgically induced astigmatism, also it get ride of the bag tilt and oblique astigmatism preoperatively producing improvement of BCVA. Also it gives less side effects on the long run and better prognosis(3).

### 2. Patients and Methods

We included 20 consecutive eyes with subluxation of crystalline or cataractous lens between

marsh, 2011 and Jan., 2013. Zonular weakness and lens subluxation with diverse etiologies, like Marfan syndrome, and trauma, were included.

Four subluxation with grade two opacity or less. Male patients represent (15 eyes) 75 % of the cases and female patient represent 5 eyes (25 %).

Four eyes was clear from lenticular opacity (20%) and 6 eyes with grade I lenticular opacity (30%) and 10 eyes with grad II opacity (50%).

### Degrees of Lenticular Opacity

The lens was decentered in 4 eyes (20%) and tilted in 16 eyes (80%). The evaluation of different etiologies of subluxation was based on the patients' medical history and verified by the physician. A detailed examination was performed for every case, both preoperatively and at each follow-up visit. Preoperatively, the refractive error and visual acuity were recorded. Slit-lamp evaluation was carried out to assess anterior chamber depth, the presence or absence of vitreous in the anterior chamber, extent of subluxation in clock hours, and zonular integrity. Cataract density was assessed. intraocular pressure (IOP) was measured with Goldmann/ Perkins applanation tonometer. A detailed retinal evaluation,

including B-scan ultrasound with dim fundus, was performed. Axial length and biometry was done.

### Surgical Technique

Preoperative preparation includes topical antibiotics as moxifloxacin drops three times per day and topical non steroidal anti inflammatory as Voltaren eye drops three times per day were given three days before surgery and oral moxifloxacin 400 mg at the day of surgery and the consecutive 4 days. Intravenous mannitol 1mg/kg was given before surgery if the eye had an unusually shallow AC or if vitreous was present in the AC. General anesthesia unless contraindicated, peribulbar block was used. Opposite the center of the arc of the zonulysis conjunctiva and tenon's capsule was opened cauterization of sclera fashioning scleral flap (Fig. 1) rectangular with the base to limbus. Clear corneal incision was done by 3.2 keratome, side port by MVR, injection of viscoelastic in the form of sodium hyaluronate 1.6% in the AC. Puncture of the ant. Capsule by cystitome, insertion of dialer from the side port to support the subluxated lens until finishing capsulorhexis. Two port anterior vitrectomy was done in cases presented by vitreous in the AC. Good hydrodissection and hydrodelimitation were done then the straight needle of 10/0 prolene pair back was introduced under the scleral flap pass through the lens equator then from capsulorhexis grasped by non toothed curved forceps to the outside of the corneal wound. the classic CTR (Fig., 2) put on the corneal surface and the outside straight needle of 10/0 prolene was cut and a loop of prolene around the middle of the arc of CTR was done and tying the prolene around the CTR with the knot to the inside of the arc not to injure the bag. Onsertion of CTR in the bag gently until the end with gentle pulling of the scleral end of the thread with adjusting pulling until centration of the lens. A stay knot of the scleral end of the prolene was done. I/A of intrabagal lens matter or phaco emulsification according to the hardness of the nucleus. Implantation of single piece soft acrylic lens into the bag. At the end assessment of the bag centration and if not untying the scleral stay knot and re pull or push to get a good centraion of the bag then stable scleral bite tightened to the sclera. Closing the conjunctiva by virgin 8/0 inturrupted sutures. Washing intraocular viscoelastic hydration of the wound and side port and subconjunctival garmycine and dexamethasone was given and dressing the eye.

### Postoperative Evaluation

The main outcome measures were centration of the capsular bag and BCVA at one day, 1 month and 6 months. Secondary outcome measures included

IOL stability and centration and perioperative complications.



Figure 1: Scleral Flap

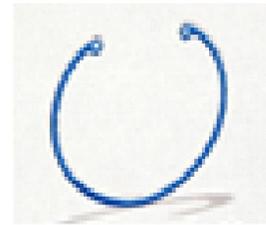


Figure 2: Classic CTR

### 3.Results

Their mean age at time of surgery was 47.46 + 15.25 years (6-61 years) Mean extent of subluxation was 7.5 + 1.0 clock hours. Preoperatively, vitreous was detected in the anterior chambers of 4 eyes (20%). Anterior chamber vitrectomy was performed in 4 eyes. Mean follow-up was 9.8 + 1.8 months. Preoperatively only 2 of the 20 eyes (10.0%) had a BCVA of 20/40 or better, as compared to 18 eyes at the last visit (90%).

#### BCVA 20/40 or Better Pre and Postoperative

Posterior capsule rupture occurred in 2 eyes during fixation of the CTR before insertion of the IOL. A 3-piece IOL was then placed in the sulcus with posterior optic capture. In 2 eyes (10%) IOL decentration was noted and repositioning was required in 1 eye. Posterior capsule opacification developed in 6 eyes (30%); 4 eyes (20%) required Nd:YAG capsulotomy. Other complications included posterior synechiae in 2 eye (10%), and retinal detachment in 0 eye (0%) Posterior dislocation of the bag (0%) Corneal edema in 2 eyes (10%) (Table 1) in all eyes the capsular bag was retained, a single-point fixation capsular tension device. Four of the 20 eyes (20 %) had vitreous presentation before the start of surgery, required a vitrectomy.

At first day postoperative, 16 eyes (80%) had a BCVA of 20/40 or better, In the 1 week incidence jump to (90%) after corneal edema subsided. There was no difference between the BCVA at 1 week and at last visit in 18 of 20 eyes (90%). There were no cases of retinal detachment or endophthalmitis. Mild

decentration of the IOL occurred in 2 eyes but one was seeing 20/40 or better and the other eye required further surgery at first day postoperatively. Three of these 4 eyes had had at least 8 clock hours of zonulysis with vitreous prolapse preoperatively.

**Table 1: Postoperative Complications.**

Postop. complication	No. of eyes	Incidence	Notes
PC rupture	2	10 %	Ant vit. 3 piece sulcus IOL with optic capture in PC tear
IOL decentration	2	10 %	One eye needs reposition
PCO	6	30 %	4 eyes needs yag capsulotomy
Post. synechia	2	10 %	
RD	0	0 %	
Post. Dislocation of the bag	0	0 %	
Corneal edema	2	10%	

#### 4. Discussion

Lensectomy is an effective approach for cases with Marfan syndrome and intracapsular cataract extraction in cases of traumatic severely subluxated crystalline lenses is also effective approach to counteract pupillary block glaucoma as well as lenticular myopia(4). Capsular phimosis and IOL decentration due to progressive zonular insufficiency. However, expected with implantation of PCIOL. the use of capsular tension ring (CTR) in this cases prevent that complications (5). A standard 10/12 mm sized CTR can be easily placed in the eyes despite a smaller capsular diameter reducing the rate of IOL decentration. Putting a standard CTR no CTR segment causes expansion of the equatorial capsular bag, redistributes capsular strength equitably and reduces the risk of forward displacement of the IOL-iris diaphragm. We did scleral fixated CTR to prevent posterior dislocation of the bag due to progressive zonulysis(6). CTS placed even before phacoemulsification in the event of severe phacodonesis demanding bag stabilization. On the other hand, the capsulorrhexis should be of perfectly 5.5–6 mm. CTR is a preventive measure against IOL decentration and capsular phimosis by exerting symmetric centrifugal force, the addition of CTR scleral fixation further secures the ring to the sclera and decreases the risk of future displacement of the bag-IOL-CTR complex, so become a standard of care in these cases (7).

#### Conclusion

Standard CTR scleral fixation is a safe and effective procedure to manage severely subluxated crystalline lens and preventing postoperative

complications as progressive IOL decentration posterior dislocation of the bag.

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