Scleral Fixation of a One-Piece Toric Intraocular Lens

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ABSTRACT

PURPOSE: To describe a novel technique for toric intraocular lens (IOL) repositioning and fixation in the absence of adequate capsular support.

METHODS: Case report and literature review.

RESULTS: Two cases are presented with scleral fixation of a one-piece toric IOL (SN6AT series; Alcon Laboratories, Inc., Fort Worth, TX). In both cases, toric IOLs initially placed within the capsular bag became decentered due to poor capsular support. To avoid the potential complications of lens explantation and maintain the astigmatic benefits of the toric IOL, scleral fixation of the lenses was performed. The Hoffman technique was used to create reverse scleral pockets without conjunctival dissection. A 10-0 non-dissolvable suture was used to capture and then secure the lens haptics in a lasso-type fashion. Sutures were then buried within the previously created scleral pockets. Both patients had well-centered lenses postoperatively that remained stable at last follow-up, 30 months postoperatively.

CONCLUSION: In the absence of adequate capsular support, scleral fixation is a viable option for one-piece toric IOL fixation to avoid IOL explantation.

We describe the use of this technique in two cases to reposition and fixate displaced toric IOLs and discuss the potential risks and benefits of this procedure.

CASE REPORTS

CASE 1

A 68-year-old woman with a manifest refraction of -10.00 +4.00 × 85 and keratometry values of 43.75/47.25 × 92 in the right eye underwent seemingly uncomplicated cataract extraction and placement of a toric IOL (SN6AT5 series; Alcon Laboratories, Inc., Fort Worth, TX, +8.5 diopter) in the 90 degree meridian (JBR). On postoperative day 1, the IOL was significantly decentered and inferiorly displaced (Figure 1). The patient was taken back to the operating room for IOL repositioning. On examination in the operating room, a capsular tear was noted inferiorly. The lens was repositioned and fixated...
using the technique described below (Video 1, available in the online version of this article). Four months after IOL repositioning, the patient’s uncorrected distance visual acuity was 20/40 and corrected distance visual acuity (CDVA) was 20/30 with a manifest refraction of -0.75 +1.50 ×120. Her CDVA improved to 20/25 and IOL positioning has remained stable through her latest follow-up for 30 months after surgery. She subsequently had uneventful toric IOL implantation in her left eye.

**CASE 2**

An 81-year-old woman with a history of neovascular age-related macular degeneration had complicated cataract surgery with placement of a toric IOL at an outside facility approximately 4 months prior to presentation to one of the authors (SM). She was noted to have 2 clock-hours of zonular dehiscence, vitreous in the anterior chamber, and toric IOL displacement, with gross decentration but toric IOL alignment within 5 degrees of intended. The surgical technique used was similar to case 1 (Video 2, available in the online version of this article). Six weeks postoperatively, CDVA was 20/60, limited by age-related macular degeneration, with a manifest refraction of -1.25 +0.75 ×170. The lens was centered and stable at the last postoperative visit.

**SURGICAL TECHNIQUE**

For both cases, the Mendez degree gauge was used to mark the appropriate meridian for IOL orientation. Patients received retrobulbar block. Partial-thickness limbal grooves were made using a crescent blade at the appropriate meridians. Two reverse scleral tunnel pockets were then created with a crescent blade, tunneling from the limbus within the sclera for approximately 3 to 4 mm. A stab incision paracentesis was created in the cornea anterior to the pockets. A 27-gauge needle was passed approximately 2 to 3 mm posterior to the limbus through conjunctiva and sclera through the scleral pocket until the tip of the needle was visible posterior to the IOL haptic. A 10-0 double-armed suture (polypropylene with STS needle [case 1], polyester with PC-7 needle [case 2]) was passed through the opposite paracentesis, underneath the haptic, and into a 27-gauge needle passed through the scleral pocket. The suture needle was then fed out through the scleral pocket and externalized outside of conjunctiva. This procedure was repeated with the needle positioned anterior to the haptic and the suture passing anterior to the haptic, which was then externalized to capture the haptic in a lasso-type fashion.

The above technique was repeated for the second haptic using the opposite scleral groove and paracentesis as compared to the first haptic to ultimately capture both haptics. Special attention was paid to ensure that the IOL was sufficiently posterior and haptics were within the capsular bag to avoid or minimize haptic–iris contact. The IOL was centered and positioned, the sutures were pulled back through the scleral pockets, and the knots were tied and trimmed to bury them within the scleral pockets.

**DISCUSSION**

These cases demonstrate the potential for one-piece IOL scleral fixation in the setting of inadequate capsular support. This technique is applicable for one-piece toric IOLs that become decentered or dislocated after initially successful implantation. The technique described is minimally invasive, easy to learn, and reproducible.

Scleral fixation of one-piece IOLs continues to be controversial. There are potential complications with sulcus placement of one-piece IOLs related to iris chafing from IOL movement, including pigment dispersion, elevated intraocular pressure, intraocular hemorrhage, and cystoid macular edema. Therefore, appropriate posterior positioning of the IOLs using reverse scleral pockets to fixate the IOL to the...
sclera at a sufficient distance from the iris is necessary to prevent these complications. Maintaining the haptics within the remaining capsular bag may further minimize haptic–iris contact.

One-piece IOLs are not specifically designed to have sutures passed around their haptics; thus, the long-term stability of this technique remains unknown. Although it is possible that these IOLs will suffer suture erosion with subsequent decentration, we believe that this is unlikely. If this situation arises, the same treatment options (scleral refixation or explantation) would subsequently be available as at the time of initial repair. Because IOL explantation is more complicated than scleral fixation, it seems reasonable to attempt fixation of the current IOL prior to immediately proceeding with removal. At this time, we do not advocate planned scleral fixation of a one-piece toric IOL; however, this option remains to be evaluated.

**AUTHOR CONTRIBUTIONS**

*Study concept and design (SM, JBR); data collection (MEE, JBR); analysis and interpretation of data (MEE, JBR); drafting of the manuscript (MEE, JBR); critical revision of the manuscript (MEE, JBR, SM); supervision (JBR)*

**REFERENCES**