Glued scleral fixation for subluxated mature cataract and management of postoperative intraocular lens dislocation using a scleral patch graft

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We describe glued scleral fixation of a multipiece intraocular lens (IOL) in a highly myopic patient with a subluxated mature cataract. Postoperatively, the haptic dislocated as a result of scleral necrosis. The IOL was repositioned by anchoring the haptic and covering the necrosed sclera with a donor scleral patch graft. Methods to avoid this complication are discussed.

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Options for intraocular lens (IOL) implantation in eyes with deficient or absent posterior capsule support include iris-fixated IOLs, anterior chamber IOLs (AC IOLs), and transscleral IOL fixation. Complications of sutured scleral-fixated IOL implantation include suture-induced inflammation, suture erosion with delayed IOL subluxation, and dislocation due to a broken suture. The technique also requires perfect adjustment of suture length and tension to ensure good scleral-fixated IOL centration and prevent IOL tilt.

Sutureless techniques of scleral fixation that place posterior chamber IOL (PC IOL) haptics in scleral tunnels to prevent suture-related complications have been described. Fixating the haptics beneath scleral flaps using glue has also been described.

The use of fibrin glue is currently an off-label treatment in ophthalmology; however, it has been used to seal cataract incisions, corneal perforations, and traumatic lens capsule perforations and for temporary closure of scleral flaps after trabeculectomy in eyes with hypotony, conjunctival autografts, and amniotic membrane transplantation.

Posterior-assisted levitation is a technique for lifting a descending nucleus with a cyclodialysis spatula inserted through a pars plana sclerotomy, and its safety and long-term outcomes have been documented. The technique can also be used for extreme zonule dehiscence. Patch grafting with donor sclera can be performed for tectonic indications or to prevent exposure of implants.

CASE REPORT

A 23-year-old highly myopic patient with an intumescent mature cataract subluxated more than 270 degrees presented for treatment at our hospital. Sub-Tenon anesthesia was preferred as the patient had an axial length of 28.0 mm. Due to an intumescent cataract with elevated intralenticular pressure caused by hydrated cortical fibers and difficulty achieving a complete capsulorhexis, intracapsular cataract extraction with anterior vitrectomy and scleral fixation was planned because the power of commercially available scleral-fixated IOLs started at +10.0 D.

Conjunctival peritomy was performed followed by minimal cautery. A 6.0 mm frown incision was made at 12 o’clock with scleral pockets, and a small internal opening was completed with a keratome. The scleral flaps were fashioned at the 3 o’clock and 9 o’clock positions using a crescent blade. Posterior-assisted levitation was
performed through a pars plana sclerotomy at 10 o’clock (Figure 1, a). After the mature cataract had been raised above the pupil, it was expressed using an ophthalmic viscosurgical device; the lens was always supported by the viscocannula (Figure 1, b). Anterior vitrectomy was performed.

Sclerotomies were made under the partial-thickness scleral flaps at 3 o’clock and 9 o’clock. The foldable hydrophobic acrylic multipiece IOL was introduced into the anterior chamber through the preexisting 6.0 mm tunnel with 1 hand using a McPherson forceps rather than with an injector system. An end-grasping 25-gauge forceps (Grieshaber, Alcon Surgical, Inc.) was introduced from the 3 o’clock sclerotomy to grasp the polypropylene haptic in the anterior chamber and externalize it (Figure 1, c). The maneuver was repeated from the 9 o’clock sclerotomy while ensuring that the previously externalized haptic did not slip back into the posterior chamber. Fibrin glue (Reliseal, Reliance Life Sciences) was applied to the dried scleral beds, and the scleral flaps were repositioned, fixing the haptics in position (Figure 1, d).

Two months after surgery, the temporal haptic had slipped from position and the IOL was hanging by the nasal haptic. The dislocated IOL was repositioned under sub-Tenon anesthesia. Iris hooks were used for maximum pupil dilation to improve visualization (Figure 2, a). Because an anterior vitrectomy has been performed, there was minimal risk for vitreous traction while the PC IOL was raised. The free-hanging haptic was grasped with a 25-gauge forceps and externalized. Polypropylene (Prolene) 10-0 knots were tied to the haptic and anchored to the sclera to prevent recurrence of the IOL dislocation (Figure 2, b).

The tissue in the area of the temporal flap appeared macerated (Figure 2, c). A scleral patch graft was used to cover the area of the flap that looked unhealthy (Figure 2, d). Banked donor sclera was trimmed to the required size and shape and anchored to the underlying sclera with interrupted polypropylene 10-0 sutures. The surrounding conjunctiva was undermined to cover the scleral graft (Video 1, available at http://jcrsjournal.org).

Postoperatively, the corrected distance visual acuity was 6/9 and the patient has been closely followed.
DISCUSSION

The glued PC IOL technique has been reported to provide stable configuration of an IOL, resulting in less pseudophakodonesis\(^A\) and less endophthalmdonesis and thus a lower risk for complications such as pseudophakic retinal detachment, cystoid macular edema, and uveitis–glaucoma–hyphema syndrome. There is no risk for suture-related complications such as suture-induced inflammation or infection of suture degradation resulting in IOL subluxation and dislocation. If unanticipated extensive intraoperative capsule loss should occur, the multipiece PC IOL can be used for implantation and does not require a special inventory of IOLs such as scleral-fixated IOLs or AC IOLs. It can be used in cases of high myopia in which conventional scleral-fixated IOLs in the required powers may not be available.

The complications of glued PC IOLs include decenteration, pigment dispersion, and macular edema.\(^{11}\) There is also a theoretical risk for viral disease transmission and for sensitization to bovine blood proteins (as the glue contains bovine aprotinin), which may predispose the patient to future risk for an autoimmune disease.\(^{12}\) However, the complication of flap necrosis noted in our patient has not been reported. Minimal use of cautery with the haptics tucked into scleral pockets\(^2\) could prevent it. If it should occur, use of sutures to secure the IOL in position would be necessary. A scleral patch graft was used in our patient to provide structural integrity to the area of flap necrosis as well as to prevent exposure of the externalized haptic.

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Figure 2. Sequence of events at resurgery. a: The macerated scleral flap that caused the IOL dislocation (yellow arrow). b: The dislocated IOL visualized using iris hooks. c: Anchoring the dislocated haptic to the sclera. d: Suturing the scleral patch graft in situ.
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