Sutureless Intrasceral Posterior Chamber IOL Fixation

This technique is less technically demanding than transscleral suturing or gluing and enables the surgeon to easily recenter the lens.

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n eyes with insufficient or no capsular support, IOL implantation and fixation techniques are still controversial. Many reports in the literature confirm that anterior chamber or iris-fixated IOLs can be implanted, or, alternatively, a posterior chamber IOL can be fixated in the ciliary sulcus using transscleral suturing or gluing.1-22 We recently developed a sutureless technique for sulcus fixation of a posterior chamber IOL using permanent incarceration of the haptics in a scleral tunnel parallel to the limbus. This method combines the control of a closed-eye system with the postoperative axial stability of the posterior chamber IOL.22

SURGICAL TECHNIQUE

After peritomy, the eye is stabilized either by 25-gauge pars plana infusion or with an anterior chamber maintainer. We try to prevent any diathermy of episcleral vessels to reduce the risk for scleral atrophy. Two straight sclerotomies ab externo are prepared with a sharp, 24-gauge cannula (Neopoint Luer No. 17; Servoprax GmbH, Wesel, Germany) located 1.5 to 2 mm postlimbal and exactly 180° from each other (Figure 1).

Figure 1. The limbus-parallel intrasceral tunnel is prepared with a 24-gauge cannula. Note the 25-gauge pars plana infusion for stabilization of the eye.

Figure 2. Temporarily externalized haptics.

Figure 3. Intrasceral implantation of the first haptic using 25-gauge endgripping forceps.

TAKE-HOME MESSAGE

• As an alternative to transscleral suturing or gluing, a posterior chamber IOL may be fixated to the sulcus using permanent incarceration of the haptics.
• The sutureless technique avoids complications associated with suturing IOLs into the ciliary sulcus.
• This technique also enables the surgeon to easily recenter the IOL.

The cannulas are then used to create a limbus-parallel tunnel at approximately 50% scleral thickness, starting from the ciliary sulcus sclerotomies and ending with...
externalization of the cannula after 2 or 3 mm. A standard three-piece IOL with a haptic design fitting to the diameter of the ciliary sulcus is implanted with an injector, and the trailing haptic is fixated in the corneal incision. The leading haptic is then grasped at its tip with end-gripping 25-gauge forceps, pulled through the sclerotomy, and left externalized (Figure 2). With the same forceps, the haptic is then introduced into the intrascleral tunnel (Figure 3). The same maneuvers are performed with the trailing haptic. The ends of the haptics are left in the tunnels to prevent foreign body sensation and erosion of the conjunctiva and to reduce the risk for inflammation. The sclerotomies are checked for leakage. If necessary, they are sutured. For a full video of this procedure, please visit http://www.eyetube.net/videos/default.asp?lilese.

We have used this technique in more than 50 eyes over the past 3 years. Our standard IOLs are the Sensar AR40e (Abbott Medical Optics Inc., Santa Ana, California) and the AcrySof (Alcon Laboratories, Inc., Fort Worth, Texas); however, we have also used multifocal IOLs, such as the ReZoom (Abbott Medical Optics Inc; Figure 4).

**DISCUSSION**

Our technique is appropriate for fixation of standard three-piece posterior chamber IOLs. However, it should not be used to fixate newer one-piece acrylic or silicone IOLs. Management of secondary implantation or re-fixation of dislocated posterior chamber IOLs with scleral tunnel fixation of the haptic is less technically demanding because it stabilizes the IOL in the posterior chamber without the use of difficult suturing procedures. This technique also enables the surgeon to easily recenter the IOL. Posterior chamber IOL torsion and decentration can be minimized by accurate placement of the haptics in the scleral tunnel, above the ciliary sulcus. To avoid torsion, the haptic design of the implanted three-piece IOL should be the same as the diameter of the ciliary sulcus.

Incarcerating a longer part of the haptic stabilizes the axial position of the IOL, which should decrease the incidence of tilt. Intraoperative IOL centration is possible due to adjustments made to the final intrascleral position of the haptics (Figure 5).

The potential complications of using sutures for transscleral fixation of posterior chamber IOLs include suture erosion, suture knot exposure, and recurrent dislocation caused by a broken suture. All are avoidable with the sutureless technique. Some techniques for scleral fixation of secondary IOLs, located within a scleral pocket, require two suture passes through the sclera for each haptic. This creates twice as much potential for adverse bleeding events and twice as many endophthalmitis ports as our nonsuturing technique.

Intrascleral fixation is an established technique in retinal surgery (ie, silicone scleral buckling procedures) as well as refractive surgery. Because of the overall diameter of the IOLs, we do not exert higher forces on the sclera. Scleral tunnels are well known in cataract surgery procedures, and scleromalacia should not be expected unless the patient has preexisting inflammation, such as scleritis, episcleritis, rheumatoid arthritis, or herpes zoster ophthalmicus. Because the tips of the haptics are buried, conjunctival erosion should not occur. The risk for chronic inflammation or recurrent bleeding is potentially lower than with sulcus-fixated IOL because there is no contact with the ciliary body. Very rigid haptics (ie, those made of PMMA) may lead to slow dislo-
cation from eye rubbing or contusion. We therefore recommend using IOls with more flexible haptics, such as Prolene or Teflon (DuPont, Wilmington, Delaware).

CONCLUSION
A modified technique can be performed for any procedure that requires transscleral IOL fixation. This includes implantation of secondary IOls, repairing dislocated IOls,29,30-32 and use of adjunctive surgical devices, such as the Ahmed Capsular Tension Segment and Cionni Capsular Ring (both manufactured by Morcher GmbH, Antony, France). This technique simplifies scleral fixation of dislocated posterior chamber IOls and allows successful repositioning of dislocated and subluxated posterior chamber IOls. It also minimizes intraoperative maneuvers and could thus reduce the risk for intraoperative trauma. Furthermore, this technique can be performed with standard three-piece posterior chamber IOls without the need for special haptic architecture or preparation. Additionally, there is no need to store or order special IOls for rare indications.

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