

FELLOWS' FOCUS

FOUR-POINT FIXATION FOR SCLERAL-SUTURED IOLS



Comfort and confidence are keys to consistent success.

BY CHRISTOPHER M. ADERMAN, MD

The placement of secondary intraocular lenses (IOLs) is one of the most common procedures retina surgeons perform, so it is important that we become comfortable with various techniques during fellowship. Implantation of an anterior-chamber IOL, refixation of a dislocated IOL, and scleral fixation of an IOL can each be appropriate choices, depending on clinical factors such as patient age, ocular comorbidities, and the mechanism of lens dislocation.¹

In cases that require scleral fixation with sutures, nonabsorbable PTFE monofilament suture (Gore-Tex; W.L. Gore) has largely replaced nylon due to its long-term stability. Although there are numerous methods for scleral fixation, the most common technique performed at our institution employs PTFE monofilament suture with either an Akreos AO60 (Bausch + Lomb) or an enVista MX60 (Bausch + Lomb) IOL. Each of these IOL models provides stable four-point fixation. In this article,

we review our technique and discuss the pros and cons of each lens.

THE SUTURED LENS TECHNIQUE

Before vitrectomy and lens or IOL removal, limited conjunctival peritomies are created nasally and temporally, and a toric lens marking set is used to mark the horizontal axis to ensure proper sclerotomy placement and lens centration. Calipers are used to mark the sclerotomy sites 4 mm to 5 mm apart, 3 mm posterior to the limbus, and centered around the horizontal axis. This positioning simulates in-the-bag placement, so standard IOL power calculation formulas can be used.

Trocars (23-, 25-, or 27-gauge)^{2,3} are placed superonasally and superotemporally, and the empty trocar needle is used to create inferonasal and inferotemporal sclerotomies parallel to the limbus. The trocars are inserted perpendicularly without tunneling, which facilitates

the rotation of the knot in the PTFE sutures at the end of the case. The acrylic lenses are easily folded and can fit through a 3-mm clear corneal incision or scleral tunnel.

The needles of the 7-0 CV-8 suture (Gore-Tex) are removed, and the suture is bisected and looped through the eyelets of the IOL before it is inserted into the eye. It is critical to keep the suture strands organized. One end of the first suture is grasped with Ahmed Micro-Graspers (MicroSurgical Technology) forceps, inserted through the corneal incision, and passed using the handshake technique to MaxGrip forceps (Alcon) that have been inserted through one of the sclerotomies. The suture is then externalized, and the same procedure is repeated with the other end, securing one side of the IOL.

Some surgeons also externalize one or both ends of the suture on the other side of the IOL before folding and inserting the lens. This leaves the final suture to be externalized after the lens



Figure 1. The four eyelets of the Akreos AO60 allow true four-point fixation.

has been inserted. The PTFE sutures can then be trimmed and loosely secured by tying the first portion of a 3-1-1 knot or a slipknot, and the tension can be adjusted to center the lens perfectly before securing the suture and rotating the knot into the superonasal and superotemporal sclerotomies.

Leaky wounds can be sutured, but be wary of severing the PTFE sutures to spare yourself a frustrating fishing expedition into the vitreous cavity. Alternatively, a transconjunctival approach can be used, eliminating the need for peritomies at the start of the case (Video).

THE LENSES

The Akreos AO60 is a popular IOL choice for scleral fixation. This acrylic lens has four eyelets through which sutures can be looped, providing true, stable four-point fixation. The benefit of this lens is its ease of use. Looping the sutures through the eyelets outside the eye (Figure 1) and externalizing the sutures before IOL insertion reduces the risk of crisscrossing sutures or flipping the lens.

Four-point fixation minimizes the risk of lens tilt, and the lens can be centered in the eye easily by adjusting the tension on the two sutures. The lens can, however, bend or warp if sutured too tightly. The drawback of this lens is that it is composed of a hydrophilic acrylic material, and opacification can result from air or gas exposure. This is rare, but it may require a lens exchange if it happens. Take this into consideration in patients with a high risk of retinal detachment. Such patients should be thoroughly counseled regarding this risk.

The *enVista MX60* is made with a



Figure 2. Looping the suture around the optic-haptic junction of the *enVista MX60* creates a pseudo-four-point fixation.

hydrophobic acrylic material, so it is not susceptible to opacification with air or gas. Although this lens has only two triangular eyelets at the haptic-optic junctions, these allow a pseudo-four-point fixation. If the suture is looped over the haptic, under the eyelet, and then back over the haptic (Figure 2), the IOL will remain stable without tilt when the sutures are externalized.

The setup for this lens is similar to that for the AO60, with the sclerotomies placed 3 mm posterior to the limbus and 4 or 5 mm apart. Lens insertion is trickier with this IOL, as the suture can easily slip around the haptic and cause the lens to tilt. Keep tension on the externalized ends of the suture at all times to prevent the suture from looping back under the haptic. Folding the haptic inside the lens like a taco during insertion is one technique to ensure that the suture stays properly positioned anterior to the haptic. This IOL is a useful option for patients with retinal detachment or those at high risk of needing air or gas tamponade.

BACK TO BASICS

No matter which secondary suture techniques or IOLs you become comfortable using, it is important to remember the basics of residency training and to review lens power calculations carefully on a case-by-case basis. Perform quality control checks to confirm reliable, up-to-date biometry measurements. Ensure that there are no discrepancies between axial lengths

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in the patient's two eyes, and check that the technician correctly adjusted the software for the status of the eye (eg, is there silicone oil in the eye now, or will there be at the end of the case?). Because biometry measurements taken by referring physicians typically do not include calculations for our preferred IOLs, we use the Barrett II Universal IOL calculation method, which has resulted in reliable refractive outcomes.

Fellows are exposed to many techniques, but the key to obtaining consistently good results is to know a few techniques very well. The more standardized the approach for each case, the more comfortable and confident the physician will be, and these are critical factors for maximizing visual outcomes. ■

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SECTION EDITOR CHRISTOPHER M. ADERMAN, MD

- Second-year Vitreoretinal Surgery Fellow, Wills Eye Hospital, Philadelphia, Pennsylvania
- caderman@midatlanticretina.com
- Financial disclosure: None

SECTION EDITOR FERHINA S. ALI, MD, MPH

- Second-year Vitreoretinal Surgery Fellow, Wills Eye Hospital, Philadelphia, Pennsylvania
- fali@midatlanticretina.com
- Financial disclosure: None

SECTION EDITOR KATHERINE TALCOTT, MD

- Second-year Vitreoretinal Surgery Fellow, Wills Eye Hospital, Philadelphia, Pennsylvania
- ktalcott@midatlanticretina.com
- Financial disclosure: None