

# ALTERNATIVES FOR THE SCLERAL FIXATION OF IOLs



Surgeons may wish to add two relatively simple techniques to their armamentarium.

BY LIAT VEIG MENDEL, MD, AND GUY KLEINMANN, MD

## MODIFICATION OF INTRAOCULAR LENS INSERTION USING 4-FLANGED FIXATION WITH A STANDARD CARTRIDGE AND A 2.4 MM CORNEAL INCISION IN EYES WITH NO CAPSULAR SUPPORT

Mahler O, Einan-Lifshits A, Hecht I, Biron R, Pras E, Dubinsky-Pertzov B<sup>1</sup>

Industry support: None

### ABSTRACT SUMMARY

Mahler and colleagues developed a technique for IOL implantation and fixation in aphakic eyes and those that lack capsular support. Their technique is a simplification of the sutureless flange technique for scleral fixation described by Canabrava et al.<sup>2,3</sup> The proposed modification allows an IOL with four eyelets to be implanted through a 2.4-mm corneal incision with minimal equipment.

A precut 6-0 polypropylene suture with sharp edges is threaded through both leading loop haptics of an Akreos AO60 IOL (Bausch + Lomb). Two marks are made 2 mm from the limbus and 4 mm apart both nasally and temporally for a total of four marks. The threaded IOL is loaded into the cartridge so that the suture passes through the cartridge nozzle and into the anterior chamber through the corneal incision. A 30-gauge bent needle is inserted through the conjunctiva and sclera adjacent to the marks and then turned radially to penetrate the eye through the inferior mark at

the 9 o'clock position to form a scleral tunnel. Next, the end of the suture is inserted into the lumen of the needle with the handshake technique<sup>4</sup> and pulled out of the eye. The process is repeated with another 30-gauge needle to leave the other end of the suture at the superior mark. After securing the two sutures at one side (temporal or nasal), the IOL is injected into the eye using the standard injector.

Another 6-0 polypropylene suture is inserted through the main incision, and the steps are repeated at the opposite side. Finally, the IOL is centered, and low-temperature cautery is used to create flanges, which are subsequently buried under the conjunctiva.

The technique was used successfully in six eyes of five patients. Mean follow-up time was approximately 2 months, and all of the IOLs were well centered and stable. No intra- or postoperative complications were observed.

### DISCUSSION

Strategies for IOL implantation in the absence of capsular support include the use of an anterior chamber IOL, an iris claw IOL, and iris or scleral fixation. Each of these techniques has drawbacks.<sup>5-8</sup> The flange technique for scleral fixation recently became a popular alternative for scleral fixation in which the IOL is manually folded and inserted through a 3.4- or 2.7-mm incision.<sup>2,3,9</sup>

The proposed modification by Mahler et al simplifies the technique to allow the IOL to be inserted through a 2.4-mm corneal incision using a standard IOL cartridge. This reduces the potential for complications such as wound leakage, surgically induced astigmatism, and infection.<sup>10</sup> The use of an IOL cartridge, moreover, reduces the risk of scratches and irreversible imprints on the IOL.<sup>11,12</sup> Anchoring four points of the

## STUDY IN BRIEF

- Surgeons proposed a technique for the scleral fixation of an IOL in eyes that lack capsular support. An IOL with four eyelets is inserted through a 2.4-mm corneal incision and anchored to the sclera with four flanges made from 6-0 polypropylene sutures, thereby improving IOL stability.

### WHY IT MATTERS

The technique appears to be a simple alternative for scleral fixation that combines the advantages of the flange technique with the use of a small corneal incision.

IOL to the sclera reduces the risk of IOL tilt. Additional advantages of the technique are that a leading needle is

not required for a 6-0 polypropylene suture because of its thickness and the suture can be inserted directly

into a 30-gauge needle. Finally, the technique can speed up visual rehabilitation.

## CORRECTING OPTIC CAPTURE WITH 2 FLANGED 6-0 SUTURES AFTER INTRASCLERAL HAPTIC FIXATION WITH VISCONEDDLING

Mascarenhas Menna Barreto V, Mascarenhas Menna Barreto C, Kern Menna Barreto P, Kern Menna Barreto R<sup>13</sup>  
Industry support: None

### ABSTRACT SUMMARY

Flanged IOL fixation or the Yamane technique is performed to fixate an intrascleral IOL without the use of a suture or glue.<sup>14</sup> Yamane et al reported that optic capture of the IOL occurred in more than 5% of the cases in their series.<sup>15,16</sup> Mascarenhas and colleagues proposed a technique for managing this complication.<sup>13</sup>

Two ultrathin-walled 30-gauge needles are prepared. One is bent 20° at 12 mm from the tip, and the other is bent 45° degrees at 7 mm from the tip. Both needles are filled with a small amount of an OVD. The first needle is attached to an OVD syringe. A 6-0 polypropylene suture that is 4.5 cm in length is fully introduced into the first needle. The second needle is attached to an insulin syringe.

The needles are passed between the IOL and the iris, over the IOL, 2 mm posterior to the limbus. The two tips are then positioned close together. The plunger of the OVD syringe is pushed until the suture penetrates the lumen of the second needle and advances about 7 mm. The needles are then removed, while each end of the suture is withdrawn from the eye. High-temperature cautery is used to create a flange at each end.

The steps are repeated about 4 mm away from the first suture to create a second parallel suture with two flanges. Tension on the sutures is then adjusted, and all four flanges are buried under the conjunctiva.

## STUDY IN BRIEF

► A visconeedling technique was used to correct optic capture of the IOL by the pupil in two eyes in which the Yamane technique for scleral fixation had been used.

### WHY IT MATTERS

The technique appears to be simple and could be performed in other surgical scenarios involving sutures inside the eye.

At 6 and 9 months, respectively, results for two cases were optimal, and neither patient experienced a recurrence of iris-optic capture.

### DISCUSSION

The visconeedling technique is performed in a closed system. Neither special devices nor an OVD is necessary to maintain a deep anterior chamber.<sup>17</sup> The larger diameter of the 6-0 polypropylene suture should reduce the rate of degradation compared to a 10-0 suture.<sup>18,19</sup> To optimize suture tension, Mascarenhas and colleagues suggested applying counterpressure on the contralateral flange while making the second flange. Further adjustments can be made later at the slit lamp. They suggested that introducing the sutures 2 mm posterior to the limbus should reduce the risk of surgically induced astigmatism if the sutures are too tight. ■

1. Mahler DS, Einar-Lifshits A, Hecht I, Biron R, Pras E, Dubinsky-Pertsov B. Modification of intraocular lens insertion using 4-flanged fixation with a standard cartridge and a 2.4 mm corneal incision in eyes with no capsular support. *J Cataract Refract Surg.* 2021;47(9):1227-1233.

2. Canabrava S, Canêdo Domingos Lima AC, Ribeiro G. Four-flanged intrascleral intraocular lens fixation technique: no flaps, no knots, no glue. *Cornea.* 2020;39(4):527-528.

3. Agarwal A, Jacob S, Kumar DA, Agarwal A, Narasimhan S, Agarwal A. Handshake technique for glued intrascleral haptic fixation of a posterior chamber intraocular lens. *J Cataract Refract Surg.* 2013;39(3):317-322.

4. Güell JL, Verdaguer P, Elies D, et al. Secondary iris-claw anterior chamber lens implantation in patients with aphakia without capsular support. *Br J Ophthalmol.* 2014;98(5):658-663.

5. De Silva SR, Arun K, Anandan M, Glover N, Patel CK, Rosen P. Iris-claw intraocular lenses to correct aphakia in the absence of capsule support. *J Cataract Refract Surg.* 2011;37(9):1667-1672.

6. Khan MA, Gupta OP, Smith RG, et al. Scleral fixation of intraocular lenses using Gore-Tex suture: clinical outcomes and safety profile. *Br J Ophthalmol.* 2016;100(5):638-643.

7. Lyle WA, Jin JC. Secondary intraocular lens implantation: anterior chamber vs posterior chamber lenses. *Ophthalmic Surg.* 1993;24(6):375-381.

8. Canabrava S, Bernardino L, Batistelli T, Lopes G, Diniz-Filho A. Double-flanged-haptic and capsular tension ring or segment for sutureless fixation in zonular instability. *Int Ophthalmol.* 2018;38(6):2653-2662.

9. Canabrava S, Andrade N Jr, Henriques PR. Scleral fixation of a 4-eyelet foldable

intraocular lens in patients with aphakia using a 4-flanged technique. *J Cataract Refract Surg.* 2021;47(2):265-269.

10. Tejedor J, Pérez-Rodríguez JA. Astigmatic change induced by 2.8-mm corneal incisions for cataract surgery. *Invest Ophthalmol Vis Sci.* 2009;50(3):989-994.

11. Vrabcic MP, Syverud JC, Burgess CJ. Forceps-induced scratching of a foldable acrylic intraocular lens. *Arch Ophthalmol.* 1996;114(6):777.

12. Milazzo S, Turut P, Blin H. Alterations to the AcrySof intraocular lens during folding. *J Cataract Refract Surg.* 1996;22(suppl 2):1351-1354.

13. Mascarenhas Menna Barreto V, Mascarenhas Menna Barreto C, Kern Menna Barreto P, Kern Menna Barreto R. Correcting optic capture with 2 flanged 6-0 sutures after intrascleral haptic fixation with visconeedling. *J Cataract Refract Surg.* 2021;47(9):1234-1236.

14. Yamane S, Sato S, Maruyama-Inoue M, Kadosono K. Flanged intrascleral intraocular lens fixation with double-needle technique. *Ophthalmology.* 2017;124:1136-1142.

15. Yamane S. Yamane double-needle technique: rationale and results. In: Chang DF, Lee BS, Agarwal A, eds. *Advanced IOL Fixation Techniques*. Slack; 2019:345-349.

16. Jones J. Complications of double-needle flanged intrascleral haptic fixation: rationale and results. In: Chang DF, Lee BS, Agarwal A, eds. *Advanced IOL Fixation Techniques*. Slack; 2019:363-366.

17. Vote BJ, Tranos P, Bunce C, Charteris DG, Da Cruz L. Long-term outcome of combined pars plana vitrectomy and scleral fixated suture posterior chamber intraocular lens implantation. *Am J Ophthalmol.* 2006;141(2):308-312.

18. Price MD, Price FW Jr, Werner L, Bertie C, Mamalis N. Late dislocation of scleral-sutured posterior chamber intraocular lenses. *J Cataract Refract Surg.* 2005;31(7):1320-1326.

19. Masket S, Fram NR. Safety-basket suture for management of malpositioned posterior chamber intraocular lens. *J Cataract Refract Surg.* 2013;39(10):1633-1635.

### SECTION EDITOR EDWARD MANCHE, MD

- Director of Cornea and Refractive Surgery, Stanford Laser Eye Center, California
- Professor of Ophthalmology, Stanford University School of Medicine, California
- edward.manche@stanford.edu
- Financial disclosure: None

### GUY KLEINMANN, MD

- Chairman, Ophthalmology Department, Wolfson Medical Center, Holon, Israel
- guykl.email@gmail.com
- Financial disclosure: Consultant (CorNeat, Hanita Lenses, Johnson & Johnson Vision); Research grant (Belkin Laser)

### LIAT VEIG MENDEL, MD

- Ophthalmology Department, Wolfson Medical Center, Holon, Israel
- liat.veig@gmail.com
- Financial disclosure: Research grant (Belkin Laser)