Scleral Fixation of a Foldable Intraocular Lens

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Abstract. Scleral fixation has become more popular and is now performed by surgeons all over the world. At present, there are no available foldable intraocular lenses (IOLs) with holes that would enable tying a suture on to their haptic. We describe a method for using an available 3-piece acrylic foldable IOL with PMMA haptics for scleral fixation. This enables surgeons to benefit from the advantages of a small incision in cases where there is no need to exchange a previously implanted rigid IOL. [Ophthalmol Surg Lasers 2002;33:257-259]

INTRODUCTION

From the early 1990s, scleral fixation has increased in popularity as an intraocular lens (IOL) solution in eyes lacking capsular support. This method consists of sewing a polymethylmethacrylate intraocular lens (PMMA IOL) into the ciliary sulcus using a prolene suture on a long needle. The technique can be applied to secondary implantation in aphakia with a lack of capsular support or when there is a dislocated IOL that needs to be exchanged. It is also useful as part of the primary procedure for lensectomy or cataract extraction with a dislocated lens or loss of the capsule during surgery. Except in the case where there is a rigid PMMA IOL that must be removed, it would be optimal not to open the eye to as much as 5 to 6 mm to implant the posterior chamber intraocular lens (PC IOL). Even when a dislocated PC IOL needs to be removed, there are some surgeons who would remove a foldable IOL by folding it inside the eye and pulling it out through a small incision or cutting it with specially designed scissors.\textsuperscript{3,5}

Foldable 3-piece IOLs only come in a form that has no manipulating holes on the haptics, unlike the CZ70BD IOL (Alcon, Fort Worth, TX), a rigid lens with 2 holes conveniently positioned for scleral fixation purposes. The lack of those holes in the haptics makes the suturing of a foldable lens into the ciliary sulcus problematic.

We have devised a method that enabled us to suture an Acrysof IOL (Alcon, Fort Worth, TX) in the sulcus, using a small incision of 3.4 mm. We have used it in 2 cases with good success.

TECHNIQUE

A clear cornea incision of 3.0 mm is prepared at 11 o’clock with a blade and widened to 3.4 mm. At the 2:30 and 8:30 o’clock position, a minimal peritomy is performed, and the sclera is cauterized with minimal cautery. A 2 mm-long partial thickness cut in the superficial sclera using a flat blade, such as a 69 blade, is prepared at 1 mm posterior and parallel to the limbus. A lamellar pocket is then dissected posteriorly for about 2 mm in the sclera. An anterior chamber maintainer (ACM) is inserted at the 6 o’clock position to help reform the eye, since the eye will soften after the vitrectomy. An anterior vitrectomy is performed through the incision. A double-armed 10-0 prolene suture on a CIF-4 needle (Ethicon, Somerville, NJ) is delivered through the incision and directed to the 2:30 o’clock position. It is directed just under the iris and through the premade lamellar pocket in the sclera. The other needle is used to do the same and come out through the 8:30 o’clock position, 1 mm posterior to the limbus. The suture is cut in the middle so that 2 long ends of it are coming out from the incision, and the 2 needles are coming out through the sclera in the
ciliary sulcus area at the 2:30 and 8:30 o'clock positions. A disposable battery operated diathermy is used to melt the end of the haptic, slowly bringing it in proximity to the haptic end without touching, until a small ball of melted PMMA forms (Figure 1). Care is taken to ensure the melted end of the haptic is smooth. This serves as a stopper for the knot, should it slide towards the end of the haptic. On the side of the incision, each end of the suture is tied to a haptic of the IOL (MA60, Acrysof, Alcon, Fort Worth, TX) with a slip knot, and secured with a second locking knot. The IOL is folded with forceps and inserted into the eye folded in half, so that the haptic intended for fixation at the 8:30 o'clock position goes in the eye first (Figure 2). This results in the clockwise rotation of the IOL as the sutures are tightened and in proper positioning of the implant. In our first patient, the haptic intended for the 2:30 o'clock position went in first. When the sutures were pulled tight, the lens rotated counterclockwise and upside down, such that it vaulted anteriorly resulting in the patient being myopic: $-4.25 + 1.75@80^\circ$.

Once the IOL is in the eye, the sutures are pulled cautiously on the side of the sclera, and the IOL is tightened in place. Then, on each side, the 10-0 prolene is passed through the lamellar pocket, then back through into the inner part of the pocket. The loop of the prolene is tied to itself. The knot is cut flush and buried under the partial thickness flap. Alternately, a second 10-0 prolene on a regular needle can be passed close to the transcleral suture and tied to the exiting transcleral end. The incision is covered with conjunctiva and the eye is then patched. No protruding suture or knot is present to later erode through the sclera.

DISCUSSION

We describe here a novel method for using foldable 3-piece IOLs for scleral fixation. This provides us with the opportunity to benefit from the advantages of a small incision over a 5 to 6 mm incision. These benefits include faster healing, less astigmatism, and increased safety for the eye during and after the surgery.6-9

We hope the manufacturers will design a foldable IOL that will enable securing the sutures to the haptics without the need to use diathermy and will allow surgeons to perform even easier and safer procedures.

REFERENCES

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