

Background

Intraocular lens implant is routinely placed in the capsular bag following a cataract surgery, as it is the least invasive and quickest method to replace crystalline lens with best visual outcome and minimal post-operative complications.

In the absence of adequate capsular support, intraocular lens(IOL) can be implanted in the anterior chamber, in the ciliary sulcus or can be fixed to iris or sclera.

If there is no capsular support, Scleral fixation of intraocular lenses(SFIOL) allows placement of IOL in a near anatomical position of the lens posterior to the iris decreasing the risk for recurrent iritis or corneal decompensation that arise from anterior chamber IOL or iris fixated IOL. Various techniques like glued SFIOL, Yamane method or intra-scleral placement of haptic without glue has been described for sutureless SFIOL placement and they have been reported to have predictable post-operative visual outcomes and safety profiles.¹

Objective

To evaluate the surgical indications, surgical technique, pre and post-operative visual outcome and post-operative complications of sutureless intra-scleral haptic placement of SFIOL implantation in the presence of absent capsular support.

Materials and Methods

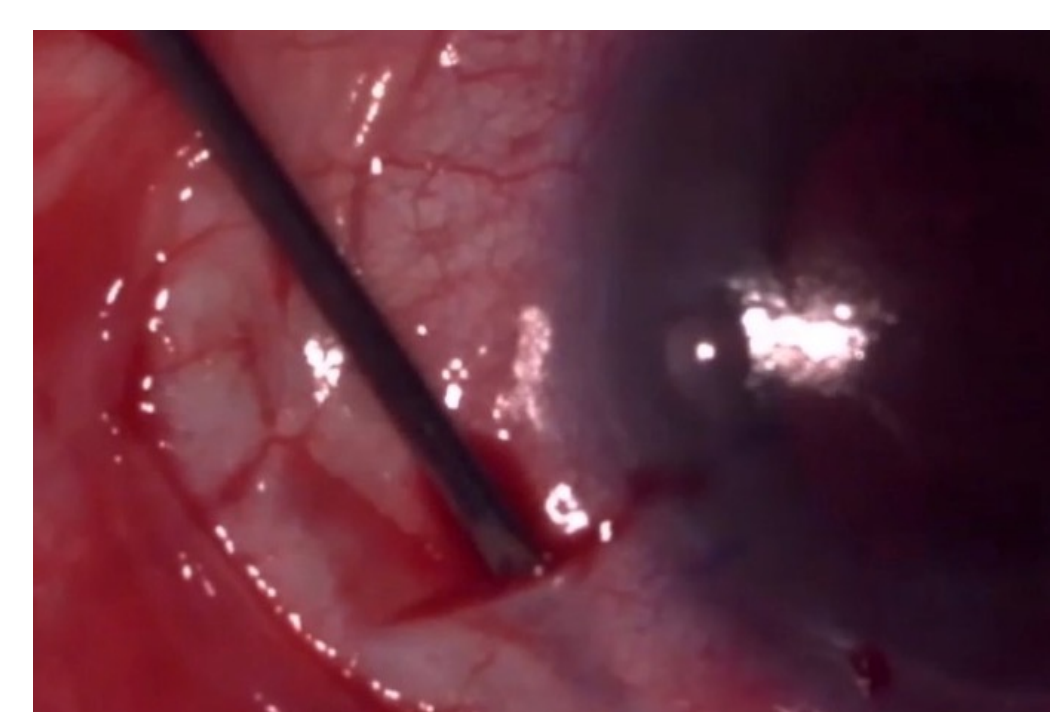
This is a single center retrospective case series which took place between August 2018 and August 2020. All patient who underwent Sutureless SFIOL surgery due to absent capsular support were identified and data collected from electronic patient record.

Surgical procedure: After localized conjunctival peritomy two partial thickness sclerotomy radial to limbus were made, 180 degrees apart using a 15∞ blade. Partial thickness intra-scleral tunnels were created parallel to the limbus starting from the sclerotomy using a 25G needle or a crescent blade. After this, 3 port 23G pars plana vitrectomy(PPV) was performed followed by IOL explant or nucleus fragmatome depending upon the indication using Constellation Vision System (Alcon Laboratories, Inc, Duluth, GA) for all patients.

After this a three-piece foldable IOL (AMO Tecnis, ZA9003) was injected through self-sealing superior scleral incision and the haptics were externalized 2mm from the limbus through the sclerotomy.

Then the haptics were placed into the intra-scleral tunnel using a 25G needle and secured into position. The sclerotomy and the peritomy were secured using absorbable 8-0 Vicryl sutures.

All patients were analyzed for surgical indications, pre and postoperative visual outcomes, intra-operative and post-operative complications, the need for repeat surgery for SFIOL repositioning if required. All patients were followed up at 1 week, 1 month and 3 months post-operatively.



Partial thickness scleral tunnel being made from a previously created sclerotomy, parallel to the limbus using 25G needle

The SFIOL haptics exteriorized through the sclerotomies prior to being tucked under the scleral tunnels



Results

A total of 12 eyes of 12 patients had undergone this procedure during that period, 9 males, 3 females. The mean age was 69 ± 9.81 years. The most common indication for surgery was aphakia following complicated cataract surgery in 5 patients. Other indications were spontaneously dislocated (3 patients) PCIOL, posterior dislocation of PCIOL secondary to trauma (2), spontaneous subluxation (>6 clock hours) of clear crystalline lens (1) and dislocated SFIOL (1).

Mean pre-operative visual acuity was 1.57± 0.60 LogMAR. The mean post-operative visual acuity at 3 months was 0.32 ± 0.30 LogMAR. Primary PPV was performed in 6 eyes. 6 eyes were already vitrectomised for previous retinal detachment repair (5) and non-resolving vitreous haemorrhage (1) and needed only limited peripheral vitrectomy. Fragmatome lensectomy was performed for nucleus drop in 2 eyes and intra capsular cataract extraction (ICCE) was performed in 1 eye. In 3 eyes with posteriorly dislocated PCIOL, the dislocated 3-piece IOL was repositioned as SFIOL.

The main post-operative complications included post-operative cystoid macular oedema (3), IOL dislocation requiring repositioning (3), transient high intraocular pressure (2), and post-operative optic capture (2).

3 patients had SFIOL dislocation of which 2 patients underwent SFIOL exchange due to broken haptic and in one patient, the dislocated haptic was diathermised and repositioned into scleral pockets.

Pre-operative CMO was seen in 1 eye for which intravitreal triamcinolone was given as part of PPV +SFIOL. The CMO was found to resolve following surgery at 2 months post-op. In 2 eyes, the CMO had resolved following topical anti-inflammatory and steroid drops.

High intraocular pressure was controlled using topical anti glaucoma medications. No patient required long-term glaucoma medication due to SFIOL. Patients with optic capture did not have any visual complaints or signs of iritis.

Patient Characteristics

Characteristic	Data
No. of patients	12
Age	
Mean ±SD	Years, 69 ± 9.81
Range	52-82
Gender (Males/Females)	9/3
Indications	
Aphakia following complicated cataract surgery.	5
Posteriorly dislocated PCIOL	3
Post traumatic aphakia with posterior dislocation of lens	2
Spontaneous subluxation (>6 clock hours) of clear crystalline lens	1
Previously operated dislocated SFIOL	1

Post-operative Complications

Post-operative cystoid macular oedema	3 patients
IOL dislocation	3 patients
High intraocular pressure	2 patients
Post-operative optic capture	2 patients

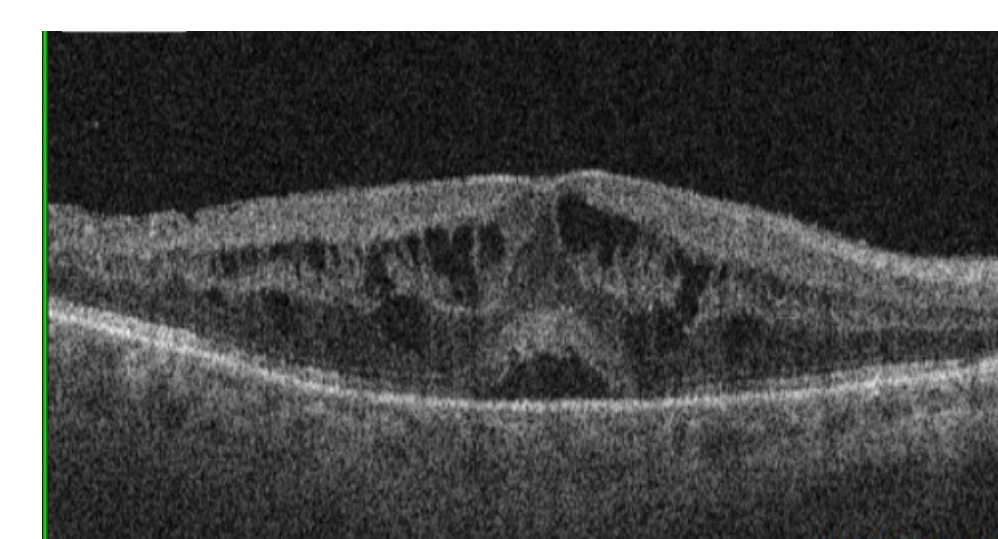


Image showing Post-operative CMO seen in a patient at 2 months post op and resolved with treatment at 5 months post op

Discussion

Artificial intraocular lens implantation in the absence of capsular support is always a surgical challenge. Various methods for scleral fixation of intraocular lenses have been described, including suture fixation and sutureless fixation methods, with or without vitrectomy.

Several methods ranging from inserting haptics in a scleral pocket without any anchoring sutures, using fibrin glue on the haptic and closure of the scleral flap, and melting the haptic tips to form a bulbous end to prevent dislocation through sclerotomy site have been described for sutureless fixation of IOLs.²⁻⁵

Sclerotomy is made in all techniques - using a needle, a blade, or a trocar to externalize the haptics. Scleral flaps or intra-scleral tunnels are created circumferential to the limbus for sutureless scleral fixation of haptics. Sutureless SFIOL is less invasive than sutured SFIOL and aims to achieve good post-operative visual outcomes. The stability of IOLs is attained by the scar tissue formed around the haptics.

Post-operative complications seen in our patients are similar to that have been reported but we did not face persistent iritis and glaucoma or retinal detachment. Patients had good visual outcomes with transient and treatable post-operative complications.

Conclusion

Sutureless SFIOL fixation methods are well recognized procedures with good visual outcome. This technique is less invasive and it eliminates the suture-related complications of sutured scleral fixation methods. The sutureless fixation of the haptics in intra-scleral pockets help to achieve stability of the IOL and minimizes the risk of postoperative astigmatism. In eyes with longer axial length than average, sutured SFIOL is better as the overall length of a 3-piece IOL may not be sufficient to secure it in position.

References

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