Abstract

Here, we report a case of 66-year-old female who came with a history of secondary aphakia due to the complication of cataract surgery in the left eye with a vision of HM + which is improving with pinhole to 6/9 and right eye PCIOL with a vision of 6/6, managed with new foldable acryflex T IOL (CM T FLEX) scleral fixated intraocular lens (IOL). Two partial-thickness limbal-based scleral flaps of 2.5 mm × 2.5 mm were created 180° apart; sclerotomies were made using 23G needle 1.5 mm away from the limbus. The new acryflex T–flex IOL implantation was performed through the 2.8 mm clear corneal tunnel incision, and T-shaped IOL haptics were externalized with the 23G forceps under the scleral flap. Fibrin glue was used to close the scleral flaps and conjunctiva. Postoperative period was uneventful; at the end of 1 month, the patient regained a good visual acuity of 6/6 (P) with a good stable centration of IOL.

Keywords: Aphakia, CM T flex intraocular lens, secondary intraocular lens, sutureless intrascleral fixation, virectomy

Introduction

Intraocular lenses (IOLs) are universally preferred over either aphakic spectacles or contact lenses as a method of visual rehabilitation in aphakic patients. However, depending on the condition of the posterior capsule and ciliary zonule, the insertion of an IOL on the capsule may cause such problems as IOL displacement into the vitreous cavity, decentration, or tilting. Sutured scleral fixated IOLs (SFIOLs) have been used for over three decades with good outcomes although at risk of suture disintegration over the long term. Recently, sutureless SFIOLs have become popular and can be fixated using different techniques such as the Scharioth technique, Narang and Agarwal’s glued SFIOL, Yamane’s et al. double-flanged technique, or Baskaran’s et al. X-Nit technique. Many modifications of these techniques have also been described using needles, trocars, flaps, sutures, and glue. Iris fixated IOLs including haptic suturing to the iris stroma, and retropupillary iris-claw IOL placement, has also been described with results similar to sutureless SFIOLs). However, the scleral fixation of an IOL can also lead to many complications, such as a decrease in the corneal endothelial cell density, refractive error after surgery, IOL dislocation, vitreous hemorrhage, infection through the suture, and retinal detachment.

Case Report

A 66-year-old female presented to our hospital with complaints of defective vision of 2 weeks duration in the left eye. She gave the history of undergoing cataract surgery 2 weeks back elsewhere. On ocular examination, best-corrected visual acuity in the right eye was 6/6 and N6, and the left eye was hand movement, which is improving with pinhole to 6/9. On slit-lamp examination, the right eye was normal, and the left eye had clear cornea with vitreous in the anterior chamber and folded capsular bag with cortical remnant. The fundus examination of both eyes was normal.

The patient was planned for secondary foldable hydrophilic CM T-FLEX scleral fixated IOL in the left eye.

Preoperative workup, such as axial length, keratometry, intraocular pressure, pachymetry, anterior segment optical

Address for correspondence: Dr. P. A. P. Aysha, M.N. Eye Hospital, 781 TH Road, Tondiarpet, Chennai, Tamil Nadu, India. E-mail: ayshpap@gmail.com

How to cite this article: Nivean M, Nivean PD, Madhivanan N, Aysha P. CM T – Flex intraocular lens an innovative design for aphakia secondary to postcataract surgery. TNOA J Ophthalmic Sci Res 2020;58:30-3.
coherence tomography, specular microscopy, and biometry, was done using SRK/T Formula and A constant 118.0 with target refraction of emmetropia.

Written consent for the surgery was obtained.

Under peribulbar anesthesia using the Ashwin Glued IOL marker 0°–180° was marked. This is the important step as it ensures the centration and torsional stability of the IOL. Conjunctival peritomy was done on either side, and bipolar cautery used to cauterize the bleeders. Two partial-thickness limbal based scleral flap about 2.5 mm × 2.5 mm created on either side of the markings. A 23G trocar was placed in the inferotemporal quadrant for the infusion to prevent hypotony during the procedure, and through the side port diluted triamcelone acetonide injected and anterior vitrectomy was performed. Two sclerotomies with 23G needle are made from 1.5 mm from the limbus on either side under the sclera flap. A 2.8 mm clear corneal incision is made using the keratome; the new CM T flex IOL, which is a foldable hydrophilic lens with a specialized T-shaped haptics, was loaded in the cartridge and placed in the injector [T Flex Figure 2]. The IOL is injected through the cornea gently so that T junction of the IOL comes out first which makes it easy to grasp using the specially designed PraNiv T flex forceps through one sclerostomy site, usually the head or the neck is grasped and then the IOL is injected gently so that trailing haptic is kept at the wound, now the forceps is gently brought through the sclerostomy and then, we can see the pop of the T flex pop after pull (PAP-Manuver). Now using the NiShi grasping forceps through the side port, the arm of the IOL is held, and using the handshake technique, the T junction is transferred to the second forceps and brought out through the other sclerostomy site. AC is formed by air bubble, the infusion cannula is removed, the sclera bed is made dry, and fibrin glue is used to seal the sclera flap and conjunctiva [Figure 3].

On postoperative day 3, the cornea was clear with mild congestion of the conjunctiva covering the flap and anterior chamber showed 1+ cells and flare, the iris was round, and regular and stable T flex IOL in situ [Figure 4]. At the end of the 1st month, unaided visual acuity was 6/6 (P) with normal conjunctiva over the sclera flap with the clear cornea and quiet anterior chamber [Figure 5] and well-positioned T-flex IOL as shown in ultrasound biomicroscopy [Figure 6].

**DISCUSSION**

Szurman et al. presented the first technique that introduces injector implantation in Transscleral IOL suturing. Then, transscleral fixation by injector implantation of foldable IOLs

![Figure 1: Preoperative](image1)

![Figure 2: CM T flex intraocular lens](image2)

![Figure 3: Surgical steps (a) 180° apart scleral flaps, (b) PraNiv T flex forceps grasping the head of the intraocular lens, (c) bringing out the junction, (d) CM T flex intraocular lens in position, stable](image3)

![Figure 4: Third-day postoperative](image4)
Nivean, et al.: CM T – FLEX intraocular lens an innovative design for aphakia secondary to postcataract surgery

has been gaining popularity by other surgeons.[11-13] Scleral fixation of a foldable IOL reduces operating time and maintains superior, anterior chamber stability. A smaller incision and the lack of suture reduce postoperative astigmatism.

We present here in our first experience with injector implantation of foldable CM T flex IOL for scleral fixation. It is made up of hydrophilic material which contains 26% water with refractive index of 1.460. The optical diameter of CM T flex IOL is 6.00 mm, and overall diameter is 13.75 mm. The angulation of IOL is 10° with A constant of 118.0.

The main advantage of this IOL is it has a T-shaped design which can be brought out through the 23G sclerostomy site and left under the sclera bed. There is no need of any haptic tuck and suturing so this make the procedure surgically easier and less time-consuming and less trauma to the ocular tissue.

Kim et al. described their technique in which haptics were externalized through two adjacent corneal incisions and tied with 10/0 polypropylene suture with ab externo needle passing.[13] Their modified technique is safe and effective but is time-consuming.

Surgical treatment of aphakia with one-piece IOL may be complicated by some factors caused by the limited design of the lens, such as lack of haptic angulation, bulky haptics and sharp square edges of both haptic and optic. This condition might increase the risk of posterior iris touch and consequently iris pigment dispersion glaucoma or iris atrophy. Even so, other implant types such as iris suturing or iris enclavation may also cause these complications.[14]

Based on our experience, we would like to provide ophthalmic surgeons a simple and effective technique for secondary implantation of foldable CM T flex IOL through a 2.8 mm incision without the use of glue or sutures for haptic externalization. This can be used in complicated cataract surgery, where in-the-bag IOL implantation or sulcus fixation is impossible.

**Conclusion**

This new CM T flex hydrophilic foldable IOL is a good option for treating aphakia. This new speciallized design does not need tucking or suturing of the haptics, which makes the procedure easier, less time-consuming, and minimal tissue handling leading to better postoperative results. Being hydrophlic, the maneuver in the anterior chamber is easy; the angulation between the optic and haptic makes the position behind the iris, thus not restricting the pupillary dilatation or causing any pupillary block glaucoma. The sclera flaps are closed with glue, and hence, this makes totally sutureless surgery.

**Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

**Financial support and sponsorship**

Nil.

**Conflicts of interest**

There are no conflicts of interest.

**References**

1. Johnston RL, Charteris DG. Pars plana vitrectomy and sutured posterior chamber lens implantation. Curr Opin Ophthalmol 2001;12:216-21.
2. Iino T, Ohshita M, Yamamoto T. Ab externo sulcus fixation by single unilateral suture of the intraocular lens haptics. Ganka 2005;47:1335-40.
3. Sindal MD, Nakhwa CP, Sengupta S. Comparison of sutured versus sutureless scleral-fixated intraocular lenses. J Cataract Refract Surg 2016;42:27-34.
4. Gabor SG, Pavlidis MM. Sutureless intrascleral posterior chamber intraocular lens fixation. J Cataract Refract Surg 2007;33:1851-4.
5. Narang P, Agarwal A. Glued intrascleral haptic fixation of an intraocular lens. Indian J Ophthalmol 2017;65:1370-80.
6. Yamane S, Sato S, Maruyama-Inoue M, Kadonosono K. Flanged intrascleral intraocular lens fixation with double-needle technique. Ophthalmology 2017;124:1136-42.
7. Baskaran P, Ganne P, Bhandari S, Ramakrishnan S, Venkatesh R, Gireesh P. Extraocular needle- guided haptic insertion technique of scleral fixation intraocular lens surgeries (X-NIT). Indian J Ophthalmol 2017;65:747-50.
8. Ohtani S, Miyata K, Ono K. Outcome of sulcus fixation of the posterior chamber lens. Jpn J Clin Ophthalmol 2000;54:531-5.
9. Krause L, Bechakis NE, Heinmann H, Salditt S, Foerster MH. Implantation of scleral fixated sutured posterior chamber lenses: A retrospective analysis of 119 cases. Int Ophthalmol 2009;29:207-12.
10. Tsuiki E, Taniguchi H, Kitaoka T. Evaluation of transscleral fixation of intraocular lens. Ganka Rinsho Ibou 2004;98:1077-80.
11. Choi KS, Park SY, Sun HJ. Transscleral fixation by injector implantation of a foldable intraocular lens. Ophthalmic Surg Lasers Imaging 2010;41:272-5.
12. Kim SJ, Lee SJ, Park CH, Jung GY, Park SH. Long-term stability and visual outcomes of a single-piece, foldable, acrylic intraocular lens for scleral fixation. Retina 2009;29:91-7.
13. Szurman P, Petermeier K, Jaisle GB, Bartz-Schmidt KU. A new small-incision technique for injector implantation of transsclerally sutured foldable lenses. Ophthalmic Surg Lasers Imaging 2007;38:76-80.
14. Wagoner MD, Cox TA, Ariyasu RG, Jacobs DS, Karp CL, American Academy of Ophthalmology. Intraocular lens implantation in the absence of capsular support: A report by the American Academy of Ophthalmology. Ophthalmology 2003;110:840-59.