



Original Research Article

Scleral Fixated IOLs - an experience

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ABSTRACT

Context: Scleral fixation of IOL is the procedure of implanting a posterior chamber IOL in the sulcus in absence of posterior capsular support as in prior cataract extraction or Aphakia, Traumatic cataract, subluxation/dislocation of natural lens.

Aims: To study the outcome of 68 Aphakic eyes which underwent Sutured Scleral Fixation of IOLs.

Results in terms of Intraoperative difficulties, Postoperative complications and Visual recovery were noted.

Settings and Design: Prospective Interventional Study.

Materials and Methods : 68 eyes of 68 patients were subjected to Sutured Scleral fixation of Posterior chamber IOL surgery in Dept. of Ophthalmology in a tertiary Government teaching institute, either primary or as secondary surgery. Good Best Corrected Visual Acuity and a quiet eye with no fundus abnormality were the prerequisites. Two point fixation was done using 10-0 Prolene straight needle suture by a single surgeon.

Results: Intraoperative difficulties encountered were Hypotony, hyphaema, and suture entangling. Postoperative complications like Hyphaema and Iritis were seen. Postoperative Best Corrected Visual Acuity in 92% cases was 6/6 to 6/18. No special IOL or instruments were required in this technique.

Conclusions: Sutured Scleral fixation is the best option for Aphakic patients without capsular support in the hands of a careful surgeon.

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1. Introduction

Scleral fixation of IOL is the procedure of implanting a posterior chamber IOL in the sulcus in absence of posterior capsular support as in prior cataract extraction or Aphakia, Traumatic cataract, subluxation/dislocation of natural lens.

Various options for Secondary IOLs available are AC IOLs, Iris claw IOLs, Sutured IOLs, Glued IOLs and Sutureless Intrasceral IOLs. All of them have their own advantages and drawbacks.¹

2. History

Scleral fixation of posterior chamber IOLs was first described by Malbran et al, in 1986²

Stark et al, 1989 placed IOL in ciliary sulcus by suturing haptic to sclera & iris. Lyle & Jin, 1992, did 11 & 5 o'clock fixation under triangular scleral flaps. Guinness et al, 1995 did 10.30 & 4.30 o'clock fixation with one straight & 1 curved needle. Uthoff et al 1998, 3 & 9 o'clock fixation was done.

2.1. Types of trans scleral Support

1. Ab externo approach- preferred. . .
2-point & 4-point fixation
2. Ab interno approach.

2.2. Subjects and Methods

3. Aims and Objectives

To study the outcome of 68 eyes who underwent sutured scleral fixation of posterior chamber IOL. Results in terms

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of Intraoperative difficulties, Postoperative complications and Visual recovery were noted.

4. Materials and Methods

68 eyes of 68 patients were subjected to sutured scleral fixation of posterior chamber IOL from Jun 2007 to Feb 2019 in Dept. of Ophthalmology of a teaching Government Institute.

The Ethics committee approved the protocol.

Indications of Scleral fixation of pCIOL- Inclusion criteria were

1. Prior aphakia of one eye with good Vision correction
2. PC rent or aborted primary IOL implantation
3. Subluxation of Lens
4. Traumatic Cataract with PC rent

4.1. Exclusion criteria were

1. Aphakia with BCVA of less than 6/60
2. Patients with aphakic glaucoma
3. With corneal pathology,
4. With inflamed eye, iritis, uveitis
5. With disorganized anterior segment/ organised scarring
6. With any fundus abnormality, retinal detachment / CME

68 Eyes of 68 patients were chosen for surgery by a single surgeon

Preoperative evaluation was meticulously done.

Best Corrected Visual Acuity, Routine examination of eye and adnexa, Slit lamp examination in detail to look at Limbus for incision, Corneal edema, scarring, Anterior chamber inflammation, Pupil and Iris- reaction to light, peaked, irregular pupil, or rubeosis iridis, Status of posterior capsule remnants, Cortex, Vitreous Face and Fibrosis if any.

Fundus examination for CME or RD. followed by Keratometry and A Scan, and IOL power calculation. Intraocular Pressure measurement and Sac Syringing.

Timing of Scleral Fixation Surgery was decided as

Primary or Secondary- minimum 4 wks. after first surgery to take care of inflammation, hypotony and CME.

4.2. Procedure

After written consent and Peribulbar block, eye painted and draped, Speculum and Bridle suture applied, Conjunctival Peritomy performed, vessels cauterized, Triangular scleral flaps made 180 deg apart, 2 point (10-4, or 2-8 clock) 3 mm behind the limbus Pars Plana fixation, using One Straight and one curved needle 10-0 Prolene suture. The straight needle was fed into a bent 26G needle and brought out. The suture loop brought out through the scleral tunnel incision

with Mc pherson's forcep, cut and then tied to the routine one piece pCIOL haptics at the highest point with 3 throws of tight knots. Posterior chamber IOL was then introduced behind the Iris taking care to avoid suture entangling. Scleral flaps covered the suture knots were sutured with 10-0 nylon.

Lewis technique was employed.

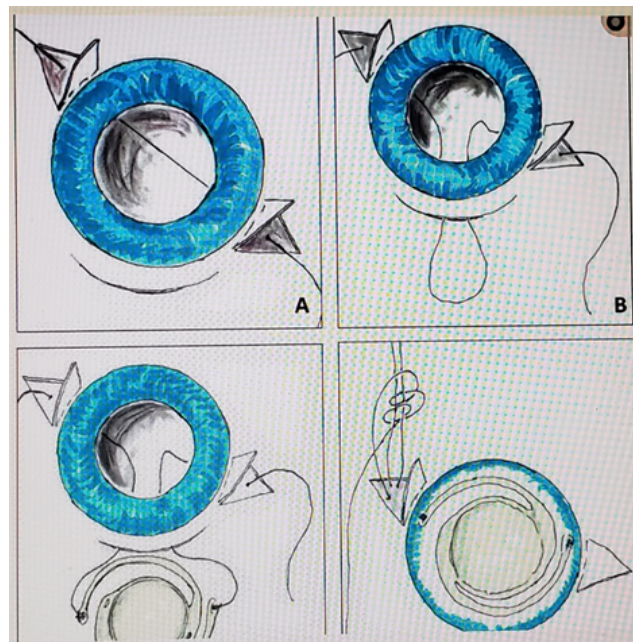


Fig. 1: Technique of IOL suturing.

4.3. Selection of IOL and suture

Specifications of Suture supported IOLs 6-6.5 mm optic, 13-14 mm length

We used routinely available IOLs without eyelets, because these were available at our Government setup.

Suture used was 10-0 prolene with one straight and one curved needle. The same suture needle was used to suture under the scleral flaps. Scleral flaps and scleral tunnel incision was sutured with 10-0 nylon.

Postop. Steroid and antibiotics e.d. given for 4 wks. Follow Up Was done on Day 1, wk 1,2,4, 3mths and 6 mths, and yearly thereafter.

At each visit Vision, Slit Lamp examination and Fundus was examined.

We had a long term followup of about 5-10 years.

5. Results

5.1. Timing of surgery

Primary surgery was done in 9 cases. Whereas we preferred Secondary surgery after 4 weeks in 59 (86.76%) cases.

Table 1:

Indication for Surgery	Cases
Aphakia	59
Traumatic Cataract	4
Subluxation of Lens	5
Total	68

5.2. Complications

5.3. Intraoperative difficulties

Hypotony made operating difficult in Primary surgery in 4 cases. Bleeding from Iris, ciliary body was seen in 2 cases. Suture entangling was seen in 2 cases. Suture breakage on one end was encountered on the table and the procedure needed to be repeated.

5.4. Postoperative complications

Hyphaema was seen in 2 cases. Immediate postop. Iritis was noted in 4 cases and was treated. CME was seen in 2 patients. RD was seen in 1 patient of traumatic Cataract after 1 month of surgery. Suture erosion, Decentration of IOL or Endophthalmitis was not seen.

Table 2: Visual Outcome

Postop BCVA	Cases
6/6-6/9	28 (41.17%)
6/12-6/18	35 (51.47%)
6/24-6/60	5
6/60 and less	0

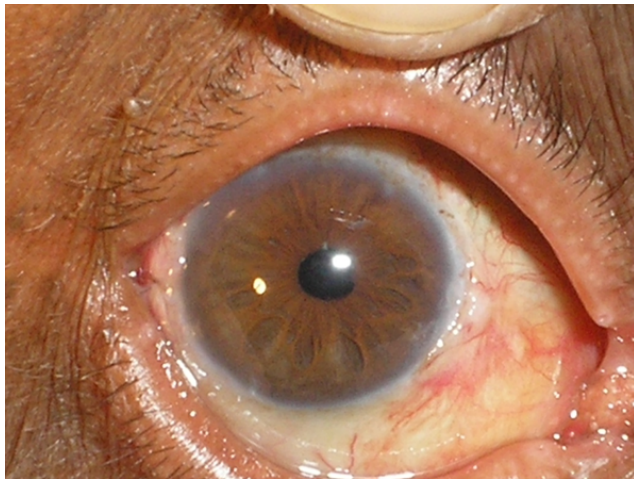


Fig. 2: Postoperative pic.

6. Discussion

Options for Secondary IOL

1. A/c IOL

2. Iris claw IOL
3. Scleral fixated IOL- Sutured
4. Glued IOLs
5. Sutureless Intrasceral IOLs
6. Each has its own Advantages and Disadvantages.

6.1. Secondary A/C IOLs^{3,4}

Advantages being- Easy to implant, Easy to explant and require less surgical time.

Complications being- Corneal Endothelial decompensation, edema., UGH syndrome, CME and poor Visual Acuity.

6.2. Secondary IRIS Claw IOLs

6.3. Advantages being

Easy to explant

6.4. Complications

Central circular pupil required, Pseudophakodonesis, Decentration/ dislodge, Uveitis, Corneal Decompensation. Procedure is technically difficult.

6.5. Secondary Scleral Fixated IOLs.

6.6. Advantages being

IOL is placed closer to nodal point, Better optical properties, Less Pseudophakodonesis, Less risk of Pupillary block Glaucoma, Less risk of Corneal Decompensation or UGH syndrome. Could be technically difficult and Time consuming.

Complications would be Hyphaema, RD.

1. Uhtoff Teichmann in Germany study in 624 patients, Observed that BCVA improved in 92% cases, Complications were IOL decentration in 1.9%, Suture erosion 17.9%, CME 5.8%, RD 1.4%, Vitreous Hmz 1%.⁵
2. In a Korean study by Shin W.J.in 7 eyes reported it to be safe method. (1 case had macular degeneration)⁶
3. Stem MS The risks associated with sutured SFIOL surgery include the potential for postop lens dislocation, lens tilt, suprachoroidal or vitreous hmz, RD and endophthalmitis. The rates may vary based on the surgeon, patient circumstances and the technique used to affix the IOL to the sclera. In general, the complications arise from suboptimal suture placement.⁷
4. In a 2015 study by Cavallini of 13 eyes with long term follow up from 5-10 yrs. found only 2 eyes with minimal lens decentration and this didn't affect vision.⁸
5. Ma DJ studied ciliary sulcus and pars plana fixation and concluded using the pars plana for the iol haptics

on pociol transscleral fixation is as effective as and safer than using ciliary sulcus.⁹

6. Mahmood SA studied 70 eyes, and reported average BCVA improved to 6/12 with complications like transient IOP elevation(36%), IOL tilt(7.1%),CME (5.7%) Vit. Hmg(2.9%), hyphema(2.9%)uveitis(1.4%), and RD (1.4%).similar to our study.¹⁰
7. Luk ASW assessed the long term outcome and complication profile of SFIOL in a cohort of 104 eyes of chinese pts.72% improved final postoperative visual acuity.24% had postop. Complications. suture breakage with lens subluxation occurred in 1.9% eyes.¹¹
8. Mc Allistot AS, Hirst LW, 82 eyes studied with 72% improved corrected distant Visual acuity.¹²
9. Agarwal A described fibrin glue assisted sutureless pociol implantation with good results in 10 eyes.¹³
10. Hoffman, Scharioth, Yamane have recently advised various techniques like scleral pockets or scharioth scleral tunnels or Flanges for securing the sutures or IOL haptics., but these seem to have a learning curve and require special instruments, sutures and IOLs.^{14–16}

6.7. *Our study results were comparable to these other case series.*

1. Visual outcome of these pts. with scleral fixated IOLs has been excellent. 92.5% patients had BCVA 6/18 - 6/6.
2. Precise location of anchoring points of lens at pars plana was important for preventing complications like bleeding from ciliary body, iris .
3. Scleral flaps to prevent Suture erosion & Endophthalmitis.
4. Proper technique and Tightening suture to prevent lens decentration and tilt.
5. Meticulous Anterior Vitrectomy to prevent Uveitis & CME.
6. No special IOL, or special instrument or expenses required.

7. Conclusion

Sutured Scleral fixation is the best cost effective option for aphakic patients without posterior capsular support in hands of a careful surgeon

8. Source of Funding

None.

9. Conflict of Interest

None.

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