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OUTCOME OF SCLERAL FIXATED POSTERIOR CHAMBER INTRAOCULAR LENS IN EYES WHICH LACK CAPSULAR BAG SUPPORT

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ABSTRACT: PURPOSE: The aim of this study was to ascertain the outcome of transscleral suture fixation of posterior chamber intraocular lenses. **METHODS:** This was a prospective interventional study done at Sarojini Devi eye Hospital Hyderabad. Study group included patients attending outpatient department of Sarojini eye Hospital Hyderabad and found fit for sclera fixation IOL implantation. Study period was from March 2013 to March 2015. Sample size was 53 eyes. In 48 of 53 eyes, no sclera flap was taken and no knot technique of suture fixation was employed. **RESULTS:** 53 eyes of 45 patients underwent sclera fixation of posterior chamber IOL's during this period. 33 eyes were of male patients and 20 of female. Age of patients ranged from 7 years to 77 years. Indication for surgery was Marfan's syndrome, traumatic subluxation, post-surgical aphakia, lens subluxation, senile cataract with subluxation and idiopathic lens subluxation. All patients had statistically significant improvement in post-operative best corrected visual acuity. Complications included vitreous haemorrhage in 3 patients, retinal detachment in 1, choroidal detachment in 1, iridodialysis in 1 case, raised IOP in 3 cases, IOL exchange in 1 case and loose suture in 1 case. **CONCLUSIONS:** Transscleral fixation of PCIOL, though technically demanding is a good technique in cases with no adequate posterior capsule or with the zonular weakness.

KEYWORDS: PCIOL, Sclera fixated IOL (SFIOL), Best corrected visual acuity (BCVA).

INTRODUCTION: Intraocular lens implantation is an essential component of modern cataract surgery. Most of the cataract surgeries are carried out with implantation of posterior chamber intraocular lens. However if capsular or zonular support is inadequate, Like in Congenital and secondary weakness of the lens zonules, trauma, lens dislocation and posterior capsular rupture during cataract extraction, it may not be possible to implant a PCIOL. In such situations surgeons need to choose other available options like sclera fixated posterior chamber intraocular lens, iris fixated intraocular lens or anterior chamber intraocular lens.

Sclera fixated posterior chamber intraocular lens is thus becoming a popular and better alternative procedure as it is mostly free from complications of anterior chamber and iris fixated intraocular lens implantation. Sclera suture fixation IOL is the first choice in most cases of IOL dislocation with inadequate residual lens capsule.¹ It is relatively in normal anatomical position, not dependent on presence of iris tissue, has limited pseudophacodonesis and minimal uveal tissue contact but associated with complications like suture irritation, loose suture, corneal edema and risk of failure of polypropylene suture.² To achieve suture less sclera IOL fixation, Gabor et al placed the IOL haptic in a sclera tunnel^{3,4} whereas as a technique devised to attach the IOL using biological fibrin glue.

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Anterior chamber intraocular lens have complications like pupillary block, endothelial damage with high risk of corneal decompensation, cystoids macular edema, uveitis, glaucoma, hyphaema and pseudophakia bullous keratopathy.^{5,6}

Iris fixated intraocular lens have high incidence of lens dislocation, inflammation and hyphaema.

In this prospective international study, we have made an attempt to evaluate the clinical outcome of those patients who underwent trans scleral fixated intraocular lens implantations at Sarojini Devi Hospital Hyderabad during the period of March 2013 to March 2015, With mean follow up period of 8.13 months.

AIM AND OBJECTIVES:

AIM: To study the outcome of sclera fixation intraocular lens.

OBJECTIVES:

- a. To evaluate postoperative visual acuity and refractive outcomes.
- b. To evaluate the intra operative complications.
- c. To identify the type of postoperative complications.

MATERIALS AND METHODS:

Study Design: Prospective interventional study.

Study Setting: Sarojini Devi eye Hospital Hyderabad.

Study Population: Patients attending outpatient department of Sarojini Devi hospital Hyderabad and found fit for sclera fixation IOL implantation.

Study Period: March 2013 to March 2015-06-19.

Sample Size: In the year 2012, the number of sclera fixated IOL surgeries done at our institute were 28. In our study period the expected number of surgeries will be about 35. We have included all the eligible cases undergoing sclera fixated intraocular lens which were enrolled from March 2013 to March 2015.

Inclusion Criteria: Patients who undergo scleral fixation of posterior chamber intra ocular lens (SFIO) implantation in Sarojini Devi Eye Hospital Hyderabad are included in the study.

Exclusion Criteria: All pre-existing detectable other anterior or posterior segment lesions (corneal scars, chronic uveitis, amblyopia, high axial myopia, retinal lesions) affecting visual outcome or complicating surgery were excluded.

All patients with other systemic associations affecting the outcome of surgery were also excluded.

Procedure: Patients will be subjected to detailed.

1. Preoperative evaluation including visual acuity.
2. Slit lamp examination with photographs.
3. Dilated fundus evaluation.
4. Tonometry.
5. Gonioscopy.

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6. Keratometry.
7. Trial of contact lens to evaluate the possibility of diplopia after surgery.
8. A scan biometry & IOL power calculation.
9. Special investigation like OCT, Specular microscopy.
10. Axial mapping will be done whenever needed.
11. Syringing of the eye to be operated.
12. Blood pressure.
13. Urine tested for sugar & albumin.

Patients who were considered suitable for SFIOL after thorough pre op evaluation were taken up for surgery. Preoperative carbonic anhydrase inhibitor tablet Acetazolamide 250 mg OD, on the day of surgery was given. All the patients are subjected for dilatation of pupil with tropicamide + phenylephrine. Flurbiprofen eye drops are instilled for prolonged dilation. Steeper axis is marked preoperatively with the help of topography wherever possible.

Surgery was carried in general anaesthesia in children and local anaesthesia in adults. Local anaesthesia consisted of peribulbar injection of 3:2 mixture of 3ml of 2% xylocaine (mixed with hyaluronidase and 1:100000 adrenaline) and 2ml of 0.75% bupivacaine.

All surgeries were done by a single experienced surgeon.

The operation was performed with the help of an operating microscope with co axial illumination. Lids, eyebrows and forehead were painted with betadine solution. The surgical field was draped with sterile disposable drape. Self-retracting lid speculum was used to separate the lids. The fornices were thoroughly washed with saline.

Surgical Steps:

- a) Conjunctival peritomy was carried out and a 6mm triplanar sclerocorneal tunnel made along the marked steeper axis the side incisions is made 180 degrees apart.
- b) Ab externo fixation was followed with or without making flaps. 9-0 prolene on straight needle was introduced 0.75-1 mm behind the limbus through full thickness sclera without making sclera flaps. Straight needle was introduced and rail roaded through the opposite site using a 26 gauge needle.
- c) In few cases two triangular partial thickness sclera flaps were made adjacent to limbus, 180 degree apart and 9-0 prolene passed through the sclera bed 0.75-1 mm from limbus.
- d) Anterior chamber was entered through the sclerocorneal tunnel and 9-0 prolene suture was then being pulled out through the main wound, cut and each end tied to eyelet haptics of SFIOL.
- e) In case of decentered or subluxated IOL, it was explanted first from the main wound. SFIOL was then introduced. In case of cataractous lens, lens delivered through sclera corneal tunnel before introducing SFIOL.
- f) Sutures were pulled out and fixed taking multiple partial thickness sclera bites (5 zig zag intrascleral passes) in most of the cases. it was ensured that the cut end of the suture is long. In cases with flap, suture pulled through the sclera bed and tied. Sclera flaps covered the knots thus preventing knot erosions.
- g) Anterior vitrectomy was performed in all cases with vitreous loss.
- h) Conjunctiva covered over the suture site and sutured with 8-0 vicryl. Sub conjunctival antibiotic steroid injection given.
- i) Patient was examined on post op day 1 and complications if any were noted.

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- j) Antibiotic eye drops were given for 2 weeks and steroid eye drops were prescribed and gradually tapered over a period of 6 weeks.
- k) Patients were followed on post op day 3, 1 wk, 4 wks, 3 months, 6 months and 1 yr in all possible cases. In every visit, BCVA, intraocular pressure, detailed fundus evaluation and IOL status noted.

RESULTS: 53 Eyes of 45 consecutive patients who underwent sclera fixation posterior chamber IOL implantation at Sarojini Devi Eye Hospital during the period of March 2013 to March 2015 were taken in our study.

Table 1 shows the mean age of patients undergoing surgery was 45.5 yrs. The youngest patient operated was 7yrs and oldest being 77yrs. Majority (43%) of the patients was between 46 yrs to 60 yrs.

Table 2 shows common indications for undergoing SFIOL was subluxated IOL in 12 eyes (22.64%) and post-surgical aphakia in 11 eyes (20.75%)

Table 3 on comparing preoperative and post-operative best corrected visual acuity, the postoperative BCVA. In 7 of 11 eyes with post-surgical aphakia there is no difference in preoperative and post-operative visual acuity.

Table 4 shows 11 eyes (20.74%) had either operative or postoperative complications.

Commonest complications were vitreous haemorrhage and raised intraocular pressure.

DISCUSSION: The aim of our study is to assess the outcome of sclera fixated posterior chamber intraocular lens in eye that lack support.

In our study sclera fixation of PCIOL implantation was done in 53 eyes of 45 patients with a mean follow up period of 8.13 months and maximum follow up period of 1 year. 68% (33%) were males. The age of the patients varied from 7yrs to 77 yrs, with a mean of 45.45 years.

On comparing preoperative and postoperative BCVA, the post-operative BCVA was significantly better.

Commonest complication was vitreous haemorrhage and raised intraocular pressure. 11 eyes (20.74%) had either operative or postoperative complications.

In a study conducted at Atlanta, Georgia and Korea, with a mean follow up of 40.9 months of 29 eyes, one eye (3%) showed inferior decentration of IOL, 1 (3%) eye had intra operative vitreous haemorrhage, 2 eyes (7%) had early post-operative hyphaema and 2 eyes (7%) had transient raised IOP.⁷

In the study conducted by Muhhamad muneer quraishyet al in 18 eyes of 12 patients, with a follow up period of 6 to 12 months, 1 case had vitreous haemorrhage with IOL tilt for which iol exchange with ACIOL was done.⁸

CONCLUSIONS: Sclera fixation of posterior chamber intraocular lens is a reasonably safe procedure for eyes, in which sulcus or in the bag fixation is not possible due to zonular dialysis or capsule deficiency. This procedure is useful in cases like congenital or secondary zonular weakness, traumatic subluxation of lens or posterior capsular rupture after cataract extraction. This is also useful in the management of pediatric aphakia and in those cases with abnormal anterior chamber, wherein an anterior chamber or an iris fixated lens cannot be implanted.

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In cases with intraoperative zonular dialysis, no flap, no knot technique helps the surgeon, as it is difficult to make sclera flaps in a hypotonous globe.

9-0 prolene sutures were used in all cases. It is sturdier and can resist degradation over time⁴. This is probably a better option than 10-0 prolene. Suture breakage is not seen in our study as compared to other studies.

No sclera flap and no knot technique of fixing the suture, by taking multiple partial thickness sclera bites seems to be a safe procedure and did not cause any specific problems during our study. Long term follow up is needed to ascertain the effectiveness of 9-0 prolene suture and no sclera flap and no knot technique of fixing the suture.

In our study there are very few cases with early postoperative complications like vitreous haemorrhage, retinal detachment, choroidal detachment, raised intra ocular pressure, which were timely managed and did well during the follow up period. Late complications, which were also few, included raised intraocular pressure and loose suture. Our results are comparable with other studies.

Age interval(yrs)	No. Of patients	Percentage
0-15	7	13.2
16-30	6	11.3
31-45	8	15.1
46-60	23	43.4
61-75	8	15.1
76-90	1	1.9
Total	53	100

Table 1: Age

	No. of eyes	Percentage (%)
Traumatic Subluxation	9	16.98%
Post-surgical aphakia	11	20.75%
Dropped nucleus	2	3.77%
ACIOL	2	3.77%
Congenital subluxation	5	9.43%
Senile subluxated cataract	3	5.66%
Subluxated IOL	12	22.64%
Marfan's	6	11.32%
Juvenile cataract with subluxation	3	5.66%
TOTAL	53	100%

Table 2: Indication for SF IOL

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BCVA	No. of eyes Pre-operative	No. Of eyes post-operative
<1mt	14(26.41%)	0
1mt -3mt	7(13.20%)	0
>3mt -6/60	7(13.20%)	1(1.91%)
>6/60-6/18	10(18.87%)	4(7.54%)
>6/18-6/6	15(28.32%)	48(90.56%)
TOTAL	53(100%)	53(100%)

Table 3: Comparing preoperative and post-operative best corrected visual acuity (BCVA)

Total eyes	53
No. Of eyes with no complications	42
No. Of eyes with one complications	10
No. Of eyes with more than one complications	1

Table 4: Surgical complications

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