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A CLINICAL STUDY ON SCLERAL FIXATED INTRAOCULAR LENS (SFIOL) WITH SUTURE

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ABSTRACT **AIM:** To study the visual outcome and complications in patients operated with scleral fixated lens with suture, where capsular support is not adequate. **MATERIALS AND METHOD:** A total of 50 cases of aphakia were included. Detailed history was taken and thorough ocular examination was done including visual aquity, slit lamp examination, intraocular pressure measurement, gonioscopy and indirect ophthalmoscopy . Routine systemic investigations were done as required. The cases were operated with SFIOL implantation by double suture with four point fixation. **RESULT:** Post operative visual aquity improved in all the cases and complications were seen in 38% cases. **CONCLUSION:** We found that implantation of SFIOL using four point fixation by double suture is an effective method to treat aphakia with resultant improved vision.

KEYWORDS : SFIOL, double suture, four point fixation.

INTRODUCTION:

Optical rehabilitation in aphakic patients presents a unique challenge. The choice of intraocular lens implantation in aphakic patients includes anterior chamber IOL (ACIOL), Iris fixated IOL, iris claw IOL, scleral fixated IOL (SFIOL) - sutured or sutureless.[1]

Each of these IOL has its own merits and demerits. ACIOL is technically less demanding but it has potential for increased damage to corneal endothelium and angle structures. Iris claw IOL and iris fixated IOL have increased chances of pigment release and intraocular inflammation.[2]

SFIOL has the advantage of more physiological position near the nodal point of eye and greater distance from cornea. Sutured SFIOL is technically more demanding and can have problems like pseudophacodonesis and suture related complications such as knot exposure, suture breakage and IOL subluxation.[3]

However, to avoid suture related intraoperative and postoperative problems, the management approach depends on surgeon preferances and individual case specificities, including integrity of capsule remnants, type of IOL and coexisting ocular pathology.[4,5,6,7] Most of the surgeons prefer scleral fixated PCIOLs to ACIOLs on the assumption that glaucoma, macular edema and corneal complications occur less frequently with PCIOL implantation.[8]

Sutured scleral fixation techniques require passage of suture and manipulation of IOL haptics near the vitreous base. Several studies advocated pars plana vitrectomy with removal of as much vitreous as possible before scleral fixated PCIOL implantation to prevent vitreous entwinement around the lens haptic and suture site, which may result in retinal breaks from vitreous traction.[9]

Fibrin glue assisted PCIOL implantation is a new technique started in December 2007 in eyes with deficient capsular support. Externalization of the greater part of the haptics into the scleral tunnel along its curvature stabilizes the axial positioning of the IOL and thereby prevents any IOL tilt and the partial thickness scleral flaps are repositioned with fibrin glue.[10]

Nowadays, intrascleral haptic fixation is coming up as a successful alternative. However there is not much study available in different technique of SFIOL in this region.

MATERIALS AND METHOD:

The study was an institutional prospective interventional study conducted in the department of Ophthalmology, RIO, Gauhati Medical College and Hospital for a period of one year. A total of 50 cases were selected from OPD, who were in the age group of 20 to 60 years, after qualifying the inclusion and exclusion criteria. Informed consent was taken and each case was thoroughly examined after taking detailed history. Necessary investigations were done and the cases were taken up for surgery. Postoperative follow up was done till 6 months. All the findings were documented.

Inclusion criteria-

1) Surgical aphakic cases without other complications and good aphakic correction.
2) Traumatic aphakia with normal pupil, cornea, retina and good aphakic correction.
3) Adult patients between age group of 20-60 years.

Exclusion criteria-

1) Aphakic patients with other ocular complications like diabetic retinopathy, any other retinal or uveal disease, chronic dacryocystitis etc.
2) Grossly injured eye with loss of iris, vitreous or corneal endothelial damage.
3) Uncooperative patients.
4) Patients with extremes of age.
5) Aphakia with systemic complications like heart or renal disease.

Procedure-

Anaesthesia was given, local or general when indicated. Proper antiseptic dressing was done. The eye was marked, painted with betadine solution and draped. Universal eye speculum was applied. Adequate conjunctival peritomy (> 180˚) was done using sclerocorneal scissors and forceps, followed by cauterization of bleeders. Sclerocorneal tunnel of 6.5 mm length was made superiorly. Triangular partial thickness scleral flaps were made 180˚apart at 3 o clock and 9 o clock position using diamond blade and the flaps were raised using crescent blade. Bimanual anterior vitrectomy and total vitrectomy if indicated was done. Adhesions in iris and pupil, when present, were separated. A 10-0 prolene suture was introduced through the scleral flap on one end, 1.5-2 mm away from limbus, docked in a hollow 23 gauze needle passed through the other end and externalised. It was then turned back inside the eye through another point on the same side in a similar way and externalised from the other end. The loop formed by the 10-0 sutures was then externalised through the main tunnel and cut in the middle. The ends were passed through the eyelets on the haptics of the specially designed SFIOL and tied. Then the IOL was introduced into the eye in the bag position. The haptics were then sutured to the scleral flaps with four ends of the suture. The ends were trimmed and the flaps were apposed keeping the suture ends underneath. Anterior chamber was washed out and the main tunnel was closed. Suture was given when required. Conjunctival peritomy was closed with 10-0 nylon suture. Betadine ophthalmic solution along with moxifloxacin eyedrop was instilled followed by pad and bandage application.

Post operative management-

Topical instillation of antibiotic and steroid eye drops 6 times a day for 2 weeks were prescribed and tapered off.
Lubricating eyedrops were given for 6 weeks.

Antiglaucoma medication was given when required.

Follow up-

Patients were followed up on day 1, day 7, day 15, 6th week and then 2 monthly upto 6 months. Postoperative visual aquity determination, intraocular pressure measurement with anterior and posterior segment evaluation were done. Photographs were taken during the visits.

RESULTS AND OBSERVATIONS:

Age group-

	Age group (in years)	No. of patients
1.	20-30	2
2.	31-40	1
3.	41-50	20
4.	50-60	27

Out of the 50 patients, 30 were male while 20 were female patients.

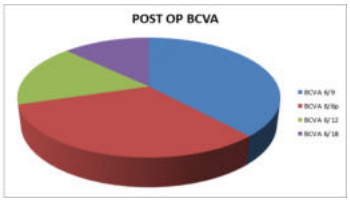
Causes of aphakia and indications of SFIOL-

	Cause	No. of patients
1.	Intraoperative posterior capsule rent	30
2.	Dislocated PCIOL	15
3.	Traumatic aphakia	5

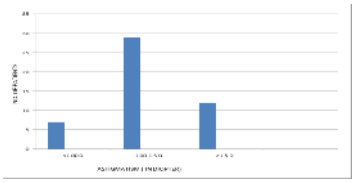
Visual aquity

	BCVA	No. of patients (preop)	No. of patients (post op)
1.	PL- HM	1	0
2.	FC-6/60	12	1
3.	6/36-6/24	37	2
4	>6/24	0	47

Out of the 47 patients having BCVA more than 6/24 by Snellen chart postoperatively, 6 patients had BCVA of 6/18, 8 had 6/12, 18 had 6/9 and 15 patients had BCVA of 6/6(partial).



Post operative astigmatism-



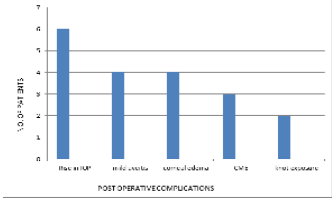
Post operative complications-

Early postoperative period-

- Transient increase in intraocular pressure- in 6 cases (12%).
- Bleeding- nil.
- Transient corneal edema- in 4 cases (8%).
- Cystoid macular edema- in 3 cases (6%).
- Mild uveitis- in 4 cases (8%).

Late postoperative period-

- Suture knot exposure- 2 cases (4%).
- Suture knot breakage- none
- IOL decentration- none
- IOL dislocation- none
- Glaucoma-none
- Retinal detachment- none



DISCUSSION

Age group-

The patients were of age group between 20 to 60 years. Only 2(4%) patients were of the age group 20-30 years, while 27 patients (54%) were of age group 50-60 years. Mean age was 50 years.

In a study conducted by Abbie SW Luk et al in 2013, it was found that mean age at surgery for SFIOL was 67 years. [11]

In 2021, a research conducted by Ho Ming Wong, it was stated that mean age at surgery was 51.47 %.[12]

Indications-

In our study, we found 30 patients (60%) with intraoperative posterior capsular rent, 15 cases (30%) with dislocated IOL and 5 cases (10%) were traumatic aphakia.

In a study by Sunil Ganekal in 2012, the most common indication for SFIOL implantation was found to be cataract surgery complicated with posterior capsule rupture (58%).[13]

In another study by Efstathios Vounotrypidis et al in 2019, the leading cause for surgery was found to be IOL dislocation. (75%).[14]

Indications of SFIOL implantation as a secondary procedure in cases of ICCE aphakia are young patients, loss of iris tissue and compromised angle, while as a primary procedure it is done in cases of capsulozonular deficiency (PC rent), dislocated lens and IOL exchange.[15]

Post poperative visual aquity-

Visual aquity improved postoperatively in all the patients in our study. Those patients (6%) whose postoperative vision was less than 6/24, had macular degeneration and mild optic atrophy. BCVA of 6/6 (partial) was achieved in 30 % patients, while BCVA of 6/9 was seen in 36% cases. 6 patients (12%) had BCVA 6/18 while 8 patients (16%) had BCVA 6/12.

In a study conducted by Yolanda YY Kwong et al in 2007, postoperative BCVA of 20/40 or better was achieved in 47.2% cases. [16] BCVA improved in 87% cases in a study carried out by Ayse Burcu et al in 2014. [17]

Post operative astigmatism-

In our study, the mean post operative astigmatism was 1.25 D. 60.4 % patients had astigmatism between 1-1.5 D. 12 patients had astigmatism of more than 1.5 D (25%).

In November 2000, Q Zhang et al conducted a study where the mean post operative astigmatism was found to be 1.37±1.03 at day 1, 1.24± 0.93 at one month and 1.04±0.75 at three months. [18]

In a study conducted by Sami Yilmaz et al in 2022, post operative astigmatism following implantation of sutured SFIOL was 2.68 ±1.04. [19]

Post operative complications-

In our study, transient ocular hypertension was the most common post operative early complication (12%), which was treated effectively with antiglaucoma medication. Cystoid macular edema, another complication to arise (6%), which occurred within 2 months, was treated with topical NSAID and oral acetazolamide. Transient corneal edema (8%) and mild anterior uveitis (8%) were other complications to be seen in the early postoperative period within seven days. There was no case of IOL related complication in our study. However, there were two cases of postoperative knot exposure (4%).

In 2013, Abbie SW Luk found that suture related complications were the most common post operative complication (24%). [11]

A study conducted by M Ali Khan in 2016 stated that hypotony (7%), rise in IOP (7%), vitreous hemorrhage(7%), hyphema (2%), serous choroidal detachment (2%) and corneal edema (1%) were the complications.[20]

CONCLUSION

SFIOL implantation is an effective technique in aphakic cases where there is no capsular support and in the bag IOL implantation is not possible . Evidence shows that implantation of SFIOL leads to good vision in such cases. Four point fixation gives better IOL stability and less chance of tilt and astigmatism. Surgical techniques for SFIOLs are

improving as innovative surgeons attempt modifications of existing techniques. Methods to reduce perioperative and postoperative complications merit additional studies. Long term data comparing the various techniques in SFIOL implantation will be crucial. It is expected that with time there will be refinement of materials and techniques and there will be better acceptance of these methods.

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