SCLERAL FIXATION IOL: OUTCOME AND COMPLICATIONS

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ABSTRACT

BACKGROUND

To assess the visual outcome and complications in patients after Scleral fixation of intra ocular lens in 30 eyes (28 pts., 2 patients bilateral).

METHODS

This experimental study was conducted at SDEH, Hyderabad, between June 2014-Jan 2015. All cases included were worked up according to the protocol. All patients underwent Ab-externo scleral fixation of IOL by the same surgeon. Patients were followed up on 1st day, 1st week, 1st month, 2nd month and 3rd month. Complete eye examination including BCVA, IOP in all cases and FFA, OCT, B scan done where required in all visits. Complications were noted on each visit.

RESULTS

Twenty-eight patients were included in the study, with mean age of 42 years (Range 10-70). At the end of 3 months, majority of the patients, 18 (60%), had visual acuities of 6/12 or better. No complication was seen in 14 (48%) eyes of the patients. Most common post-operative complication was astigmatism, which could be corrected with Spectacles. Transient vitreous haemorrhage was seen in 4 (13.2%) eyes. Transient raise of IOP noted in 6 (20%) eyes. Corneal decompensation in 1 eye (3%). Except one (Corneal decompensation) all cases had a Better Uncorrected Visual acuity and quality of Vision.

CONCLUSION

Ab-externo Scleral fixation of an IOL was found to be safe and showed favorable postoperative results with fewer complications.

KEYWORDS

Aphakia, Scleral Fixation, Astigmatism.

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INTRODUCTION

Intraocular lens (IOL) implantation to correct aphakia, provides good visual rehabilitation in comparison to spectacles or contact lens. When there is no proper capsular support, Anterior chamber lenses, Iris fixated lenses and Scleral fixated intra ocular lenses may be considered.^[1,2] The placement of IOL in the posterior chamber rather than Anterior or Iris fixated lenses reduces the risk of various complications like Corneal endothelial damage, damage to anterior chamber angle structure, pupillary block glaucoma, hyphema, uveitis, iris chafing, dislocation and pseudo phakodonesis.^[3]

Positioning lens closer to the rotational center of the eye, just anterior to the vitreous face, may reduce the centrifugal forces on the lens and stabilize the ocular contents, thereby decreasing the probability of complications such as Iritis, Cystoid macular edema (CME) and Retinal detachment.^[4,5] Another advantage of positioning the lens closer to the nodal point and center of the eyes is the superior optical properties of the lens in this position.^[6] There are two surgical techniques, namely Ab-interno (Inside out) and Ab-externo (Outside in). The Ab-interno technique involves the passage of needle from the inside of the eye to the outside through the sclera.^[7,8] which is more complicated and blind technique.

The Ab-externo technique involves the passage of a needle from the outside of the eye to the inside through the sclera. In the Ab-externo method, scleral fixation of IOL in the ciliary sulcus can be achieved.^[9] more accurately. With this method, the surgeon's view is never obscured. All the manipulation occurs in the iris plane. The surgeon can thus decrease the risk of vitreous hemorrhage.^[10] Retinal detachment and lens malposition by avoiding the potential inaccuracies of suture placement those are inherent to the Ab-interno technique.^[11,12]

METHODS

The study included 30 aphakic eyes of 28 patients (2 pts. Bilateral) who underwent Ab-externo scleral fixation of IOL during June 2014 to Jan 2015 at SDEH, Hyderabad. All patients were selected from the Retina Dept. who were referred from General Ophthalmology & Paediatric Ophthalmology. The patients were in 10-70 yr. age group. Those patients with visually significant ocular pathologies involving angle structure, cornea, retina, macular and optic nerve were excluded. A written informed consent was taken prior to procedure. The detailed history of each patient was taken about any Systemic and other ophthalmic problems. A detailed ophthalmic examination was carried out including charting of best corrected visual acuity using Snellen's notation, Slit lamp bio microscopic examination of anterior segment, measurement of IOP and Peripheral Retinal examination. B Scan and OCT done wherever required. A Scan Biometry was performed before the procedure in all cases.

Surgical Procedure

All procedures were performed by the same surgeon. Wherever required Pars plana Vitrectomy was done to remove Nucleus/IOL.

A Superior conjunctival peritomy was created. A Triangular partial-thickness limbal-based scleral flap

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measuring 3 mm long was fashioned at Horizontal meridians. IOP maintained either with Pars plana Scleral infusion or A.C. Maintainer. A 6 mm Sclero corneal tunnel incision was made superiorly at 12 O' position and anterior chamber (AC) was entered through 3.2 mm knife. Anterior vitrectomy was performed wherever it is required. The straight needle carrying the double armed 10-0 polypropylene suture was placed through the 9 O'clock sclera bed 1- 2 mm posterior to the posterior surgical limbus.

The needle tip was passed through the sulcus and behind and parallel to the iris until it was visualized in the pupillary area. In a similar manner, a 28-gauge needle was inserted through 1-2 mm from limbus at 3 o'clock sclera bed. The straight needle was passed into the barrel of 26 G needle and the withdrawn from the eye by Rail road technique. A loop of this suture was withdrawn through the corneal sclera wound. The loop of suture was cut, and securely tied to the superior & inferior haptic loops of the PMMA Scleral fixated Lens.

The lens was inserted into the sulcus and rotated into position while removing slack from the attached sutures. 10-0 polypropylene sutures were Secured to the Scleral bed ensuring the knots and sutures are buried under the scleral flaps. Scleral flaps were repositioned and the conjunctiva closed with 8-0 Vicryl. All patients were examined next day, followed after one week and monthly for three months after the surgical procedure. During each visit, best corrected visual acuity (BCVA) was checked along with complete eye examination using slit lamp and Indirect Ophthalmoscopy. IOP measured in fall visits. B scan, FFA and OCT were performed whenever required. These findings were noted on pro forma and analyzed subsequently.

RESULTS

Twenty-eight patients were included in the study, with mean age of 42.6 years. Minimum age of the patient's included was 10 years while the maximum age was 70 years. Out of 28 patients, 17 (60 %) were male and 11 (40%) were female. Intra operative complications like Mild Vitreous hemorrhage resolved after few days. Breakage of Suture and IOL were replaced during the surgery. Chronic uveitis was managed medically. Except one patient who had Corneal decompensation, all others had a better quality of Vision after Scleral Fixated IOL. Most of the Eyes 21/30 (70%) had visual acuities of BCVA 6/12 or better. Comparison of visual acuities before and after surgery is shown in Table-II. No complication was seen in 18/30 (60%) eyes. Another complication noted was vitreous hemorrhage, which was seen in 4 (13.2%) patients (Table-III). Other post-operative complications were Uveitis and Astigmatism. The Pupil abnormalities were seen 8 patients All complications could be managed Medically.

	Cause	Eyes	Percentage
Post Lensectomy	Marfan's	4	13.2
	Developmental Cataract	4	13.2
Post Cataract Surgery	Unknown cause	3	10
	P.C Rent	5	16.5
	Nucleus Drop	4	13.2
	IOL Drop	4	13.2
Post Trauma	Cataract surgery	4	13.2
	Dislocation of Lens	2	6.6

Table 1: Causes of Aphakia all Cases are for Secondary Implantation

BCVA	Before Surgery	After Surgery
6/6- 6/12	18	20 (60%)
6/18- 6/24	6	6 (20%)
6/36- 5/60	2	3 (10%)
< 5/60	4	1 (3%)

Table 2: Visual Acuities Before and after Surgeries

	Eyes	Percentage
Vitreous hemorrhage	4	13.2
Suture Breakage	3	10
IOL Breakage	1	3

Table 3: Intra operative Complications

		Eyes	Percentage
Astigmatism	< 1.00 D	4	13.2%
	1.00- 2.00	10	33.3%
	2.00- 4.00	15	50%
	> 4.00	1	3.3%
Uveitis	For > 4 weeks	9	30.7%
IOP Raise (> 20 mm Hg)	for > 2 weeks	6	20.8%
Pupil abnormalities		8	26.4%
Cystoid Macular oedema	after 6 weeks	6	20.8%
Corneal Decompensation	Vn < 6/60	1	3.3%
IOL Dislocation & Endophthalmitis		0	0

Table 4: Postoperative Complications

DISCUSSION

Visual rehabilitation of a patients with Aphakia presents a challenge. Most of the times aphakic glasses, because of magnification and anisocoria cannot be prescribed. Almost all patients in this group are unable to use contact lenses due to either financial constraints or difficulty in handling & maintaining. The options therefore include Anterior chamber IOL implant, Iris fixated intraocular lens and Sclera fixated posterior chamber IOL implants. Among them scleral fixated PC IOL implant can provide minimum magnification of the image and safety as compared to other options.^[13]

Visual Acuity

In our study, the post-operative best corrected visual acuity of 6/12 or better was achieved in 21 (70%) patients who underwent scleral fixation of IOL.

- This is comparable with Lee and Yuen's work.^[13] who reported best corrected visual acuity of 6/12 or better in 19 (76%) out of 25 cases.
- Ghanem and colleagues.^[14,15] reported postoperative BCVA of 6/9 or better in 10 (71.43%) out of 14 eyes undergoing scleral fixation of IOL.
- Similarly, Ozdekandco - workers.^[16] reported the improvement of postoperative BCVA 6/12 or better in 14 eyes (93.3%) undergoing scleral fixation of IOL.
- The Main advantage for the Vision is the Uncorrected Visual Acuity which has improved for every body except one who had Corneal Decompensation and Corneal surgery is being planned for.

Complications

Intra operatively soft eye was observed in 7 (23.3%) of the patients in One study done by Isra Ahamed Bhutto et al.^[17] We

never had a problem as we have used Either AC maintainer or Pars plana infusion.

Another complication noted was vitreous hemorrhage, which was seen in 4 (13.2%) cases in our study. In another study also it is seen in 5 (16.7%) patients, which is almost same. The most common post-operative complication in our series was Astigmatism (>2 D.cyl) and Transient Uveitis in 16 (52.8%) and 9 (10%) eyes respectively.

The minimum astigmatism was-1.00 D.cyl and maximum was- 4.50 D.cyl. (Mean astigmatism was- ____ D.cyl) in this study. The cause of astigmatism was large corneal incision or tight sutures, IOL decentration or tilt. Ghanem and colleagues.^[14] also reported astigmatism as occurring complication in 3 eyes (21.4%). Similarly, Sasahara and Kiryu.^[18] reported astigmatism in 12 eyes (13%).

Due to iris manipulation while doing scleral fixation of IOL, we noticed Transient anterior uveitis in 9 eyes for a period of more than 4 weeks, which is comparable with the results of Kwong et al and Kanigowska K.^[19] Cystoid Macular edema seen in 6 (20 %) eyes, which were treated medically. Endothelial Decompensation occurred in 1 (3%) eye.

None of the Patients had major complications like Endophthalmitis or Dislocation of IOL. Due to the unavailability of foldable scleral fixating IOL, we did not use them in this study. The outcome could be improved further by taking care of certain measures like using foldable IOL instead of rigid PMMA IOL as the former can be inserted by giving smaller incision as compared to later one. This might ultimately reduce the postoperative astigmatism.^[20]

The positive findings of this study are that our results are comparable to other studies done in different regions, proving the efficiency of the procedure. The lack of serious complication makes it an effective alternate to other methods of optical correction of Aphakia with inadequate capsular support.

Limitations of the Study

There are certain limitations of this study. This study does not have an epidemiological value as incidence and prevalence of Aphakia within adequate capsular support cannot be ascertained. This is because the sampling technique was non probability convenience.

CONCLUSION

Our results suggest that Ab-externo scleral fixation of an IOL was found to be one of the safe procedures showing a favorable postoperative visual outcome in Aphakic eyes.

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