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Visual Outcome and Complications of Scleral Fixated Intra-Ocular Lens

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Abstract: ***This study includes 45 aphakic eyes of 45 patients who underwent scleral fixation of Intraocular lens. These patients were assessed for visual outcome and complications after implantation of scleral- fixated intraocular lens (SFIOL) using the Ab-externo technique. A detailed ocular examination was done for all patients and all patients were operated by a single surgeon. The technique of Ab-externo SFIOL implantation showed good visual outcome in the absence of serious complications.***

Keywords: SFIOL, Ab-Externo, Aphakia, BCVA

1. Introduction

Placement of intra-ocular lens (IOL) is a common and routine procedure in ophthalmic surgery. There is a broad consensus that placement of a posterior chamber intraocular lens (PCIOL)in the capsular bag remains the preferred location. However, in the absence of capsular support, anterior chamber intraocular lens (ACIOL), iris fixated IOL and sutured and sutureless scleral fixated intraocular lens (SFIOL) implantation have been performed for many years[1].

The placement of IOL in the posterior chamber rather than anterior or iris fixated lenses reduces the risk of various complications, like keratopathy, damage to anterior chamber angle structure, pupillary block glaucoma, hyphema, uveitis, iris chafing, dislocation and pseudophakodonesis[2].

Scleral fixation offers more physiological position for IOL implantation. There are two surgical techniques for scleral fixation, 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[3]. Ab-interno is more complicated and blind technique.Ab externo fixation refers to scleral fixation in which sutures are passed from the outside to the inside of the eye.

2. Literature Survey

Since the introduction of IOLs in the late 1940s by Sir Harold Ridley, there have been a lot of changes in the designs, fixation and indications for its use. Malbran *et al* were the first to describe trans-sulcus scleral fixation of posterior chamber IOLs in aphakia eyes that had previously undergone ICCE in 1986.There were also a number of favourable reports on secondary SFIOL in the literature.Technique for suturelessintrascleral fixation of PCIOLs was first reported by Maggi and Maggi . Gabor and Pavlidis described a technique for sulcus fixation of the haptics of the IOL. Use of a biological glue to attach the haptic to sclera was a technique described by Agarwal.

3. Aim

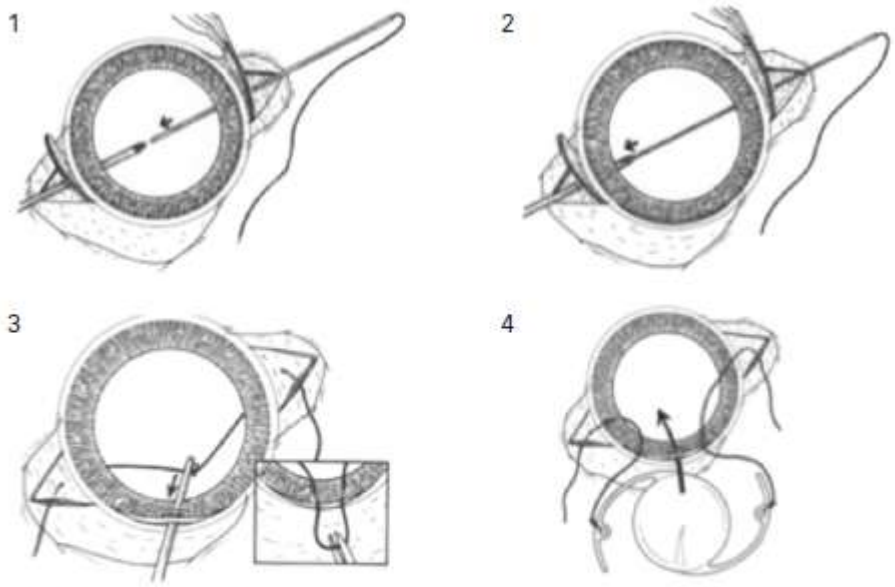
To assess the visual outcome and complications after implantation of scleral- fixated intraocular lens (SFIOL) in adult aphakicpatients using the Ab-externo technique.

4. Material and Method

The study included 45aphakic eyes of 45 patients who underwent Ab-externo scleral fixation of IOL during March 2016 to March 2017. The patients were in 50 to70 year age group. Aphakic patients without capsular support, sub-luxated lens (>180°), dislocated lens and dislocated IOL were the inclusion criteria. The patients with hazy cornea, non-dilating pupil, macular scar and glaucoma were not enrolled in the study.

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 chart, Slit lamp bio-microscopic examination of anterior segment, measurement of IOP with applanation tonometer and Peripheral Retinal examination. B Scan and OCT done wherever required. A-Scan Biometry was performed before the procedure in all cases. All procedures were performed by the same surgeon.

All eyes were operated in local anaesthesia by a single surgeon.The surgical technique was modified to anterior or complete vitrectomy depending on the type of presentation.Single kind of IOL were implanted: A single piece polymethylmethacrylate IOL with 6.5 mm optic was used and an eyelet on each haptic at the point of maximum haptic spread for Scleral Fixation. 9-0 polypropylene suture was used with knots buried under partial thickness scleral flaps.Postoperative medication included topical drops (antibiotic and steroid) given 4 times daily and steroids tapered slowly for 4 weeks.All patients were examined next day post-surgery, follow-up done 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.



1. Partial thickness scleral flaps are created exactly 180° apart. A double-armed 9-0 polypropylene CIF-4 or CTC-6 needle is then passed under one of the scleral flaps about 1.5 mm behind the limbus in the ciliary sulcus space and docked on a 25-gauge needle entering under the opposite scleral flap in the same plane. 2. The docked suture is then retrieved and pulled across the eye. 3. A main incision is then created and a hook instrument is used to pull the suture out in a loop where it is cut to create two loose ends. 4. The loose ends are then tied to each eyelet of the haptic, and the lens is inserted in the eye and the scleral passed needles can be passed along the sclera and tied onto itself to secure the haptic under the scleral flaps.

5. Result

Of 45 eyes who completed 1 month follow- up, 28 were men and 17 women. There was a significant improvement in uncorrected distance visual acuity after surgery. Onemonth postoperative best corrected distance visual acuity was 6/18 or better in 28eyes. The common intra-operative complication was vitreous haemorrhage. Common post-operative complication was uveitis and pupil abnormalities. No serious complications such as endophthalmitis and retinal detachment were seen.

BCVA	Before Surgery	After Surgery
6/6 to 6/18	10	28
6/24 to 6/36	22	12
6/60 or less	13	5

Intra-Operative Complications	
Vitreous haemorrhage	6
Suture breakage	2

Post-Operative Complications	
Astigmatism	36
IOP Rise (20 mmHg)	12
Uveitis	10
Pupil Abnormalities	10
Cystoid Macular Oedema	7
Corneal Decompensation	2
IOL Dislocation	0
Endophthalmitis	0
Retinal Detachment	0

6. Conclusion

The technique of Ab-externo SFIOL implantation showed good visual outcome in the absence of serious complications.The outcomes and safety profile of SFIOL implantation is valuable for the management of aphakia in the absence of capsular support. However, long-term suture-related problems should be discussed with the patients before surgery.

7. Discussion

Optical rehabilitation of a patient with monocular aphakic presents a therapeutic challenge. Aphakic glasses, because of magnification and anisoconia cannot be prescribed. Almost 75% of patients in this group are unable to tolerate contact lenses. The viable options therefore include, epikeratophakia, anterior chamber IOL implant, iris fixated intraocular lens and sclera fixated posterior chamber IOL implants. Among them scleral fixated IOL implant can provide minimum magnification of the image as compared to other options[4].

The scleral fixated IOL implantation is associated with various advantages: It preserves the corneal endothelial cells, reduces the risk of injury to the iris and ciliary body, reduces the risk for glaucoma and produces stable, long-term fixation[5]. In addition, it is implanted in the same plane as the crystalline lens, therefore, it is optically more physiological. However, the technique has its own limitations[5]. it is time-consuming, requires surgical skill with aggressive intraocular manipulations and the suturing is difficult to perform. Furthermore, in long-term, there may be

complications such as suture erosion and degradation resulting in IOL tilt or decentration and ocular hypertension.

Ab-externo fixation can be either 2-point fixation or 4-point fixation. The 4-point fixation has better lens stability and less suture-related complications[6]. Two-point fixation technique, on the other hand, has the advantage that it is safe and requires less intraocular manipulations leading to less chance of complications. More recently a single point fixation technique has been described for lenses with partial posterior capsular support[7].

In our study, the post-operative best corrected visual acuity of 6/18 or better was achieved in 13 patients who underwent Ab-externo scleral fixation of IOL. The main advantage for the vision is the Uncorrected Visual Acuity which has improved for everybody except one who had Corneal Decompensation and Corneal surgery is being planned for.

The most common post-operative complication in our series was astigmatism in 36 eyes. The minimum astigmatism was-2.00D and maximum was - 3.50D. (Mean astigmatism was - 2.42D) in this study. The cause of astigmatism was large corneal incision or tight sutures and IOL decent ration. Ghanem and colleagues[8] also reported astigmatism as most frequently occurring complication in 3 eyes (21.4%). Similarly, Sasahara and Kiryu[9] reported astigmatism in 12 eyes (13%).Due to iris manipulation while doing scleral fixation of IOL, we noticed Transient anterior uveitis in 10 eyes for a period of more than 4 weeks, which is comparable with the results of Kwong et al and Kanigowska K[10]. Cystoid Macular 0edema seen in 7eyes, which were treated medically. None of the Patients had major complications like Endophthalmitis or Dislocation of IOL.

So we conclude that SFIOLs give a good visual outcome in patients with cataract with inadequate capsular support. 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 anatomical position of IOL is well maintained by the technique. Minor complications are common; however, vision threatening complications are not. The technique is difficult to master, but is generally safe and effective on short-term follow-up.

8. Future Scope

Visual rehabilitation of patients with aphakia has always been a challenge. SFIOL has been a boon for such patients. Further research should be done to prevent complications, minimize astigmatism and gain better visual benefit in such aphakic patients.

References

[1] Young AL, Lenng-Gys , Cheng-LL A modified technique of sclera fixated intra ocular lenses for aphakic correction. Nature Publishing Group Eye. 2005;19:19–22.
[2] Azar DT, Clamen L, Flakier P. Principles and practice of ophthalmology. 2nded. Philadelphia: W.B Saunders Company; 2000. Secondary intraocular lens implantation; pp. 1514–1536.
[3] Chakrabarti A, Gandhi RK, Chakrabarti M. Ab-externo 4-point scleral fixation of posterior chamber intraocular lenses. J Cataract Refract Surg. 1999;25:420–426.
[4] Kokame GT, Yamamoto I, Mandel H. Scleral fixation of dislocated posterior chamber intraocular lenses: Temporary haptic externalization through a clear corneal incision. J Cataract Refract Surg. 2004;30:1049–1056.
[5] Evereklioglu C, Er H, Bekir NA, Borazan M, Zorlu F. Comparison of secondary implantation of flexible openloop anterior chamber and scleral-fixated posterior chamber intraocular lenses. J Cataract Refract Surg2003;29:301-8.
[6] Chakrabarti A, Gandhi RK, Chakrabarti M. Ab externo 4-point scleral fixation of posterior chamber intraocular lenses. J Cataract Refract Surg1999;25:420-6.
[7] Narain S, Gupta S, Ahuja A. A newer surgical technique for single and 2 point scleral fixation of posterior chamber IOL. AIOC Ophthalmology Abstracts; 2003. p. 245.
[8] Ghanem VC, Ghanem EA, Ghanem RC. Monoscleral fixation IOL after extra capsular extraction of subluxated lenses in patients with Marfan syndrome. Arq Bras Oftalmol. 2004;64:763–767.
[9] Sasahara M, Kiryu J, Yoshimura N. Endoscope-assisted trans scleral suture fixation to reduce the incidence of intraocular lens dislocation. J Cataract Refract Surg. 2005;31:1777–1780.
[10] Kanigowska K, Grałek M, Karczmarewicz B. Trans sclerally fixated intraocular artificial lenses in childrenanalysis of long-term postoperative complications. KlinOczna 2007;109(7-9):283–286.