

Consequences of Sclera-fixated Intraocular Lens (SFIOL) Implantation after 1 Year Follow Up

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Abstract

Purpose: To evaluate the consequences of sclera-fixated intraocular lens (SFIOL) after one year of implantation surgery

Methods: This observational study was conducted among 50 patients at the National Institute of Ophthalmology and Hospital (NIOH), Dhaka, from June 2021 to December 2021. The study population was taken among patients whose SFIOL surgeries were performed in the Department of vitreo retina. The sampling method was purposive sampling. Variables were age, gender, best corrected visual acuity (BCVA), lens status, etiological factor, history of pars plana vitrectomy, and post-operative complications. All examinations were done accordingly, and collected data were correctly recorded. Ethical principles were followed.

Results: The mean age was 54±18.3 years where 72% of cases were male. Aphakia was present in 64% of patients, 14% of patients had pseudophakia, and 22% were phakic. Among the patients, 78% had a history of complications due to cataract surgery and 18% suffered from trauma. Both anterior and pars plana vitrectomy were done to 46% of patients, and 54% had been treated only with anterior vitrectomy. In this study, mean BCVA was 1.4±0.5 during admission, 0.8±0.3 during discharge, 0.5±0.3 after one month and 0.3±0.2 after one year. After one year, BCVA significantly decreased from admission ($p=0.001$). Post-operative complications were found in 6% of cases.

Conclusion: After SFIOL implantation, significant visual improvement appeared. It's a sight-saving process that gives patients better visual acuity.

Key Words: Sclera-fixated Intra Ocular Lens (SFIOL), anterior and pars plana vitrectomy, Aphakia

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Introduction

Cataract surgery and ocular trauma are significant incidents that lead to inadequate capsular support. A specialized intraocular lens (IOL) can ensure visual rehabilitation for these patients. The surgeon's challenge was to choose between anterior chamber (AC) IOL, iris-fixated IOL, iris claw IOL, and sclera-fixated IOL(SFIOL)^{1,2}. ACIOL was one of the early options, but it has complications like corneal decompensation, chronic inflammation, and glaucoma³. Complications with iris-fixated IOL include uveitis, cystoid macular oedema, and iris erosion of the haptic leading to recurrent bleeding^{4,5}. Several previous studies have shown favourable medium-term outcomes following SFIOL than ACIOL or iris-fixated lens⁶⁻⁸. SFIOLs have a better ocular safety profile than ACIOLs, or iris-fixated IOL is implanted in the sulcus region. SFIOL is closer to the natural

anatomic position of the crystalline lens near the nodal point and remains safe from the corneal endothelium, anterior chamber and iris⁹.

As early as 1993, Sundmacher and Althaus mentioned three rules that must be followed to obtain an anatomically correct position for the transscleral fixed IOL:

1. The suture should penetrate only the sulcus and not the adjacent iris or ciliary body
2. The loops of the IOL haptic must be primarily directed into the ciliary sulcus
3. The IOL chosen must be so designed that it suits the anatomic needs of the procedure and provides a safe distance between the lens and the iris¹⁰

In recent practice, SFIOL is fixed to the sclera in the region of the ciliary sulcus¹¹

This study was conducted at the National Institute of Ophthalmology and Hospital (NIOH), Dhaka. This study aimed to evaluate the visual outcome of SFIOL after one year of implantation surgery.

Methodology

This observational study was conducted at the National Institute of Ophthalmology and Hospital (NIOH), Dhaka, from January 2021 to December 2021. The study population was taken among patients whose SFIOL surgeries were performed in the Department of Vitreo retina . The sampling method was purposive sampling. Inclusion criteria were patients above 18 years of age, dislocated posterior or anterior chamber IOL, aphakia, traumatic cataract with weak capsular support, zonular dehiscence, and ectopia lentis.

Exclusion criteria were patients with ocular morbidities like corneal opacity, amblyopia, retinal detachment, globe rupture, macular

disorders (macular degeneration, macular atrophy, macular hole, haemorrhage etc.), and glaucoma. Variables were age distribution, gender distribution, best corrected visual acuity, lens status, etiological factor, previous surgery history, pars plana vitrectomy, and post-operative complications.

A detailed history was taken. The clinical examination was performed and adequately recorded. Proper ocular examinations were done by torchlight and then under a Slit lamp. Snellen's chart measured visual acuity (uncorrected and best corrected). Goldmann Applanation Tonometer evaluated intraocular pressure. Ophthalmoscopy was performed. Patients were advised for colour fundus photography, fluorescence fundus angiography, optical coherence tomography etc., which were needed for proper diagnosis and treatment plan. Investigations reports were observed. Patients were instructed for proper follow-up visits at regular intervals. All collected data was recorded correctly. A proforma was prepared to record the data on the particulars of the patients. Ethical principles were followed accordingly.

Statistical analysis

The statistical analysis was conducted using SPSS (Statistical Package for Social Science) version 26 statistical software. The study's findings were presented by frequency and percentage in tables and graphs. Means and standard deviations for continuous variables and frequency distributions for categorical variables were used to describe the characteristics of the total sample. Associations of continuous data were assessed using paired sample t-test. Here, $p < 0.05$ was considered significant, and all p-values were two-sided.

Results

Table I: Baseline characteristics of the study population (n=50)

Baseline characteristics	n (%)
Gender	
Male	36 (72.0%)
Female	14 (28.0%)

Age (in years)	
Mean \pm SD	54 \pm 18.3
Range	40-70
Lens status	
Aphakia	32 (64.0%)
Phakic eye	11 (22.0%)
Pseudophakia	07 (14.0%)
Etiological factor	
A complication of cataract surgery	39 (78.0%)
Trauma	9 (18.0%)
Others	2 (4.0%)
History of Pars Plana Vitrectomy	
Anterior Vitrectomy	27 (54.0%)
Anterior Vitrectomy and Pars Plana Vitrectomy	23 (46.0%)

Among the 50 patients, 36 (72%) were male, and 14 (28.0%) cases were female. The mean age was 54 \pm 18.3 years. According to lens status, 32 (64.0%) patients had aphakia, and 39 (78.0%) patients had a history of complications due to cataract surgery. Twenty-three (46.0%) patients were treated with anterior and pars plana (table I).

Table II: Visual acuity of the study population at different time intervals (n=50)

Best corrected visual acuity (in log mar)	Mean \pm SD
During admission	1.4 \pm 0.5
During discharge	0.8 \pm 0.3
After one month	0.5 \pm 0.3
After one year	0.3 \pm 0.2

The best corrected visual acuity was 1.4 \pm 0.5 during admission, 0.8 \pm 0.3 during discharge, 0.5 \pm 0.3 after one month and 0.3 \pm 0.2 after one year (table II).

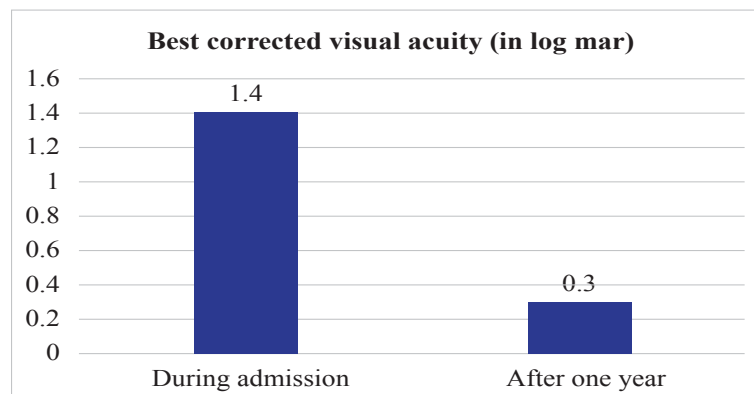


Figure I: Visual acuity of the study population during admission and after one year (n=50)

Paired t-test showed that Best corrected visual acuity significantly decreased after one year ($p=0.001$) (figure I).

Post-operative complications	n (%)
Vitreous Haemorrhage	1 (2.0%)
CMO	1 (2.0%)
IOL Dislocation	1 (2.0%)

Discussion

A total of 50 cases were taken as the study population, where 72.0% were male patients and 28.0% were female. In Bangladesh, social stigma, socioeconomic condition, educational status, and cultural set-up have their influence which was responsible for more male patients than female. This study had similarities with Georgios¹² et al. , where 66% were male, and 34% were female. In Zhao¹³ et al. study, 75% of cases were male, and 25% were female. Vinaya¹⁴ et al. study and Hun¹⁵ et al. study had similar results where male patients were more than females.

In this study, the age range was 40 to 70 years. The mean age was 54±18.3 years. This study had similarities with Hun¹⁵ et al., where the mean age was 60 years, and the age range were 39 - 77 years. In Georgios¹² et al studies, the mean age was 69 years, and the age range was 44 -91. Walia¹⁶ et al study had mean age 54 years. Aditya¹⁷ et al. study had a mean age of 57 years.

In this study, 64.0% of patients had aphakia, 14.0% had pseudophakia, and 22.0% were phakic. Hun¹⁵ et al. study had 54.0% pseudophakia, 23.0% aphakia and 23.0% aphakia.

Among the patients, 78.0% had a history of complications due to cataract surgery. 18.0% of patients suffered from trauma. In Walia¹⁶ et al. study, 60.0% suffered from cataract surgery complications, and 33.0% of patients suffered from trauma. In the Vinaya¹⁴ et al. study, 40.0% had ectopia lentis, 30.0% suffered from cataract surgery complications, and 20.0% of patients suffering from trauma. Studies performed in the Indian subcontinent, like Walia¹⁶ et al., had similarities with this study, where the maximum number of patients were from cataract surgery complications.

In this study, 46% of patients had been treated with both anterior and pars plana vitrectomy, and

54% had been treated only with anterior vitrectomy. Georgios et al.¹² studies had similar results where only 30% of patients needed PPV. Aditya¹⁷ et al. study showed 58% of patients had been treated with vitrectomy.

In this study, Best corrected visual acuity was measured. It was 1.4±0.5 during admission, 0.8±0.3 during discharge, 0.5±0.3 after one month and 0.3±0.2 after one year. This study has similarities with the Hun¹⁵ et al. study. Their preoperative visual acuity was 1.32±0.68 during admission and 0.8±0.53 during discharge. Walia¹⁶ et al. study stated that preoperative visual acuity was 1.37±0.37 during admission and 0.37±0.29 after one year of surgery. Georgios¹² et al studies also had a similar result. According to these studies, significant improvement in vision appeared after surgery. After one month of surgery, patients gained better vision with spectacle.

Postoperative complications were found in 6% of cases. 2% had a vitreous haemorrhage, 2% had CMO, and 2% had IOL dislocation. In Georgios¹² et al. studies, 7.4% had a vitreous haemorrhage, 7.4% had hypotony, and 3.7% had CMO. In Vinaya¹⁴ et al. study, 4% had IOL dislocation, 4% had IOL decompensation, 2% had DME, and 2% had RD. Hun¹⁵ et al. study had similar results.

Limitations of this study are single-centre nature, short duration of follow-up and the use of different surgeons performing the surgeries.

Future prospective multi-centre studies with long-term follow-up may be beneficial.

Conclusion

SFIOL implantation is one of the sights saving procedures. It can ensure vision in maximum cases, even after cataract surgery or trauma complications. It has an excellent visual outcome with effective lifestyle modification.

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Conflict of Interest: None

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