



Original Article

Visual Outcomes and Complications of Iris Claw Intraocular Lens Implantation in Aphakic Patients

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ABSTRACT

Purpose: This study aims to assess the visual outcomes and postoperative complications in aphakic patients who underwent iris-claw intraocular lens Implantation particularly in cases lacking adequate capsular support for conventional IOL placement.

Methods: This prospective clinical study was conducted over 6 months at PES Institute of Medical Sciences and Research and included 24 aphakic eyes. Patients with aphakia secondary to complicated cataract surgery or ocular trauma, lacking sufficient capsular support for conventional IOL implantation were enrolled. Preoperative assessment included best-corrected visual acuity (BCVA), slit-lamp biomicroscopy, and intraocular pressure (IOP) measurement and ocular biometry using A-scan and B-scan ultrasonography where indicated. All patients underwent iris-claw IOL implantation and were followed up at regular intervals for six months. Postoperative evaluation included BCVA, refractive outcomes, and complications such as cystoid macular edema (CME), disencapsulation, pupil ovalization, and raised IOP.

Results: A significant improvement in visual acuity was observed in the majority of patients. More than 90% of eyes achieved a postoperative refractive error within ± 2.00 diopters of emmetropia. The most common complication was pupil ovalization (24%), followed by CME (8%) and IOL disencapsulation (8%). Elevated IOP was noted in 4% of cases. Rare complications, including hyphema, uveitis, and endophthalmitis, occurred in less than 1% of eyes.

Conclusion: Iris-claw IOL implantation is a safe and effective option for visual rehabilitation in aphakic patients without capsular support. Short-term follow-up demonstrates favorable visual outcomes with an acceptable complication profile, supporting its role as a reliable secondary IOL implantation technique.

Keywords: Aphakia; Iris-claw intraocular lens; Secondary IOL implantation; Visual outcomes; Postoperative complications; Cystoid macular edema; Intraocular pressure.

INTRODUCTION

- Aphakia, the absence of the crystalline lens of the eye, can result from surgical removal (commonly post-cataract extraction), trauma, or congenital anomalies. In cases where capsular support is insufficient or absent, standard posterior chamber intraocular lens (PCIOL) implantation is not feasible, necessitating alternative methods for visual rehabilitation [1,2].
- Iris-claw intraocular lenses (ICIOLs), first introduced by Worst in the 1970s, have emerged as a viable option in such scenarios [3].
- Recent studies have demonstrated favorable visual outcomes and low complication rates following iris-claw IOL implantation in aphakic patients, including those undergoing secondary implantation after complicated cataract surgery or trauma [4,5].

- Retropupillary fixation, in particular, is gaining popularity due to its posterior chamber location and reduced contact with corneal endothelium, thus preserving corneal clarity [6].
- However, concerns still persist regarding potential complications such as pigment dispersion, iris atrophy, disencapsulation, cystoid macular edema, and intraocular pressure fluctuations [7,8].

MATERIALS AND METHODS

Study Design and Setting:

This prospective clinical study was conducted over 6 months at the Department of Ophthalmology, PES Institute of Medical Sciences and Research, India.

Study Population:

A total of 24 aphakic eyes were included in the study. All enrolled patients underwent iris-claw intraocular lens (IOL) implantation.

Inclusion Criteria:

- Aphakia without capsular support
- Secondary to cataract surgery complications or ocular trauma

Exclusion Criteria:

- Active ocular infection or inflammation
- Corneal decompensation
- Uncontrolled glaucoma
- Retinal pathology interfering with visual outcome

Sample Size and Sampling Method:

The study included a total of 24 aphakic eyes. A purposive sampling technique was employed, enrolling eligible patients with aphakia who presented during the study period and met the inclusion criteria.

Data Collection and Follow-up:

All patients underwent a comprehensive preoperative evaluation, including assessment of best-corrected visual acuity (BCVA), slit-lamp biomicroscopy, and intraocular pressure (IOP) measurement. Following evaluation, all eyes underwent iris-claw intraocular lens implantation as the chosen surgical intervention.

Postoperative follow-up was conducted at scheduled intervals over a period of six months. Clinical outcomes were assessed during each visit to monitor visual recovery and identify any procedure-related complications.

Statistical Analysis:

Statistical analysis was performed using SPSS version 20. Descriptive statistics were used to summarize continuous variables as mean \pm standard deviation and categorical variables as frequencies and percentages. The improvement in best-corrected visual acuity (BCVA) before and after surgery was assessed using the paired t-test. A p-value of less than 0.05 was considered statistically significant.

Outcome Measures:

- The primary outcome measures included postoperative best-corrected visual acuity (BCVA) and refractive status.
- Visual improvement and the degree of refractive correction were evaluated at each follow-up visit.
- In addition, postoperative complications were documented, including cystoid macular edema (CME), disencapsulation of the iris-claw IOL, pupil ovalization, and elevation of intraocular pressure (IOP).

RESULTS

A total of 24 aphakic eyes were included in this prospective study. Among them, the majority of patients demonstrated significant improvement in visual acuity following iris-claw intraocular lens implantation. More than 90% of eyes achieved a postoperative refractive outcome within ± 2.00 diopters of emmetropia.

Postoperative complications were observed in a subset of patients, with pupil ovalization noted in 24% of eyes, cystoid macular edema in 8%, and intraocular lens disencapsulation in 8%. Elevated intraocular pressure was recorded in 4% of cases. Rare complications such as hyphema, uveitis, and endophthalmitis were seen in less than 1% of eyes.

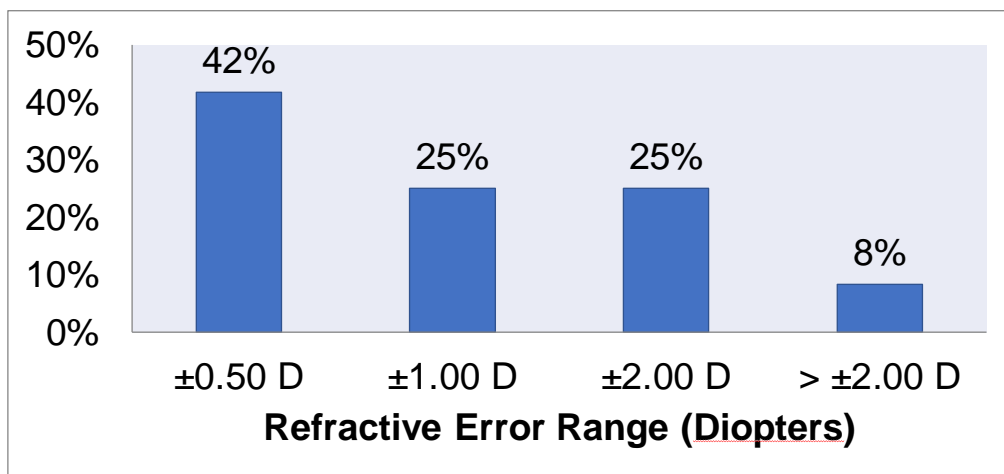
Table No.1: Patient Demographics and Clinical Characteristics (n = 24)

Variable	Value
Mean age (Years)	62.5 ± 10.2
Gender	Male: 15 (62.5%), Female: 9 (37.5%)
Laterality	Right Eye: 12 (50%), Left Eye: 12 (50%)
Cause of Aphakia	Complicated cataract surgery: 22 (91.6%) Ocular trauma: 2 (8.4%)

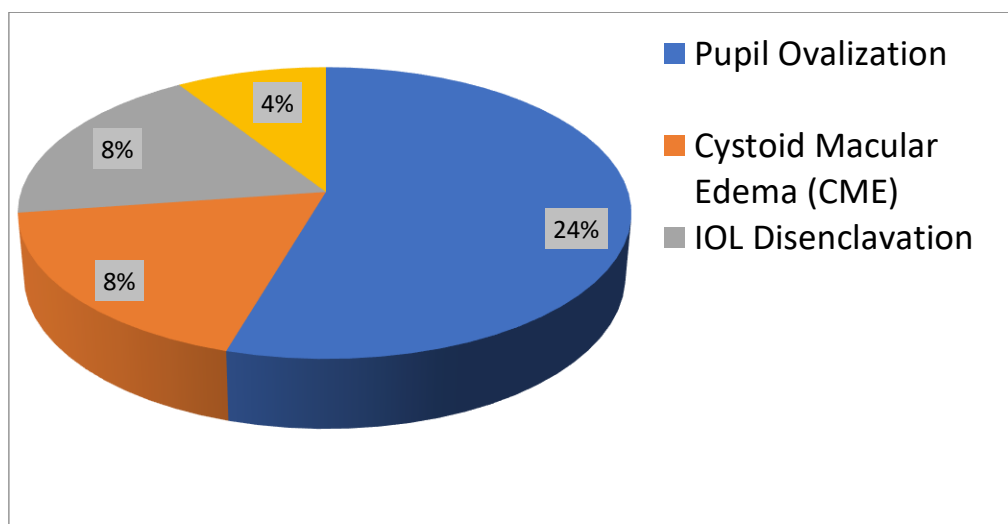
Table No.2: Preoperative and Postoperative BCVA Comparison (n = 24)

Time	Mean BCVA (LogMAR) ± SD
Preoperative	1.20 ± 0.30
Postoperative (1 month)	0.50 ± 0.20
Postoperative (6 months)	0.30 ± 0.15

P < 0.001 (Highly significant) Paired t-test



Graph No.1: Distribution of Postoperative Refractive Error (n = 24)



Graph No.2: Postoperative Complications Observed

DISCUSSION

The present study evaluated the visual and refractive outcomes of iris-claw intraocular lens implantation in aphakic eyes without adequate capsular support. The mean age of patients was 62.5 ± 10.2 years, indicating that the procedure is commonly required in the elderly population, likely due to a higher incidence of cataract-related complications. A male predominance was observed (62.5%), which may reflect increased healthcare-seeking behavior or higher exposure to risk factors. Both eyes were equally affected, suggesting no laterality predilection.

Complicated cataract surgery was identified as the primary cause of aphakia in 91.6% of cases, while ocular trauma accounted for 8.4%. This highlights that the majority of cases requiring secondary intraocular lens implantation arise from surgical complications rather than traumatic events. These findings are consistent with current trends where increased surgical volume contributes to a higher absolute number of complicated cases.

Visual outcomes in the present study were highly favorable. There was a statistically significant improvement in mean BCVA from 1.20 ± 0.30 preoperatively to 0.30 ± 0.15 at six months postoperatively ($p < 0.001$). This substantial gain in visual acuity demonstrates the effectiveness of iris-claw IOL implantation in visual rehabilitation. Refractive outcomes were also encouraging, with 42% of eyes achieving a postoperative refractive error within ± 0.50 diopters, and more than 90% within ± 2.00 diopters, indicating good predictability of the procedure. Only 8% of eyes had a refractive error exceeding ± 2.00 diopters, reflecting a low rate of suboptimal refractive outcomes.

Postoperative complications were relatively infrequent and mostly mild. Pupil ovalization was the most commonly observed complication, occurring in 24% of eyes, which may be attributed to iris tissue manipulation during enclavation. Cystoid macular edema and intraocular lens disclavation were each noted in 8% of cases, while elevated intraocular pressure was seen in 4%. These complications were manageable and did not significantly affect the overall visual outcomes. The low incidence of serious complications such as endophthalmitis further supports the safety profile of the procedure.

Overall, the findings of this study suggest that iris-claw intraocular lens implantation provides effective visual rehabilitation with favorable refractive outcomes and a low complication rate in aphakic patients lacking capsular support. The results reinforce its role as a reliable secondary intraocular lens implantation technique, particularly in settings where alternative fixation methods may be technically challenging or associated with higher complication risks.

Limitations: The study is limited by a small sample size and short follow-up duration of six months, which may not fully capture long-term visual outcomes and late postoperative complications.

CONCLUSION

- Iris-claw intraocular lens (IOL) implantation is a safe and effective option for visual rehabilitation in aphakic eyes without capsular support.
- In this study, the majority of patients showed significant improvement in visual acuity, with over 90% of eyes achieving a refractive error within ± 2.00 diopters of emmetropia.
- The procedure was associated with a relatively low rate of complications. While pupil ovalization was the most common complication (24%), other adverse events such as cystoid macular edema, IOL disclavation, and transient intraocular pressure rise were infrequent and manageable.

Ethics approval and consent to participate

The study was conducted in accordance with the principles of the Declaration of Helsinki. Ethical approval was obtained from the Institutional Ethics Committee of PES Institute of Medical Sciences and Research prior to the commencement of the study. Written informed consent was obtained from all participants after explaining the nature of the procedure, potential benefits, and associated risks. Confidentiality of patient data was strictly maintained throughout the study.

List of abbreviations

Abbreviation	Full Form □
BCVA	Best-Corrected Visual Acuity
IOL	Intraocular Lens
ICIOL	Iris-Claw Intraocular Lens
PCIOL	Posterior Chamber Intraocular Lens
IOP	Intraocular Pressure
CME	Cystoid Macular Edema
D	Diopters
SD	Standard Deviation
%	Percentage

Data Availability

The datasets generated and analyzed during the current study are available from the corresponding author on reasonable request. All relevant data supporting the findings of this study are included within the article. Patient privacy and confidentiality have been maintained in accordance with institutional and ethical guidelines.

Conflicts of Interest

There is **no conflicts of interest** related to this study.

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Authors' contributions

All authors contributed to the study concept and design, supervision, and final approval of the manuscript.

Dr. K Harshitha was involved in data collection, patient evaluation, and surgical procedures.

Dr. M. Narayan contributed to data analysis and interpretation of results.

Dr. K Harshitha assisted in literature review and manuscript drafting.

Dr. K Harshitha, Dr. Shaik Salma Begum, Dr. G. Hemeswari, Dr. Rachana D, Dr. Bollempalli Sri Sai Chaitra,

Dr. Palaboina Rupanjali yadav contributed to data entry, statistical analysis, and preparation of tables and graphs.

Dr. K Harshitha was involved in manuscript revision, proofreading, and final editing.

All authors read and approved the final manuscript.

Accountability for all aspects of the work: All authors

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Supplementary Materials

Additional supporting material related to this study, including detailed data tables, graphical representations of visual and refractive outcomes, and case-wise complication records, is available from the corresponding author upon reasonable request. No supplementary files have been submitted as part of the main manuscript.

REFERENCES

1. Apple DJ, Mamalis N, Loftfield K, et al. Complications of intraocular lenses. A historical and histopathological review. *Surv Ophthalmol.* 1984;29(1):1-54.
2. Liang IC, Chang YH, Hernández Martínez A, Hung CF. Iris-Claw Intraocular Lens: Anterior Chamber or Retropupillary Implantation? A Systematic Review and Meta-Analysis. *Medicina (Kaunas).* 2021 Jul 30;57(8):785. doi: 10.3390/medicina57080785. PMID: 34440990;
3. Worst JG, Massaro RG, Ludwig HH. The introduction of iris claw lenses. *J Cataract Refract Surg.* 1993;19(6):684-687.
4. Forlini M, Soliman W, Bratu A, et al. Long-term follow-up of retropupillary iris-claw intraocular lens implantation: a retrospective analysis. *BMC Ophthalmol.* 2015;15:143.
5. Baykara M, Sahin O, Ozcetin H, Timucin OB. Posterior iris fixation of the Artisan intraocular lens in aphakic eyes: long-term follow-up. *J Cataract Refract Surg.* 2007;33(6):894-897.
6. De Silva SR, Arun K, Anandan M, Glover N, Patel CK, Rosen PH. Iris-claw intraocular lenses to correct aphakia in the absence of capsular support. *J Cataract Refract Surg.* 2011;37(9):1667-1672.
7. Helvaci MR, Altiparmak UE, Yeter V, et al. Visual outcomes and complications of iris-claw IOLs: anterior vs retropupillary fixation. *Int Ophthalmol.* 2021;41(1):211-219.
8. Lifshitz T, Levy J, Klemperer I, Belfair N, Levinger S. Artisan aphakic intraocular lens implantation in eyes with no capsular support: anterior chamber versus retropupillary implantation. *J Cataract Refract Surg.* 2010;36(5):823-829.