

**POST-SURGICAL VISUAL AND INTRAOCULAR PRESSURE OUTCOMES FOLLOWING CATARACT SURGERY IN LENS-INDUCED GLAUCOMA: A PROSPECTIVE OBSERVATIONAL STUDY FROM WESTERN INDIA****Dr. Ashita Kumawat**

Resident Of Ophthalmology.

Dr. Punit Singh

Professor.

Dr. Ramesh

Associate Professor.

ABSTRACT **Purpose:** To assess post-surgical visual outcomes, intraocular pressure (IOP) control, and complication profile in patients with lens-induced glaucoma (LIG) undergoing cataract surgery. **Methods:** A prospective observational study was conducted at Mathura Das Mathur Hospital, Jodhpur (April–June 2025). One hundred one patients with LIG underwent manual small-incision cataract surgery (MSICS) or alternative lens extraction. Pre- and postoperative data included best corrected visual acuity (BCVA), IOP, and complications. Patients were followed up at day 1, 1 month, and 3 months. **Results:** The mean age was 64.3 ± 9.2 years (range 41–82). Phacolytic glaucoma (54.5%) was more common than phacomorphic glaucoma (43.5%). At baseline, 93.1% had vision $\leq$ hand movements, and 74.2% presented with IOP >31 mmHg. Postoperatively, 84.1% achieved BCVA $\geq 6/18$ and mean IOP reduced from 39.7 ± 12.9 mmHg to 14.7 ± 4.6 mmHg ($p < 0.001$). Early presentation (<1 week) was associated with significantly better outcomes compared to delayed presentation (>2 weeks). **Conclusion:** Early cataract extraction, particularly MSICS with PCIOL implantation, provides favorable visual and IOP outcomes in LIG. Delayed presentation is associated with poorer prognosis.

KEYWORDS : Lens-induced glaucoma, phacomorphic glaucoma, phacolytic glaucoma, intraocular pressure, small-incision cataract surgery.

INTRODUCTION

Glaucoma is one of the leading causes of irreversible blindness worldwide, and lens-induced glaucoma (LIG) continues to remain a significant clinical entity in developing countries such as India. LIG occurs when a mature or hypermature cataract causes secondary elevation of intraocular pressure (IOP), either by mechanical obstruction (phacomorphic glaucoma) or leakage of lens proteins causing trabecular meshwork blockage (phacolytic glaucoma). The prevalence of cataract blindness in India is compounded by delayed access to surgery, socio-economic barriers, and poor health-seeking behavior in rural communities. In regions such as Western Rajasthan, advanced cataracts are frequently encountered, and lens-induced glaucomas form a substantial proportion of preventable glaucoma cases.

Previous studies, including those from Nepal, South India, and Africa, have highlighted that timely cataract extraction not only restores vision but also controls IOP effectively. However, outcomes are often dependent on the duration of symptoms, severity of optic nerve damage, and surgical technique employed. Manual small-incision cataract surgery (MSICS) remains the preferred technique in resource-limited settings due to its cost-effectiveness, shorter surgical time, and ability to handle advanced cataracts. This study was undertaken to assess the post-surgical outcomes in patients with LIG presenting to a tertiary care hospital in Western Rajasthan, focusing on visual prognosis, IOP control, and complication profile.

MATERIALS AND METHODS

This prospective observational study was conducted at the Department of Ophthalmology, Mathura Das Mathur Hospital, Dr. S.N. Medical College, Jodhpur, between April and June 2025. A total of 101 patients diagnosed with lens-induced glaucoma were included. Ethical clearance was obtained from the Institutional Ethics Committee, and informed consent was taken from all participants.

Inclusion criteria were patients aged 40 years and above with clinical diagnosis of LIG (phacomorphic, phacolytic, or other subtypes) requiring cataract extraction. Exclusion criteria included patients with pre-existing primary open-angle or angle-closure glaucoma, secondary glaucomas of other causes, history of ocular trauma, or prior intraocular surgery.

All patients underwent detailed ocular examination including visual acuity assessment with Snellen's chart, slit-lamp biomicroscopy, IOP measurement using Goldmann applanation tonometry, gonioscopy when feasible, and dilated fundus examination or B-scan ultrasonography when media opacity precluded visualization. Systemic history and comorbidities such as diabetes and hypertension

were also recorded.

Surgical intervention consisted primarily of MSICS with posterior chamber intraocular lens (PCIOL) implantation. In cases of inadequate capsular support, alternative approaches such as anterior chamber IOL, scleral-fixed IOL, or aphakia were performed. Standard perioperative regimen included topical steroids and antibiotics. Postoperative follow-up was conducted at day 1, 1 month, and 3 months. Outcomes measured included BCVA, IOP, and intraoperative/postoperative complications.

Statistical analysis was performed using paired t-test for comparing pre- and postoperative IOP, Wilcoxon signed-rank test for visual acuity, and ANOVA/Fisher's exact test for subgroup comparisons. A p -value < 0.05 was considered statistically significant.

RESULTS**Table 1: Age Distribution Of Patients With LIG**

Age group (years)	n (%)
41-50	8 (7.9%)
51-60	31 (30.7%)
61-70	36 (35.6%)
>70	26 (25.7%)

Figure 1: Age distribution of patients with LIG

Table 2: Types Of Lens-induced Glaucoma

Type of LIG	n (%)
Phacomorphic	44 (43.5%)
Phacolytic	55 (54.5%)
Others	2 (2.0%)

Figure 2: Distribution of LIG subtypes

DISCUSSION

Our study demonstrated that cataract extraction in patients with lens-induced glaucoma results in significant improvement in visual acuity and effective control of IOP. The mean IOP reduced from nearly 40 mmHg preoperatively to 15 mmHg postoperatively, a finding consistent with prior studies by Pradhan et al. and Venkatesh et al. The majority of patients (84.1%) achieved BCVA $\geq 6/18$ by 3 months, which compares favorably with outcomes reported in similar settings.

Interestingly, phacolytic glaucoma was slightly more prevalent than phacomorphic glaucoma in our cohort, contrary to studies from South India where phacomorphic glaucoma is more commonly reported. This variation may be attributed to differences in patient demographics, awareness levels, and access to healthcare facilities.

The higher prevalence of hypermature cataracts reflects the delayed presentation of patients in rural Rajasthan, often due to lack of awareness and socio-economic barriers.

Early presentation was significantly associated with better outcomes. Patients presenting within one week of symptom onset had higher chances of achieving BCVA $\geq 6/18$ and lower rates of postoperative complications. This emphasizes the importance of early detection and prompt referral. Delayed cases often had irreversible optic nerve damage, leading to poorer visual outcomes despite IOP normalization.

MSICS with PCIOL implantation proved to be a safe and effective surgical technique, with low intraoperative complication rates (4.9% PCR, 4.9% zonular dialysis). This is in line with previous studies that demonstrated MSICS as an ideal procedure for advanced cataracts in developing nations due to its affordability, shorter learning curve, and suitability for dense lenses. Although phacoemulsification offers faster recovery, it is less feasible in settings with advanced cataracts and limited resources.

Our complication rate at 3 months (39.4%) was slightly higher than reported in some other series, particularly among phacomorphic cases. This highlights the aggressive course of angle-closure mechanisms compared to phacolytic pathology. Nevertheless, most complications were manageable, and vision improvement remained satisfactory in the majority of cases.

The findings of this study underscore the need for public health initiatives to promote early cataract surgery, especially in rural and underserved populations. Screening camps, patient education, and community outreach can significantly reduce the incidence of LIG-related blindness. Further research with longer follow-up is warranted to assess optic nerve recovery and long-term glaucoma control.

CONCLUSION

Early cataract extraction, particularly via MSICS with PCIOL implantation, provides excellent outcomes in patients with lens-induced glaucoma. Delay in presentation is a critical determinant of poor visual prognosis. Community education and timely referral remain essential to reduce preventable blindness due to LIG in resource-limited settings.

Declarations

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Informed Consent: Obtained from all participants

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