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Visual Outcome after Cataract Surgery in Phacomorphic Glaucoma in Tertiary Eye Care Centre in Western Nepal

Prabhat Kiran Devkota[1], **Shital Khattri Chattri**[2], **Anita Yogi**[3], **Sushila Pokhrel**[4], **Saraswati Khadka Thapa**[5]

[1]Department of Ophthalmology, [2]Department Optometrist,[3]Optometry and Vision Sciences Student, [4]Department of Ophthalmology, [5]Research Department, Lumbini Eye Institute & Research Center, Bhairahawa, Nepal

ABSTRACT

Background

Phacomorphic glaucoma is a preventable secondary glaucoma resulting from neglected cataract. This study evaluated the visual and intraocular pressure (IOP) outcomes after cataract surgery in patients diagnosed with phacomorphic glaucoma.

Methods

A prospective observational study was conducted at Lumbini Eye Institute, Bhairahawa, Nepal, from August 1 to September 15, 2025, including 42 patients with phacomorphic glaucoma. All underwent comprehensive ophthalmic evaluation and manual small incision cataract surgery (SICS) with intraocular lens implantation. Pre- and postoperative visual acuity (VA), IOP, and complications were assessed. Statistical analyses were performed using SPSS version 16, with significance set at p-value<0.05.

Results

The mean age was 57.9±10.05 years, with a male-to-female ratio of 1:1.2. Most patients were farmers (69%) from lower socioeconomic backgrounds. The median VA improved significantly from 2.7 LogMAR preoperatively to 1.0 LogMAR postoperatively (p-value<0.001). Mean IOP decreased from 31.6 mmHg to 13.0 mmHg (p-value<0.001). Postoperative complications occurred in 36% of cases, most commonly posterior capsular rupture, posterior capsular opacification, and uveitis.

Conclusions

Phacomorphic glaucoma predominantly affects elderly individuals from rural and socioeconomically deprived backgrounds. Cataract surgery effectively reduces IOP and improves visual acuity; however, delayed presentation often limits visual recovery due to irreversible optic nerve damage. Early detection, community awareness, and timely surgical intervention are essential to prevent avoidable blindness from lens-induced glaucoma.

Keywords: cataract; intraocular pressure; phacomorphic glaucoma; visual outcome.

Correspondence: Dr. Prabhat Kiran Devkota, Department of Ophthalmology, Lumbini Eye Institute & Research Center, Bhairahawa, Nepal. Email: drprabhatdevkota@gmail.com, Phone: +977-9847073933. **Article received**: 2025-10-12. **Article accepted**: 2025-11-02. **Article published**: 2025-12-31.

INTRODUCTION

Phacomorphic glaucoma is a secondary angle-closure glaucoma caused by swelling of a mature or hypermature cataractous lens that induces pupillary block and elevated intraocular pressure(IOP).[1-3] Cataract remains the leading cause of global blindness, accounting for over 50% of cases.[4,5]In Nepal, the Rapid Assessment of Avoidable Blindness (RAAB) survey (2018–2021) reported that 65.2% of people aged ≥50 years suffer visual impairment due to cataract.[6] Patients in developing countries often present late due to limited awareness, poverty, and poor access to eye care. This study aimed to evaluate visual and IOP outcomes, and postoperative complications following Small Incision Cataract Surgery (SICS) in phacomorphic glaucoma patients.

METHODS

This is hospital based prospective observational study, which was conducted among the patients who were diagnosed as phacomorphic glaucoma. Total 42 patients were enrolled in the study from 1st August 2025 to 15th September 2025, attended in glaucoma department of Lumbini Eye Institute and Research Centre. Phacomorphic glaucoma were diagnosed on the basis of patient reported symptoms including acute ocular pain, severe vision loss, redness along with clinical findings such as shallow anterior chamber, corneal edema, intumescent cataractous lens and IOP above 21 mmHg.[5,6]All patient with phacomorphic glaucoma who diagnosed in Glaucoma OPD were included. Patients who were uncooperative during examination, those with pre-existing ocular such as open-angle or angle closure glaucoma and those who had already undergone ocular surgery were excluded from the study. A non-probability purposive sampling technique was applied to select the sample. Baseline demographic and clinical data including age, gender, education, address, ethnicity, type of cataract, duration of symptoms, pre-post operative visual acuity and intraocular pressure were collected using performa. Visual acuity was assessed using a Snellen chart, intraocular pressure with Goldmann Applanation Tonometry, and anterior segment evaluation with slit-lamp biomicroscopy, while fundus examination of affected eye was performed after cataract surgery. postoperative complications were documented, and following findings were documented at the follow-up visits: measurements of VA and IOP of the postoperative first day, first week, six weeks. Ethical approval was obtained from the Institutional Review Committee of (Lumbini Eye Institute and Research Institute) (IRC Ref. No. 55/024/25), and written informed consent was taken from the participants. Data were entered into SPSS version 16 and used descriptive statistics to find out the socio demographic information and used Chi-square and T-tests to find out the associations between predictor and outcome variables, by using statistical significance at p-value<0.05.

RESULTS

Among the 42 enrolled patients diagnosed with phacomorphic glaucoma, 57% were female and rest 43% were male, with a male-to-female ratio of 1:1.2, indicating a slight female predominance. The mean age of the participants was 57.95 years±10.05 SD (Figure 1).

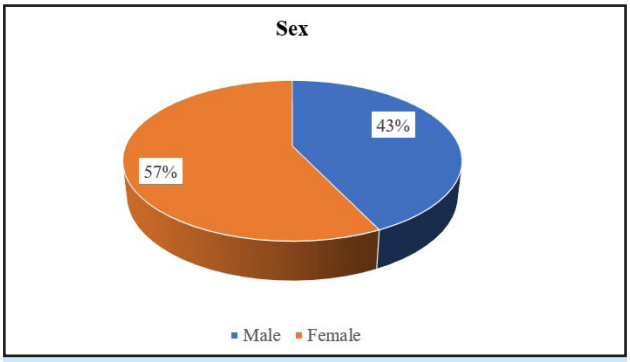

Figure 1. Pie Chart showing sex distribution of patients.

In terms of age distribution, the largest proportions of patients were found in the 45-59 years (42.9%) and 60-74 years (42.9%) categories, whereas 7.1% were younger than 44 years and 7.1% were 75 years or older. This highlights that phacomorphic glaucoma was most frequently observed among individuals in the middle-aged to elderly groups (Table 1).

With respect to laterality, the right eye was involved in 52% of patients, while the left eye was affected

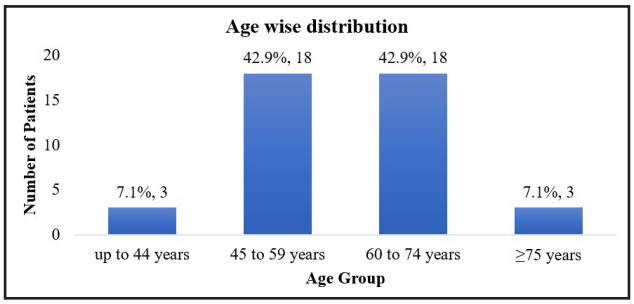

Figure 2. Bar Diagram showing age group of patients.

in 48%, showing nearly equal distribution between the two eyes. Occupation-wise, the majority of the patients were farmers (69.0%), reflecting the predominance of an agrarian lifestyle in the study population. Other occupations included laborers (9.5%), service holders (7.1%), and various other occupations (14.3%). In terms of ethnicity, the largest group was Madeshi (61.9%), followed by Tharu (16.7%), Muslim (11.9%), Khas (7.1%), and Janajati (2.4%).

The duration of symptoms prior to presentation varied. More than one-third of the patients (33.3%) presented after more than one month of onset, while 31.0% sought treatment within the first week. A smaller proportion presented within 1–2 weeks (19.0%) and between 2 weeks to 1 month (16.7%). This finding suggests that a considerable proportion of patients delayed seeking medical attention.With regard to socioeconomic status, the majority of the study population belonged to the lower socioeconomic class (54.8%), followed by the upper lower class (28.6%), and the lower middle class (16.7%) (Figure 3)

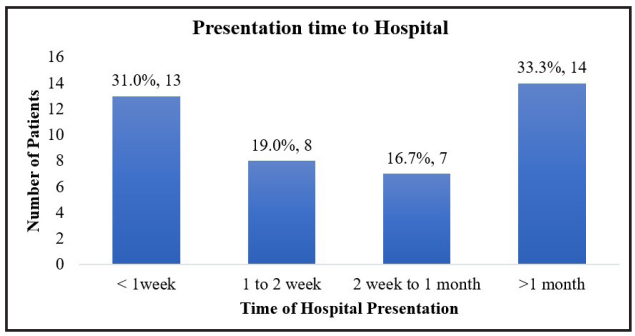

Figure 3. Bar diagram showing time of hospital presentation.

Analysis of visual outcomes demonstrated a significant improvement in visual acuity following surgery. The median preoperative visual acuity (VA) was 2.7 LogMAR, which improved to 1.0 LogMAR at 1 month postoperatively. This improvement was statistically significant, as shown by the Wilcoxon Signed Ranks Test (p-value<0.001).

Similarly, intraocular pressure (IOP) demonstrated a significant reduction following intervention. The mean preoperative IOP was 31.57 mmHg (SD=11.428), consistent with raised pressure at presentation. At 1 month postoperatively, the median IOP had reduced to 13 mmHg (IQR=3). This reduction was also statistically significant (p-value<0.001), indicating that surgical management was effective in controlling IOP.

Postoperative complications occurred in 36% of patients, Among the 15 reported complications, posterior capsular rupture was the most frequent intraoperative complication (46.7%), followed by postoperative complications such as posterior capsular opacification (26.7%) and postoperative uveitis (26.7%) (Figure 4).

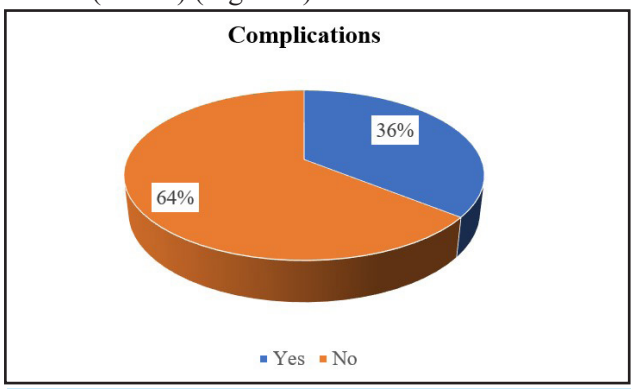

Figure 4. Pie chart showing complication after surgery.

Normality testing revealed that both preoperative VA (LogMAR) and 1-month VA (LogMAR) were not normally distributed (p-value<0.001 for both), indicating that non-parametric tests are required for analysis (Table 1).

Table 1. Comparison of Visual Acuity at Presentation and at 1-Month Follow-Up.

Visual Acuity	Median	Wilcoxon Signed Ranks Test	p-value
VA presentation (logMAR)	2.7	-5.38	<0.001
VA at 1 month (logMAR)	1		

Normality testing showed that preoperative IOP was normally distributed (p-value=0.393), while 1-month IOP was not (p-value<0.001), indicating the need for parametric analysis of preoperative data and non-parametric analysis of 1-month data (Table 2).

Table 2. Comparison of intraocular pressure at presentation and at 1-month follow-up.

Visual Acuity	Mean/Median	Test	p-value
Preoperative IOP	31.57 (SD=11.428)	T test: 17.904	<0.001
1 month Postoperative IOP	13 (IQR= 3)	Wilcoxon Signed Ranks Test -5.59	<0.001

Most patients late arrived due to mix of geographic and socioeconomic and geographic barriers. The majority were farmers from poor economic classes and disadvantage ethnic groups, who lived in rural areas with poor access to eye care. Occupational commitments, financial difficulties, cultural beliefs, and lack of awareness contributed to delays, while older patients frequently attributed visual decline to aging. As a result, many presented only after weeks to months of symptoms, explaining the very poor preoperative vision observed.

In this study, poor visual outcomes were mainly due to delayed presentation with advanced disease, as indicated by very poor baseline vision and increase intraocular pressure. The IOP was significantly decreased by surgery but visual improvement was limited by irreversible optic nerve damage that had already taken place. Advanced age, low socioeconomic status, and poor access to timely care further contributed to the poor results.

DISCUSSION

Phacomorphic glaucoma, a type of lens-induced glaucoma, remains a significant cause of preventable blindness in developing countries, primarily due to delayed intervention for advanced cataract. Demographic Profile: In our study, the mean age was 57.9 years, with female predominance (57%) and most patients being farmers from lower socioeconomic backgrounds. Similar age and gender trends were reported by Sitoula et al.[3], Tadesse et al.[4], Sharanabasamma et al.[5] and Shrestha et al.[6], all highlighting the vulnerability of rural, marginalized populations. Causes of Late Presentation & Duration of Symptoms: One-third of our patients presented more than one month after symptom onset, mainly due to financial difficulty, lack of awareness, cultural beliefs, and rural residence. Comparable delays were reported in Sitoula et al.[3] and Shrestha et al.[6], while Tadesse et al.[4] and Sharanabasamma et al.[5] emphasized that early presentation within two weeks significantly improves outcomes. Thus, socioeconomic deprivation and poor awareness remain the key reasons for late presentation. Visual Outcomes: Visual acuity improved from a median of 2.7 LogMAR preoperatively to 1.0 LogMAR at one month, but recovery was limited by irreversible optic nerve damage in late presenters. This trend mirrors findings from Sitoula et al.[3], Tadesse et al.[4], and Sharanabasamma et al.[5], where good visual outcomes were strongly associated with early treatment. In contrast, Shrestha et al.[6] reported poorer outcomes due to uniformly late presentation.

Intraoperative and Postoperative Complications: Complications occurred in 36% of our cases, with posterior capsular rupture being the most frequent. While other studies did not quantify rates, they also linked poor outcomes to delayed presentation and advanced disease. Arcot et al.[7] specifically noted that early surgery reduces complications and prevents optic nerve damage. IOP Control: Mean IOP decreased from 31.6 mmHg to 13 mmHg in our study, consistent with other reports (Sitoula et al.[3], Tadesse et al.[4], Sharanabasamma et al.[5], Rijal & Karki et al.[8], Pankaj et al.[9]), confirming that cataract extraction effectively controls IOP. However, final vision is determined by preoperative optic nerve status.

Limitations

In developing countries like Nepal, phacomorphic glaucoma is a common presentation, often seen in patients with advanced cataract. This study has certain limitations, including the use of a non-probability sampling design, a relatively small sample size, and a short follow-up duration. The limited follow-up period may have restricted the assessment of long-

term visual outcomes, intraocular pressure stability, and delayed postoperative complications.

CONCLUSIONS

Phacomorphic Glaucoma predominantly affects elderly females from rural, lower socioeconomic backgrounds. Delayed presentation often due to financial, cultural, and geographic barriers results in advanced disease with markedly elevated intraocular pressure and poor vision at baseline. Although cataract surgery effectively lowers IOP and improves visual acuity, irreversible optic nerve damage in late presenter's limits recovery. Early detection, community awareness, timely referral, and prompt surgical intervention remain crucial to prevent avoidable blindness from Lens Induced Glaucoma.

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Author Contribution

Dr. Prabhat Kiran Devkota[1]: Concept, study design, data analysis, manuscript writing. Ms. Shital Khattri Chattri[2], Ms. Anita Yogi[3]: Data collection, literature review. Dr. Sushila Pokhrel[4], Mrs. Saraswati Khadka Thapa[5]: Supervision & final approval

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