

Visual Outcome in Patients with Phacomorphic Glaucoma After Manual Small Incision Cataract Surgery

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ABSTRACT

Background: Phacomorphic glaucoma is a sight-threatening secondary angle-closure glaucoma caused by an intumescent cataractous lens, leading to a shallow anterior chamber, raised intraocular pressure, pain, redness, and marked visual loss. Manual small-incision cataract surgery is a practical and effective option in such settings, but visual outcome may depend on the timing of presentation and the severity at admission. **Aim of the study:** This study aimed to assess visual outcomes in patients with phacomorphic glaucoma following manual small-incision cataract surgery. **Methods & Materials:** This hospital-based prospective observational study was conducted at the National Institute of Ophthalmology and Hospital, Dhaka, Bangladesh, from January to June 2025. A total of 50 clinically diagnosed phacomorphic glaucoma patients were enrolled purposively. All patients underwent manual small incision cataract surgery, with posterior chamber intraocular lens implantation. Follow-up was done on the 1st postoperative day, at 1 week, 4 weeks, and at the final visit to assess visual acuity, intraocular pressure, and postoperative complications. Data were analyzed using SPSS version 26.0. **Results:** Among 50 patients, the mean age was 64.8 ± 9.1 years, and most were female (64.0%) and from rural areas (64.0%). The right eye was affected in 54.0% of cases, and most patients presented within 3 to 7 days, with a mean symptom duration of 5.8 ± 3.4 days. Diminution of vision was present in all cases, while ocular pain and redness were also common. Most patients required combination anti-glaucoma therapy preoperatively, and 94.0% underwent MSICS with PCIOL implantation. Visual outcome improved progressively during follow-up, and at final follow-up, 64.0% achieved good vision, 26.0% had moderate vision, and 10.0% had poor vision. Most patients, 72.0%, had no postoperative complications; persistent corneal oedema was the most common complication, and no case of endophthalmitis was observed. **Conclusion:** Manual small incision cataract surgery provided a favourable visual outcome in most patients with phacomorphic glaucoma. The majority achieved good final vision with a low rate of serious postoperative complications.

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INTRODUCTION

Phacomorphic glaucoma is a vision-threatening form of secondary angle-closure glaucoma. It is caused by an intumescent cataractous lens, which produces shallowing of the anterior chamber and a rapid rise in intraocular pressure. This often results in pain, redness, corneal oedema, and profound visual loss^[1-3]. Its relevance is amplified by the

continuing global burden of cataract and glaucoma. In 2020, cataract remained the leading cause of blindness in adults aged 50 years and older. It accounted for about 15.2 million blind people globally. Glaucoma causes about 3.6 million cases of blindness and another 4.1 million cases of moderate-to-severe visual impairment ^[1,4,5]. Cataract alone accounted for 39.55% of global blindness in 2020. South Asia had the highest proportion of cataract-related blindness worldwide [4]. The problem is especially relevant in South Asia and Bangladesh. In these regions, delayed cataract surgery still contributes substantially to avoidable blindness ^[4,6-8]. A recent national survey in Bangladesh reported blindness prevalence among adults. It highlighted the continuing importance of age-related eye disease in the country ^[6]. Another population-based Bangladeshi study found glaucoma in 3.2% of people aged 35 years and older. This suggests a large pool of individuals at risk of glaucoma-related visual morbidity ^[7]. At the same time, South Asian evidence shows persistent barriers to timely cataract surgery, particularly among women. Eliminating gender disparity could meaningfully reduce cataract blindness in the region ^[8]. These epidemiological realities create the context in which advanced cataract may still present as phacomorphic glaucoma in tertiary hospitals. Clinically, phacomorphic glaucoma is important because visual prognosis depends not only on successful lens extraction but also on the timing of presentation, the severity of preoperative intraocular pressure elevation, associated inflammation, and surgical safety ^[2,3,9,10]. Manual Small Incision Cataract Surgery (MSICS) remains highly relevant in low-resource settings. It is less expensive, quicker to perform, widely applicable, and suitable for dense cataracts. It still offers good visual rehabilitation ^[11]. Outcome studies have shown that cataract surgery can effectively lower intraocular pressure and restore useful vision in many cases of lens-induced glaucoma. However, delayed presentation is consistently associated with poorer recovery ^[2,3,9,10]. In a Bangladeshi tertiary eye care report, most patients presented late, with severe visual loss at baseline. Yet, vision and intraocular pressure improved after small-incision cataract surgery ^[3]. Larger contemporary studies have similarly shown that shorter symptom duration is associated with better postoperative visual acuity and better intraocular pressure control ^[9,10]. Even so, the available literature still leaves an important gap. Much of the recent evidence comes from India or from mixed lens-induced glaucoma cohorts. Bangladesh-specific published data appear limited and often combine phacomorphic and phacolytic cases rather than focusing exclusively on phacomorphic glaucoma after MSICS ^[3,9,10]. In addition, differences in presentation, surgical technique, biometric risk factors, and follow-up make it difficult to generalize findings across settings ^[9-13]. Therefore, the aim of the present study was to assess visual outcomes in patients with phacomorphic glaucoma following manual

small-incision cataract surgery.

METHODOLOGY & MATERIALS

This hospital-based prospective observational study was conducted at the National Institute of Ophthalmology and Hospital, Dhaka, Bangladesh, from January to June 2025. A total of 50 patients diagnosed clinically with phacomorphic glaucoma were enrolled purposively during the study period. Adult patients of either sex presenting with an acute rise of intraocular pressure associated with intumescent or mature cataract, shallow anterior chamber, ocular pain, redness, and diminished vision were included. Patients with traumatic cataract, lens-induced glaucoma other than phacomorphic type, pre-existing advanced glaucoma, corneal opacity obscuring examination, retinal or optic nerve disease affecting vision, and those unwilling to participate were excluded. After obtaining informed written consent, each patient was evaluated using a predesigned data collection sheet. Detailed history was taken regarding age, sex, residence, occupation, duration of symptoms, presenting complaints, and systemic comorbidities. Ocular examination included assessment of visual acuity, slit lamp biomicroscopy, intraocular pressure measurement, anterior chamber depth, pupil status, lens status, and posterior segment evaluation whenever possible. Initial medical treatment was given to control intraocular pressure before surgery. All patients underwent manual small-incision cataract surgery, with posterior chamber intraocular lens implantation, depending on intraoperative conditions. Operative details, type of anaesthesia, and intraoperative complications were recorded. Postoperative follow-up was performed on the 1st postoperative day, at 1 week, 4 weeks, and at the final follow-up, during which visual acuity, intraocular pressure, and postoperative complications were assessed.

The primary outcome variable was final visual acuity after surgery. Data were analyzed using SPSS version 26.0. Categorical variables were expressed as frequencies and percentages, while quantitative variables were presented as means $\pm$ standard deviations.

RESULTS

Among the 50 patients, the largest age group was 60–69 years, comprising 21 cases (42.0%), followed by ≥ 70 years, with 14 cases (28.0%). The mean age was 64.8 ± 9.1 years. Females were predominant (32 cases, 64.0%), and most patients came from rural areas (32 cases, 64.0%). The most common occupation was housewife, with 28 cases (56.0%) [Table I].

Table I: Socio-demographic characteristics of the study population (n = 50)

Variables	Frequency (n)	Percentage (%)
Age group (years)		
< 50	3	6.00

50–59	12	24.00
60–69	21	42.00
≥ 70	14	28.00
Mean ± SD	64.8 ± 9.1	
Sex		
Male	18	36.00
Female	32	64.00
Residence		
Urban	18	36.00
Rural	32	64.00
Occupation		
Housewife	28	56.00
Service	7	14.00
Business	6	12.00
Farmer	5	10.00
Others	4	8.00

The right eye was slightly more commonly affected in 27 cases (54.0%). Most patients (24 cases, 48.0%) presented within 3–7 days, with a mean symptom duration of 5.8 ± 3.4 days. Diminution of vision was present in all patients (100.0%), followed by ocular pain (92.0%) and redness (84.0%). Regarding comorbidities, hypertension was the most common single condition, with 14 cases (28.0%), while 28.0% had no comorbidity [Table II].

Table II: Clinical presentation of patients with phacomorphic glaucoma (n = 50)

Variables	Frequency (n)	Percentage (%)
Affected eye		
Right	27	54.00
Left	23	46.00
Duration of symptoms before presentation		
< 3 days	14	28.00
3–7 days	24	48.00
> 7 days	12	24.00
Mean ± SD (days)	5.8 ± 3.4	
Presenting complaints		
Diminution of vision	50	100.00
Ocular pain	46	92.00
Redness	42	84.00
Watering	38	76.00
Headache	27	54.00
Nausea/vomiting	18	36.00
Systemic comorbidities		
Diabetes mellitus	10	20.00
Hypertension	14	28.00
Both DM and HTN	9	18.00
None	14	28.00
Others	3	6.00

More than half of the patients (28 cases, 56.0%) required combination anti-glaucoma therapy before surgery. Most surgeries were performed within 24–48 hours (22 cases, 44.0%), while 40.0% were performed within 24 hours. Nearly all patients underwent MSICS with PCIOL implantation (47 cases, 94.0%). Peribulbar anaesthesia was used in 42 cases (84.0%), and no intraoperative complications occurred in 43 cases (86.0%) [Table III].

Table III: Preoperative management and operative profile (n = 50)

Variables	Frequency (n)	Percentage (%)
Preoperative anti-glaucoma medication used		
Topical medication only	9	18.00
Oral acetazolamide	8	16.00
Intravenous mannitol	5	10.00
Combination therapy	28	56.00
Time from admission to surgery		
Within 24 hours	20	40.00
24–48 hours	22	44.00
> 48 hours	8	16.00
Type of surgery		
MSICS with PCIOL	47	94.00
MSICS without IOL	3	6.00
Anaesthesia		
Peribulbar	42	84.00
Retrobulbar	7	14.00
Topical	1	2.00
Intraoperative complications		
None	43	86.00
Posterior capsular rent	3	6.00
Vitreous loss	2	4.00
Zonular dialysis	1	2.00
Others	1	2.00

Visual outcome improved progressively over follow-up. On the 1st postoperative day, most patients had moderate vision (26 cases, 52.0%), while 32.0% had poor vision. By the final follow-up, good vision increased to 32 cases (64.0%), whereas poor vision decreased to 5 cases (10.0%) [Table IV].

Table IV: Visual acuity outcome at different follow-up visits (n = 50)

Follow-up visit	Good vision n (%)	Moderate vision n (%)	Poor vision n (%)
1 st postoperative day	8 (16.0)	26 (52.0)	16 (32.0)
1 week	18 (36.0)	22 (44.0)	10 (20.0)
4 weeks	28 (56.0)	16 (32.0)	6 (12.0)
Final follow-up	32 (64.0)	13 (26.0)	5 (10.0)

At the final follow-up, the majority of patients achieved a good visual outcome (32 cases, 64.0%). A moderate visual outcome was observed in 13 cases (26.0%), while only 5 cases (10.0%) had a poor visual outcome [Table V].

Table V: Final visual outcome following MSICS (n = 50)

Final visual outcome	Frequency (n)	Percentage (%)
Good (6/12 or better)	32	64.00
Moderate (< 6/12 to 6/60)	13	26.00
Poor (< 6/60)	5	10.00

Most patients had no postoperative complications (36 cases, 72.0%). The most common complication was persistent corneal oedema (5 cases, 10.0%), followed by anterior uveitis (3 cases, 6.0%). Raised IOP and posterior capsular opacification each occurred in 2 cases (4.0%), while endophthalmitis was not observed [Table VI].

Table VI: Postoperative complications during follow-up (n = 50)

Complications	Frequency (n)	Percentage (%)
No complication	36	72.00
Persistent corneal edema	5	10.00
Anterior uveitis	3	6.00
Raised IOP	2	4.00
Optic atrophy	1	2.00
Posterior capsular opacification	2	4.00
IOL decentration	1	2.00
Endophthalmitis	0	0.00
Others	0	0.00

DISCUSSION

In this study of 50 patients with phacomorphic glaucoma, the mean age was 64.8 ± 9.1 years, 64.0% were female, and 64.0% came from rural areas. This demographic pattern is broadly consistent with recent South Asian and Southeast Asian series, in which the mean age usually ranged from about 60.7 to 70.2 years, and women predominated [2,14,15]. Our rural predominance also aligns with Venkataratnam et al., who reported that 73.6% of patients were rural, suggesting that delayed cataract care remains concentrated in underserved populations [16]. The common presenting complaints in our series, diminution of vision (100%), ocular pain (92.0%), and redness (84.0%), were very similar to reports from Malaysia and Nepal, where reduced vision affected 94.7% to 100%, pain 84.2% to 96.2%, and redness 62.3% to 81.6% of cases [15,17]. These similarities support the typical acute inflammatory and pressure-related presentation of phacomorphic glaucoma. The mean symptom duration in our study was 5.8 ± 3.4 days, and 48.0% presented within 3 to 7 days. This is close to the “early presenter” pattern described by Rajkumari et al., where 81.5% presented within 10 days, and by Venkataratnam et al., where 61.1% presented within 1 week, although our patients presented somewhat later than those in Jayakumar et al., where the mean duration was 3.38 ± 1.61 days [14,17,18]. This point is clinically important because several studies have shown that shorter symptom duration is associated with better vision. Sharanabasamma and Vaibhav found that 76.2% of patients presenting within 2 weeks achieved 6/12 or better, compared with 12.5% among those presenting later [2]. Chandrashekhara et al. reported that symptoms for less than 1 week were associated with both a higher likelihood of IOP <21 mmHg and BCVA 6/18 or better [10]. Farooq et al. similarly showed that 81.3% of patients with symptoms for ≤ 5 days achieved 6/12 or better, compared with 18.7% among patients with symptoms for > 5 days [13]. Ayub et al. also identified delayed presentation beyond 15 days as a predictor of poorer recovery [19]. Taken together, these data suggest that our moderate delay to presentation may have limited the proportion of excellent final visual outcomes. Surgically, 94.0% of our eyes underwent MSICS with PCIOL, 84.0% received peribulbar anaesthesia, and 86.0% had no intraoperative complication. This supports the continued

practicality of primary lens extraction with IOL implantation in phacomorphic glaucoma. Rajkumari et al. also reported favorable results with MSICS and minimal long-term need for anti-glaucoma medication [14]. Senthil et al. found that cataract surgery alone provided IOP control comparable to combined surgery, with faster and better visual rehabilitation, reinforcing the rationale for avoiding routine combined trabeculectomy in uncomplicated cases [20]. Our intraoperative complication rate was lower than that reported by Yaakub et al., who reported a posterior capsular rupture rate of 21.0%, and also lower than those reported by Jayakumar et al. and Zulaikha et al., who described higher rates of posterior capsular rent, vitreous loss, or zonular dialysis [15,18,21]. This may reflect case selection, surgical expertise, earlier intervention, or the fact that most of our patients underwent standard MSICS with PCIOL rather than more technically demanding combined procedures. Our final visual results were encouraging: 64.0% achieved good vision (6/12 or better), 26.0% had moderate vision, and 10.0% had poor vision. This is remarkably similar to Jayakumar et al. (64.0% with good vision) and Farooq et al. (64.0% with 6/12 or better), and is close to Rajkumari et al., where 70.8% achieved 6/6 to 6/12 [13,14,18]. Our outcome was somewhat lower than the larger retrospective series by Chandrashekhara et al. (72.7% 6/18 or better), Ayub et al. (75.6% 6/18 or better), and Zulaikha et al. (83.3% 6/15 or better), but better than the poorer outcomes seen in Yaakub et al. and Shrestha et al., where only 34.2% and 30.2%, respectively, reached good postoperative vision [14,15,17,19,21]. The likely explanations are differences in presentation time, baseline optic nerve damage, corneal edema, and postoperative follow-up duration. Our complication profile, with 72.0% having no postoperative complication, 10.0% persistent corneal edema, and 6.0% anterior uveitis, compares favorably with reports of striate keratopathy or corneal edema ranging from 10.8% to 32.0%, and postoperative inflammation reaching 20.8% to 45.5% in other series [13-15,18]. Clinically, these findings support early diagnosis, prompt IOP lowering, and definitive cataract extraction, especially in older rural women, to prevent irreversible optic neuropathy and maximize visual recovery.

Limitations of the study: The study was limited by its single-centre design, small sample size, short follow-up period, and lack of a comparison group. These factors may reduce the generalizability of the findings and limit the assessment of long-term outcomes.

CONCLUSION

In conclusion, manual small incision cataract surgery provided a favourable visual outcome in most patients with phacomorphic glaucoma at the National Eye Institute, Dhaka. The majority achieved good final vision with a low rate of serious postoperative complications. Early diagnosis, prompt control of intraocular pressure, and

timely surgical intervention appear essential for better visual recovery in these patients.

RECOMMENDATIONS

Early diagnosis and prompt referral of patients with phacomorphic glaucoma should be emphasized to prevent avoidable visual loss. Timely intraocular pressure control, followed by early manual small-incision cataract surgery, is recommended to improve visual outcome. Community awareness, especially in rural populations, and strengthening cataract surgical services at tertiary eye hospitals may further reduce delay in presentation and treatment.

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