

Visual Outcome after SICS Surgery in KWMC&H, Mirzapur, Tangail

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Abstract

Background: Cataract being one of the leading causes of preventable blindness, is highly prevalent in developing countries like Bangladesh. The National Program for Control of Blindness (NPCB) aims to reduce cataract-related blindness through cataract control programs. The most commonly performed surgical procedure is small-incision cataract surgery (SICS).

Methods: A retrospective longitudinal interventional study was conducted in the Department of Ophthalmology at Kumudini Women's Medical College, Mirzapur, over a period of six months. A total of 103 eyes underwent SICS surgery and were followed for one month to assess postoperative visual outcomes and any complications. During this period, patients were started on a combination of antibiotic and steroid eye drops, which were tapered over four weeks.

Results: Among the participants, 73 patients (70.88%) had good vision, defined as visual acuity of 6/6–6/18, while 29 patients (28.15%) had moderate vision, with visual acuity of <6/18–3/60. One patient was blind, with visual acuity of <3/60. Intraoperative complications occurred in nine patients (8.74%) as posterior capsular rent and in 13 patients (12.62%) as iris prolapse. Postoperatively, hyphema was observed in 7 patients (6.80%).

Conclusion: This study shows that good visual outcomes with a low complication rate can be achieved following SICS with posterior chamber intraocular lens implantation.

Keywords: Senile Cataract, Blindness Prevention, Visual Outcome, Best Corrected Visual Acuity, SICS.

1. INTRODUCTION

Cataract is one of the leading causes of avertible blindness worldwide, contributing to 66.2% of the estimated 50 million cases of preventable blindness [1], with the majority occurring in developing countries, which account for approximately 75% of global blindness [2]. According to population-based research and meta-analyses, cataract is responsible for nearly 47.8%–51% of blindness across the world [3-7]. Overall, around one billion people experience visual impairment that could have been avoided,

of whom approximately 65.2 million are affected specifically due to cataracts [8]. As such, cataract represents a significant public health issue, given that untreated cases substantially compromise both quality of life and overall productivity.

Blindness is appreciably severe in developing countries like Bangladesh due to ignorance, poverty, and the dearth of medical resources in the peripheral areas [1,9]. In Bangladesh, one of the most densely populated developing nations, around 700,000 people live with blindness, with cataract accounting for roughly 80% of these

cases [10,11]. Challenges such as limited healthcare infrastructure and socioeconomic constraints frequently lead patients to present late, sometimes with complications including phacolytic or phacomorphic glaucoma [12,13]. The National Program for Control of Blindness (NPCB) via cataract control programs aims at clearing the backlog of blindness due to cataract [14]. These programs are increasing the number of surgical facilities dispensed, commonly through techniques such as SICS, which can be employed in suboptimal conditions and incurs lower maintenance cost compared to phacoemulsification [15].

Various surgical approaches are employed to manage cataract, including intracapsular cataract extraction (ICCE), extracapsular cataract extraction (ECCE), conventional ECCE, small-incision cataract surgery (SICS), and phacoemulsification [16,17]. While phacoemulsification is commonly utilized in developed countries, the scenario is different in resource-limited settings. Manual SICS has gained widespread popularity and is one of the most frequently performed cataract procedures in developing nations, including Bangladesh. The technique is feasible in less-than-ideal surgical conditions, reduces the high maintenance requirements associated with phacoemulsification, and provides comparable advantages while being more accessible, less time-consuming, and cost-effective [18,19].

SICS takes less time to perform, is more cost-effective, and is considered the most appropriate method to perform high-volume cataract surgeries in developing countries [18]. However, the outcomes of SICS and the improvement in visual acuity of patients' post-surgery are not always as anticipated, and more attention needs to be paid to the surgical amenities being provided [20]. The purpose of our study is to determine the visual acuity and outcome in patients who underwent SICS in a tertiary hospital in KWMC&H.

2. OBJECTIVE

The aim of this study was to assess the visual acuity and outcomes in patients who underwent SICS surgery at KWMC&H.

3. METHODOLOGY & MATERIALS

This retrospective longitudinal interventional study was conducted in the Department of Ophthalmology at Kumudini Women's Medical College, Mirzapur, between January 1, 2023, and June 30, 2023. A total of 103 patients aged above 40 years, presenting with diminution of vision

due to cataract and undergoing SICS surgery, were included. Only patients diagnosed with stage III or IV pelvic organ prolapse, measured by the POP-Q system, were considered for the study to evaluate visual outcomes and complications following SICS with PCIOL implantation.

Inclusion Criteria

- All the patients above the age of 40 years having diminution of vision due to cataract who underwent cataract surgery by SICS were included in the study.

Exclusion Criteria

- Patients below the age of 40 years and those with other causes of diminution of vision, such as glaucoma, diabetic retinopathy, corneal opacities, any macular pathology, chronic kidney disease, active malignant disease, and traumatic cataract, were excluded from the study.

All patients underwent a detailed history and comprehensive ocular examination, including visual acuity, intraocular pressure by non-contact tonometer, sac patency test, fundus examination, and systemic assessment including blood pressure and random blood sugar, with physician clearance for surgical fitness. HbsAg serology was performed for all patients. Preoperatively, antibiotic eyedrops were instilled one day before surgery, and tropicamide with phenylephrine eyedrops were used for pupil dilation.

Surgeries were performed by a single surgeon under aseptic precautions after written informed consent. A peribulbar block was administered, a universal eye speculum applied, and a superior rectus bridle suture placed. A fornix-based conjunctival flap was raised, hemostasis achieved with wet field cautery, and a straight scleral incision made 2 mm behind the limbus. A scleral tunnel was created using a crescent knife, anterior chamber entry performed with a keratome, and anterior capsulotomy carried out. Hydro dissection, nucleus prolapse, and delivery using the phacosandwich technique were followed by cortical aspiration and PCIOL implantation in the capsular bag. Anterior chamber wash was performed, and subconjunctival dexamethasone plus gentamycin administered.

Postoperatively, patients received oral antibiotics for three days and analgesics as required. Topical antibiotic-steroid drops were tapered over four weeks, and tropicamide eyedrops were given

once nightly for one week. Visual acuity was assessed on day 1, week 1, and week 4. Cataract was defined as clouding of the crystalline lens partially or completely obstructing the red reflex [21]. Visual outcomes were categorized per WHO: normal to mild (6/6–6/18), moderate (<6/18–6/60), severe (<6/60–>3/60), and blind (<3/60) [1].

4. RESULTS

Data were analyzed using R 4.1.1 and Microsoft Excel.

Continuous variables were expressed as mean ± SD, categorical variables as frequency and percentage, and pre- versus postoperative vision was compared using the McNemar test, with $p \leq 0.05$ considered statistically significant.

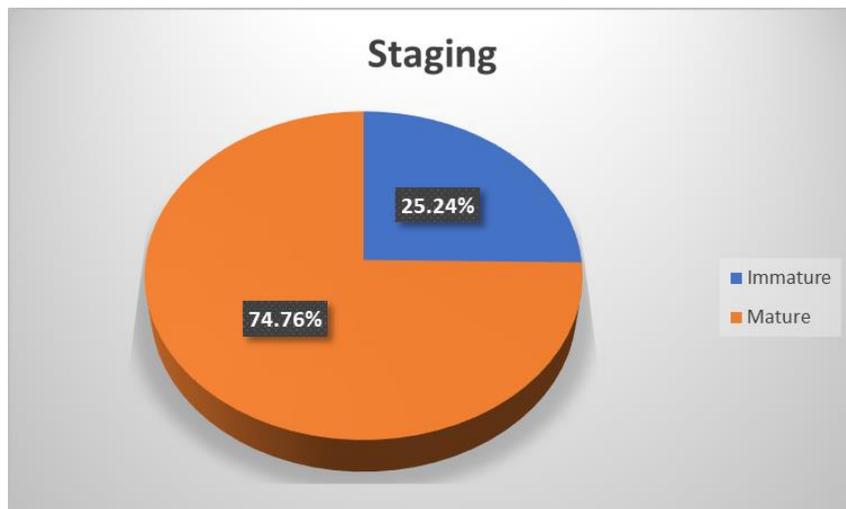


Figure 1. Staging of Cataract Among Study Eyes (n = 103)

A total of 103 eyes were included in the study. Of these, 26 eyes (25.24%) had immature cataracts, while 77 eyes (74.76%) were classified as mature cataracts.

Table 1. Demographic Characteristics of the Study Patients (n = 103)

Variable		Number of Patients	Percentage (%)
Age (years)	40–49	7	6.8
	50–59	23	22.33
	60–69	41	39.81
	70–79	21	20.39
	80–89	11	10.68
Gender	Female	63	61.17
	Male	40	38.83

The age distribution of the patients showed that the majority were between 60–69 years (41 patients, 39.81%), followed by 50–59 years (23 patients, 22.33%), 70–79 years (21 patients, 20.39%), 80–89 years (11 patients, 10.68%), and 40–49 years (7 patients, 6.8%). Regarding gender, 63 patients (61.17%) were female and 40 patients (38.83%) were male.

Table 2. Visual Status Before and Four Weeks After SICS (n = 103)

Visual Status		Before SICS	After 4 Weeks of SICS
Blind	<3/60	79 (76.7%)	1 (0.97%)
Visual Impairment	Moderate vision (<6/18 – 3/60)	21 (20.39%)	29 (28.15%)
Good Vision	6/6 – 6/18	3 (2.91%)	73 (70.88%)

Visual outcomes after Small Incision Cataract Surgery (SICS) demonstrated significant improvement. Before surgery, 79 eyes (76.7%) were classified as blind (<3/60), 21 eyes (20.39%) had moderate visual impairment (<6/18

– 3/60), and 3 eyes (2.91%) had good vision (6/6 – 6/18). Four weeks postoperatively, only 1 eye (0.97%) remained blind, 29 eyes (28.15%) had moderate visual impairment, and 73 eyes (70.88%) achieved good vision.

Table 3. Intraoperative and Postoperative Complications (n = 103)

Complication Type		Number of Eyes (%)
Intraoperative	Posterior capsule rent	6 (5.83%)
	Iris prolapse	7 (6.80%)
Postoperative	Inferior haptic in the AC	1 (0.95%)
	Hyphaema	7 (6.80%)

Intraoperative complications were minimal, with posterior capsule rent occurring in 6 eyes (5.83%) and iris prolapse in 7 eyes (6.80%). Postoperative complications included inferior haptic in the anterior chamber in 1 eye (0.95%) and hyphaema in 7 eyes (6.80%).

5. DISCUSSION

This was a retrospective longitudinal study conducted in a tertiary hospital in Mirzapur, assessing the visual outcomes and complications over four weeks in patients who had undergone SICS. The age distribution showed that the majority of patients were in the range of 60–69 years, with a mean age of 62.37 ± 9.01 years. This is very similar to previous studies. Wetarini et al. [15] found that 43.5% of cataract patients were in this age group, with a mean age of 63 ± 10 years in Bali, Indonesia. Nwosu et al. [22] in Nigeria reported comparable findings with a mean age of 64 years, while studies conducted in India also showed similar results. Khandekar et al. [23] conducted a study in central India and found that 41.86% of patients were in the age group of 61–70 years. More women (61.17%) were found to have cataract in our study.

Prior studies have shown that women have a higher age-adjusted risk of developing cataract than men. This could be due to the longer average lifespan of women, resulting in a higher prevalence of cataract surgery [23–26]. Cataract remains a major contributor to blindness in Bangladesh as well as around the world. The presenting visual acuity in our study is comparable to other studies [27]. Most studies indicate that in developing countries, the majority of patients present to hospitals at a stage when they are blind or nearly blind in at least one eye [28–30], as opposed to developed countries, where patients present earlier, with better visual acuity. In a study conducted in Sub-Saharan Africa, the predominant visual acuity (36.9%) was hand motion close to face [28]. A study in Nepal concluded that one in eight patients in the sample population operated for cataract were blind at presentation [30].

Results were assessed based on visual grading categorized by the World Health Organization

(WHO). A total of 73 patients (70.88%) had good vision, i.e., visual acuity of 6/6 – 6/18, followed by 29 patients (28.15%) with moderate vision, i.e., visual acuity of <6/18 – 3/60, and one patient was blind, with visual acuity of <3/60. Intraoperative complications were observed in nine patients (8.74%), including posterior capsular rent, and iris prolapse occurred in 13 patients (12.62%). Postoperatively, seven patients (6.80%) developed hyphema.

According to the WHO and the International Agency for the Prevention of Blindness (IAPB) action plan, >85% of patients should achieve good vision (6/6 – 6/18) after cataract surgery [31]. Our study exceeded this target at the four-week follow-up period. Assessing visual acuity post-cataract surgery is a routine practice for surgical evaluation. Various factors influence the visual outcome, such as the stage of cataract, ocular and systemic comorbidities, surgical technique, surgical skills, and intraoperative complications [32–34].

Our study had fewer overall complications (2.86%), including posterior capsular rent, iris prolapse, and hyphema, compared to other studies that reported higher complication rates [23,35,36]. The limitation of our study is its small sample size of 103 eyes and a short follow-up duration of one month postoperatively. Therefore, a larger sample size with a longer observation period is ideally required to accurately assess visual outcomes post-SICS.

6. CONCLUSION

This study, conducted at a tertiary hospital in Bangladesh, demonstrates that good visual outcomes with a low complication rate can be achieved after SICS with PCIOL implantation. Cataract surgery remains the only available definitive solution, and SICS performed in this study showed favorable visual outcomes. It is an easily accessible, affordable technique that can be safely implemented on a large scale in developing countries. This study demonstrates that SICS can serve as an effective and affordable treatment option, particularly in regions of the country lacking advanced resources. It is an

excellent tool for eliminating preventable blindness due to cataract.

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