



A PROSPECTIVE OBSERVATIONAL STUDY FROM A TERTIARY CARE CENTER

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**ABSTRACT**

**Purpose:** To evaluate the incidence, risk factors, and outcomes of corneal complications following cataract surgery. **Methods:** A prospective observational study was conducted on 200 patients undergoing either Phacoemulsification or Manual Small Incision Cataract Surgery (MSICS). Preoperative and postoperative assessments were performed, including visual acuity, slit-lamp biomicroscopy, tonometry, and keratometry. Postoperative evaluations were conducted on Day 1, Week 1, and Week 6. Corneal complications, visual outcomes, and surgically induced astigmatism were assessed. **Results:** Phacoemulsification showed superior early visual outcomes and significantly less surgically induced astigmatism ( $0.42 \pm 0.32$  D) compared to MSICS ( $0.81 \pm 0.56$  D). Corneal edema and other complications were more frequent in the MSICS group. However, both techniques had comparable intraoperative complication rates. **Conclusion:** Phacoemulsification offers better early visual recovery and lower astigmatism. MSICS remains an effective, economical option for high-volume surgeries in resource-limited settings.

**KEYWORDS :** Cataract surgery, Phacoemulsification, MSICS, corneal edema, surgically induced astigmatism, visual acuity

**INTRODUCTION**

Cataract remains the leading cause of curable blindness globally, particularly in developing countries. In India, cataracts contribute to over 60% of blindness. While Phacoemulsification is the preferred technique in high-resource settings, MSICS is widely used in developing regions due to its cost-effectiveness and suitability for dense cataracts.

The cornea plays a pivotal role in vision; therefore, postoperative corneal complications can severely affect outcomes. This study focuses on evaluating corneal complications following cataract surgery and comparing outcomes between Phacoemulsification and MSICS.

**Aims And Objectives**

**Primary Aim:**

To evaluate the incidence of corneal complications after cataract surgery.

**Objectives:**

To identify risk factors contributing to corneal complications.

To assess preventive measures.

To evaluate final visual outcomes post-surge

**MATERIALS AND METHODS**

**Study Design**

Prospective observational study conducted in the Department of Ophthalmology.

**Sample Size**

200 patients based on OpenEpi calculation (5% significance, 20% allowable error).

**Inclusion Criteria**

Patients <80 years undergoing cataract surgery with informed consent.

**Exclusion Criteria**

Traumatic or congenital cataracts, prior intraocular surgeries, glaucoma, retinal pathology, pseudoexfoliation, or

immunocompromised status.

**Preoperative Evaluation**

Visual acuity (UCVA/BCVA), slit-lamp biomicroscopy, fundus exam, IOP (Applanation), sac syringing, keratometry, and A-scan biometry.

**Surgical Procedure**

Patients underwent either Phacoemulsification or MSICS under standard protocols.

**Postoperative Evaluation**

Conducted on Day 1, Week 1, and Week 6: Visual acuity, slit-lamp exam, keratometry, and fundus evaluation.

**Statistical Analysis**

Data analyzed using SPSS v21.

Mean  $\pm$  SD for quantitative data, percentages for categorical variables.

Tests used: t-test, Mann-Whitney U, Chi-square.

p < 0.05 considered statistically significant.

**RESULTS**

**Demographics**

**Mean Age:**  $64.2 \pm 7.76$  years

**Gender:** 57.5% female

**Laterality:** Right eye – 54.5%, Left eye – 45.5%

**Preoperative Visual Acuity**

53.5% had BCVA < 6/60

**Cataract Grading (Top Categories):**

**NS Grade 2 + PSC:** 24.5%

**NS Grade 2 + PSC + CC:** 16.0%

**NS Grade 3 + PSC:** 12.0%

**Intraoperative Complications**

**Comparable between groups:**

**Iris Prolapse:** Phaco (5%), SICS (4%)

**Posterior Capsular Rupture:** Phaco (5%), SICS (3%)

**DMD:** Phaco (1%), SICS (3%)  
**Postoperative Visual Acuity** (6/6)

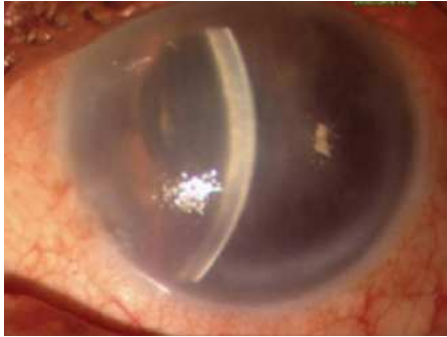
**Corneal Complications**

**Day 1: Corneal edema:** Phaco (8%), SICS (17%)

**Striate Keratopathy:** Phaco (2%), SICS (6%)

**Week 1: Corneal edema:** Phaco (0%), SICS (10%)

202Venkatesh R, et al. Outcomes of cataract surgery using MSICS vs Phaco. Indian J Ophthalmol. 2014;62(1):59–64. Ruit S, et al. Low-cost high-volume MSICS. Br J Ophthalmol. 2007;91(1):110–115. Zhang J, et al. Meta-analysis of phaco vs MSICS outcomes. Ophthalmology. 2016;123(2):284–292. Pham N, et al. Visual outcomes after cataract surgery in rural India. Clin Ophthalmol. 2020;14:1849–1856.



**Corneal edema and increased corneal thickness.**

Time Point	Phaco (%)	SICS (%)	p-value
Day 1	30	4	<0.05
Week 1	51	9	<0.01
Week 6	77	67	0.156



**Corneal edema with descemet's membrane detachment**

**Corneal Decompensation:** SICS (1%)  
 Surgically Induced Astigmatism (at 6 weeks)  
**Phaco:** 0.42 ± 0.32 D  
**SICS:** 0.81 ± 0.56 D (p < 0.01)

**DISCUSSION**

This study demonstrated that Phacoemulsification provides faster visual recovery and lower astigmatism, while MSICS, although more associated with transient corneal edema, is a viable and economical alternative. Intraoperative complications were similar, suggesting that both techniques are safe in experienced hands.

Other studies (Zhang et al., Ruit et al.) support these findings. MSICS remains a practical solution for dense cataracts and in rural or resource-poor settings, especially when combined with trypan blue and advanced techniques.

Limitations include short follow-up and lack of analysis on surgeon variability and endothelial cell count. Future studies should address these factors and evaluate long-term visual quality and corneal health.

**CONCLUSION**

Phacoemulsification offers better early postoperative visual outcomes and lower astigmatism, but MSICS remains a cost-effective and reliable option for large-scale cataract management. Both techniques are effective and safe, with surgical outcomes depending significantly on surgeon expertise and patient selection.

**6. REFERENCES**

1. World Health Organization. Global data on visual impairments. WHO;