

A Clinical Study of Corneal Complications of Cataract Surgery at BMIMS, Pawapuri, Nalanda, Bihar

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Abstract

Background: In this study, we examine the prevalence of ocular problems following manual small incision cataract surgery and extra capsular cataract extraction (ECCE) (SICS). We research the many preoperative, intraoperative, and postoperative prophylactic procedures that can be used to prevent these problems as well as the various etiological factors that contribute to them.

Methods: From October 2021 to November 2022, 100 patients underwent cataract surgery at the Department of Ophthalmology, BMIMS, Pawapuri, Nalanda, Bihar. Two groups of patients were randomly assigned. The 50 patients in Group A underwent ECCE with PCIOLs, whereas the 50 patients in Group B underwent minor incision cataract surgery with PCIOLs.

Results: Five post-operative cases (10%) in ECCE and four instances (8%) in SICS experienced corneal edema on the first post-operative day. In 4 cases of ECCE (8%) and 3 cases of SICS (6%), striate keratitis manifested. In contrast to 52% of instances in SICS, nearly 62% of patients who underwent ECCE accepted cylinders between 0.25-0.75 D.

Conclusions: We draw the conclusion from this study that different advancements in cataract surgery have decreased the incidence of corneal complications, assisted in early visual rehabilitation, and minimised post-operative astigmatism by careful selection of incision type and placement for MSICS.

Keywords: Cataract Surgery, Corneal Edema, Extra Capsular Cataract Extraction, Manual Small Incision Cataract Surgery.

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Introduction

The modern goal of cataract surgery is to achieve emmetropia, which is now considered to be a refractive operation, rather than only to restore eyesight. The surgical approach has rapidly changed as a result of the evolving trends in cataract surgery,

moving from intra capsular cataract extraction to extra capsular cataract extraction, from sutured surgery to suture less cataract extraction, to the most cutting-edge technique of phacoemulsification, and so forth. The incidence of corneal complications has decreased as a result of recent

advancements in cataract surgery, but this newer technology has also brought about a number of new complications, including epithelial toxicity, mechanical or toxic endothelium injury, stripped Descemet's membrane (DM), and sterile corneal ulcer. Therefore, the majority of serious corneal problems can be avoided by paying close attention both during and after cataract surgery [1].

The preservation of corneal endothelium function remains a key objective with the development of new cataract surgery procedures. To ascertain the impact of incision size and location on endothelial cell loss, numerous investigations have been carried out [2]. Even though improvements in surgical technique have decreased the frequency of epithelial and fibrous down growth as well as DM separation, prompt reorganization and intervention are essential.

With the emphasis being more on the refractive components of cataract surgery, artificially produced astigmatism has introduced a completely new dimension to cataract surgery in the modern day.

Review of the literature reveals a tendency towards early visual rehabilitation and minimising post-operative astigmatism through careful placement and incision type selection for tiny incision cataract surgery [3].

This study was carried out to shed light on the numerous difficulties associated with manual small incision cataract surgery and standard extra capsular cataract extraction, as well as to pinpoint the underlying causes of these complications.

Material and Methods

From October 2021 to November 2022, this prospective study was conducted in the Department of Ophthalmology, Bhagwan Mahavir Institute of Medical Sciences, Pawapuri, Nalanda, Bihar. 100 cataract

patients were enrolled in this study and were separated into two groups at random. Extra capsular cataract extraction (ECCE) with posterior chamber intraocular lenses was performed on 50 patients in Group A. (PCIOL). 50 patients in Group B had PCIOL-assisted small incision cataract surgery (SICS).

Patients had senile cataracts without any evident retinal pathologies or ocular comorbidities, such as corneal opacity, corneal dystrophy or degeneration, glaucoma, uveitis, or pseudo-exfoliation. Patients with diabetes and hypertension were not included in the study.

A thorough history was obtained. The visual acuity prior to surgery was identified. A thorough fundus examination and slit lamp examination were performed. To verify the effectiveness of the lacrimal passageways, intraocular pressure (IOP) was measured using the Goldmann applanation-tonometer and syringing. IOL power was determined using an A-scan and keratometer.

All procedures were carried out while under peribulbar anaesthetic and a microscope. ECCE or SICS surgeries with PCIOL implantation were completed using standard operating procedure. The sutures were made of 10.0 ethilon. Following surgery, typical post-operative protocols called for the administration of oral antibiotics, analgesics, systemic steroids (only when necessary), and topical antibiotic steroids.

On the first post-operative day, patients were evaluated, and they were released three days later. Every patient was routinely followed up with after one week, six weeks, and three months. After six weeks, visual acuity was tested, and corrective eyewear was given.

Results

50 of the 100 eyes that underwent surgery were the right eye (RE), and 50 were the left eye (LE). 40 women and 60 men participated

in the study (Table 1). 48 developed cataracts and 52 immature cataracts both had surgery. Five cases of corneal oedema (10%) developed in SICS on the first post-operative day, while four cases (8%) developed in ECCE. In 4 SICS patients (8%) and 3 ECCE

cases (6%), striated keratitis manifested. While 52% of cases in the ECCE group fall into this category, over 62% of patients in the SICS group received cylinders between 0.25-0.75 D.

Table 1: Sex wise distribution of patients

Sex	No. of cases	Percentage
Male	60	60%
Female	40	40%
Total	100	100%

The distribution of cataract in various age groups is seen in Table 2. The majority of patients, 40, or 40%, were between the ages of 60 and 69. There were 4 patients (4%) in the 40–49 age group, 21 patients (21%) in the 70–79 age group, 33 patients (33%) in the 50–59 age group, and 2 (2%) in the 80–plus age group.

Table 2: Age wise distribution of patients

Age group (in years)	No. of cases	Percentage
40-49	4	4%
50-59	33	33%
60-69	40	40%
70-79	21	21%
>80	2	2%
Total	100	100%

Table 3 shows that the SICS with PCIOL implantation was performed in 50 cases (50%), ECCE with PCIOL implantation in 50 cases (50%).

Table 3: Type of cataract surgery

Surgery	No. of cases	Percentage
SICS with PCIOL	50	50%
ECCE with PCIOL	50	50%
Total	100	100%

On the first postoperative day, the corneal problems were observed in 16 instances (16%), as shown in Table 4. Striate keratitis was observed in 4 cases (8%) of ECCE with PCIOL and 3 cases (6%), respectively, of SICS with PCIOL. Corneal edoema was observed in 5 (10%) of the cases of ECCE with PCIOL and in 4 (8%), of the cases of SICS with PCIOL.

Table 4: Immediate post-operative corneal complications (first post-operative day)

Corneal complications	No. of cases		Percentage	
	ECCE PCIOL	SICS PCIOL	ECCE PCIOL	SICS PCIOL
Striate keratitis	4	3	8	6
Corneal edema	5	4	10	8
Total	9	7	18	14

Table 5 shows that astigmatism of ≤ 0.75 has been induced in early 62% patients by ECCE and nearly 52% patients who underwent SICS.

Table 5: Estimation of induced astigmatism

Sl. No.	Astigmatism	ECCE (n=50)	SICS (n=50)
1.	0 to 0.75	31(62%)	26(52%)
2.	1.0 to 1.5	13(26%)	14(28%)
3.	1.75 to 2.5	3(6%)	7(14%)
4.	2.51	3(6%)	3(6%)

Discussion

Age-related cataracts are a significant factor in the amount of cataract surgeries performed in various developing nations. Procedures like phacoemulsification remain an expensive modality of therapy for the majority of the people in India, one of the developing nations where cataract backlog is still a serious socioeconomic problem, and they find it difficult to finance it. With the use of trypan blue dye, MSICS appears to be a safe technique, especially for white cataracts [4,5].

The incidence of corneal problems has decreased as a result of recent advancements in cataract surgery. Review of the literature reveals a tendency towards early visual rehabilitation and minimising post-operative astigmatism through careful placement and incision type selection for tiny incision cataract surgery [3-6] When comparing ECCE to SICS, the incidence of striate keratopathy and corneal edoema was highest. The two main factors are enhanced manoeuvring in the anterior chamber (AC) during the expression of the hard nucleus after prolapsing into the AC and the retention of viscoelastic in the anterior chamber (AC) in many cases [7].

After receiving medical care, striate keratitis and ocular edoema disappeared in 8 days. These results were in accordance with the research done by Sudhakar *et al* [3]. They discovered that moderate transitory striate keratitis almost often disappeared three days after surgery.

The findings of this study are equivalent to those of Sudhakar *et al.* and national survey studies [3] In a few ECCE cases, higher induced astigmatism of more than 2.5 D was observed, which may be related to corneal flattening around the incision. As a result, ECCE creates post-operatives that combat astigmatism (ATR).

However, SICS causes less astigmatism than ECCE since it reduces the high levels of astigmatism that already exist and go against the rules, which enhances the visual result. Astigmatism stabilisation is also accomplished at the end of the second day in SICS [7] Due to the self-sealing tunnel, SICS has a greater wound strength. In SICS, the incision's distance from the limbus and lack of sutures, which result in minimal distortion of the central corneal curvature, are credited with the satisfactory visual results.

Conclusion

We draw the conclusion that in the SICS group, ocular complications including striate keratopathy (6%) and corneal edoema (8%) were brief and went away after one week. In contrast to SICS with PCIOL, where it is only 52%, ECCE with PCIOL has a post-operative astigmatism of less than 1 D in 62% of patients. By carefully choosing the incision type and site for MSICS, new advancements in cataract surgery have therefore decreased the incidence of corneal complications, assisted in early visual rehabilitation, and minimised post-operative astigmatism.

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