

# Study of Complications and Outcomes of Phacoemulsification Cataract Surgery

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## Abstract

**Background:** It's unknown if surgical complication rates and long-term visual acuity results differ between patients who had phacoemulsification cataract surgery.

**Objective:** To study the complications and outcomes of phacoemulsification cataract surgery

**Methods:** Out of numerous cataract surgeries performed at the hospital, around 50 patients had developed intra-operative and post-operative complications for phacoemulsification. The operations were carried out under local anaesthetic. The intraoperative problems, as well as the operational step in question, were recorded. Visual acuity and a full anterior and posterior segment evaluation were reported postoperatively.

**Results:** Male predominance was observed with 54% and females were 46%. The male: female ratio was 1.17:1. The mean age was  $52.34 \pm 6.71$  yrs. Majority of the cases around 92% had visual outcome of 6/12 or Better Around 6% had visual outcome of  $< 6/12$  but  $\geq 6/60$  and 2% had visual outcome of  $< 6/60$ .

**Conclusion:** Although the risk of problems from cataract surgery using the phacoemulsification technique is lower, anticipating of these risks, as well as preparation and preventative measures, may help to reduce the risk of difficulties.

**Keywords:** Phacoemulsification, Cataract, Intra-operative complications, Post-operative complications

## Introduction

Despite the fact that cataracts may be quickly and affordably repaired with a conventional procedure, they remain the most common cause of blindness globally. Cataract surgery is one of the most common procedures performed in the world. The operation restores eyesight to the large proportion of individuals who have crystalline lens opacification.<sup>1</sup>

Cataract surgery procedures and outcomes have evolved considerably during the last three decades. In the United States, intracapsular cataract extraction has largely given way to almost entirely extracapsular procedures.<sup>2</sup> Smaller incisions have become the norm, with most surgeons opting for phacoemulsification

as their preferred procedure. Improved intraocular lens materials and designs have accompanied these advancements, making them particularly well adapted for usage with tiny incisions.<sup>3</sup>

More than 20 years ago, phacoemulsification was proposed as a procedure for removing a cataractous lens.<sup>4</sup> The popularity of phacoemulsification has risen dramatically as procedures and equipment have improved, resulting in improved safety and efficiency.<sup>5</sup>

Phacoemulsification had been a breakthrough in cataract surgery. Prior to the development of phacoemulsification, surgeons would remove the entire lens and capsule.<sup>6</sup> It was difficult to place

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an intraocular lens because of this. The eye's lens provides a significant amount of focusing power.<sup>7</sup> Phacoemulsification is usually done at an outpatient surgical centre, and there is no need to stay in the hospital. Local anaesthetic or topical anaesthesia are used during cataract surgery.

## Materials and Methods

**Study setting:** Department of Ophthalmology

**Sample size:** 50 patients with complications for phacoemulsification

### Inclusion Criteria:

- Consecutive phacoemulsification cataract surgeries.
- Age between 40 years to 75 yrs.

### Exclusion Criteria:

- Age < 40 years or > 75 years
- Mature and Hyper mature cataract
- Inability to give informed consent
- Previous intra ocular injury, inflammation or surgery

Out of numerous cataract surgeries performed at the hospital, around 50 patients had developed intra-operative and post-operative complications for phacoemulsification

Uncontrolled diabetes, uncontrolled hypertension, and active infection in any part of the body. Details about the patient's demographics and medical history were obtained. Blood pressure was taken, and regular blood and urine tests were performed. Each patient had a full anterior segment examination, posterior segment examination, intraocular lens powering, and intraocular pressure measurement performed prior to surgery.

The specifics of the pre-operative, operational, and post-operative procedures were recorded. The operations were carried out under local anaesthetic. The intraoperative problems, as well as the operational step in question, were recorded. Visual acuity and a full anterior and posterior segment evaluation were reported postoperatively.

## Observation and Results

50 patients had developed complications for phacoemulsification cataract surgery

**Table 1: Distribution based on Gender**

Gender	Frequency	Percentage
Male	27	54%
Female	23	46%
Total	50	100%

Male predominance was observed with 54% and females were 46%. The male: female ratio was 1.17:1.

**Table 2: Distribution based on Age group**

Age	Frequency	Percentage
41 -50	6	12%
51 - 60	25	50 %
61 - 70	18	36%
>70 years	1	2%

Majority of the patients belonged to the age group of 41 to 50 yrs with 50% frequency, followed by 36% belonging to the age group of 61 to 70 yrs, 12% belonged to the age group of 41 to 50 yrs and 2% belonged to the age group of >70 yrs. The mean age was  $52.34 \pm 6.71$  yrs.

**Table 3: Distribution based on Visual outcome after management**

Visual outcome after management of complications (after 1 month)	Frequency	Percentage
6/12 or Better	46	92 %
< 6/12 but $\geq$ 6/60	3	6%
< 6/60	1	2%
Total	50	100%

Majority of the cases around 92% had visual outcome of 6/12 or Better Around 6% had visual outcome of < 6/12 but  $\geq$  6/60 and 2% had visual outcome of < 6/60.

**Table 4: Distribution based on Intra-operative complications**

Intra-operative Complication	No. of patients (n=23)	Percentage
Posterior capsule rupture with vitreous loss	8	34.78%
Posterior capsule rupture without vitreous loss	4	17.39%
Zonular Dialysis	3	13.04%

Intra-operative Complication	No. of patients (n=23)	Percentage
Descemet's Membrane Detachment	3	13.04%
Failure to implant lens	2	8.69 %
Iris Prolapse	1	4.34%
Capsulorrhexis Extension	1	4.34%
Broken Haptic	1	4.34%

Intraoperative complications like Posterior capsule rupture with vitreous loss was seen in 34.78% of the cases, 17.39% of the cases had Posterior capsule rupture without vitreous loss. Descemet's Membrane Detachment was seen in 13% of the cases. Failure to implant lens was seen in 8.69% of the cases. Iris prolapse, Capsulorrhexis Extension and Broken Haptic was seen in 4.34% of the cases.

**Table 5: Distribution based on Post-operative complications**

Post-operative Complication	No. of patients (n=27)	Percentage
Corneal oedema	10	37.03%
Wound Leak	6	22.22 %
Secondary Glaucoma	4	17.39%
Epithelial defect	3	13.04%
Hyphaemia	2	8.69 %
Retained cortical matter	1	4.34%
Decentred IOL	1	4.34%

Post-operative complications like Corneal oedema was seen in 37% of the cases, wound leak was seen in 22.22% of the cases, Secondary glaucoma was seen in 17.39% of the cases, epithelial defect was seen in 13% of the cases, Hyphaemia was seen in 8.69% of the cases, Retained cortical matter and decentred IOL was seen in 4.34% of the cases each.

## Discussion

Following cataract surgery, phacoemulsification provides desired anatomical and functional results, and it has become the gold standard technique in industrialised nations. It is so reassuring that early best corrected visual acuity correlates equally well with later best corrected vision in these instances as in those with more recent surgery that uses smaller incisions.

Randleman JB et al. reported phacoemulsification under topical anaesthetic done by resident surgeons. A BCVA of 20/40 or greater was reached in 86.6 % of patients. The rate of postoperative complications was 9.9%. In 4.1 % of patients, there was vitreous loss.<sup>8</sup> Aravind et al, also reported the similar outcomes.<sup>9</sup>

A first-day postoperative (POD1) visit is recommended by the American Academy of Ophthalmology in functionally monocular patients who have experienced intraoperative problems or who are at high risk of immediate postoperative issues such as an increase in intraocular pressure (IOP).<sup>10</sup> A follow-up appointment should be planned within 48 hours for people who do not pose these concerns. In contexts where follow-up is inadequate, early vision evaluation for all patients and follow-up examination just for patients who return to the clinic without prompting are appropriate indicators of surgical quality. A progressive training path in which adequate expertise with big incision ECCE comes before learning manual SICS, and phacoemulsification is taught only after manual SICS (which includes capsulorrhexis) is mastered.<sup>11</sup> The cost of the Phaco machine, maintenance and improvements to the equipment and facilities, personnel pay, and consumables are all related with high expenses in phacoemulsification surgery. Phacoemulsification, on the other hand, may be taught to residents with satisfactory aesthetic outcomes and a similar risk of significant surgical problems.

## Conclusion

Although the occurrence of problems associated with cataract surgery using the phacoemulsification technique is low, anticipating of these issues, as well as preparation and preventative measures, may reduce the incidence of these complications.

**Ethical Clearance:** Ethical clearance was obtained from Government Medical College, Nalgonda, prior to the commencement of the study

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**Conflict of interest:** Nil

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