

COMPLICATION RATE IN PRELIMINARY EXPERIENCE IN PHACOEMULSIFICATION CATARACT SURGERY

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ABSTRACT

Objective: To describe the perioperative and postoperative complications related to cataract surgery performed by phacoemulsification technique at Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad Medical Complex Peshawar.

Methodology: One hundred consecutive cataract operations using phacoemulsification were performed from January 2011 to December 2011 at the KIOMS. After thorough examination and investigations, patients were operated. Most were operated using peribulbar anesthesia. First examination was done on the first post-operative day and then patients were followed after three weeks and eight weeks. Their per-operative and postoperative complications were analyzed and compared with complication rates reported in other studies.

Results: Total 100 cases were included in the study with 30 patients having bilateral and 40 patients having unilateral cataract. The mean age of patients was 57.4 ± 9.3 years. Posterior capsular rupture in 19 (19%) patients was the most common intraoperative complication. Corneal edema in 49 (49%) patients on first postoperative day was most common post operative complication. After three weeks the vision was 6/12 or better in 80 (80%) of cases.

Conclusion: Posterior capsular rupture and corneal edema were most common intraoperative and postoperative complications respectively. Majority of patients had 6/6-6/12 vision by the end of first three weeks of cataract surgery.

Key Words: Cataract surgery, Complications, Lens, Phacoemulsification, Posterior capsule surgery.

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INTRODUCTION

Cataract is the commonest age related disease in most countries worldwide^{1, 2}. Number of treatable cataract-blind throughout the world is increasing, particularly in developing nations. According to the World Health Organization's definition of blindness (best corrected acuity less than 20/400 in the bet-

ter-seeing eye), there are an estimated 5 million cataract-blind in India, 2 million in China, and at least 3 million in Africa; and the numbers are increasing^{3,4}. Techniques for cataract surgery in the developing world have changed dramatically during the last decade. For years, intracapsular cataract surgery was the procedure of choice⁵, and less than a decade ago it was considered impractical to perform large-scale extracapsular cataract extraction or posterior chamber intraocular lens implantation⁵. In the era of modern cataract surgery phacoemulsification is the most demanded procedure by cataract patients and patients' expectations are high about the outcome. To stay in practice it is becoming essential to learn the art and science of phacoemulsification as stated by Durrani J "We must not succumb to inertia and stay static or else the world will pass by"⁶. To determine the feasibility of using phacoemulsification in the setting of a developing country, we performed the following prospective study to evaluate the immediate complications after phacoemulsification in

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100 cases. The study's goals were to quantify the surgical complications and to determine whether adequate results in terms of visual acuity could be obtained.

METHODOLOGY

One hundred consecutive cataract operations using phacoemulsification were performed from January 2011 to December 2011 at KIOMS by the first author having preliminary experience in phacoemulsification cataract surgery. Eyes with glaucoma, pseudoexfoliation, or prior ocular surgery were not selected for phacoemulsification during the course of the study. Complete preoperative evaluation that included a comprehensive eye examination, a measurement of best corrected Snellen visual acuity, fundus examination, and the recording of demographic information was done. Routine laboratory investigations were done. In majority of patients, peribulbar anaesthesia was given. Superior rectus suture was needed in 34% of cases. Pupils were dilated with tropicamide 1% and phenylephrine 10% eye drops. Three-step tunnel incision was given at about 11 O' clock position with 3.2 mm keratome. Anterior chamber was filled with methylcellulose 2%. The surgical technique included continuous-tear capsulorrhexis, using a bent needle or utrata forceps, hydrodissection, and bimanual divide-and-conquer technique was used for nucleus removal. Depending on availability, a one-piece or a three-piece polymethylmethacrylate posterior chamber intraocular

lens was implanted in all eyes. After the procedure, intracameral antibiotics were injected in all patients. At the time of surgery, the following information were recorded: time from initial incision to injection of postoperative antibiotics, phacoemulsification time (normalized for phacoemulsification power), and occurrence of intraoperative complications. Patients were followed in the OPD next day, after three weeks and after eight weeks.

RESULTS

Total of 100 cases were included with 30 patients having bilateral and 40 having unilateral cataract. The mean age of patients was 57.4 ± 9.3 years. Various Types of anaesthesia used in this study are given in Table 1. On first post-operative day the vision was less than 6/60 in majority of patients as in Table 2. 6/12 and better visual acuity were achieved in majority of patients after three weeks Table 2. The intra-operative & early post-operative complications are given in Table 3 & Table 4 respectively. The commonest intraoperative complication was posterior capsular rupture seen in 19 (19%) of the cases. Among the early post-operative complications corneal oedema was the commonest cause for reduced vision on the first post-operative day accounting for 49 (49%) of cases. Corneal oedema was present in 49 (49%) of cases, which was the main cause for reduced vision on first post-operative day. After three weeks the vision was 6/12 or better in 80% of cases.

Table 1: Type of anaesthesia

Anaesthesia	Percentage (n)
Peribulbar	60% (60)
Topical	40% (40)
Facial block	17% (17)

Table 2: Post-operative visual acuity

Snellen's vision	% (n) of patients on day 1	% (n) of patients at 3 weeks
6/6-6/12	21% (21)	80% (80)
6/18-6/60	30% (30)	11% (11)
6/60-CF	47% (47)	5% (5)
<CF	2% (2)	3% (3)
NPL	0	1% (0.67)
Total	100% (100)	100% (100)

Table 3: Intraoperative complications

Complications	% (n)
Posterior capsule tear	19% (19)
Iris damage	7% (7)
Iris prolapsed -Zonular dehiscence	11% (11)
Hyphema	3% (3)
Nucleus lost into vitreous	1% (1)
Vitreous loss	1% (1)

Table 4: Complications after operation

Complications	% (n)
Transient corneal edema and striate keratopathy	49% (49)
Uveitis	3% (3)
Endophthalmitis	1% (1)
Decentration of IOL	1% (1)
Bullous keratopathy	2% (2)
Iris atrophy	0% (0)

DISCUSSION

In our setup, phacoemulsification is a new procedure and most of the consultants do other procedure as extracapsular cataract surgery⁷ and manual small incision cataract surgery.

Posterior capsule tear occurred in 49 cases included in this study (19%). This rate is higher than the rate reported by experienced ophthalmologists (0.45%–2.5%)⁸⁻¹⁰. Not all of cases of posterior capsule tear resulted in vitreous loss. The rate of vitreous loss, 1% in this study, is also comparable with previous reports of resident-performed cataract surgery in the literature (1.3–14.7%)¹¹ and is still higher than the incidence of vitreous loss reported by experienced ophthalmologists⁸⁻¹⁰. For relatively new surgeons, the cases performed were frequently challenging, however the surgeon have previous experience in capsulorrhexis as in many other reported series where the residents usually have performed many ECCE surgeries before performing phacoemulsification¹².

The skills of manipulating the nucleus away from the posterior capsule, iris, and the corneal endothelium are probably related to surgeon experience. The complication rates that we observed are likely to be related to the surgeons' overall level of skill and experience. The complication rate could decline more slowly for surgeons with less extracapsular cataract surgical experience. As one of the main components in phacoemulsification is capsulorrhexis, which is difficult to perform and without that phacoemulsification is not possible, surgeon has to have complete expertise over that.

The complication rates observed were much higher and needs further evaluation of phacoemulsification as a safe alternative to conventional extracapsular cataract extraction in the developing world. Our study has some limitations. It was not designed to answer the questions of speed of visual rehabilitation or long-term success - it dealt only with complications detected during surgery or on the first post-operative day. We do not know whether the initial complications we report, correlate with a long-term decrease in visual acuity. However, many of the complications are minor and are unlikely to result in marked visual loss. The results obtained in our study may or may not be generalizable to other groups learning phacoemulsification, to less experienced surgeons, to other surgeons with prior experience in phacoemulsification, or in other geographic regions. The availability of a tutor¹³⁻¹⁵ (a faculty member who helps a resident during a case) might also influence the types and number of intraoperative complications. We did not attempt to compare prospectively the complications associated with phacoemulsification and traditional extracapsular cataract surgery. The current results may be viewed in the context of the existing complication rate of extracapsular surgery in developing countries^{4,16,17} and the complication rate of phacoemulsification in the hands of experienced surgeons in the United States^{18,19}. The patients who underwent cataract surgery in the current study are relatively young but similar to the age at surgery in other developing nations. As would be expected, our complication rate was higher than that in the United States study^{18,20} as our surgeons

are learning, the phacoemulsification procedure. But the rate was lower than that in another recent study involving one surgeon's preliminary experience with phacoemulsification in India¹³. We must express some reservations. First, the cost effectiveness of phacoemulsification needs to be proved. In developing nations, there are limited fiscal resources available for health care. Studies comparing the direct and indirect costs of high-volume phacoemulsification and conventional extracapsular cataract surgery are needed. Additional utilization studies are needed to evaluate the allocation of physicians and paramedical professionals during phacoemulsification. Health-care planners should realize that not all cataracts can be attacked using phacoemulsification nor should all surgeons be advised to perform the procedure. We should train surgeons in developing nations in newer surgical techniques. It would be ideal to have a tutor present at the time of surgery and to have the use of an extensive video library for better training. Surgery practice in animals might also be a better way to learn. However, these training tools are rarely available in less developed nations. We are currently developing training programs to resolve these problems and we hope to minimize complications during the initial training period.

CONCLUSION

Posterior capsular rupture and corneal edema were most common intraoperative and postoperative complications respectively. Majority of patients had 6/6-6/12 vision by the end of first three weeks of cataract surgery. In our study, the complication rates observed were much higher and needs further evaluation of phacoemulsification as a safe alternative to conventional extracapsular cataract extraction in the developing world.

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CONTRIBUTORS

MA conceived the idea, planned and wrote the manuscript of the study. SK, MN and SI helped in manuscript writing and did the data analysis. NS supervised the study. All the authors contributed significantly to the research that resulted in the submitted manuscript.