

# Subjective Difficulties and Complications of Each Stage of Phacoemulsification by Residents

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## ABSTRACT

**Aim:** To describe the subjective difficulties and complications related to phacoemulsification technique for cataract surgery performed by 4<sup>th</sup> year residents.

**Design:** Prospective and observational study.

**Methods:** This prospective study was conducted in the institute of Ophthalmology, Mayo Hospital, Lahore for one year from 1.1.09 to 31.12.09 in 100 cases which underwent phacoemulsification surgery by 4<sup>th</sup> year residents trainee of fellowship Details of subjective difficulties of each stage of phacoemulsification and complications like posterior capsular rupture with or without vitreous loss, dislocated lenticular fragments in to vitreous, descemet, s membrane dehiscence and zonular dehiscence noted. Result was analyzed and compared with other studies.

**Results:** From a total of 100 surgeries, most of subjective difficulties were present during continous curvilinear capsulorrhexis (CCC) and phacoemulsification procedure. Complications included posterior capsular ruptured in 13(16.2%) cases, vitreous loss in 11(13.9 cases), 2 (2.50%)cases without vitreous loss, Dislocated nuclear fragments into vitreous 4(5%)cases and 2 (2.50%)cases required parsplana lensectomy, and zonular dehiscence in 2 (2.50%)cases and in 1(1.2%)cases descemet membrane dehiscence.

**Conclusion:** The resident can perform the phacoemulsification well with a very low rate of complications rate by early recognition of complications with prior training with extracapsular cataract extraction.

**Key words:** Cataract, complications, phacoemulsification.

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## INTRODUCTION

Cataract is the most common cause of preventable blindness in the world<sup>1</sup>. Cataract surgery is the most common intra-ocular procedure. For the last few decades, technique of cataract surgery has been dramatically changed from intra-capsular cataract extraction to extra-capsular cataract extraction, with posterior or anterior chamber intraocular lens implantation to phacoemulsification, with foldable intraocular lenses implantation.

Now a day's phacoemulsification is the procedure of choice in developed countries due to its advantages on extra capsular cataract extraction like small incision, early rehabilitation time and less astigmatism<sup>2</sup>. Due to advantages of phacoemulsification. We added performing of phacoemulsification technique in our postgraduate training programmed. The purpose of this study is to compare the results of subjective difficulties and complications of phacoemulsification with other studies.

## METHODS AND MATERIAL

This prospective study was designed to evaluate the subjective difficulties and complication of phacoemulsification in 100 cases of cataract surgery

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performed by residents under the supervision of experienced ophthalmic surgeon in Institute of Ophthalmology/Mayo Hospital Lahore from 1.1.09 to 31.12.09.

Pre-operative evaluation that included visual acuity, slitlampbiomicroscopic examination, fundus examination, intraocular pressure. We included the cases with immature cataract (Grade II-III nuclear sclerosis) and no ocular complications, Cases with subluxative lenses, uveitis, and traumatic cataract excluded from this study. We divided our study in three stages. 1<sup>st</sup> stage included application of local anesthesia, draping and preparing of case. 2<sup>nd</sup> stage included capsulorrhexis, hydro dissection, and 3<sup>rd</sup> stage included phacoemulsification, irrigation aspiration, and intraocular lens implantation, to evaluate the subjective difficulties and complications during procedure of phacoemulsification. Included posterior capsular ruptured, with or without vitreous loss, zonular dehiscence, and dropped nucleus or fragment in to vitreous cavity.

## RESULT

This study comprises 100 consecutive cases of phacoemulsification, with intra ocular lens implantation performed by 4<sup>th</sup> year residents under the experienced ophthalmologist over a period of one year from 1.1.09 to.12.09. Which included 56 male 44

female patients? 52 were right eyes and 48 were left eyes. The age ranged 31 between 38 to 48 years. (Mean age 43 years). The anesthetic technique used for the cases was peribulbar xylocain injection and Alcaïn eye drops (Proparacain hydrochloride 0.5%). Out of 100 eyes 80 eyes (80%) underwent phacoemulsification 20 (20%) were converted into extra capsular cataract extraction due to interoperated complications. In 13(16.2%) of cases, reason for conversion was absence of intact posterior capsule, in 6(7.5%) of cases nucleus was very soft and difficult to culprit. In 1(1.25%) of cases it was due to failure to dial the nucleus. A proforma was completed for every patient after the completion of surgery .A proforma rating the degree of subjective difficulties in three steps of phacoemulsification, which further categories in to 9 individual stages. Each individual stage given 5 point scales from point 1 to 5. Point 1 is very easy and point 5 is very difficult.

1<sup>st</sup> stage consists of peribulbar block, draping of surgical field, and corneal incision. 2<sup>nd</sup> stage consists of capsularhexis, hydro dissection and 3<sup>rd</sup> stage comprises of phacoemulsification, irrigation aspiration and intraocular lens implantation.

In 1<sup>st</sup> stage peribulbar anesthesia and draping of field was completed in almost all cases. Clear corneal incision was related to wound constriction, including long corneal tunnel in 2(5%), 1(1.25%) with corneal abrasion. The 1<sup>st</sup> stage was successfully completed. In 2<sup>nd</sup> stage capsularhexis is most difficult in 5(6.2%) cases, which included extension of capsularhexis towards posterior capsule. The hydro dissection was not completely performed in early cases but in later cases it was performed completely. In 3<sup>rd</sup> stage, phacoemulsification was most difficult due to work in small space in anterior chamber with phaco tip and second instrument wasn't managed successfully in 20(20%) cases. The most common identified complication was posterior capsular ruptured during phacoemulsification or irrigation aspiration technique. Of 100 phacoemulsifications performed 13(16%) of cases with Posterior capsular ruptured, in which 11(13.9%) experienced with vitreous loss and 2 (2.5%) without vitreous loss. Four of the 13( 3.7%) cases with posterior capsular ruptured had dislocated lenticular fragment in the vitreous cavity; two of which (2.5% of the total 100) required parsplana lensectomy for dislocated large nuclear fragments, The other two cases had small nuclear fragment and did not required surgery..Zonular dehiscence occurred in 2(2.5 %), .Descemet's membrane dehiscence occurred in 1(1.25%) (Table 1).

Table 1: Intraoperative Complications of Phacoemulsifications

Complications	Frequency	%age
Posterior capsular ruptured with vitreous. Loss.	11	13.9
Posterior capsular ruptured without vitreous loss	2	2.50
Nuclear.fregment in vitreous	4	5
Zonular dehiscence	2	2.50
Descemet's membrane dehiscence	1	1.25.

In 76(95%) eyes of total of 80 eyes, Intra ocular lens were implanted in 4 5(56.25%). Lens were placed in a bag and 30(37.50%) in sulcus, 1(1.25%) had sclera fixation.

## DISCUSSION

The skill to learn phacoemulsification technique is more advance than performing extra capsular cataract extraction. In learning phase, it needs constant supervision and monitoring by an experienced surgeon. It is difficult to master the phaco procedure as compared to extra capsular cataract extraction, because it requires coordination of hand and feet too.

In this prospective study, we evaluated the subjective difficulties in each stage of phacoemulsification and its complication intraoperative. Our study shown that most difficult stage was capsularhexis 72.3%, phacoemulsification with 62.2%. This rate is comparable to the rate reported in the literature by experienced ophthalmologist<sup>3</sup> (74.4% and 61.2%) studies<sup>3</sup> ,.The rate of complete succession of procedure is in 1<sup>st</sup> stage is 100%, with intraocular lens implant at 95% and irrigation aspiration successful in 82% is. comparable to other studies<sup>4</sup> , where phacoemulsification training in residence showed that 1<sup>st</sup> stage was completed with 100% success, hydro dissection in 92.8%, irrigation aspiration in 78.4%, and intraocular lens implantation in 83.1% . Posterior capsular ruptured occurred in 13 of the cases included in this study (16.2%).This rate is comparable to rates reported in the literature by other training institutions (2.6-9.9%)<sup>5, 6</sup> . It is higher than rate reported by experienced ophthalmologist (0.452.5%)<sup>7</sup> , the rate of vitreous loss, 11.2% in this study is also comparable with previous report of resident-performed cataract surgery in the literature (1.3-14.7%). This rate is still higher than incidence of

vitreous loss reported by experienced ophthalmologist, other studies performed by resident<sup>5,6</sup> the rate of posterior capsular ruptured and vitreous loss is higher than rates experienced ophthalmologist<sup>8,9</sup>. This study also found that residence had a low rate of dislocated lens fragments' in the vitreous 4 eyes(5%) of 100 phacoemulsification, only 2 (2.5%) cases required parsplana lensectomy for removal of nuclear fragments. The reporting risk of requiring parsplana lensectomy to remove the lens fragments dislocated during cataract surgery ranges from 0.2% to 1.68% in the literature<sup>8,9,10</sup>.The reporting rate of Zonular dehiscence is 2 (2.5%) double than the studies noted in literature<sup>11</sup>.The reported rate of descemet, s membrane dehiscence is 1(1.25%). All residents cataract cases are supervised by experienced anterior segment surgeon may have reduced the complication rates from what would have been seen without supervision. In conclusion, the surgical complication rate of 4<sup>th</sup> year trainee performing the phacoemulsification are low they are comparable to the complication rates reported by other experienced ophthalmologist. This study demonstrate that with appropriate training it is possible to obtain acceptable low rate of complications with phacoemulsification with prior training with extra capsular cataract extraction technique.

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