Original Article

Incidence of Intraoperative Complication of Phacoemulsification and its management in Pandit Deen Dayal Upadhyaya Hospital, Jaipur

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Abstract

Background: Cataract is the most common cause of preventable blindness in the world. Whereas cataract surgery is the most common surgical procedure in all of medicine. With advent of phacoemulsification, there is faster optical and physical rehabilitation of the patient. **Aim:** This study was done to know the incidence and type of intraoperative complication in phacoemulsification and the correct method to manage these complication. **Material and Method:** The duration of study is 1 year. It is prospective type of study comprised 100 patient who were operated by phacoemulsification method. The method to choose patients were simple random sampling method and follow up period for patients was 6 weeks. **Results:** The maximum number of patients came under V to VI decade, females proportion was higher, being 57 in no. (57%) as compared to males 43%. The most common type of cataract was posterior subcapsular cataract in this study and it constitutes 35% eyes (35%). BCVA preoperative was 6/12 to finger counting at 1 m. 71% patients had preoperative BCVA of 6/36 or better. Total phaco time was less than 1 min in 33% of patients and in 60% of patients it was in between 1 to 2 minutes. Intraoperative complication occurred in 18% of total cases. The most common complication is emulsifying the nucleus and the conversion rate to convert in small incision cataract surgery was 5% (in 5 cases). The complication rate was more higher grade of nucleus density. The post operative BCVA was > 6/18 in 96% of cases and > 6/9 in 81% of cases. **Conclusion:** With the advent of better technology in phaco machines and better techniques in phacoemulsification surgery, the complication rate is less and it can be accepted as routine method.
Key word: Phacoemulsification, best corrected visual acuity, nucleus grades, posterior subcapsular cataract.

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INTRODUCTION

The different parts of lens are capsule, cortex and nucleus. The lens fibres are closely arranged in a regular manner. The lens is the 2nd highest contributor for the refractive power of eye. Any defect to the transparency of the lens and its capsule whether it is caused by congenital or acquired causes is known as cataract. Cataract is the most common surgical cause of preventable blindness in the world. Cataract surgery is perhaps the most common surgical procedure in medicine.

There is change in techniques of cataract surgery in past few decades. Advancement in microsurgical instrument and operative equipments and phaco machines have made surgery safe.

With phacoemuslification surgery the postoperative healing is quicker and faster rehabilitation of patient with lesser Astigmatism. With phaco surgery majority of patients are safe but it is also associated with few intraoperative complication.

This study is done to know the types of common intraoperative complications in phaco surgery and their management.

MATERIAL AND METHOD

This study was conducted in Department of Ophthalmology, Pandit Deen Dayal Upadhyay Hospital, attached to SMS Hospital, Jaipur.

The study is prospective and it consists of 100 patients who were operated by phacoemulsification. The study was in between Feb. 2015 to March 2016.

The selection of patients was by Simple Random Sampling and follow up period was 6 weeks.

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Inclusion Criteria

1. Patients were operated by phaco method and the grading of nucleus was under grade III.
2. The age of patient were above 18 years and both sex groups.

Exclusion Criteria

- Patients with HMSC, subluxated cataract; cataract with Pseudoexfoliation.
- Patients were having grade IV and above cataract.
- Patients with Glaucoma, associated uveitis, traumatic injury or any other ocular abnormality.
- Informed consent was taken; preoperative BCVA was taken on Snellen's chart. Detailed eye examination was done on slit lamp. Lens opacity classification system (LOCS) III was used for nucleus grading. Pupillary reaction was noted. Applanation Tonometry was done and lacrimal patency was evaluated. Fundus was evaluated by 78D lens.

RESULTS

We conducted this study in Pandit Deen Dayal Upadhyay Hospital, Jaipur and enrolled 100 patients. The maximum patient were fallen in age group 50-60 years with 32% of patients followed by 60-70 years (24%). Mean age was 58.54 years (Table 1). The male to female proportion was 43:57. The most common type of cataract is posterior subcapsular cataract. About 35% of patients were fallen in this group followed by nuclear sclerosis grade II with posterior subcapsular cataract (28%). Table 3 showing the best corrected visual acuity in preoperative and postoperative status. Intraoperative phaco time was maximum between 1-2 minutes in 60% cases. In 7 patients it was in between 2-3 min and was more associated with complication. In 33% cases it was less than 1 min. Intraoperative complication occurred in 18% of patients. The most common complication was not able to crack the nucleus and difficulty to proceed phacoemulsification, so converted taken into SICS (5%) followed by PCR and tunnel related complication (3% of each). Complication rate was more with nuclear sclerosis 3 + PSC and it was associated with post-operative BCVA ($P < 0.001\%$).

Table 1 - Age wise distribution in study

Age in year	No. of patients	%
21 - 30	1	1
31 - 40	9	9
41 - 50	20	20
51 - 60	32	32
61 - 70	24	24
71 - 80	12	12
> 80	2	2
Total	**100**	**100**
Gender		
Males	43	43
Females	57	57
Total	**100**	**100**

Table 2: Types of cataract in study

Eye involved	No. of patients	%
Right	46	46
Left	54	54
Types of Cataract		
PSC	35	35
NS2	6	6
NS2+PSC	28	28
NS3	13	13
NS3+PSC	12	12
Cupiliform cataract	2	2
NS1+PSC	2	2
PSCs+Cuneiform	1	1
Anterior capsular cataract	1	1

PSC - Posterior subcapsular cataract, NC - Nuclear cataract)

Table 3: Pre and Post-operative BCVA

Preoperative BCVA	No. of patients	%
6/12 - 6/18	14	14
6/24 - 6/36	57	57
6/60 - CF5m	20	20
CF4m - CF3m	5	5
CF2m - CF1m	4	4
Post-operative BCV		
6/6 - 6/9	81	81
6/12 - 6/18	15	15
6/24 - 6/36	3	3
6/60 - 1/60	1	1

Table 4: Intra-operative complications (N = 100)

Intra-operative complications	No. of patients	%
Absent	82	82
Present	18	18
Nucleus can not be divided (converted into SICS)	5	5
Iris incarceration into phacoprobe	2	2
PCR	3	3
Tunnel Related / premature entry	3	3
Extended Rhexis	1	1
Surge	1	1
Iris prolapsed into sideport	1	1
DM detachment	2	2

Table 5 : Incidence of Intra-operative complication with type of cataract

Type of cataract	No. of patients	Total complication
PSC	35	2 (11.11%)
NS2	6	2 (11.11%)
NS2 + PSC	28	2 (11.11%)
NS3	13	5 (27.7%)
NS3 + PSC	12	5 (27.7%)
Cuneiform	3	1 (5.55%)
Other	3	1 (5.55%)

Table 6: Relationship of intra-operative complication to postoperative BCVA

Intra-operative complications	No. of patients (N=100)	6/6-6/9 (N=81)	6/12-6/18 (N=15)	6/24-6/36 (N=3)	6/60-1/60 (N=1)
Absent	82	75	7	0	0
Present	18	6	8	3	1
Hardnucleus converted to SICS	5	2	2	0	1
PCR	3	1	2	0	0
Iris incarceration in phaco probe	2	1	1	0	0
Extended Rhexis (Running Rhexis)	1	1	0	0	0
Tunnel related complication	3	1	1	1	0
Surge	1	0	0	1	0
DM detachment	2	0	2	0	0
Iris prolapsed in Side port	1	0	0	1	0

DISCUSSION

We conducted this study in Pandit Deen Dayal Upadhyay Hospital, with 100 patients. The follow up schedule was 1 POD, 4th POD, at the end 1st week,3rd week and 6th week.

Majority of patients (32%) were in between 5th to 6th decade followed by 24% in 6th to 7th decade. The mean age was 58.54 years. The Male : Female ratio was 43 : 57. The right eye and left eye proportion was 46:54. According to type of cataract in our study, the PSC was maximum and it was 35% followed by nuclear sclerosis II + PSC (28%). Pre-operative BCVA was 6/12 to 6/18 in 14% of patients and 57% patients were having in between 6/24 to 6/36. Total phacotime was 1-2 min in 60% cases,

< 1 min in 33% cases and it was taken > 2 min in 7% cases. Intraoperative complication occurred in 18% of cases. This is approximately same as it was observed by Eiichi, N., Toshiyuki, K. *et al*.[1] We find more difficulty in emulsifying hard nucleus and 5% of cases were converted to SICS. The majority of other complications were PCR (3%), Tunnel Related complication (3%) and incarceration of iris in phaco probe (2%). Running rhexis was present in 1%, surge was in 1%, DM detachment was in 2% of cases and prolapse of iris in side port was 1%. In 5% of cases we find difficulty in emulsifying nucleus so it was converted into SICS. Similar steps were taken in other studies [Thomas R[2]]. The second common intraoperative complication was PCR with vitreous loss and it was in 3% of total cases. It was approximately similar to other studies [Martin KR *et al*[3]]. All PCR were associated with vitreous loss. 2 of them occurred during cortical wash. As soon as PCR occurred, bottle height decreased, AFR decreased, AC were filled by VES and vitrectomy was done. In 2 cases PCIOL and in one case ACIOL was implanted. In 2% of cases iris was caught in phaco probe. It was reported 4% by Robin AL, *et al*.[4] Once iris is caught by phaco probe, the footswitch is released immediately to position 1 to release the iris. Partial damage to iris at the site of incarceration occurred. In the study tunnel related complication like premature entry was noted in 3 cases. At the end of surgery 10-0 Nylon suture was applied to tunnel. It was 1.4% reported by Eiichi N. *et al*.[1] Capsulorrhexis related complications were seen in 1% of complication. This was running of rhexis. Once the rhexis is run to periphery, it was completed by making Nick in initial Nick in opposite direction and phaco was completed successfully with caution. The incidence was 3.8% by Ng DT *et al*.[5] Detachment of Descemets membrane was present in 2% of cases. This was due to blunt entry Keratome. At the end of surgery, this was managed by injecting a single large air bubble in the anterior chamber. Intraoperative iris prolapse in the side port was noted in 1% of cases. This was due to large side port. At the end of surgery 10-0 Nylon suture applied at the side port. 18% of cases showed some complication in our study. This complication rate increases as the Nucleus grading increases. Nuclear cataract grade 3 has complication in 35% of cases with $P < 0.001$. Complication rate is also associated with total phacoemulsification time. It was 1-2 min in 60% cases, < 1 min in 33% cases and > 2 min in 7% cases. A significant association was noted in between increase in phacotime and intraoperative complication. Postoperative BCVA was noted in 96% of cases better than 6/18. Same finding was noted by Thomas R *et al*.[2] Cases with PCR had postoperative BCVA < 6/24. One case has developed cystoid macular edema. The cases where intraoperative complications was absent is associated with postoperative BCVA of 6/9 or better with $P < 0.001$.

CONCLUSION

It appears that good selection of cases with cautious phacoemulsification results in lesser complication rate and those too can be managed in better way. So we can conclude that phacoemulsification is safe procedure.

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