
PHACO TRAINING- A LEARNING EXPERIENCE

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Introduction

The use of phacoemulsification has increased steadily over the past several years due to good results, availability of phaco machine and increased patient awareness. ^(1,2) This increasing trend raises several important training issues. A proper analysis of the learning curve of beginning phaco surgeons is very useful in establishing guidelines for training programs. Many studies were done in the past to evaluate the training programmes for residents and beginning phaco surgeons. ⁽³⁻⁴⁾ We have tried to evaluate our training program in this study.

Aim

This retrospective study was performed to evaluate the difficulties faced by ophthalmologists while learning phacoemulsification, to study the incidence of commonly encountered complications and visual rehabilitation of these cases. It also evaluates ideal ophthalmic setting for phacoemulsification-training courses.

Materials and methods

This study was conducted at Bombay City Eye Institute where phaco-training courses are being held for the past 3 years. These are held 4 times in a year at 3-monthly intervals. The course consists of didactic lectures, observation of live surgeries, followed by performing surgeries by trainees under expert guidance. It also involves one-to-one interactions with trainers and watching of their own video cassettes for improvisation. Intraoperative complications were recorded in detail and postoperative course was followed.

The method of analysis consisted of

- 1) Retrospective analysis of the records of 190 patients who had undergone phacoemulsification at our centre as part of training program for evaluation of
 - Intra and postoperative complication
 - Visual rehabilitation
- 2) By giving a questionnaire to all the trainee doctors to enumerate and grade the difficulties faced by them during phacoemulsification

38 ophthalmologists underwent training in the technique of phacoemulsification over a period of 18 months, from August '99 to March '2001. These ophthalmologists were all well versed in standard

microscopic extracapsular cataract extraction and IOL implantation. They were either well conversant in capsulorrhexis or at least attempting CCC in all their cases with or without success. Some of them were also performing small incision non-phaco cataract surgery. All of them were familiar with hydrodissection and hydrodelamination procedures.

Each of the trainee doctors was allotted 5 cases each. Cases, which were suitable for beginning phaco-surgeons, were selected. These included adequately dilating pupil and nuclear sclerosis of grade 2 to grade 3. Extremes of age or of intraocular lens power (high myopia/ hypermetropia), and patients with systemic problems were excluded. Also patients with deep sockets, one-eyed patients or patients with previous ocular surgeries, and traumatic cataracts were not included.

Surgical Technique

The steps are like any routine phacoemulsification surgery and are as follows:

- Insertion of wire speculum followed by superior rectus bridle suture
- Two side ports made with paracentesis knife followed by injection of viscoelastic
- Making of scleral tunnel with crescent knife
- CCC with 26G needle or Utrata forceps as per surgeons preference
- Hydrodissection and delineation
- Phacoemulsification by divide and conquer method
- Bimanual aspiration of cortex
- IOL implantation in the bag (one piece '5' mm optic PMMA lens)
- Suturing of the wound if required

In case of any serious complications (posterior capsular rupture, zonular dialysis, nucleus drop / subluxation), the management of the case was taken over by the trainer and managed appropriately. In cases where adequate posterior capsular support was present, a '6' mm optic PCIOL was placed, otherwise a Kelman type 4 point fixation ACIOL was implanted. A vitreoretinal surgeon managed nucleus drop by phacofragmentation at the same sitting.

Results

This study included 38 trainee ophthalmologists who did 5 cases each. A total of 190 cases were analyzed. Results are shown in Table No.1

All the surgeons were asked to grade the most diffi-

cult steps in phacoemulsification in decreasing order and the results were analyzed. Following was the interpretation by the trainees.

Surgeon graded most difficult steps:

1. Cracking
2. CCC
3. Quadrant manipulation
4. Irrigation and aspiration
5. In the bag IOL implantation

of complications. Most of the surgeons felt that cracking the nucleus, CCC, and IOL implantation in the bag were the most difficult steps in phacoemulsification. All of them were satisfied with their training.

Conclusion

Phacoctraining has a fairly high rate of complications as the learning involves quite a few new steps. It

Complication	Number of cases	Percentage	Time at which occurred
Nuclear fragment drop/subluxation	8	4.2%	5-quadrant manipulation 2-cracking of nucleus 1-rotation of nucleus
Posterior capsule rupture	21	11.05%	4 cases resulted in nuclear fragment drop 2-cracking of nucleus 7-quadrant manipulation 6-irrigation and aspiration 2-IOL implantation
Zonular dialysis	7	3.68	4-rotation and dialing 3-irrigation and aspiration Vitreous loss occurred in one case
CCC extending to periphery	9	4.73%	2 cases converted to ECCE Rest cases CCC retrieved after cutting with Vannas scissors and phako done
Wound related	16	8.42%	5-wound burn 6-repeated iris prolapse 5-improper sclerocorneal
Conversion to ECCE	9	4.73%	2-cases of CCC extension to periphery 4-cases of nucleus drop 3-cases of PCR

6. Wound construction

All the patients were evaluated for eventual visual outcome by best corrected visual acuity using Snellen's chart 1 month postoperatively. The recorded visual acuities were 6/9 or better in 135 out of 190 patients (71.05%), between 6/9 and 6/18 in 38 cases (20%) and 6/18 or less in 17 cases (8.94%). The visual acuity in these cases did not improve because of varied pathologies like preexisting ARMD (4), diabetic maculopathy (5), postoperative CME (7), corneal opacities and pigment deposits on IOL (5 cases).

Discussion

The phacoemulsification learning curve is made easier by proper technique and guidance⁽¹⁻⁴⁾. There is a correlation between age of the surgeon and their previous experience with ECCE or small incision cataract surgery. The complication rate is fairly high for converting surgeons but the eventual visual outcome is good (6/9 or better in 71.05%) due to proper intra and postoperative management

should be undertaken in an institute under expert guidance where all the facilities for management of complications exist.

References

1. Martin KR, Burton RL. The phacoemulsification learning curve: per-operative complications in the first 3000 cases of an experienced surgeon. Eye 2000;14(Pt 2):190-195
2. Badoza DA, Jure T, Zunino LA, Argento CJ. State-of-the-art phacoemulsification performed by residents in Beunos Aires, Argentina. J Cataract Refract Surg 1999;25:1651-1655
3. Ng DT, Rowe NA, Francis IC, et al. Intraoperative complications of 1000 phacoemulsification procedures: a prospective study. J Cataract Refract Surg 1998;24(10):1390- 1395
4. Thomas R, Naveen S, Jacob A, Braganza A. Visual outcome and complications of residents learning phacoemulsification. Indian J Ophthalmol 1997;45(4):215-219