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EVALUATION OF LEARNING CURVE OF OPHTHALMIC RESIDENTS PERFORMING CATARACT SURGERY AT TERTIARY EYE CARE.

Ophthalomology

Dr Santosh Singh Patel Professsor & HOD, Department Of Ophthalmology, AIMMMCR, Durg, Chhattisgarh

Dr Rajesh Kumar Sahu* Associate Professor, Department Of Ophthalmology, GMC Mahasamund, Chhattisgarh
*Corresponding Author

ABSTRACT

To analyze complication & problems faced during cataract surgery by ophthalmic residents at tertiary Centre. Hospital based-Prospective study of 22 months during residency of 14 residents who performed 173 cataract surgery. Pre-op preparation, intra-op observation, interview of other residents regarding problem faced during surgery & pre & post-op evaluation by evaluator was done according to ICO-OSCAR:ECCE scoring. Common problems noted were difficulty in capsulotomy 12%, suture tying 10%, cortical wash & IOL insertion 15%. Common complications like irregular corneal incision, descemet's detachment, loose suture, retained lens matter were noted. Problem & complication faced in initial 50% cases were reduced in next 50%. Individualized training approach under supervision makes residents more confident. For best residency training a customized & closely monitored programme is essential.

KEYWORDS

ICO-OSCAR:ECCE scoring, cataract surgery, residency training

1.INTRODUCTION

Cataract is leading cause of blindness worldwide. Although cataract can be surgically removed, in many countries surgical services are inadequate and cataract remains the leading cause of blindness. Surgical intervention is considered one of the most cost-effective intervention to restore sight in cataract.[1] A qualified, trained ophthalmic surgeons are required for delivering good quality vision rehabilitation services to the community[2].

In Ophthalmology due to new innovations and research, surgical techniques and expertise are continuously growing.[3] The knowledge and skills of new techniques should pass through the succeeding generations of ophthalmological trainees is both a responsibility and necessity of teachers and trainers in the field.[4] Many different studies have examined the outcomes and complication rates associated with cataract surgery performed by ophthalmology residents and have concluded that, overall, the complication rates and outcomes are acceptable when done in supervision of a experienced trainer.[5]

2.METHODS

The aim of this study was evaluation and analysis of complications and problems faced during learning curve of ophthalmology residents when performing cataract surgery at tertiary care centre. It was Hospital based - Prospective study, done at Raipur, Chhattisgarh in Residents of ophthalmology department.

There were four proforma, out of which proforma- 1, 3 & 4 are filled by post graduate student and proforma- 2 is filled by evaluator. Proforma-1 is related to bio-data, history taking and general & local examination of the patient, proforma- 2 is related to Surgical Competency Assessment of Extra-capsular Cataract Extraction (ICO-OSCAR:ECCE, rubric -scoring system) which is filled by evaluator at the end of surgery, proforma- 3 is related to problem faced during cataract surgery and proforma- 4 is related to complications of cataract surgery. In study total 173 cases of cataract surgery which is done by 14 Residents are included, 10 Residents are M.S. candidate (3 years duration) and 4 Residents are D.O.M.S. candidate (2 years duration).

Cataract surgery done by Residents are observed and score was given by evaluator according to ICO-OSCAR:ECCE scoring table and learning curve was prepared according to performance and score obtained.

3.RESULTS

Total 173 cataract surgery done by 14 Residents were included in our study. The evaluation and analysis of each Resident was done by giving score when they are doing cataract surgery and what problems they faced during surgery and what complication done by all of them under supervision of senior consultants.

Under supervision of senior consultant the residents learn very well and with proper technique, they perform well, less number of complications occurred. Study shows that even less number of case exposure some residents performs well, some perform good and some residents performances are average.

The common problem faced by all residents are difficulty in capsulotomy, difficulty in suture handling & tying, difficulty in cortical wash and difficulty in IOL insertion. The common complications done by all residents are irregular corneal incision, descemet's detachment, loose suture, retained lens matter and corneal edema. Study shows that common complications are corneal complications due to difficulty in hand eye coordination with operating microscope. Major complications like posterior capsule tear and vitreous loss are very less due to direct under supervision of senior consultants.

Score was given by evaluator according to ICO-OSCAR:ECCE scoring table and learning curve was prepared according to performance and score obtained for every resident. (Figure 1) Total learning curve of all Residents shows that 6 Residents scored more than 80 marks, 7 Residents scored between 80 – 60 marks and 1 Resident scored < 60 marks. The common learning curve drawn for comparison of performance of all Residents.

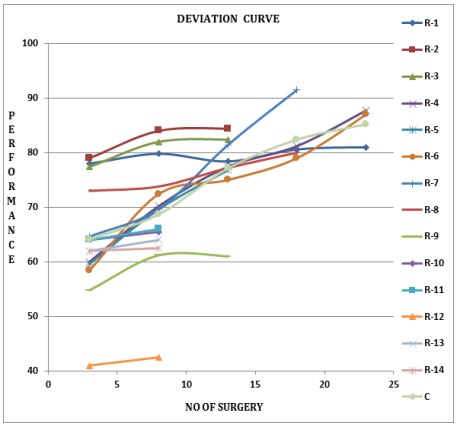

Figure 1: Learning curve of all residents compared with average (deviation curve)

The common problem faced by all residents were more in number in initial 50% cases, which is reduced in next 50% cases which is done by the residents.

The major problem faced by all residents was difficulty in capsulotomy (16%), and difficulty in suture handling and tying.(14.9%) in initial 50% cases which is reduced in next 50% cases 8.1% and 5.8% respectively.(Figure 2)

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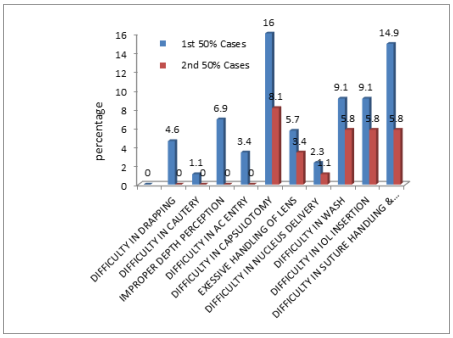

Figure 2 : Common Curve of problems faced by all residents

The common complication done by all residents were more in number in initial 50% cases, which is reduced in next 50% cases .The common complications done by all residents were irregular corneal incision (10.3%), descemet's detachment(8%), loose suture(8%), retained lens matter(6.8%) and corneal edema (9.1%) in initial 50% cases but significantly reduced in next 50% cases.(table 1)

Table 1: Common Complications During Cataract Surgery By All Residents

COMPLICATIONS	1ST 50% CASES (N = 87) in %	2ND 50% CASES (N = 86) in %
Irregular corneal incision	10.3	4.6
Scleral incision	2.3	1.1
Descemet's detachment	8	4.6
Endothelial damage	4.5	2.3
Posterior capsule tear	4.5	1.1
Vitreous loss	4.5	1.1
Iris peaking	2.2	1.1
Iris hole	2.2	0
Loose suture	8	4.6
Corneal edema	9.1	5.8
Retained lens matter	6.8	3.4

N = Total no of cataract surgery (173)

4. DISCUSSION

This study was done for evaluation and analysis of complications and problems faced during learning curve of ophthalmology residents when performing cataract surgery at tertiary care Centre during their residency period. Nowadays with the use of virtual simulation environment, or with the wet-lab with eyes of goat or pigs, resident's efficiency has been improved effectively.[6]

Patient's age, gender, cataract grading, and different residents performing surgery did not appear to significantly affect the complication rate in our study. This results are consistent with other studies.[7] Our study results shows that out of 14 residents 6 residents were scored more than 80% marks and their overall performance was good and their learning curve was good. They achieved this by doing more than 20 cataract cases. Rest of the residence performance was average because they doing less number of surgeries. M.S. candidate perform better due to 3 years residency duration, more duration of surgical exposure, more no of surgery they done, so their learning curve was good. In comparison to M.S. candidate, D.O.M.S. candidate performance was average due to 2 years residency duration, less duration of surgical exposure and less no of surgery they done, so their learning curve was average (Figure 1). The common problem faced by all residents were more in number in initial 50% cases, which is reduced in next 50% cases which is done by the residents.(Figure 2) The major problem faced by all residents was difficulty in capsulotomy, cortical wash, IOL insertion and suture handling and tying. Our study shows that some residents have poor microscope hand eye coordination in initial cases so they feel uncomfortable during surgery. The common complication done by all residents were more in number in initial 50% cases, which is reduced in next 50% cases which is done by residents. (Table 1) The major complications occurred by all residents was irregular corneal incision, descemet's detachment, loose suture and corneal edema. The corneal complications are more in number. With appropriate training and supervision, a resident can achieve good results by doing extracapsular cataract extractions with lens implantations. These results were comparable to those reported by others.

Our study shows that all Residents performance was good and under supervision they perform well. This coincides with the findings of Grigg et al (2011)[8], and Odugbo OP et al (2011)[9] with supervision, ophthalmology residents achieved results generally equivalent to results obtained by experienced ophthalmic surgeons. Vitreous loss is a serious complication of cataract surgery. It has been suggested that high rates of vitreous loss may be an inevitable consequence when residents are learning extracapsular cataract extraction (ECCE). Our study shows that out of 173 cataract surgeries done by Residents only 4 residents done posterior capsule tear and vitreous loss in beginning surgeries and improved later which is very less and acceptable. This coincides with findings of Hashemi et al (2011)[10], the authors believe that an educational program including practice surgery, graded responsibility, and experienced assistance may be responsible in part for dramatically reducing the rate of this serious complication during surgery done by the beginning resident. Randleman JB (2007) et al[11], study demonstrates that the rate of vitreous loss among residents learning phacoemulsification is higher than the reported incidence of vitreous loss for residents learning planned extracapsular cataract surgery with expression of the lens nucleus.

5.CONCLUSION

Residency training programs should provide residents with a balanced clinical and surgical experience to optimally prepare them for autonomous practice. The main point is: how can residency programs best divide their time?

The present study shows that there is requirement of customized programme for residency training and more surgical exposure and wet lab facility for better result. During residency the residents must have good wet lab workout, more exposure of surgery for their training & more confident they perform individual surgery after completion of residency. It can also be concluded that performance of resident were good under supervision of senior consultant and problems & complications decreased.

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