Indian Journal of Clinical and Experimental Ophthalmology 2021;7(4):687–690

Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Clinical and Experimental Ophthalmology

Journal homepage: www.ijceo.org

Original Research Article

Visual outcomes and intraoperative complications of small incision cataract surgery performed by junior residents in GMC

Vishaka Naik[1,*], **Ugam P .S Usgaonkar**[1]

[1]*Dept. of Ophthalmology, Goa Medical College, Bambolim, Goa, India*

ARTICLE INFO

Article history:
Received 21-08-2021
Accepted 26-08-2021
Available online 03-01-2022

Keywords:
MSICS
Resident
Intraoperative complications

ABSTRACT

Aims: To evaluate in intraoperative complications of MSICS performed by Junior Residents and to compare the incidences of major complications in the first six months of training versus last six months of training.
Materials and Methods: It is a retrospective type of study. From March 2018 to February 2019 a total of 293 manual SICS were conducted by the Junior Residents in Department of Ophthalmology. Each of the patients underwent a detailed ophthalmological examination preoperatively and underwent MSICS under peribulbar anesthesia. Consents for surgeries were obtained from each patient.
Following intraoperative complications were noted: tunnel related complications, capsulorrhexis related complications, Iridodialysis, posterior capsular rent, zonular dialysis, vitreous leak, surgical aphakia, Descemet membrane detachment, placement of ACIOL, Nucleus drop and IOL drop. The patient's immediate postoperative vision was also noted.
Statistical analysis used: SPSS version 15.0.
Results: Tunnel related complications were found in 13.98% patients either as scleral button holing or premature entry. Posterior capsular rents and bag disinsertion were found in total of 11.94% patients owing to which 3.07% were left aphakic. 63.13% patients had visual acuity better than 6/12 by snellens chart on first postoperative day.
Conclusions: Performance of adequate anterior capsulotomy, minimal handling of the cornea and avoidance of posterior capsular rent are some of the challenges faced by the residents while learning MSICS. Stepwise supervised training can help a resident doctor master these steps while keeping the complications at acceptably low levels.
Key Messages: Stepwise supervised training of residents performing MSICS can minimize complications

1. Introduction

Cataract has remained the leading cause of blindness world-wide in the last two decades.[1–3] The necessity for a good outcome after cataract surgery cannot be overemphasized. The outcomes of cataract surgery depend in part on the surgeon's skills. In many teaching centres MSICS with intraocular lens (IOL) implantation is the surgery taught for resident doctors at the outset. Although the aim of modern cataract surgery is to attain a high quality visual rehabilitation by phacoemulsification, in a developing country like ours with high volume cataract surgery, MSICS is a quick yet safe alternative.[4] Thomas et al. have argued that confidence in SICS is desirable before learning phacoemulsification to maintain complications at acceptably low levels.[5] While phacoemulsification is the preferred surgery for a cataract, SICS is still useful and phacoemulsification can be converted to SICS when complications arise. In some training centres mastering standard SICS is required before admission to learn

* *Corresponding author*.
E-mail address: vishu1847@gmail.com (V. Naik).

https://doi.org/10.18231/j.ijceo.2021.138

phacoemulsification.[6] The aim of the study was to analyse the intraoperative complications of MSICS performed by residents and also to compare the incidences of complications occurring in the first six months of training program versus last six months.

2. Materials and Methods

This was a retrospective study to assess the visual outcomes and intraoperative complications in the 293 manual SICS with IOL implantation done by five junior residents under supervision, in the department of ophthalmology.

All the five junior residents had completed first year of masters and had an experience of planned extracapsular cataract surgery with IOL implantation. They were comfortable with can opener capsulotomy and were yet to be taught continuous curvilinear capsulorrhexis (CCC). They had assisted ample number of MSICS and were familiar with its steps.

Inclusion criteria: patients above the age of 60 years with immature cataract or mature cataract that consented for cataract surgery. Exclusion criteria: Patients with known ocular comorbidity, hypermature cataract, subluxated and traumatic cataract, one eyed patients, diabetics, poorly dilating pupils, uveitis and preexisting corneal decompensation were excluded.

Surgical procedure: the peribulbar anaesthesia was administered with lignocaine 2% and adrenaline to which hyaluronidase was added. Parts cleaned with betadiene and patient was draped. Superior rectus bridle suture was taken. Superior fornix based conjunctival flap was raised. Superior partial thickness sclerocorneal tunnel measuring 6mm was made; side port entry was done. In initial cases, can-opener anterior capsulotomy was performed after staining the anterior capsule with tryphan blue. Later the trainee was taught CCC under viscoelastic substance. Anterior chamber entry was done. Hydrodissection followed by nucleus delivery using wire vectis was conducted. Cortical clean-up was carried out manually with Simcoe cannula. A PCIOL was implanted. In cases of posterior capsular rent, automated vitrectomy was done and was followed by placement of rigid IOL in sulcus or ACIOL or left aphakic (complications being handled by the supervisor). Viscoelastic was used to maintain the anterior chamber and protect the endothelium during the procedure and washed at the end. Side port hydrated and anterior chamber formed using balanced salt solution. Tunnel was sutured in cases of premature entry with 10-0 nylon. At the end of surgery Subconjunctival injection of dexamethasone and gentamicin was given and eye was patched. Data on complications of surgery were obtained from operative notes. The entries of the residents were reviewed by the supervisors. Data was analyzed descriptively using the Statistical Package for the Social Sciences, SPSS version 15.0.

Ethical clearance was obtained from institutional ethics committee.

3. Results

Table 1 showed intraoperative complications and Table 2 revealed immediate post operative vision. Comparing the intraoperative complications in the first six months of training versus later six months of training, it was noted that both tunnel related complications and posterior capsular rents significantly were reduced in later six months of training. Scleral button holing was seen in eight patients and premature entry in 17 patients in first six months. Sixteen posterior capsular rents were noted in the first six months; however equal number of bag disinsertion were in seen in first and later six months if training program.

Table 1: *Some eyes had more than one complication

S.No.	Complications	Number out 293	Percentage
1	Scleral button hole	12	4.09
2	Premature entry	29	9.89
3	Capsulotomy related complications	26	8.87
4	Iridodialysis	11	3.75
5	Posterior capsular rent	25	8.53
6	Zonular dehiscence/ bag disinsertion	10	3.41
7	Vitreous loss	32	10.92
8	Failure to implant lens	9	3.07
9	ACIOLs	6	2.04
10	Descemets detachment	3	1.02
11	Nucleus drop	0	0
12	IOL drop	2	0.68

Table 2:

Distant visual acuity by snellens chart	Number out of 293	Percentage
6/6 to 6/12	185	63.13
6/18 to 6/60	89	30.37
Less than 6/60	19	6.48

4. Discussion

Although phacoemulsification is judged to be the answer to the problem of cataract blindness in the developing world, it is important to master MSICS. In major training centres in the developing world teach cataract surgery as a package in a stepwise manner: First large incision planned ECCE, then manual SICS and finally phacoemulsification.[6] Diverse complications can be encountered in MSICS carried out by trainees. In Deshpande S et al. the wound related complications were seen in 7.7% cases of SICS because tunnel making is a new step.[7] E.O. Megbelayin et al. compared tunnel related complications in first 3 months

and found a drop of complications from first to third month of training.[8] While in this study the complications related to tunnel construction were total of 13.98% which significantly reduced in the later 6 months of training. Performing an entire cataract surgery from start to finish can be overwhelming for residents in their training period; however it is best to introduce cataract surgery in a stepwise manner. This approach allows the trainee to focus on one step of the surgery at a time. The residents were well versed with can opener technique and hence in the initial cases of MSICS they were asked to focus only on tunnel construction and only when they had confidence in tunnel making, CCC was introduced. Rhexis run out or tear was noted in 8.53% of cases in this study. An adequate anterior capsulotomy is essential for easier nucleus delivery and optimum placement of IOL and hence it is a step which must be mastered well in learning MSICS.

Iridodialysis occurred superiorly only in eleven cases of manual SICS. This occurred during delivery of nucleus through inadequate internal tunnel, where initially iris prolapsed due to excessive viscoelastic in anterior chamber, making iris flabby. At this stage if still more viscoelastic is injected, superior pole of nucleus goes behind the iris and then leaves eye after tearing iris from its root. Thus adequate incision and early prediction can prevent this complication. In general, the major intra-operative complications in this series are acceptably low, posterior capsular rents being 8.53% and surgical aphakias being 3.07% in comparison to 11.4% and 10% reported from Sierra Leone and Thomas et al. respectively.[5,9] Both in training and in practice posterior capsule rent and subsequent vitreous loss are potentially serious complications. These have occurred mainly during nucleus delivery, cortical aspiration and placement of IOL. In this study a majority of rents occurred during cortical wash using simcoe cannula; wrinkling indicates that the posterior capsule is caught in the aspiration cannula and requires immediate back flushing to avoid the posterior capsular rupture. In this study we did not have any case with nucleus drop however two of the patients had IOL drop which required vitreoretinal intervention. The first case was noticed during implanataion of foldable IOL, the opening of lens caused posterior capsular rent followed by IOL drop in vitreous. The second case had inferior PCR during cortical wash, the IOL dropped while it was being placed in the sulcus. Thomas et al reported one case of IOL drop noticed postoperatively.[5] In our study Descemet detachment were seen only in three patients. Khanna RC, Kaza S, Palamaner Subash Shantha G et al reported Descemet membrane detachment in seven out of 522 patients undergoing MSICS.[10] Sharp tunnel instrument such as crescent knife and keratome should be used to construct the sclerocorneal tunnel. A blunt keratome could cause stripping of Descemet membrane. In all three patients air was injected in anterior chamber at the end of the surgery to push the descemets against the cornea. We conclude that stepwise supervised training can minimize complications and achieve a good outcome even in the hands of trainee residents.

It can be said that the learning curve is steeper in the first six months of training with respect to tunnel construction and also in terms of posterior capsular rents. Transition to phacoemulsification is easier if one has mastered SICS mainly because of familiarity of steps mainly CCC, hydroprocedures, etc.

Such stepwise approach in the teaching program helps us in identifying the difficult steps and the resident can be benefited from closer supervision and practice. Moreover, it has also helped us in increasing the efficiency of the surgical training of a residency program.

5. Source of Funding

None.

6. Conflict of Interest

The authors declare no conflict of interest.

References

1. Foster A, Gilbert C, Johnson G. Changing patterns in global blindness: 1988-2008. *Community Eye Health*. 2008;21:37–46.
2. Ang M, Evans JR, Mehta JS. Manual small incision cataract surgery (MSICS) with posterior chamber intraocular lens versus extracapsular cataract extraction (SICS) with posterior chamber intraocular lens for age-related cataract. *Cochrane Database Syst Rev*. 2012;4:8811–8811.
3. Tabin G, Chen M, Espandar L. Cataract surgery for the developing world. *Curr Opin Ophthalmol*. 2008;19(1):55–9.
4. Iqbal S, Riaz S, Menon A, Krishnan P, Latheef N, Kiran KR. A Prospective Comparative Study of Visual Outcome and Complications in Small Incision Cataract Surgery and Phacoemulsification. *Natl J Med Allied Sci*. 2015;4(1):50–5.
5. Thomas R, Naveen S, Jacob A, Braganza A. Visual outcome and complications of residents learning phacoemulsification. *Indian J Ophthalmol*. 1997;45(4):215–9.
6. Haripriya A, Chang DF, Reena M, Shekhar M. Complication rates of phacoemulsification and manual small-incision cataract surgery at Aravind Eye Hospital. *J Cataract Refract Surg*. 2012;38(8):1360–9.
7. Deshpande S, Deshpande SS, Reddy R, Reddy V. Statistical evaluation of intraoperative and postoperative complications occurring during learning curve of various techniques of cataract surgery at a teaching hospital in north Karnataka. *Int Surg J*. 2016;3:2211–6.
8. Megbelayin EO, Rangarajan A, Pindikura S. Learning Curve of a Trainee Ophthalmologist in Manual Small Incision Cataract Surgery: A Self-Appraisal. *J Surg*. 2013;1(5):63–9.
9. Cook NJ. Evaluation of high volume extracapsular cataract extraction with posterior chamber lens implantation in Sierra Leone, West Africa. *Br J Ophthalmol*. 1996;80:698–701.
10. Khanna RC, Kaza S, Shantha GPS, Sangwan VS. Comparative outcomes of manual small incision cataract surgery and phacoemulsification performed by ophthalmology trainees in a tertiary eye care hospital in India: a retrospective cohort design. *BMJ Open*. 2012;2(5):e001035.

Author biography

Vishaka Naik, Senior Resident https://orcid.org/0000-0002-8977-0620

Ugam P .S Usgaonkar, Professor and HOD

Cite this article: Naik V, Usgaonkar UPS. Visual outcomes and intraoperative complications of small incision cataract surgery performed by junior residents in GMC. *Indian J Clin Exp Ophthalmol* 2021;7(4):687-690.