

STUDY OF MANUAL SMALL INCISION CATARACT SURGERY CASES IN A TERTIARY CARE CENTRE

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ABSTRACT

BACKGROUND

Cataract surgery is done on a large scale in tertiary care centres in India. Because of large pool of patients requiring cataract surgery we require a procedure which is easy, cheap, effective, free from complications and with good outcome. We need to train our surgeons in fulfilling the need of the nation.

MATERIALS AND METHODS

We have selected 1051 patients selected for cataract surgery with MSICS procedure from February 2016 to December 2016. They were investigated thoroughly for comorbidities like Hypertension, diabetes, Asthma or COPD. Smoking history of the patients was recorded. Patients with active Pulmonary TB and Glaucoma were excluded from the study. These patients were followed through surgery for intraoperative and postoperative complications. Acuity of vision was checked on first POD and after 6 weeks of surgery. Astigmatism was assessed at the end of six weeks after surgery.

RESULTS

80% of these patients presented in above 50 years of age group. Nearly 50% of these patients presented with a vision of counting fingers to 6/60. Male: Female ratio among our patients is 1.4:1. The habit of smoking was observed in nearly 50% of our patients. Important comorbidities included Diabetes with or without hypertension, asthma and COPD. Intraoperative complications like difficult cortical aspiration, posterior capsular rent and difficult nuclear prolapse were observed. Postoperative complications like striate keratopathy, postoperative anterior uveitis and hyphaema were observed. Most of these complications are not vision threatening. 80% of the patients had satisfactory vision of > 6/18 at end of six weeks after surgery. Astigmatism was seen in around 20.94% of patients, but a majority of them had an astigmatism of 1 to 2D and was correctible.

Summary- MSICS is a useful technique for Cataract surgery. It is safe and effective. The results are comparable to Phacoemulsification with satisfactory vision restoration.

CONCLUSION

MSICS is a simple and safe technique for cataract surgery and can be recommended in camp and hospital conditions, especially in resource poor countries.

KEYWORDS

Cataract, Astigmatism, Striate Keratopathy, Phacoemulsification, Comorbidities.

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BACKGROUND

Manual Small Incision Cataract Surgery (MSICS OR SICS)- It is a form of extracapsular cataract extraction. It has the advantage over phacoemulsification, in that it is cost effective and has an easy learning curve. It is a common procedure in developing countries. Less instrumentation and lesser duration of the procedure make it feasible to do larger number of cataracts in hospitals and in camps and thus

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helping in the eradication of cataract-induced blindness which is curable. So many people below poverty line can be treated under blindness prevention programmes like DBCS by this simplified procedure. This procedure involves self-sealing sutureless wound where a sclero-corneal section is done creating a tunnel, capsulorrhexis followed by nucleus management, cortical wash and IOL implantation in the posterior chamber. All through the procedure visco is used and finally after IOL placement visco is cleared and anterior chamber is formed. Wound is sealed by conjunctival flap. Subconjunctival injection of gentamycin and dexamethasone is given and the eye is closed with eyepad. Usually superior section is done, but in cases of glaucoma temporal section is preferred so that in future trabeculectomy can be done.

Recent investigations have shown comparable outcomes and complication rates between patients undergoing phacoemulsification and MSICS with posterior chamber intraocular lens placement.

Aim- To study

- A. Demographics
- B. Comorbidities
- C. Smoking habit
- D. Intraoperative complications
- E. Immediate postoperative complications
- F. Delayed postoperative complications
- G. Postoperative visual acuity and Astigmatism among patients undergoing MSICS (Manual Small Incision Cataract Surgery).

Our aim is to study the effectiveness of MSICS as a method of cataract surgery.

MATERIALS AND METHODS

Inclusion Criteria

1. Cases registered for cataract surgery in our tertiary care centre from February 2016 to December 2016.
2. Patients with immature, mature, nuclear and posterior subcapsular cataract.
3. Patients with cataract having old pulmonary fibrotic shadows in x-ray with no active Tuberculosis.
4. Patients of cataract with comorbidities like diabetes mellitus, hypertension, COPD, asthma, arthritis, connective tissue disease, cancer and renal failure.

Exclusion Criteria

1. Patients having glaucoma with cataract; patients having acute or chronic uveitis.
2. Patients having traumatic cataract.
3. Patients having active pulmonary tuberculosis.
4. Patients having active cardiovascular disease.

METHODS

1. We assessed them preoperatively for their comorbidities and subjected them to MSICS procedure.
2. We followed the patients intraoperatively and postoperatively for the complications and studied the visual acuity on first postoperative day and six weeks after surgery.

RESULTS

Demographics of the patients of cataract surgery-

Sl. No.	Age Group	No. of Patients	Percentage
1.	< 40	7	0.67%
2.	40 - 49 years	84	7.99%
3.	50 - 59 years	323	30.73%
4.	60 - 69 years	399	37.96%
5.	> 70 years	238	22.64%

Table 1. Age Distribution

Total No. of Patients who underwent cataract surgery (MSICS)= 1051

Sex	Number	Percentage
Males	647	61.56%
Females	404	38.44%
Total	1051	

Table 2. Sex Distribution

Total No. of Cases 1051

Sl. No.	Comorbidity	Number of Cases	Percentage
1.	None	236	22.45%
2.	Bronchial Asthma/COPD	239	22.74%
3.	Diabetes Mellitus alone	169	16.07%
4.	Hypertension alone	136	12.09%
5.	Hypertension and Diabetes together	204	19.41%
6.	HIV	11	1.05%
7.	Others like Arthritis, Connective Tissue disease, Cancer, Renal Failure	69	6.56%

Table 3. Co-morbidities

Sl. No.	Total Number of Active Smokers	Smoking History > 5 Years	Smoking History < 5 Years	Passive Smokers
1.	523 (49.76%)	421 (40.05%)	102 (9.70%)	298 (28.35%)

Table 4. Smoking History among Patients Registered for Cataract Surgery

Sl. No.	Side of the Eye Operated	Number of Cases	Percentage
1.	Right	557	53%
2.	Left	494	47.00%

Table 5. Laterality of the Eyes Operated

Sl. No.	Visual Acuity	Number of Cases	Percentage
1.	> 6/60	441	41.96%
2.	Counting Fingers to < 6/60	504	47.95%
3.	Hand Movements -Counting Fingers	106	10.08%

Table 6. Preoperative Best Corrected Visual Acuity

Sl. No.	Type of Cataract	Number of Cases	Percentage
1.	Nuclear Cataract Grade I to II	121	11.51%
2.	Nuclear Cataract Grade III to IV	178	16.94%
3.	Immature Cataract	329	31.30%
4.	Mature Cataract	234	22.26%
5.	Hyper-mature Cataract	73	6.94%
6.	Posterior Sub-Capsular Cataract	116	11.04%

Table 7. Type of Cataract

Sl. No.	Complication	Number of Patients	Percentage of Total
1.	Retrobulbar Haemorrhage due to Anaesthesia	15	1.43%
1.	Stripping of Descemet's membrane	31	2.95%
2.	Constriction of Pupil	91	8.66%
3.	Difficult Nucleus Prolapse	52	4.95%
4.	Zonulodialysis	16	1.52%
5.	Nucleus Drop	11	1.05%
6.	Iridodialysis	13	1.24%
7.	Posterior Capsular Rent	53	5.04%
8.	Difficult Cortical Aspiration	347	33%
9.	Difficult Nucleus Delivery	39	3.71%
10.	Vitreous Loss	21	1.99%

Table 8. Intraoperative Complications

Sl. No.	Complication	Number of Patients	Percentage
1.	Hyphaema	79	7.5%
2.	Iris prolapse	12	1.14%
3.	Striate Keratopathy	126	11.98%
4.	Flat Anterior Chamber	61	5.80%
5.	Post-Op Anterior Uveitis	95	9.03%
6.	Posterior Capsular Opacification	26	2.47%
7.	Bacterial Endophthalmitis	11	1.04%

Table 9. Early Postoperative Complications

Sl. No.	Complication	Number of Patients	Percentage
1.	Cystoid Macular Oedema	39	3.71%
2.	Delayed Chronic Postoperative Endophthalmitis	14	1.33%
3.	Pseudophakic bullous keratopathy	11	1.05%
4.	Retinal detachment	5	0.475%
5.	Epithelial ingrowth	6	0.57%
6.	Fibrous downgrowth	2	0.19%
7.	After cataract	122	11.60%

8.	Lens displacement	69	6.56%
9.	Glaucoma	22	2.09%
10.	Pupillary Capture of IOL	42	3.99%

Table 10. Late Postoperative Complications

Sl. No.	BCVA	POD 1	6 Weeks Postoperative
1.	< 6/60	192 (18.2%)	78 (7.42%)
2.	6/60 -6/24	186 (17.69%)	126 (11.99%)
3.	6/18 -6/12	287 (27.30%)	182 (17.32%)
4.	6/9 - 6/6	386 (36.73%)	659 (62.70%)
Total		1051	1051

Table 11. Postoperative Visual Acuity

Sl. No.	0.00 to 1.0D	1.0 to 2.0	> 2.0
1.	176 (80%)	38 (17.27%)	6 (2.72%)
			Total 220

Table 12. Postoperative Astigmatism 220 Cases (20.93%)

Postoperative Visual Acuity

We observed the patients on 1st POD and after 6 weeks. On first POD, majority of patients (64.03%) had a vision of 6/18 and above; 18.2% had a vision of < 6/60 and 17.69% had a vision of 6/60 to 6/24.

6 weeks observation revealed that 80.02% had a visual acuity of 6/18 or more; 7.42% had a vision of < 6/60 and 11.99% had a vision between 6/60 and 6/24.

Postoperative Astigmatism 220 Cases (20.93%)

Postoperative astigmatism was seen in 20.93% and majority of them had an astigmatism between 1 - 2D. Only 2.7% had an astigmatism of > 2.0D.

DISCUSSION

Cataract surgery is routinely done in several teaching hospitals and in private practice. Cataract is an important cause of preventable blindness. Restoration of vision makes an enormous change in the life of an individual.

Majority of our patients are old and poor. In our study, we found majority of the patients in above 50 years' age group and the largest group was 60 - 69 years' age group. Similar observation was seen in several other studies. P. M Gogate et al¹ had their surgically treated patients predominantly in the above 40 years' age group. With a male: female ratio of 1.2: 1 which is similar to our study.

In the preoperative examination, we found tobacco smoking habit among 523 or 49.76% patients. Nearly 40% of patients gave history of smoking for more than 5 years. 10% of the patients had a history of < 5 years smoking. 28% gave history of passive smoking or exposure to tobacco. Simon P Kelly, Judith Thornton, et al in their study found that smoking is an important risk factor for the development of nuclear cataract with a three-fold increase in risk.²

78% of our patients presented with comorbidities. Hypertension and diabetes separately and together were noted as comorbidities in our study occurring in nearly half of our patients. Bronchial asthma and COPD together accounted for 22.74% of our patients. Pham TQ et al in their study had diabetes and hypertension occurring in more than 80% of the patients.³

Nearly, 58% of the patients had visual acuity of less than 6/60 to counting fingers when assessed preoperatively.

Analysing the type of cataract our study showed a prevalence of mature, immature and nuclear cataract in 31%, 22% and 28% respectively. Similar prevalence of nuclear and mature cataract was seen in Anitha S. Maiya study.⁴

Increased prevalence of nuclear cataract in our study and other Indian studies may be attributed to high prevalence of smoking.²

Intraoperative complications include. Difficult cortical aspiration in 33% followed by constriction of pupil in 8.66%. Posterior capsular rent in 5.04%. Difficult nucleus prolapse was observed in 4.95%. P. M. Gogate et al found MSICS to be safe with fewer complications. These complications can be further minimised by increased training and expertise.¹

Striate keratopathy, postoperative anterior uveitis, hyphaema and flat anterior chamber occurred as early postoperative complications ranging from 5% to 11% individually. P. M. Gogate et al observed immediate postoperative complications of posterior capsular rent with or without vitreous loss and iridodialysis in around 7% of patients compared to ECCE procedure.¹ Anitha S. Maiya et al had corneal complications of 11% POD1.⁴

Ajith H et al and P. Sambare et al showed MSICS is safe with few intraoperative and postop complications.^{5,6}

Striate keratopathy was 11.98% in our study and the result is similar to Anitha Maiya study and Hosamani study.^{4,7}

Late postoperative complications in our study include pupillary capture of IOL, Lens displacement, Cystoid macular oedema and postoperative glaucoma. Other complications like delayed postoperative endophthalmitis, pseudophakic bullous keratopathy, retinal detachment and epithelial in growth occurred in small numbers. Anitha S. Maiya's study had no late postoperative complications.⁴

Hosamani study had late complications that included posterior capsular opacification (3.87%) noted and retinal detachment (0.48%) later, but vision threatening complications were minimal. Similar views were echoed in two other studies.^{7,8,9}

First POD visual acuity: Majority of patients (64.03%) had a vision of 6/18 and above; 18.2% had a vision of < 6/60 and 17.69% had a vision of 6/60 to 6/24. Similar observations were seen in Sudheer Singh's study.¹⁰

6 weeks observation revealed that 80.02% had a visual acuity of 6/18 or more; 7.42% had a vision of < 6/60 and 11.99% had a vision between 6/60 and 6/24. Similar observations were seen in other studies Anitha S. Maiya and R. Ramakrishnan et al.^{4,11}

Though postoperative astigmatism was seen in a fifth of our patients, majority of them were correctable with a defect

between 1 - 2D. Ramlal Sharma et al described MSICS is possible without application of superior rectus suture (truly stitch less) and construction of conjunctival flap with minimal postoperative scarring and astigmatism.¹²

Suresh H. H et al described its safety even in cardiac patients without any compromise in visual outcome.¹³

Ang M et al and other studies found both ECCS and MSICS are comparable in final outcome, but astigmatism is more common ECCS.^{14,1}

Jawed Alam study showed SICS surgical technique resulted in significantly better visual acuity on the 1st postoperative day in comparison with phaco. Hence, SICS with rigid PMMA IOL implantation being a cheaper, faster and easier technique may be recommended for immature cataract surgery in the developing countries.¹⁵

In the opinion of Parikshit Gogate et al, although MSICS demands skill and patience from the cataract surgeon it is a safe, effective and economical alternative to competing techniques and can be the answer to tackle the large backlog of blindness due to cataract. MSICS can cause posterior capsular opacity, but causes less astigmatism and is comparable to phacoemulsification and can be recommended in resource poor setting.¹⁶

Khanday S et al concluded that SICS induces less surgically-induced astigmatism, less inflammation, less complications influencing the overall visual prognosis.¹⁷

Rajkumari V et al found manual small incision cataract surgery being inexpensive plays a key role in management of poor outreach program marker like phacomorphic glaucoma in effectively controlling the IOP and achieving good visual acuity with minimal complications.¹⁸

Efficacy of MSICS in hospital-based eye camps in North Karnataka is reiterated by Sushma A. Hosamani et al, in black cataracts and in eye camps with good postoperative visual acuity and minimal astigmatism.^{19,20,21}

SUMMARY

1051 patients operated with MSICS in our tertiary care centre from February 2016 to December 2016 were studied. Diabetes and hypertension were predominant comorbidities among our patients. Male: Female ratio was 1.4: 1.

Nearly half of the patients presented with a vision of counting fingers to 6/60. More than one-fifth of the patients had COPD or asthma. Difficult cortical aspiration was the commonest intraoperative problem encountered in a third of the patients. Constriction of pupils, posterior capsular rent and difficult nuclear prolapse were seen in 5% - 9% of patients each. Retrobulbar Haemorrhage due to local anaesthesia, Stripping of Descemet's membrane, zonular dialysis, nucleus drop, iridodialysis and vitreous loss were less common.

CONCLUSION

Cataract is an important cause of preventable blindness. Many patients present to the hospital with very poor vision. Manual small incision cataract surgery is cost effective, safe and is useful in restoration of vision. Compared to ECCS, astigmatism is minimal. Vision restoration with MSICS is

comparable to Phacoemulsification. Identification of comorbidities and treatment is important before cataract surgery. Intraoperative and postoperative complications are minimal with MSICS in expert hands; 80% of people had a BCVA of > 6/18. Astigmatism occurred in a fifth of patients and was correctable with < 2D cylinder.

ABBREVIATIONS

MSICS: Manual Small Incision Cataract Surgery
 ECCE: Extracapsular Cataract Extraction
 DBCS: District Blindness Control Society
 IOL: Intraocular Lens
 COPD: Chronic Obstructive Pulmonary disease
 UCVA: Uncorrected Visual acuity
 BCVA: Best corrected Visual acuity
 PMML: Polymethyl Methacrylate.

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