

Visual Outcome of Manual Small Incision Cataract Surgery and Phacoemulsification in a Tertiary Care Center

Hina Kounsar¹, Suhail Raheem Rather², Sheikh Sajjad³, Uroosa Farooq⁴

¹Department of Ophthalmology, SKIMS-MCH, Srinagar, India.

²Medical Officer, Department of Health and Medical Education, Srinagar, India.

³Department of Ophthalmology, SKIMS-MCH, Srinagar, India.

⁴Department of Community Medicine, SKIMS-MCH, Srinagar, India.

Corresponding Author: Hina Kounsar

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ABSTRACT

Introduction: Phacoemulsification is considered the gold-standard procedure for cataract. However, MSICS being less expensive can be considered a better procedure for doing mass surgeries. The purpose of this comparative hospital-based study was to assess the visual outcome in the post-operative patients of MSICS and Phacoemulsification.

Method: 160 consecutive patients who completed the post operative follow up of 6 weeks were included in our study with two groups of 80 patients each. One group of patients were operated by MSICS and another by Phacoemulsification. Proper ocular examination including visual acuity (aided and unaided), pupillary reaction, slit lamp examination and fundus was evaluated at week 1 and week 6.

Results: Amongst the 80 cases of phacoemulsification 74 (92.5%) had unaided visual acuity of 6/18 or better at week 1. In case of MSICS unaided visual acuity of 6/18 or better was present in only 62 (77.5%) cases at week 1. The results were statistically significant ($P < 0.01$) in favour of Phacoemulsification. At week 6 Visual Acuity of 6/18 or better was present in 76 (95%) and 67 (83.5%) patients in Phacoemulsification and MSICS methods respectively, though better in phacoemulsification group it was not statistically significant ($P > 0.01$). Similar was case with Best Corrected Visual Acuity at week 6.

Conclusion: Phacoemulsification gives better UCVA at 1st week than MSICS though both are equally safe and efficacious procedures with low complication rates and same visual outcome when compared at 6 weeks. MSICS can thus be an alternative wherever the requisite equipment and expertise for PHACO are not available.

Key Words: Manual Small Incision Cataract Surgery, Phacoemulsification, Visual outcome, surgical induced astigmatism.

INTRODUCTION

Senile cataract is an age related, vision impairing disease characterized by gradual and progressive thickening of the lens. Cataract is one of the leading causes of treatable blindness in the world [1]. Modern cataract surgeries with the intraocular lenses are the safest, successful, and most frequently performed surgeries [2-6]. The main objective of these surgeries is to obtain early visual rehabilitation and a better unaided visual acuity with minimal surgical complications [7-8]. Our study included two main techniques of cataract extraction mostly done nowadays that is Manual Small Incision Cataract Surgery (MSICS) and Phacoemulsification (Phaco). The evolution of surgical techniques has been mainly due to decrease in the size of incision.

Phacoemulsification is considered the gold-standard procedure for cataract. However, MSICS being less expensive can be considered a better procedure for doing mass surgeries. Surgically induced astigmatism (SIA), which is common with MSICS, causes poor postoperative visual recovery in MSICS.

The purpose of this comparative hospital based study was to assess the visual outcome in the post-operative patients of MSICS and Phacoemulsification.

MATERIAL AND METHODS

A Prospective comparative hospital based study was conducted in the department of ophthalmology in SKIMS-MCH BEMINA on patients undergoing cataract surgery by MSICS and Phacoemulsification.

160 consecutive patients who completed the post operative follow up of 6 weeks were included in our study with two groups of 80 patients each. One group of patients were operated by MSICS and another by Phacoemulsification. All the patients were above the age of 45 years in both the groups with visually significant age related uncomplicated cataract.

Inclusion criteria:

- I. Patients whose age is greater or equal to 45 years,
- II. Patients with Senile cataract.
- III. Good intact zonular apparatus.
- IV. Patients who are willing to participate in the study.

Exclusion criteria:

- I. Any other type of cataract except senile cataract.
- II. Patients with any ocular trauma or any intraocular surgery.
- III. Patients with glaucoma, uveitis, pseudoexfoliation.

Demographic data of patients was collected including name, age, sex and occupation. Duration of diminution of vision was taken and other relevant past

history including systemic diseases. Proper ocular examination including visual acuity (aided and unaided), pupillary reaction, and its dilating capacity was evaluated at week 1 and week 6. Slit lamp examination of anterior segment and fundus examination was carried out after pupillary dilatation to rule out other causes of diminution of vision.

Phacoemulsification was performed by experienced surgeons under Zeiss operating microscope. Chi-square test was used for finding level of statistical significance.

RESULTS

Of the 160 patients, who were included in the study, 73 were male and 87 female. The patients age ranged from 46-78 years, with a mean of 61.4 years.

8 cases of MSICS had Iris prolapse because of premature entry into the anterior chamber. 6 patients of MSICS and 4 patients of phaco had corneal edema which subsided within a week or two. Table 1

Amongst the 80 cases of phacoemulsification 74 (92.5%) had unaided visual acuity of 6/18 or better at week 1. In case of MSICS unaided visual acuity of 6/18 or better was present in only 62 (77.5%) cases at week 1. The results were statistically significant ($P < 0.01$) in favour of Phacoemulsification. Table 2

At week 6 Visual Acuity of 6/18 or better was present in 76 (95%) and 67 (83.5%) patients in Phacoemulsification and MSICS methods respectively, though better in phacoemulsification group it was not statistically significant ($P > 0.01$). Similar was case with Best Corrected Visual Acuity at week 6 where 78 (97.5%) and 70 (87.5%) cases in phacoemulsification and MSICS had Visual Acuity of 6/18 or better respectively ($P > 0.01$). Table 3

Table 1. Distribution of complication between two procedures.

	MSICS	PHACO
Corneal Oedema	6	4
Striate Keratopathy	8	1
Posterior Capsule Rent	3	2
Iris prolapse	8	0
Iridodialysis	4	0

Table 2. Visual Acuity at week 1 and week 6 in SICS and Phacoemulsification respectively.

	VA at week 1			VA at week 6		
	MSICS	PHACO	P-value	MSICS	PHACO	P-value
6/18 or better	62 (77.5%)	74 (92.5%)	$X^2=7.0588$	67 (83.75%)	76 (95%)	$X^2=5.3311$
Worse than 6/18	18 (22.5%)	6 (7.5%)	P value =0.0079 (<0.01)	13 (16.25%)	4 (5%)	P value =0.0209 (>0.01)
Total	80	80		80	80	

Table 3. Best corrected Visual Acuity at week 6 in SICS and Phacoemulsification respectively.

	MSICS	PHACO	P-value
6/18 or better	70 (87.5%)	78 (97.5%)	$X^2=5.7658$
Worse than 6/18	10 (12.5%)	2 (2.5%)	P value =0.0163 (>0.01)
Total	80	80	

DISCUSSION

There was no significant age difference between the two groups and the mean age amongst the 160 cases in our study was 61.4 years. The age was comparable with results in other studies [9, 10, 11].

In this study there was not much significant difference between the various groups in terms of distribution of gender which is constant with the results observed in the previous studies which showed no difference in terms of gender [11,12].

There was a significant difference in visual outcomes between MSICS and Phacoemulsification surgical methods at 1 week, but significance decreased by 6 weeks. Similarly, Gamal Mostafa Abo El Maaty et al. [13] and Ruit S et al. [14] compared visual outcome of manual sutureless small incision cataract surgery (MSICS), planned extracapsular cataract extraction and phacoemulsification. These studies were in consistence with our study wherein there was a significant difference between various 2 groups in terms of distribution of Vision Category in first week. In a study by Rathi A et al [15] participants in the Group: Phacoemulsification had the better proportion of Vision Category (Post-Operative Day-7) 6/18 or better on 7th post-operative day compared to MSICS group due the difference in the size of the incision and induced astigmatism.

Both the SICS and PHACO group of patients showed improvement in the vision from week 1 to week 6, but at 6 weeks there

was not much difference in outcome of PHACO and SICS group. Similar results were seen in number of studies. Wairagade N et al [16] in their study found that at 6 weeks post-operatively Phaco group 99.6% achieved BCVA 6/18 or better as compared to 97.6% in SICS group. None of the patients had vision less than 6/60 in their study and the difference in BCVA at 6 weeks between the phaco and SICS groups was not statistically significant ($p = 0.12$). Similarly, Gogate PM et al [17] found out uncorrected visual acuity of 6/18 or better in 81.1% patients in the phacoemulsification group and 71.1% patients in the SICS group at 6 weeks with no statistically significant difference in both the groups. The BCVA was also comparable in the two groups. Comparable visual outcomes after 4 – 6 weeks between manual SICS and phacoemulsification were also seen in number of other studies like Ruit et al [14], Venkatesh et al., [4]. Singh S.K.et al [12]. Husain R et al [18] found very little difference between manual SICS and Phacoemulsification in terms of visual outcome at 4-11 weeks visit (89.50% vs 88.20%).

Cook et al [19] in their study reported incidence of 0.1% PCR in the SICS group and 0.04% in the phaco group. While there was a higher incidence of complications like posterior capsule rent, vitreous loss, in the eyes having manual small-incision surgeries, this difference was not statistically significant ($P=0.34$).

Iridodialysis occurred in 4 cases of SICS (1.6%) and none was seen in the phaco group. All cases were related to difficulty while delivering the nucleus. The higher incidence was probably because of the larger size of the incision in SICS, but the difference was not statistically significant. Gogate et al [17] and Singh et al [12] carried out a comparative study of

iridodialysis in two groups and found out that incidence is comparable. Haripriya A. et al [20] suggests that Iridodialysis though rare with both procedures, occurred statistically more often with MSICS than in phaco groups.

CONCLUSION

From our study we conclude that though PHACO is better than SICS due to its small incision which heals rapidly and gives early visual rehabilitation at 1st week post operatively but both are equally safe and efficacious procedures with low complication rates and same visual outcome when compared at 6 weeks. MSICS can thus be an alternative wherever the requisite equipment and expertise for PHACO are not available.

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