

Modified Manual Small Incision Cataract Surgery A Better Approach in terms of Post-operative Visual Recovery

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ABSTRACT- The purpose of this study was to access the outcome of modified manual small incision cataract surgery (M-MSICS) in terms of postoperative visual recovery (Best Corrected Visual Acuity). In this prospective study, the patients having cataracts with nuclear sclerosis not more than early grade 3 were randomly assigned in 2-groups with 50- patients in each group [Group A (C-MSICS), Group B (M-MSICS)]. Both techniques were compared for each stage in terms of postoperative visual recovery (Best Corrected Visual Acuity). Follow ups in postoperative period were carried out on 1st and 3rd postoperative days, 2 weeks, 4 weeks and 6 weeks. Significant early postoperative visual recovery was observed in Modified manual small incision cataract surgery (M-MSICS) as compare to conventional technique. Postoperative surgical induced astigmatism at 6 weeks was significantly less in M-MSICS group ($p < 0.05\%$). So it can be concluded that M-MSICS is better technique than C-MSICS in terms of early postoperative visual recovery & less postoperative surgical induced astigmatism.

Key-words- Conventional manual small incision cataract surgery (C-MSICS), Modified manual small incision cataract surgery (M-MSICS), Postoperative visual outcome

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INTRODUCTION

Cataract is leading cause of blindness in India accounting for 62.6% and the prevalence of blindness is 1.1%.¹ An estimated 4 million people become blind because of cataract every year, which is added to a backlog of 10 million operable cataracts in India, whereas only 5 million cataract surgeries are performed annually in the country.² Thus, a technique of cataract surgery that is not only safe and effective but also economical and easy for the majority of ophthalmologists to master, is the need of the hour. MSICS is not only safe and economic but also have easy learning curve and ideal for developing countries. The outcome of cataract surgery in terms of early good visual recovery is single most important indicator of patient satisfaction, so keeping in view this fact, we modified the

MSICS which is done routinely and then carried out this study to measure postoperative visual outcome in the follow up period up to 6-weeks.

In Modified Manual Small Incision Cataract Surgery we introduced following changes to routine MSICS which included relatively small superior “frown shaped” scleral incision (5.5mm), “hydrodelineation” and “viscoexpression of nucleus”.^{3,4}

MATERIALS AND METHODS

This prospective study was carried out in the year 2016 (March to July) in the department of Ophthalmology at Civil hospital Rohru, Shimla (HP), India.

The patients were divided in two groups as follows-

Group A: Modified Manual Small Cataract Surgery: 50 Patients.

Group B: Conventional Manual Small Incision Cataract Surgery: 50 Patients.

Inclusion Criteria: (1) Cases having operable cataract of different types with nucleus hardness of any of these grades I, II or early III.

(2). Age group selected was between 35-65 yrs.

Exclusion Criteria: (1) Any evident ocular disease or complicated cataract

(2) Patients having preoperative astigmatic error more than 0.75D.

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Surgical Techniques

- (1) In Conventional Manual Small Incision Cataract Surgery (C-MSICS), 6.5 mmsuperior straight scleral incisions was given and after performing hydrodissection the nucleus delivery was carried out by irrigating vectis.
- (2) In Modified Manual Small Incision Cataract Surgery

(M-MSIS), 5.5 mm superior “frowns shaped incision” was given and delivery of the nucleus by visioexpression technique. Hodrodelineation was performed prior to viscoexpression of nucleus.

RESULTS

The data were analysed by using Chi square test. In Chi square test, p-value was calculated and a-value of less than 0.05 implied Statistically Significant (SS) at 95% Confidence Interval (CI). The Chi square test was done by using SPS version-15.

The postoperative visual acuity with pin hole (VAPH) on 1st postoperative day (D1) was 6/18 or better in 96% cases

in M-MSICS group as compared to 83% cases in C-MSICS group (Statistically Significant, p-value 0.01). On 3rd postoperative day (D3) the visual acuity with pin hole (VAPH) was 6/18 or better in 97% cases in M-MSICS group as compared to 83% cases in C-MSICS group (Statistically Significant, p-value 0.01).

Table 1: Distribution of Postoperative Visual Acuity with Pin Hole (VAPH)

	M-MSICS			C- MSICS			Chi-Square	P value
	6/18 or better	6/24-6/60	<6/60	6/18 or Better	6/24-6/60	<6/60		
D1	96(96%)	4(4%)	0	83(83%)	17(17%)	0	15.3	0.01*
D3	97(97%)	3(3%)	0	83(83%)	17(17%)	0	12.3	0.03*
1W	99(99%)	1(1%)	0	94(94%)	6(6%)	0	8.2	0.9
2W	99(99%)	1(1%)	0	97(97%)	3(3%)	0	2.2	0.53
6W	99(99%)	1(1%)	0	98(98%)	2(2%)	0	1.7	0.6

M-MSICS: Modified Manual Small Cataract Surgery
 C- MSICS: Conventional manual small incision cataract surgery

*Significant at < 0.05 level

The mean surgical induced astigmatism (SIA) at 6-weeks was 0.79 D in M-MSICS group as compared to 1.40 D in C-MSICS group (Statistically Significant, p value 0.00).

Table 2: Distribution of Surgically Induced Astigmatism (SIA) at 6-weeks (In Dioptre)

SIA	M-MSICS	C- MSICS	Total	Chi-Square	P value
<0.25	1(1%)	0(0.0%)	1(0.5%)	138.0	.00**
0.25-1	92(92%)	10(10.0%)	102(51.0%)		
1-2	7(7%)	87(87.0%)	94(47.0%)		
>2	0(0.0%)	3(3%)	3(1.5%)		
Mean±SD	0.79±0.24	1.40±0.27	1.10±0.40		
Total	100	100	200		

SIA: Surgically Induced Astigmatism
 M-MSICS: Modified Manual Small Cataract Surgery
 C- MSICS: Conventional manual small incision cataract surgery
 **Significant at 0.01 level (t=2.58)

DISCUSSION

Studies had found MSICS to be more effective and economical than ECCE and almost as effective as and more economical than phaco-emulsification. Thus, among small incision surgeries, MSICS is ideal for developing countries. In our study we took comparatively younger age group (35-65 years) having cataracts with nucleus hardness of lower grades (Nuclear Sclerosis grade I, II or early III)⁵ keeping in view the fact that in M-MSICS group to deliver the nucleus from relatively small incision size the hydrodelineation was performed prior to nucleus delivery with viscoexpression technique. The mean preoperative astigmatism was 0.43 D. Astigmatism was calculated by simple subtraction method. In our study we excluded the cases having preoperative astigmatism > 0.75 D. This cut-off point for the preoperative astigmatic error in our study is taken keeping in view the fact that in patients with little (<0.75D) or no pre existing astigmatism, cataract surgery should be as astigmatically neutral as possible. Because as little as 0.75 D of astigmatism may cause ghosting and halos, correcting astigmatism in cataract surgery is desirable.⁶ The visual recovery was significantly earlier (on first and third postoperative day) in case of M-MSICS than in C-MSICS. This can be explained from the fact the incidence of postoperative striate keratopathy was very less in M-MSICS group because nucleus was delivered by viscoexpression technique and viscosubstance are of corneal endothellum protective nature.⁷⁻⁸

The surgical induced astigmatism (SIA) was significantly lower in M-MSICS group as compared to C-MSICS group. Majority of cases in C-MSICS (87%) group, had astigmatism between 1-2D which is considered as significant astigmatism according to Holmstrom's gradation.⁹ This can be explained from the fact that, incision size was more in C-MSICS group (6.5 mm) as compared to M-MSICS group (5.5 mm) and also frown shaped incision was given in M-MSICS technique and past studies in the literature have documented that frown shaped incision leads to less surgical induced stigmatism as compared to straight incision.¹⁰ It is worth to mention here that hydrodelineation was performed prior to the nucleus delivery with viscoexpression of nucleus in M-MSICS technique. In hydrodelineation, the fluid injection separates the epinucleus from the endonucleus, so the volume of nucleus is reduced and it can be delivered out by a relatively smaller incision size.¹¹

CONCLUSIONS

Finally it can be concluded in our study that Modified manual small incision cataract surgery (M-MSICS) is better technique than Conventional manual small incision cataract surgery (C-MSICS) in terms of early Visual recovery and significantly less surgical induced astigmatism. The only problem Few drawbacks observed with this modified technique of manual small incision cataract surgery (M-MSICS) were as follows, firstly this technique can be carried out in selected patients i.e. patients with nuclear

sclerosis of lower grades and secondly it was observed that in some cases a sheet of cortex remains after viscoexpression, so it takes bit more time for cortical matter aspiration. So it can be concluded that with the experience one may switch over to the modified technique of manual small incision cataract surgery (M-MSICS) keeping in view all the advantages of M-MSICS technique. However multicentre studies are required for the further assessment of these two techniques i.e. conventional manual small incision cataract surgery (C-MSICS) and modified manual small incision cataract surgery (M-MSICS), so that the remedial measures can be taken to improve the quality of cataract surgeries being performed by the MSICS techniques. It will also help in improving the quality of cataract surgery services being imparted to the patients under NPCB.

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REFERENCES

- [1] Jose R. National programme for the control of blindness. *Indian J Comm Health* 1997; 3:5-9.
- [2] Minasian DC, Mehera V. 3.8 million blinded by cataract each year-Projections of the first epidemiological study of incidence of cataract blindness in India. *Br J Ophthalmol*, 1999; 74:341-3.
- [3] Srinivasan Aravind. Nucleus management with irrigating vectis. *Indian Journal of Ophthalmology*, 2009; 57:19.
- [4] Gokhale Nikhil. The technique of viscoexpression in manual small incision cataract surgery. *Indian Journal of Ophthalmology*, 2009; 57: 39 – 40.
- [5] Khurana AK. Diseases of the lens. *Comprehensive Ophthalmology*. 4th ed., Delhi; New Age International (P) Limited, Publishers: 2007; pp. 180-81
- [6] Ramon C Ghanem, Dimitri T Azar. Astigmatism and cataract surgery. *Albert Jakobiec's Principles and Practics of Ophthalmology*. 8th ed., Philadelphia; Saunders Elsevier 2: 2008; pp.15-17.
- [7] Thim. Comparison between techniques of nucleus delivery with viscoexpression and hydroexpression in cadaver eyes. *J cataract Refract Surg*, 1993; 19:209-212.
- [8] Burton and Pickering. SICS using a limbal incision and delivery of nucleus by viscoexpression. *J Cataract Refract Surg*, 1995; 21:297-301.
- [9] Werblin TP. Astigmatism after cataract extraction: 6-year follows up of 6.5-and 12-millimeter incisions. *Refract Corneal Surg*, 1992; 8 (6): 448-58.
- [10] Singer JA Frown incision for minimizing induced astigmatism after small incision cataract surgery with rigid optic intraocular lens Implantation. *J. Cataract Refract Surg* 17 Suppl, 1991; 677-88.
- [11] Shimon Rumelt and Dimirit T Azar. Hydrodissection and Hydrodelineation. *Jakobiec's Principles and Practice of Ophthalmology*. 8th ed., Philadelphia; Saunders Elsevier 2: 2008; pp. 14-48.

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