

MANUAL NUCLEAR DIVISION IN ANTERIOR CHAMBER WITH MVR BLADE FOR
4MM SICS – SAFETY AND EFFICACY

Dr Ravi Chauhan, Dr Sandesh Sonarkhan, Dr Satish Solanke

Dept. Of Ophthalmology, Indira Gandhi Govt. Medical College,
Nagpur, India

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For Correspondence
Email ID:
drravianita@gmail.com

Abstract

Purpose: Critical evaluation with respect to intraoperative and postoperative complications, visual outcome and cost effectiveness in a 4mm small incision cataract surgery by phacofracture with MVR blade and conventional SICS.

Methods: 300 patients were divided into two groups 150 each. Patients had grade I-IV nuclear sclerosis and were operated under peribulbar anesthesia. 4 mm scleral tunnel made 2mm behind limbus. Capsulorhexis done, Hydrodissection done. Nucleus prolapsed in anterior chamber. Viscoelastic injected behind and in front of nucleus. Wire vectis passed through the main incision below the nucleus to stabilize it 20G MVR blade was introduced from 11O'clock and pierced through nucleus substance. MVR blade pressed against wire vectis and nucleus was bisected into two halves. The fragmented nucleus halves removed through main incision. Cortical wash was given and foldable IOL was implanted.

Results: Out of 300 patients 1.03% had grade I cataract, 20.05% had Grade II, 55.01% had Grade III and 24.04% had Grade IV. Commonest intraoperative complication was iridodialysis and extended rhexis, while post operatively striate keratopathy and cystoids macular edema were noted. There was no significant difference noted between the two groups. Also the surgically induced astigmatism was assessed post operatively and keratometric readings compared between the two groups. There was no statistical difference between the two groups in term of induced astigmatism.

Conclusions: Micro MSICS is more cost effective, with no major complications, similar post operative astigmatism, provides early rehabilitation & good visual recovery with short learning curve.

Keywords: 4 mm, MVR, SICS

Introduction

Blindness due to cataract presents an enormous problem in India not only in term

of human morbidity but also in terms of economic loss and social burden. The idea now a day in cataract surgery is to make the

patients emetropic and surgically induced less astigmatism thus it has become refracting surgery.

The success of cataract surgery is determined by the best and earliest possible visual and technical rehabilitations. The surgically induced astigmatism occurs due to wound healing at the incision site. Ophthalmologists all over the world are working with great interest and energy for countering the corneal factors with smaller and smaller incision. Controlling surgically induced atigmatism is now an integral part of cataract surgery.

Issues for considering for any surgical cataract procedure are type of surgery, length of incision, depth, and complex phenomenon of wound healing. The incision is considered the most important step of operating since it affects ocular integrity and correct stability and hence post operative surgically induced astigmatism.

Smaller incision with IOL implantation has gained importance in modern day cataract surgery however conventional incision surgery has still retained its place.

The present study evaluates small incision techniques where cataract surgery and IOL implantation with small incision, with available non sophisticated equipment with added advantage in respect of astigmatism, wound stability early visual rehabilitation. Thus it not only reduces the constantly escalating surgical expenditure but also produced highest quality results.

Aims and Objective:

1. To study and compare intra operative and post operative complication
2. To study and compare the post operative induced astigmatism.

Methodology

This is a prospective study of 300 patients, assigned to undergo 4 mm SICS (150 cases) and manual small incision cataract surgery (150 cases).

Type of study

These is randomized prospective comparative study

Plan of study

300eyes of 300 patients were randomized selected in 2 groups.

Group A

Included 150 eyes of 150 patients who underwent 4 mm manual small incision cataract surgery. Using 20 G MVR blade by pacofracture through superior sclerocorneal tunnel incision with a foldable IOL implantation.

Group B

Included 150 eyes of 150 patients who underwent manual small incision cataract surgery.

Inclusion Criteria

All patient having uncomplicated operable cataracts from grade 1 to grade 4 were included in the study.

Exclusion Criteria

Any other ocular pathology , dry eye ,glaucoma , corneal pathology ,scleral pathology , operated case of glaucoma , traumatic cataract , complicated cataract , subluxated lens , gross astigmatism , patient having diabetes, one eyed patients , patient not willing for follow up and operation .

Preoperative assessment

Patients were admitted one day before surgery. Detailed history was taken of each patient and anterior segment examination was performed using slit lamp. Visual acuity was checked with Snellen's visual acuity chart. After pupillary dilatation detailed fundus examination and retinoscopy was done. Lenticular opacity was assessed and graded. IOP was measured with applanation tonometer and patency of lachrymal system checked. Keratometry was carried out using the autorefractometer axial length was measured by A-scan and IOL power was calculated using SRK!! Formula. Routine investigations were carried out to rule out diabetes, hypertension and other infections.

Endothelial cell count was measured by specular microscope preoperatively.

Post operative follow up was done up to 6th month

An indigenous, novel surgical technique was used for doing a 4mm SICS with nuclear fragmentation with a MVR blade.

Surgical technique

All cases were performed by single surgeon and observation noted by same person throughout the study.

Group a 4 mm SICS with MVR knife (surgical procedure of group A)

Under all aseptic precaution, under peribulbar block superior Rectus brida suture and inferior rectus brida suture taken limbal based conjunctival flap is made, 2mm away from the limbus on sclera. A linear superior 4 mm sclerocorneal tunnel is made. The internal incision is about 6 mm is made and it is 1.5 mm inside the cornea. CCC done with 26 G needle cystotome after staining anterior capsule with trypan blue dye. Hydrodissection done Nucleus is prolapsed in anterior chamber. viscoelastic put in front and behind the nucleus Anterior chamber is sufficiently deepened with viscoelastic to prevent the injury to iris and posterior capsule.

4 mm wide wire vectis is passed below the nucleus to stabilize the nucleus. A 20 G MVR blade is introduced at 11 o'clock. it is pierced through the substance of the nucleus and MVR blade pressed against wire vectis so as to divide it in two equal halves each half is removed through 4 mm incision. Cortical aspiration is done with simcoe canula. Viscoelastic is put in to deepen the anterior chamber. Foldable IOL is implanted in the bag. AC. is formed with sterile air. Sub conjunctival Gentamycin and wymison given pad and bandage applied.

Statistical Methods: Descriptive statistical analysis has been carried out in the present study. Results of continuous measurements are presented on Mean \pm SD (Min-Max) and results on categorical measurements are presented in Number (%). Significance is assessed at 5 % level of significance. Student t test (two tailed, independent) has been used to find the significance of study parameters on continuous scale between two groups.

Statistical software: The Statistical software namely SPSS 22.00 and 8.0, epiinfo 7.1 were used for the analysis of the data and Microsoft word and Excel have been used to generate graphs, tables etc.

Results

Table 1: Observed intraoperative complication in two groups

Sr. No.	Types of Procedure	Group A	Group B	p value
1	Hyphema	-	-	-
2	Iridodialysis	4	2	>0.05NS
3	Extended rhexis	7	13	>0.1649NS
4	Posterior Capsular Rupture with Vitreous Loss	-	-	-
5	Zonular dehiscence	-	-	-
6	Nuclear Drop	-	-	-

We evaluated various types of intraoperative complications. The intraoperative complications in both the

group were studied. Its p value is >0.005 which is to be not significance. Thus there

was no statistical difference between the two groups.

Table 2: Post Operative Complication

Sr.No.		Group A	Group B	P value
1	Straite Kerotopathy	21	17	>0.05NS
2	Postoperative iritis	-	-	-
3	Cystoid Macular Oedema	3	6	>0.05NS
4	Hyphema	-	-	-
5	Iridodialysis	3	2	>0.05NS
6	Pco formation	-	-	-
7	Epithelial Engorwth	-	-	-
8	Flate Anterior Chamber	-	-	-
9	Fibrious Down Growth	-	-	-
10	Secondary Glaucoma	-	-	-

Its p value is >0.005 which is to be not significance .thus there is no statistical difference between the two groups.

Table 3: Distribution of post operative astigmatism at the end of 6 week.

Sr.No.		Group A	Group B	P Value
1	0-0.50 D	8	6	>0.05, NS
2	0.50 D– 1.00D	79	65	>0.05, NS
3	1.00D – 1.50D	46	51	>0.05, NS
4	1.50D – 2.00D	17	24	>0.05, NS
5	>2.00D-2.50D	0	2	>0.05, NS
6	> 2.50D	0	2	>0.05, NS
	TOTAL	150	150	

Its p value is >0.005 which is to be not significance .thus there is no statistical difference between the two groups

Table 4: Pre-operative and post operative K 1 value

Sr. No.	K1	Group A	Group B	P value
		MEAN	MEAN	
1	Pre OP	42.55	42.49	>0.05, NS
2	Postoperative 1st Month	41.31	41.25	>0.05, NS
3	Postoperative 3rd Month	41.29	41.24	>0.05, NS
4	Postoperative 6th Month	41.31	41.27	>0.05, NS

Its p value is >0.005 which is to be not significance .thus there is no statistical difference between the two groups

Table 5: Preoperative and Postoperative value of K 2

Sr. No.	K2	Group A	Group B	P value
		MEAN	MEAN	
1	Pre OP	43.83	43.78	>0.05, NS
2	1st Month	42.24	42.21	>0.05, NS
3	3rd Month	42.23	42.20	>0.05, NS
4	6th Month	42.24	42.20	>0.05, NS

Its p value is >0.005 which is to be not significance .thus there is no statistical difference between the two groups

Summary and Conclusion

The overall results of this study show that 4mm small incision cataract surgery with posterior chamber intra ocular lens implantation using MVR blade is favorable in following aspects-

1. The surgically induced astigmatism (S.I.A) is less
3. Rapid visual recovery.

4. Reduces the hospital stay.
5. Early stabilization of the wound.
6. Foldable IOL can be implanted safely through 4mm incision.
7. All the grades of nuclei can be phacofractured very well with 20G MVR Blade with less time.
8. No major intra-operative and post-operative complications observed in our study.
9. Easier to master the technique of 4mm SICS with little practice.

10. Very cost-effective, so can be used in high volume surgeries.

11. Minimum instruments are required for surgery

Hence, we conclude that to perform 4mm SICS with MVR blade is a reasonably safe and is very cost-effective, having good visual outcome, early rehabilitation and with minimum complications and without much financial burden to both patients as well as to surgeons.

Although, the MSICS preferred technique of cataract surgery is no doubt has the good results and our study shows almost similar results ,and hence according to our study we come to conclusion that ,4 mm SICS with MVR blade is superior and better alternative to MSICS as cost effective method in our country .Our technique has all the inherent advantages of suture less cataract surgery in 4 mm SICS with MVR of universal applicability, greater wound stability reduced surgically used astigmatism greater patient comfort with earlier visual.

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