

Comparative Evaluation of Different Techniques of Cataract Surgery in Diabetic and Non- Diabetic Patients: A Clinical Study

Niladri Saha^{1*}, Nilotpal Saha²

^{1*}MBBS(Cal), DO(Cal), MS (Cal), Associate Professor,
Department of Ophthalmology, MGM Medical College & LSK Hospital, Kishangunj, Bihar.

²MBBS, MGM Medical College & LSK Hospital, Kishangunj, Bihar.

ABSTRACT

Background: The present study compared Phacoemulsification versus manual small incision cataract surgery.

Materials & Methods: The present study was conducted on 64 patients of cataract of both genders. They were divided into 2 groups of 32 patients each. Group I were non- diabetic patients in which conventional extra capsular cataract surgery and small incision cataract surgery was performed on 32 patients each and group II comprised of diabetic patients in which both techniques were performed on 32 patients each. Following surgery, postoperatively patients were examined 1st day, after 2 weeks and 6 weeks. Complications in both groups were assessed.

Results: In group I, CECC technique showed iridodialysis in 1 case, MSICS showed iris prolapse in 1 case, constricted pupil in 1 case and retained cortex in 1 case. In group II, iris prolapse was seen in 1 case, retained cortex in 1 case and PC rent in 1 case while, MSICS showed iridodialysis in 1 case, iris prolapse in 1 case, retained cortex in 1 case, PC rent in 1 case and vitreous loss in 1 cases. The difference was significant ($P < 0.05$). Post- operative complications were iris prolapsed 1 in MSICS in group II, wound leak 1 in CECC in group I, II and MSICS 1 in group II, secondary glaucoma 1 in MSICS in group I and 2 in group II, posterior capsule opacity 1 in MSICS in

group I and cystoids macular edema 1 in CECC and MSICS each in group II. The difference was significant ($P < 0.05$).

Conclusion: Conventional extra capsular cataract extraction found to be effective as compared to manual small incision cataract surgery in non-diabetic than diabetics. Common complications were iris prolapsed, wound leak, secondary glaucoma, posterior capsule opacity and cystoids macular edema.

Key words: Phacoemulsification, MSICS, Diabetes.

*Correspondence to:

Dr. Niladri Saha,
MBBS(Cal), DO(Cal), MS (Cal),
Associate Professor,
Department of Ophthalmology,
MGM Medical College & LSK Hospital, Kishangunj, Bihar.

Article History:

Received: 07-09-2018, **Revised:** 02-10-2018, **Accepted:** 31-10-2018

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2018.4.6.021	

INTRODUCTION

The World Health Organization (WHO) estimated that 20 million people are blind from cataract worldwide, making it the leading cause of visual loss. By the year 2020, the projected number of persons with blinding cataract will exceed 40 million worldwide. In India, there are 12.5 million blind and it is estimated that 50% to 80% of them are blind due to cataract. In addition to backlog, an additional 3.8 million become blind each year due to cataract against 2.7 million cataract surgeries done every year.¹

Cataract is the single most important cause of avoidable blindness globally. The optimal surgical procedure worldwide is not known as different uveitic syndromes may respond differently to surgery. Secondly, in cases with extensive posterior synechia and extremely dense nuclei, it may be prudent to enlarge the incision to facilitate manual nucleus extraction. Phacoemulsification and manual small incision cataract surgery (MSICS) are the

predominant cataract surgeries being preferred to ECCE due to shorter surgical time, quicker rehabilitation, and reduced postoperative astigmatism.² However, in high-risk cataract cases both phacoemulsification and MSICS have been associated with greater intraoperative complications.³

Most authors are of the opinion that with careful patient selection, diligent surgery and appropriate perioperative care, phacoemulsification with intraocular lens (IOL) implantation is safe and effective in most patients with uveitis.⁴ However there is concern that the method used to remove the nucleus in manual small incision cataract surgery may be more traumatic to corneal endothelium than conventional extra capsular cataract excision surgery. The present study was aimed at comparing phacoemulsification versus manual small incision cataract surgery (MSICS).

MATERIALS & METHODS

The present study was conducted in the department of Ophthalmology of MGM Medical College and LSK Hospital, Kishanganj from July 2016 -July 2017. It comprised of 64 patients of cataract of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study from institutional ethical committee.

General information such as name, age, gender, etc was recorded. They were divided into 2 groups of 32 patients each. Group I were non- diabetic patients in which phacoemulsification and small incision cataract surgery was performed on 32 patients each and group II comprised of diabetic patients in which both

techniques were performed on 32 patients each. In all patients, visual acuity was checked with Snellen's visual acuity chart. After pupillary dilatation, detailed fundus direct ophthalmoscopy examination and retinoscopy was done, lenticular opacity was assessed and graded.

Preoperative adequate mydriasis was obtained with instillation of Tropicamide 0.8% with phenylephrine 5%, cyclopentolate 1% and flubriprofen 0.03% eye drops one hour prior to surgery for every 15 minutes. Following surgery, postoperatively patients were examined 1st day, after 2 weeks and 6 weeks. Results thus obtained were subjected to statistical analysis using chi- square test. P value less than 0.05 was considered significant.

Table I: Intra- operative complications in patients

Complications	Group I		Group II	
	Phacoemulsification	MSICS	Phacoemulsification	MSICS
Iris prolapse	0	1	1	1
Iridodialysis	1	0	0	1
Constricted pupil	0	1	0	0
Retained cortex	0	1	1	2
PC rent	0	0	1	1
Vitreous loss	0	0	0	1

Table II: Post- operative complications

Complications	Group I		Group II	
	Phacoemulsification	MSICS	Phacoemulsification	MSICS
Iris prolapse	0	0	0	1
Wound leak	1	0	1	1
Secondary glaucoma	0	1	0	2
PCO	0	1	0	0
Cystoids macular	0	0	1	1

RESULTS

In group I, phacoemulsification was performed on 32 patients (males-16, females- 16) and small incision cataract surgery was done on 32 patients (males-16, females- 16). In group II, phacoemulsification was performed on 32 patients (males-16, females- 16) and small incision cataract surgery was done on 32 patients (males-16, females- 16). Table I shows that in group I, phacoemulsification technique showed iridodialysis in 1 case, MSICS showed iris prolapse in 1 case, constricted pupil in 1 case and retained cortex in 1 case. In group II, iris prolapse was seen in 1 case, retained cortex in 1 case and PC rent in 1 case while, MSICS showed iridodialysis in 1 case, iris prolapse in 1 case, retained cortex in 2 case, PC rent in 1 case and vitreous loss in 1 cases. The difference was significant (P< 0.05). Table II shows that post- operative complications were iris prolapsed 1 in MSICS in group II, wound leak 1 in phacoemulsification in group I, II and MSICS 1 in group II, secondary glaucoma 1 in MSICS in group I and 2 in group II, posterior capsule opacity 1 in MSICS in group I and cystoids macular edema 1 in phacoemulsification and MSICS each in group II. The difference was significant (P< 0.05).

DISCUSSION

There are various parameters for measuring the visual outcome after cataract surgery and these include visual acuity, quality of life, and economic rehabilitation. Of these, visual acuity is probably the most suited for routine use by the ophthalmologist to measure performance and quality of service.⁵

Cataract surgery has undergone significant changes beginning with the abandonment of intracapsular surgery, and continuing with the advent of intraocular lenses, and continuing variations in extracapsular lens removal. Extracapsular cataract surgery employing a 10 mm incision at the limbus and requiring wound closure with sutures is considered a "fall back" technique that is easier to perform but has limitations.⁶ Phacoemulsification is used by most surgeons in developed countries and enables the most elegant surgery but at a high cost. A third technique, manual small incision cataract surgery (MSICS), retains most of the advantages of "phaco" but can be delivered at lower cost and is more readily applied in high volume programs. In present study we compared conventional extra capsular cataract extraction versus manual small incision cataract surgery.

We observed that intra- operative complications were iris prolapse, iridodialysis, constricted pupil, retained cortex, PC rent and vitreous loss. Post- operative complications were iris prolapsed, wound leak, secondary glaucoma, posterior capsule opacity and cystoids macular edema. This is in agreement with Henning A et al.⁷

Le et al⁸ found that in conventional ECCE, the most common surgically induced astigmatism was WTR in 73.4% of cases with mean of 2.79 D \pm 1.3 on first day. 70% of cases with mean 2.1 D \pm 1.28 and 64% of cases with mean of 1.86 D \pm 1.14 at six weeks. ATR was common in MSICS group, 83.67% of cases with mean of 1.5 D \pm 0.72 on first day, 86% of cases with mean of 1.03 D \pm 0.6 at one week and 88% of cases with mean of 1.27 D \pm 0.81 at six weeks. The induced astigmatism was less in MSICS group compared to ECCE group at first day but after six weeks there was no much significant difference found. Early visual recovery was better in MSICS group.

The size of incision of a cataract surgery has progressively decreased over time with an incision of 12.0 mm for intracapsular cataract extraction and 10.0 mm for extracapsular cataract extraction (ECCE) to MSICS of 6–7 mm and for phacoemulsification approximately 2.2–2.8 mm. A smaller incision gives distinct advantages to the patient and surgeon, both in the form of early rehabilitation, better intraocular pressure control, and low or negligible postoperative astigmatism and complications. Basic technique of MSICS has taken a sutureless and self-sealing incision into consideration.⁹

In a study by et al¹⁰ cell growth was observed across the posterior capsule of all preparations studied. It was found that there was no significant difference in the rate of cell growth on the posterior capsule with the two extraction methods, such that 50% confluency was achieved in 7.0 (SD 1.8) (n=7) days for ECCE and 7.43 (2.1) (n=7) days for phacoemulsification surgery. The physical changes to the capsule as a result of cell growth, such as wrinkling and capsular tensioning, were also seen in both groups. Cell survival and growth is dependent on the donor, rather than the surgical technique performed. There is no significant difference between phacoemulsification and ECCE surgery on the rate and nature of cell growth on the posterior capsule in vitro. Bhargava R et al compared the safety and efficacy of phacoemulsification and small incision cataract surgery (SICS) in patients with uveitic cataract and concluded that manual SICS and phacoemulsification do not differ significantly in complication rates and final CDVA outcomes.¹¹

There is, however, beyond the speed factor a proven pharmacological prophylaxis: administering non-steroidal anti-inflammatory drugs (NSAID), one eye drop three times on the day of surgery before initiating treatment reliably prevents miosis.¹² Phacoemulsification has allowed sutureless corneal incisions with faster visual recovery and increased patient comfort. Phacoemulsification has consolidated its footing as the surgical procedure of choice with the passage of time.¹³

CONCLUSION

Phacoemulsification found to be effective as compared to manual small incision cataract surgery. Common complications were iris prolapsed, wound leak, secondary glaucoma, posterior capsule opacity and cystoids macular edema.

REFERENCES

1. Yorton D, Forster A. Audit of extracapsular cataract extraction and posterior chamber lens Implantation as a routine treatment for age-related cataract in east Africa. *Br J Ophthalmol* 1999; 83: 897-901.
2. Cook NJ. Evaluation of high volume extracapsular cataract extraction and posterior chamber lens implantation in Sierra Leone, west Africa. *Br J Ophthalmol* 1996; 80:698-701.
3. Paracha Q. Cataract surgery at Marie Adelaide Leprosy Centre Karachi: An audit. *J Pak Med Assoc* 2011;61:688-90.
4. Minnasian DC, Rosen P, Dart JK, Reidy A, Desal P, Sidhu M, et al. Extracapsular cataract extraction compared with small incision surgery by phacoemulsification: A randomised trial. *Br J Ophthalmol* 2001; 85:822-9.
5. Eruchalu UV, Pam VA. A preliminary review of extracapsular cataract extraction with posterior chamber intraocular lens implantation in Kaduna, Nigeria. *NigerJ Ophthalmol* 2004;13:26-31.
6. Obiodu HC, Obi BI, Anyalebechi OC. Monitoring cataract surgical outcome in a public hospital in Orlu, south east Nigeria. *Niger Med J* 2009; 50:77-9.
7. Henning A, Singh S, Winter I, Yorston D. Can phaco be a cost-effective solution to cataract blindness? Costs and outcomes in Nepal. *Eye (Lond)* 2010; 24:1104.
8. Mendonça PT, Mendonça LT, Rosa AA, Silveira LC. Life quality assessment of patients after phacoemulsification or extracapsular cataract extraction. *Arq Bras Oftalmol* 2014; 77:12-6.
9. Muhtaseb M, Kalhor A, Ionides A. A system for preoperative stratification of cataract patients according to risk of intraoperative complications: A prospective analysis of 1441 cases. *Br J Ophthalmol*. 2004; 88:1242-6.
10. Gogate PM, Deshpande M, Wormald RP, Deshpande R, Kulkarni SR. Extracapsular cataract surgery compared with manual small incision cataract surgery in community eye care setting in western India: A randomised controlled trial. *Br J Ophthalmol*. 2003; 87:667-72.
11. Bhargava R, Kumar P, Sharma SK, Kumar M, Kaur A. Phacoemulsification versus small incision cataract surgery in patients with uveitis. *Int J Ophthalmol*. 2015 Oct 18;8(5):965-70..
12. Dick HB, Schultz T. A Review of Laser-Assisted Versus Traditional Phacoemulsification Cataract Surgery. *Ophthalmol Ther*. 2017;6(1):7-18.
13. Cataract surgery: The journey thus far. *Indian J Ophthalmol*. 2017;65(12):1273-1274.

Source of Support: Nil. **Conflict of Interest:** None Declared.

Copyright: © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882. This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Niladri Saha, Nilotpal Saha. Comparative Evaluation of Different Techniques of Cataract Surgery in Diabetic and Non- Diabetic Patients: A Clinical Study. *Int J Med Res Prof*. 2018 Nov; 4(6):106-08. DOI:10.21276/ijmrp.2018.4.6.021