

PHACOEMULSIFICATION VERSUS MANUAL SMALL INCISION CATARACT SURGERY AT SUB-DISTRICT HOSPITAL, SOPORE, KASHMIR

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ABSTRACT

BACKGROUND

The aim of this study was to compare the results of phaco-emulsification cataract surgery and manual small-incision cataract surgery.

MATERIALS AND METHODS

A prospective randomized controlled trial was carried out involving 20 patients with cataract for MSICS and 20 patients with cataract selected for phacoemulsification.

RESULTS

Total of 40 patients were included in the study, 20 patients for MSICS and 20 for phacoemulsification. Both surgical techniques achieved excellent visual outcomes with low complication rates. The initial visual recovery on the first postoperative day was better in the patients who underwent phacoemulsification, with the uncorrected visual acuity better than or equal to 6/18 in 75% of the patients, whereas the percentage was 60% in the MSICS group. The initial difference was nearly equalized within 4 weeks. At the sixth month, 85% of the patients in the MSICS group had uncorrected visual acuity better than or equal to 6/18 versus 90% of the patients in the phacoemulsification group.

CONCLUSION

Doing SICS was easier as there was no machine dependence and had fewer financial implications. Almost every cataract can be operated irrespective of pupil diameter, exfoliation, subluxation etc. There was no significant difference in visual outcome on first postoperative day in between phacoemulsification and SICS technique.

KEYWORDS

Phacoemulsification, Cataract Surgery, Visual Outcome.

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BACKGROUND

Cataract is the leading cause of blindness globally and in India, causing more than 18 million bilateral blindness worldwide,¹ Most of these blind people reside in developing countries.² In most developing countries, blindness is associated with considerable economic and social implications which impacts on the current difficulties of vulnerable populations who reside in under-served areas.³ An estimated 90% of people who are affected with cataracts reside in developing countries, which have limited capacity, infrastructure and technology to care for the visually impaired.⁴ To overcome burden of cataract blindness, there must be sufficient surgical coverage and good surgical outcome via, safety, early visual rehabilitation and

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postoperative emmetropia.⁵ Several studies have reported that despite phaco surgery is popular in developing countries,^{6,7} it is not suitable for developing countries that have a significant backlog of patients requiring surgery, as the technique is associated with high costs, including costs of phaco machine, maintenance of machines Therefore the Phaco technique is often unaffordable to certain setups.^{8,9,10} It is therefore critical that SICS be evaluated as an alternative for developing countries.

MATERIALS AND METHODS

To conduct a review of the effectiveness and adverse events associated with the surgical treatment of cataracts; focusing specifically on SICS and Phaco as treatment options. Both phacoemulsification and MSICS were performed at the Department of Ophthalmology, Sub-district hospital Sopore, Kashmir, India. The study was conducted in year 2016. Forty eyes of 40 patients were chosen. Twenty eyes were assigned to phacoemulsification with a foldable IOL implantation, and the other 20 eyes were assigned to suture less scleral tunnel MSICS. Ophthalmic history was taken regarding the onset, course and duration of diminution of vision, history of drug intake for eye diseases, and history of previous eye surgery.

Medical history was also taken regarding diabetes mellitus, hypertension, autoimmune disease (such as rheumatoid arthritis), cardiac diseases, and other relevant medical conditions. Preoperative examination included uncorrected visual acuity (UCVA), refraction, best-corrected visual acuity (BCVA), colour vision testing, pupillary light reflex testing, slit-lamp examination of anterior segment, intraocular pressure measurement by the Goldman explanation tonometer, and posterior segment examination. A keratometer was used to detect the steepest and flattest meridian, and the difference between them was the amount of corneal astigmatism and its axis was the axis of the steepest meridian. The information's that were reviewed and documented in this study included patients' sex, age, preoperative and postoperative UCVA and BCVA, preoperative clinical diagnosis, preoperative and postoperative corneal astigmatism and astigmatic axis using keratometric readings, calculating surgically induced astigmatism (SIA), and intraoperative and postoperative complications. Each patient in both groups in this study was followed up on the first postoperative day and 1 week, 1 month, 3 months, and 6 months after operation. BCVA data were categorized as better than, equal, or less than 6/18.

RESULTS

With respect to the age, there was a mean age of 60 years with 1.84 SD in the phacoemulsification group versus a mean age of 61 years with 1.25 SD in the MSICS group. Both surgical techniques achieved excellent surgical and visual outcomes with low complication rates. The initial visual recovery on the first postoperative day was better in the patients who underwent phacoemulsification, with UCVA better than or equal to 6/18 in 75% of the patients, whereas the percentage was 60% in the MSICS group. The initial difference was nearly equalized within 4 weeks. At the sixth month, 85% of the patients in the MSICS group had better than or equal to 6/18 UCVA versus 90% of the patients in the phacoemulsification group. The mean SIA was comparable in the two groups at 3 and 6 months postoperatively. The mean SIA in the phacoemulsification group was 1.23 ± 0.32 D at 3 months and 1.18 ± 0.2 D at 6 months. In the MSICS group, the mean SIA was 1.27 ± 0.22 D at 3 months and 1.2 ± 0.23 D at 6 months. There was no significant statistical difference between both groups regarding the mean SIA.

DISCUSSION

MSICS was shown to get popularity because of its comparable surgical and postoperative outcomes similar to phaco emulsification. Furthermore, MSICS has added benefit of being a cheap and affordable technique; hence, it can be used in overcrowded poor communities in which large number of cataract surgeries are needed to be performed to overcome the increasing incidence of blindness in those communities. Age was not statistically significant, With respect to the preoperative visual acuity in this study, it was almost similar in both groups. The visual outcome achieved on the first postoperative day was better in group A in which

the patients underwent phacoemulsification where the percentage of patients who achieved UCVA of 6/18 or better was 75%, whereas it was 60% in group B. Both groups achieved good visual results after 6 months, and the difference in UCVA and BCVA between both groups was statistically insignificant. Studies done previously compared the efficacy and visual results of phacoemulsification versus MSICS for the treatment of cataracts. They compared different parameters including UCVA and BCVA. They found that both the surgical techniques achieved excellent surgical outcomes with low complication rates. At 6 months, 89% of the SICS patients had an UCVA of 20/60 or better and 98% had a BCVA of 20/60 or better versus 85% of patients with UCVA of 20/60 or better and 98% of patients with BCVA of 20/60 or better at 6 months in the phaco group. They also mentioned that the surgical time for MSICS was much shorter than that for phacoemulsification, and they concluded that MSICS is an appropriate surgical procedure for the treatment of advanced cataracts.

Go gate et al compared phacoemulsification and MSICS with respect to postoperative astigmatism. Average astigmatism for the phacoemulsification group was 1.1 D (0.9 SD) and for the small incision group it was 1.2 D (0.8 SD). Ninety-one of the 185 (49.2%) patients in the phacoemulsification group and 73 of the 187 (39.0%) patients in the small incision group had astigmatism up to 0.75 D. Thus, a significantly less number of patients in the phacoemulsification group had astigmatism of less than 1 D.¹¹ With respect to the SIA in this study, the mean SIA in group A was 1.23 ± 0.32 D at 3 months after operation and 1.18 ± 0.2 D at 6 months, whereas in group B it was 1.27 ± 0.22 D at 3 months after operation and 1.2 ± 0.23 D at 6 months. There was no significant statistical difference between both groups regarding the mean SIA. This means that both techniques have changed the corneal cylinder but the effect was minimal in both groups.

	Group A (20 Patients)	Group B (20 Patients)	p Value
Mean Age	60(±) 1.84	61(±) 1.25	>0.05 (Not significant)

Table 1. Age Distribution Among the Study Groups

	Day 1(%)	6 months (%)
Group A (UCVA>/=6/18)	75	90
Group B (UCVA>/=6/18)	60	85

Table 2. Postoperative Uncorrected Visual Acuity on First Day and at 6 Months

(UCVA- Uncorrected Visual Acuity).

CONCLUSION

In developing countries with limited health resources and large populations, cataract extraction should comprise of the following features: cheap and affordable, early rehabilitation

to avoid economic loss, near emmetropic visual status postoperatively, minimal complications, minimal wound suturing, faster with increased surgical coverage, safe and effective. Phaco has all the above features except an increase in surgical coverage, but all these merits are available with SICS in settings where it has been widely used. Phaco also has a steep learning curve. The advantage that SICS has over Phaco is that it is faster and cost-effective especially for advanced white cataracts. Capital, maintenance and per-case disposable costs that are associated with Phaco are avoided with SICS. In a developing country, the importance of surgical speed and efficiency are crucial as there is a shortage of human resources for eye surgeries. It is crucial, therefore, to institute a surgical technique that is capable of serving the majority of those disadvantaged in developing countries. In order to cut the costs associated with Phaco and increase efficiency, the alternative is SICS, given the relatively similar post-surgical outcomes. We can therefore conclude that based on this study, SICS seems to be the preferred technique of choice for less resourced settings.

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