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Original Research Article

Small incision cataract surgery in rural communities in Uttar Pradesh: A clinical study of postoperative complications and visual outcomes at a tertiary eye hospital

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ABSTRACT

Aim: To study the incidence of postoperative complications and visual outcome following manual small incision cataract surgery.

Materials and Methods: This is a hospital-based retrospective study comprised of 1020 eyes of 1020 cataract patients above 31 years without any systemic illness. This study was overseen in a rural tertiary hospital in North India from November 2020 to February 2021. All patients were analyzed according to their history, age, sex and a thorough clinical examination was done. Manual small incision cataract surgery was done for all patients, and they were examined on the first postoperative day and after 1 month.

Results: In our study 57% of patients are male and 43% are female. The maximum number of patients were in the age group of 61–70 years. Intraoperative complications PC rent noticed in 1 case zonular dehiscence in 2 patients, and 3 patients were left aphakic. On the first post-op day, Striate keratopathy was 2%, Residual cortex 3%, FM Threads 9%, Anterior uveitis cells 3%, Blood clots & Dispersive hyphema 3%, Epithelial defects 1%, Corneal edema 4% were seen. Post-operative uncorrected vision at day one 83% of cases achieved good visual acuity (≥ 6/18) and the rest 16% were borderline acuity (<6/18-6/60), which at 1-month post-operative day good visual acuity improved to 87% of cases.

Conclusion: Small incision cataract surgery (SICS) with Posterior chamber intraocular lens (PCIOL) is an approved method of community-premised cataract surgery to overcome the large cataract reserve in our country it gives consistently good visual acuity post-operatively and negligible complications.

1. Introduction

Cataract is the main cause of curable blindness worldwide, with the developing world accounting for three-quarters of the numbers. About 10-12 million cataract operations are performed globally, cataract-related blindness is still thought to be increasing by 1-2 million per year.[1] This backlog can be addressed by increasing the number of cataract surgery facilities in developing countries, thus making it accessible to all people irrespective of their economic status.

Small incision cataract surgery (SICS) is a good substitute to phacoemulsification in developing countries where high-volume surgery with affordable instruments is the requirement.[2] For community-based operation, it is the best method for its cost-effectiveness and early rehabilitation of the patients.[3]

The most common post-operative complications after cataract surgery are corneal edema, striate keratopathy, retained lens matter, residual cortex, hyphema, descements detachment, decentered IOL, capsular opacification, refractive errors, macular edema and posterior capsular rents which effect the post-operative visual outcome.[4]

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Our study aims to investigate the occurrence of postoperative complications and evaluate the visual outcomes that result from manual small incision cataract surgery.

2. Materials and Methods

Patients selected from the community outreach program were admitted for cataract surgery at Sankara Eye Hospital from November 2020 to February 2021 after getting approval from Institutional Ethical Committee at Sankara Eye Hospital, Kanpur. (Registration No-IEC/SEHKNP/01-2022)

A total of 1020 cases of cataract patients above 31 years without any systemic illness were included in the study. The surgeries were done by multiple senior consultants at the hospital. Exclusion criteria were patients with glaucoma, diabetic retinopathy, corneal opacities, traumatic cataract, complicated cataract, and patients with macular pathology.

Visual acuity was checked with an E chart, and intraocular pressure was measured by a non-contact tonometer, after a short history and anterior chamber assessment, a fundus examination with a 90 D lens was done. Xylocaine sensitivity test and physician fitness was done in all patients. Antibiotic eyedrops were instilled first at the campsite after the selection of patients for cataract surgery, second after the eye assessment is complete, and third before shifting the patient to OT. Povidone Iodine eyedrops 5% were instilled after peribulbar block and after surgery prior to closing the eye with an eye patch. All surgeries were performed after taking informed and written consent in the patient's own language.

3. Procedure

After painting the eye with 10% Povidone Iodine aqueous solution, peribulbar block with 2% Lignocaine 7-8 ml plus hyaluronidase (30 turbidity unit per ml) was given. Before draping eye the surrounding area was cleaned with povidone-iodine (10% in an aqueous solution). After applying lid speculum, a fornix-based temporal conjunctival peritomy was done from 7-10 clock hours in the right eye and 2-5 clock hours in the left eye. A straight to slightly frown-shaped incision 6-7 mm depending on the grade of cataract to be extracted was made approximately 1.5-2 mm from the limbus,[5] incision was made with a razor blade fragment helping with the cost control. Crescent was used to create a sclero-corneal tunnel 1-1.5 mm into the clear cornea from the initial incision and side pockets made superiorly and inferiorly to the limbus. Keratome is used to make the internal lip entry. Anterior capsule stained by Trypan blue, viscoelastic substance (hydroxy propyl methyl cellulose 2%) was injected into the anterior chamber and Capsulorrhexis was done. Thereafter, hydro dissection was done to break all the adhesions of the nucleus within the bag and the nucleus prolapsed into AC, then Viscoelastic substance was introduced above and below the nucleus. The nucleus was taken out by Vectis using the phaco sandwich technique, the cortical matter was washed through the main wound by a Simco two-way irrigation aspiration cannula, the viscoelastic substance was introduced into the anterior chamber and 6 mm optic PMMA rigid PCIOL was implanted in the capsular bag. Then viscoelastic substance was washed out by the same cannula. Intracameral moxifloxacin 0.2 ml was used. Conjunctiva was reposited back by holding the conjunctiva with forceps, cautery was applied at two ends. Topical povidone Iodine solution 5% was used and ocular pad was applied.

Postoperatively antibiotic and steroid combination eye drops were tapered over four weeks. Postoperatively, the visual acuity was assessed on day one and the fourth week.

4. Results

In our study 57% of patients are male and 43% are female. The maximum number of patients were in the age group of 61–70 years.

Intraoperative complications PC rent was noticed in 1 case, zonular dehiscence in 2 patients and 3 patients were left aphakic. On the first post op day striate keratopathy 2%, residual cortex 3%, FM threads 9%, anterior uveitis cells 3%, blood clots & dispersive hyphema 3%, epithelial defects 1%, corneal edema 4%. Post-operative uncorrected vision at day 1 83% achieved good visual acuity (≥ 6/18) and the rest 16% were borderline acuity (<6/18-6/60), which at 1-month post-operative day improved to 87% good visual acuity.

In this study, Uncorrected visual acuity (UCVA) of SICS patients on 1^{st} post-operative day for 319 cases (31%) was of 6/6-6/9, 534 cases (52%) had UCVA 6/12-6/18, 142 cases (14%) had UCVA 6/24-6/36 and 25 cases (2%) had UCVA of 6/36-6/60. Uncorrected visual acuity at 4 weeks for 376 cases (43%) was 6/6-6/9, 379 patients (44%) was 6/12-6/18, 97 cases (11%1) had 6/24-6/36 vision, and 14 (2%) patients had UCVA of 6/36-/6/60.

Table 1: Intra operative compilations

Intra op complications		
Complication	**Number**	**Percentage**
ZD	2	33.3%
PCR	1	16.7%
Aphakia	3	50%
Total No. of cases	6	

5. Discussion

This was a retrospective study conducted in a rural tertiary eye hospital in Uttar Pradesh assessing the visual outcomes and post-op complications in patients who had

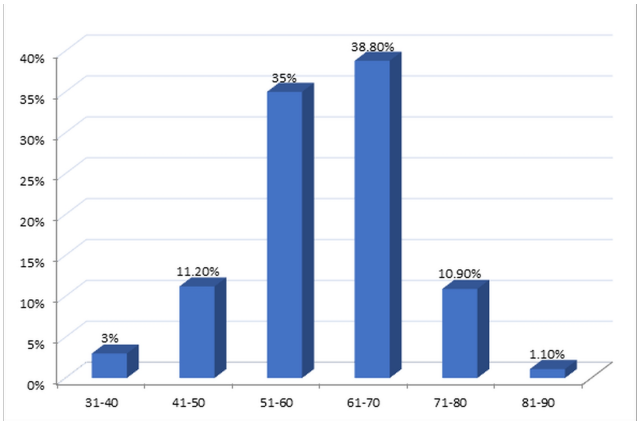

Fig. 1: Age-wise distribution of cases

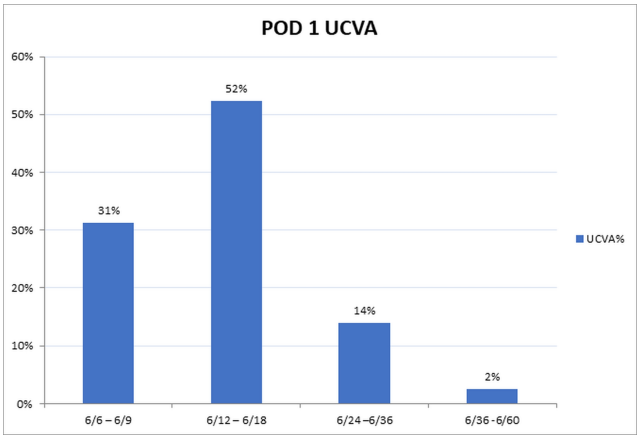

Fig. 2: Post–operative day 1 uncorrected visual acuity

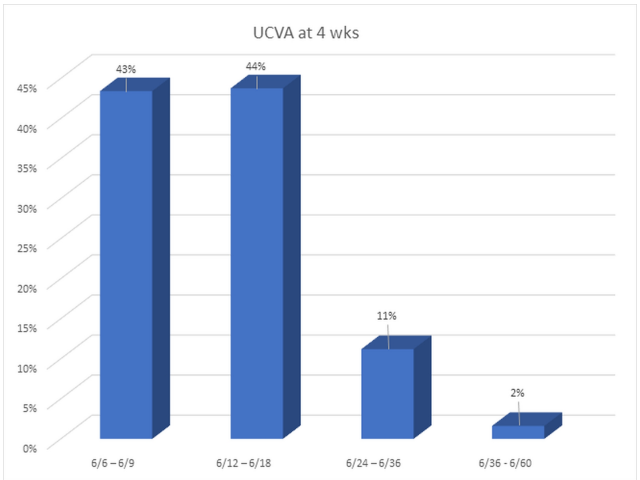

Fig. 3: Post–operative uncorrected visual acuity at 4 weeks

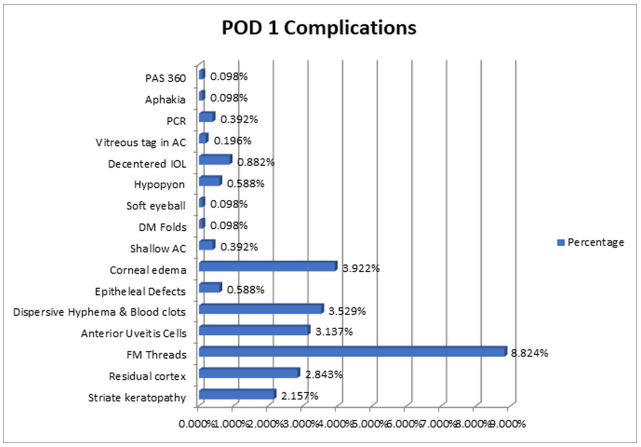

Fig. 4: Post-operative day 1 complications

undergone MSICS. Total 1020 patients were operated on by manual SICS using a non-foldable PMMA lens. Patient age ranged from 30-90 years with a mean of 60.5±17.76 years. Intraoperative complications were Posterior capsular rupture with vitreous loss seen in one case wherein anterior vitrectomy was done and pilocarpine 0.5% was used and an iris claw lens was used. Post-operative complications developed in 284 cases (28%) among them temporary corneal edema occurred in 40 cases (3.922%) which subsided by the use of topical steroids, and oral acetazolamide.[6] Iritis developed in 32 cases (3.137%) which was managed with topical steroids and homatropine 2%, within 2 weeks all the signs had subsided. PCIOL decentering occurred in 8 cases (0.784%). The results of our study correlate well with the study done by Dr. R Venkatesh et al. (2005).[7] His findings show that corrected visual acuity at the 40th postoperative day was 6/18 or better in 94% of cases. A relatively small incision (less injury) clear cornea, round pupil, less AC reaction, and less amount of induced astigmatism in the post-operative days all are indicative of better vision in SICS. The results of our study are also similar to a study conducted by A K M Shahidur Rahman Tarafder et al[8] (2009) and Khandekar et al[9] (2018).

According to the WHO and the International Agency for the Prevention of Blindness (IAPB) action plan, >85% should have a good vision of 6/6-6/18 post-cataract surgery.[10] Our study has met this target at a four-week follow-up period with good vision in 87% of operated cases.

Limitations of the study were that 154 patients were lost to follow-up and the short follow-up duration, which was 1 month. Best-corrected visual acuity was not measured due to limited resources. Thus, assessment of Best corrected visual acuity (BCVA) with a longer observation period is ideally required for assessing visual outcomes with accuracy post-MSICS.

6. Conclusion

Small incision cataract surgery (SICS) has become a popular alternative for phaco surgery.[11] Phacoemulsification is a machine-dependent technique with high financial investment and requires an adequate skill set, on the other hand, SICS has got all the benefits of instrumental phaco like high-quality cataract surgery, minimal surgically induced astigmatism, early rehabilitation, cheap non-foldable lens, no suture related problems, and less postoperative follow-up.[12,13] This technique is applicable in any remote part of the country with high volume output.[14] Therefore, SICS is the preferred technique to overcome the huge backlog of cataracts in our country with consistently good visual acuity post-operatively and negligible complications.[15]

7. Source of Funding

None.

8. Conflict of Interest

None.

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