

Comparative Study - Ideal Cataract Surgical Technique for Camp Patients - SICS or Phacoemulsification

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Abstract: Context: Charitable organizations like ours, Sankara Eye Hospital, Ludhiana, Punjab, conduct free eye camps for cataract surgeries for the low socioeconomic patients in rural areas. Though SICS remains the ideal surgical technique in camp patients, recently sometimes patients are treated with clear corneal Phacoemulsification with implantation of rigid IOL. This study hence aims to find out the most suited surgical technique for high volume camp cases. Aim: To evaluate and find the most suited surgical option between Phacoemulsification and SICS in rural camp patients. Study and Design: A prospective randomized controlled trial of cataract patients operated by two surgical techniques. Material and method: Eight two eyes were selected and were randomly allocated into two groups of 41 eyes each. The patients were analyzed based on the criteria's mentioned below to conclude which is the most preferred surgical option for rural camp operated patients. Statistical Analysis Used: Unpaired t-test was used to calculate the p-value. Results: The results were evaluated on the following criteria. The mean post-operative astigmatism at the end of four weeks - was significantly higher in phacoemulsification group as compared to SICS group. The BCVA (best corrected visual acuity) at the end of four weeks - was comparable in both groups. Subjective complaints and/or complications: In phaco group 3 patients were put one sutures each and seven had striate keratitis, while none in SICS group. Complaint of irritation was slightly more in phaco groups whereas dryness and grittiness negligibly more in SICS group. Surgical time- was less for SICS group as compared to phaco group. Conclusion: SICS with implantation of rigid PMMA lens being significantly faster to perform with more secure wound and less astigmatism is a better option in camp patients from rural areas as compared to phacoemulsification with rigid IOL.

Keywords: SICS, Phaco, Surgically Induced Astigmatism, BCVA

1. Introduction

Cataract still remains the most leading cause of preventable blindness. The significant backlog of individuals who are blind due to cataract awaiting surgery has resulted in cataract being the leading cause of blindness worldwide. It, mostly being an elective surgery, many poor patients from rural areas chose to get operated in the free camps that are organized by charitable organizations. Over the past decade the most effective and safest technique of cataract extraction remains debatable. SICS by virtue of being fast, safe and non-machine dependent, continues to be a preferred option by surgeons. In many centers like ours, phacoemulsification is being done routinely, surgeons do a clear corneal phaco, enlarge the incision and put a rigid IOL which, by virtue of being more cost effective than a foldable IOL, is mostly provided for charitable camps. This study was undertaken to find out the preferred surgical option in such patients - Clear corneal phaco emulsification with implantation of a rigid IOL, versus SICS with respect to visual outcome and safety.

2. Methods and Material

Eighty two eyes were selected from rural patients admitted in our IPD over a period of three months June 2018 to September 2018.

Selection criteria

- All patients were between 55 to 80
- clear corneas
- uncorrected visual acuity 6/60 cut off,
- no or minimal (0.25D) astigmatism, with BCVA 6/9 cut off
- no other ocular disease
- Patients were divided by simple random sampling into

Group A-SICS group- 41 eyes, and Group B- Phacoemulsification group – 41 eyes.

(WHO classifies 6/18 and better as normal vision. Less than 6/60 is considered severe visual impairment). Informed consent was taken from all patients prior to surgery.

3. Results

The mean surgically induced astigmatism at the end of four weeks in Group A (SICS group) was 0.98D; (SD=0.39), while the mean astigmatism in Group B (Phaco group) was 2.08D (SD=0.51).

The p-value was calculated using the unpaired t test, and it was $p = < 0.0001$ which was statistically significant.

The best corrected visual acuity in the two groups at the completion of four weeks was- 37/41 patients (90.24%) had 6/18 or better vision in Phaco group, as compared to 38/41 (92.68%) patients in SICS group.

Complications and/or subjective complaints following surgery- three patients in the phaco group required suturing for secure wound closure, while none in the SICS group required sutures.

Striate keratitis was seen in seven patients in Phaco group B which resolved within 1 week with standard treatment, while none in SICS group A had striate keratitis.

Complaints of grittiness and foreign body sensation were similar in both groups with 18/41 patients (43.90%) complaining of these symptoms in Phaco group as compared to 20/41 patients (48.78%) in SICS group. The average operative time in the Phaco group was 15mins as compared

to 3-5mins in the SICS group.

4. Discussion

Cataract being the most common cause of visual impairment in developing countries, many studies are still being undertaken to conclude which surgical technique is most suited for high volume surgeries [1]. A lot of camps being conducted in the charitable organizations have taken the load off the backlog that our country, India has. These organizations still continue to deal with various challenges like the mindset of the rural people of free and quick surgery [2]. Due to the surgeries being high in volume and most patients being illiterate and elderly, the hygiene and post operative compliance is the other most difficult challenge that camp surgeon faces. Rural patients opting for charitable cataract surgeries present multiple challenges to the surgeon hence ensuring adherence to follow up schedule and medication/ hygiene requires constant supervision and high vigilance on the part of the caregiver. With the help of this study our organization would like to pay a strong emphasis on the ways to improve long term surgical outcome and to improve the qualitative aspect of camp surgeries. [3-5]

As already established that smaller the incision, lesser is the post op astigmatism, [6,7] phacoemulsification hence possesses lesser rate of surgically induced astigmatism [SIA] in various studies. But in our study due to enlarging the wound upto 5.5 mm to insert a rigid IOL the SIA was found to be more. Both the surgical options i.e. Phacoemulsification and SICS are good for high volume camp surgeries. Various clinical trials comparing the safety and efficacy of Phaco and SICS concluded that both the techniques are safe and effective for visual rehabilitation of cataract patients. A study conducted by Gogate PM, Kulkarni stated that the BSVA is similar in both SICS and Phaco at 6 weeks post operative but the uncorrected visual acuity was better in a larger portion of patients who underwent Phaco at 6 weeks. [8]

The major drawback with phacoemulsification that we found is time, dependency on machine and the availability of Rigid IOL for Phaco cases as it is more cost effective than foldable IOLs. Similar results were found in a study conducted in Nepal which also concluded that SICS being faster, safer and less technology dependent is the most suited surgical

technique for rural camp patients. Hence in an Indian scenario, a surgical option that is faster, safer, and gives good visual outcome will be the preferred one.

Also another study conducted in Nepal compared the visual outcome in patients who underwent Phaco with Rigid & Foldable IOL through a 5mm & 2.5mm incision respectively. The study concluded no significant difference in visual outcomes in both the groups but the major emphasis was given on the cost of the foldable IOL which was approximately 8 times the rigid IOLs. In our study the post op SIA was found to be more in Phaco cases where the incision (clear corneal) was increased to 5.5 at the end of the surgery than in the SICS group although the visual results were similar. [9]

Also, in our study in SICS groups the astigmatism noted was against the rule, while in Phaco group (temporal incision) the SIA was mainly WTR which corroborates well with similar findings of a study by Reddy B et al., [10]. Mallik VK et al., [11] comparing superior vs temporal scleral tunnel incisions, found the superior incisions to give higher degrees of astigmatism, with a mean of 1.45D. The mean astigmatism in our study from superior sclerocorneal tunnel was found to be 0.98D whereas the temporal phaco incision alone could compensate for the Pre-existing astigmatism, enlarging to incision did the opposite.

In a study carried out in Rohtak (India) [12], comparing sclerocorneal and clear corneal tunnel incisions in cataract surgery (SICS), the mean SIA at one month was 2.03D in clear corneal tunnels and 1.35 D in sclerocorneal tunnels, and they concluded that safety and visual acuity was better with sclero-corneal incision a finding which corresponds well with our study.

In another study by Olsen T et al., [13] comparing clear corneal and scleral tunnel incisions in phacoemulsification, they concluded that clear corneal incisions yielded higher postoperative astigmatism. Similar result was obtained in our study. While no case of acute post op endophthalmitis was reported in our study. But many studies [14] have shown statistically increased incidence of post op endophthalmitis in clear corneal when compared with scleral tunnel incision indicating it as significant risk factor.

| Name of study | Type of Surgery | Sample Size | Site of Incision | Size of incision | Post-op Astigmatism |
|--------------------|----------------------|-------------|------------------|------------------|---------------------|
| Steinert RF | Phaco (foldable IOL) | 130 | Sclerocorneal | 4mm | 0.98D (at 1month) |
| Brint SF 1991 | Phaco (Rigid IOL) | | Sclerocorneal | 6.5mm | 1.44D (at 1month) |
| Archana S | SICS (rigid IOL) | 60 | Clear corneal | 6mm | 2.03D (at 1month) |
| Khurana AK 2011 | SICS (rigid IOL) | | Sclero corneal | 6mm | 1.35D (at 1month) |
| Olsen T Dam | Phaco (foldable IOL) | 100 | Clear corneal | 3.5-4mm | 0.72D (at 6 months) |
| Johansen 1997 [17] | Phaco (foldable IOL) | | Sclero corneal | 3.5-4mm | 0.36D (at 6 months) |
| Present study 2019 | SICS (rigid IOL) | 82 | Sclerocorneal | 5.5-6.5mm | 0.98D (at 1month) |
| | Phaco (rigid IOL) | | Clearcorneal | 5.25mm | 2.08D (at 1month) |

5. Conclusion

In the hands of experienced surgeons, both phacoemulsification and manual SICS achieved excellent visual outcomes, however in camp higher turnover surgeries where there is large backlog of blindness, time and machine dependency of Phacoemulsification makes it a lesser

acceptable alternative to conventional SICS.

Also to conclude enlarging the tunnel incision to implant a rigid IOL is not a good surgical option as it gives a higher degree of astigmatism with lesser secure wound. Hence SICS should be the preferred surgical technique in rural camp patients who cannot afford foldable IOLs

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