

A comparative study on superotemporal and temporal incisions in manual small incisions cataract surgery

Monali Shrirang Desai^{1*}, B S Joshi², D K Sindal³, V H Karambelkar⁴

¹Resident, ²Associate Professor, ³Professor and HOD, ⁴Professor, Department of Ophthalmology, Krishna Institute Of Medical Sciences, Karad, Maharashtra, INDIA.

Email: desai.monali@gmail.com

Abstract

Aim and Objective: To compare the astigmatism induced by a supero-temporal and temporal incision in manual small incision cataract surgery. **Methodology:** This is a hospital based single blind controlled clinical trial. **Discussion:** The study found that surgically induced astigmatism was lower in temporal group compared to that in superotemporal group.

Key Words: Astigmatism, Small Incision Cataract Surgery, Superotemporal incision, Temporal incision, Surgically Induced Astigmatism.

*Address for Correspondence:

Dr. Monali Shrirang Desai, Resident, Department of Ophthalmology, Krishna Institute of Medical Sciences, Karad, Maharashtra, INDIA.

Email: desai.monali@gmail.com

Received Date: 10/10/2017 Revised Date: 14/11/2017

Accepted Date: 09/12/2017

DOI: <https://doi.org/10.26611/1009511>

Access this article online

Quick Response Code:



Website:

www.medpulse.in

Accessed Date:
10 January 2018

image upon the retina by a correcting spherical lens.¹ Surgically Induced High Astigmatism is an important cause of poor uncorrected visual acuity after cataract surgery^{2,3}.

METHODS AND MATERIALS

76 patients were studied and randomly divided into two groups Group A had 38 patients (22 Males/16 Females) with a mean age of 67.2 ± 7.65 received superotemporal incision and Group B had 38 patients (23 Males/ 15 Females) with a mean age of 66.1 ± 8.02 received Temporal incision. The inclusion criteria were patients of good fixation and cataract up to grade 4 nuclear sclerosis. The higher grades of nuclear sclerosis were excluded to keep uniformity in size and architecture of the incision. Also patients with congenital and developmental cataract, complicated cataract, Traumatic cataract Pre-existing corneal opacity, uveitis, glaucoma and macular degeneration were excluded which independently cause limitation of vision. Preoperatively, a full ophthalmic examination including keratometry and 'A' scan biometry was done. Keratometry was performed using a manual keratometer (Bausch and Lomb). All surgeries were done under peribulbar anaesthesia. Manual SICS with viscoexpression technique was used. The incision architecture was similar in the two groups. A straight sclera incision of 5mm with two side cuts [Blumenthal

INTRODUCTION

Cataract is defined as an opacity of the lens or its capsule either congenital or acquired. It is the most common cause of treatable blindness. The mainstay of management of cataract is surgery. Phacoemulsification has become a routine procedure in most parts of the world. In order to obtain the advantages of self-sealing sutureless incisions at low cost, ophthalmologist in the developing world are performing manual small incision cataract surgery (SICS) as an alternative. The main aim of cataract surgery is to provide a good vision quantitatively as well as qualitatively and an early visual rehabilitation. Astigmatism means "without a point". Miller Stephen J defined astigmatism as a condition of refraction in which a point of light cannot be made to produce a punctate

side cuts] was placed 2mm behind the limbus supero-temporally or temporally. Sclerocorneal pocket incision was created with a crescent knife. Two side ports were made 180 degrees apart on either side of the scleral tunnel with knife. With a keratome, the anterior chamber was entered 1.5 mm into the clear cornea and the internal incision was enlarged sideways. The internal corneal opening was made 1-2mm larger than external opening. A single piece PMMA intraocular lens of 6mm optic size and 12.5 mm total size was implanted into the capsular bag. Patients were examined on days 1, 7, after 6 weeks and 3 months. Prednisolone 1% eye drops were administered six times a day in the first postoperative week and gradually tapered every week over six weeks. Moxifloxacin eye drops 0.5% were administered four times a day for the first ten days and then discontinued. Uncorrected and best-corrected visual acuity and keratometry were recorded on each visit. There were no intraoperative or postoperative complications. All patients were followed up without any dropout. All the calculations were performed by using the surgically induced astigmatism calculator (SIA) version 2.1 a free software programme⁴. The Surgically Induced Astigmatism was calculated from the pre and post-operative keratometric values, as was described by Holladay *et al.*⁵

RESULTS

Mean Surgically Induced Astigmatism in group A was found to be 0.91 D and in Group B it was 0.62 D. There was significant difference in SIA diopter values between the groups as per Student t-test (p<0.05).

Table 1:

Incision Location	Number of patients	Mean Surgically Induced Astigmatism (SIA)
Superotemporal	38	0.91
Temporal	38	0.62

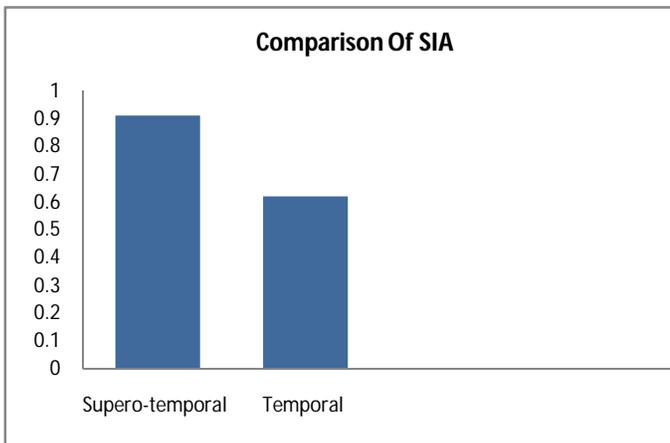


Figure 1:

DISCUSSION

Manual SICS is an alternative for phacoemulsification but the astigmatism is higher due to larger size of incision. Burgansky *et al.*⁶ have shown an increase in astigmatism with an increase in incision size. In their study by vector analysis, the mean induced astigmatism was 0.6 ± 0.3 D for 6 mm incision, 0.75 ± 0.67 D for a 6.5 mm incision and 1.36 ± 0.77 D for a 7 mm incision. Kimura *et al.*⁷ have shown by vector analysis that surgically induced astigmatism is less with an oblique incision (1.02 ± 0.66 D) than with a superior incision (1.41 ± 0.72 D). The temporal location is farthest from the visual axis and any flattening due to the wound is less likely to affect the corneal curvature at the visual axis. When the incision is located superiorly, both gravity and eyelid blink tend to create a drag on the incision. These forces are neutralised better with temporally placed incisions because the incision is parallel to the vector of the forces.⁸ With the rule astigmatism induced by a temporal incision is advantageous because most elderly cataract patients have preoperative against the rule astigmatism. A temporal incision is advantageous because it can be made easily in deep sockets and small eyes. Also, the superior site is still there if a trabeculectomy surgery has to be done for glaucoma in the future. Astigmatism induced in manual SICS done with a superotemporal and temporal scleral tunnel incision have been compared. In the study of Gokhale *et al.*,⁹ (2005), the SIA was 0.2D in the superotemporal group and it was 0.37D in the temporal group. In the study of Pawar VS, Sindal DK¹⁰ (2012) an SIA of 0.53D in the supero-temporal group and that of 0.435D in the temporal group was reported. Our study also showed similar results, with the superotemporal group having an SIA 0.91D and that of 0.62D in the temporal group.

CONCLUSION

Temporal approach SICS produces less postoperative astigmatism and has manifold advantages over superotemporal incision SICS with excellent visual outcome. A simple modification in incision placement produces comparable results to other sophisticated procedures and hence offers a way to attain better surgical outcome with limited resources available in most of the setups. Small sample size is a weakness of this study. Our conclusions need to be validated with a larger study.

REFERENCES

1. Miller SJ, Parson's Diseases of Eye. Edinburgh: Butterworth Hienmann International Edition. 18th edition 1990; 63-69
2. Prajna NV, Chandrakanth KS, Kim R, Narendran V, Selvakumar S, Rohini G, et al. The Madurai intraocular

- lens study II: clinical outcomes. *Am J Ophthalmol* 1998;125:14-25
3. Yorston D, Foster A, Wood M, Foster A. Does prospective monitoring improve cataract surgery outcomes in Africa? *Br J Ophthalmol* 2002; 86:543-7.
 4. Sawhney S, Aggarwal A, The SIA calculator Version 2.1 –Calculating Surgically Induced Astigmatism using MS Excel. [Internet]. [Cited 2012 May 10]. Available from:http://www.insighteyeclinic.in/articles/SIA_Calc_2-1_Article.pdf.
 5. Holladay JT, Dudeja DR, Koch DD. Evaluating and reporting astigmatism for individual and aggregate data. *J Cataract Refract Surg* 1998; 24:57-65.
 6. Burgansky Z, Isakov I, Avizemer H, Bartov E. Minimal astigmatism after sutureless planned extracapsular cataract extraction. *J Cataract Refract Surg* 2002; 28:499-503. [↑](#)
[PUBMED] [FULLTEXT]
 7. Kimura H, Kuroda S, Mizoguchi N, Terauchi H, Matsumura M, Nagata M. Extracapsular cataract extraction with a sutureless incision for dense cataracts. *J Cataract Refract Surg* 1999; 25:1275-9. [PUBMED]
 8. Merriam JC, Zheng L, Urbanowicz J, Zaider M. Change on the horizontal and vertical meridians of the cornea after cataract surgery. *Trans Am Ophthalmol Soc.* 2001; 99:187-95.
 9. Gokhale NS, Sawhney S. Reduction in the astigmatism in manual small incision cataract surgery through change of incision site. *Indian J Ophthalmol* 2005; 53(3):201-03.
 10. Pawar VS, Sindal DK. A comparative study on the superior, supero-temporal and the temporal incisions in small incision cataract surgeries for post operative astigmatism. *Journal of Clinical and Diagnostic Research* [serial online] 2012; 6(7):1229-1232.

Source of Support: None Declared
Conflict of Interest: None Declared

