



POST OPERATIVE ASTIGMATISM AFTER MANUAL SMALL INCISION CATARACT SURGERY REQUIRING SCLERAL TUNNEL SUTURING

Ophthalmology

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ABSTRACT

Purpose: To study postoperative astigmatism after manual small incision cataract surgery (MSICS) which required scleral tunnel suturing. **Materials And Methods:** This is a prospective study of 120 cataract patients attending ophthalmology out patient department from December 2021 to May 2022 who underwent MSICS which required scleral tunnel suturing. Preoperative evaluation was done. MSICS was performed in all cases and scleral tunnel suturing was performed in these cases as there were complications like shallow anterior chamber, button hole, premature entry, iris prolapse and posterior capsular rent. Suturing was done to stabilise sclerocorneal wound. In cases with posterior capsular rent inspite of stable wound, suturing was done to avoid post op infections like endophthalmitis. Patients were followed up at 1 week, 4 weeks, 6 weeks and 8 weeks postoperatively. **Results:** Out of 120 patients 72 patients (60%) had WTR astigmatism and 48 patients(40%) had ATR astigmatism preoperatively. After 8 weeks post suture manipulation among WTR astigmatism patients 70.61% had <1 D astigmatism and among ATR patients 72.91% had <1 D astigmatism. 70% patients had BCVA 6/9 or better, 25.83% had BCVA between 6/12 -6/24 and 4.1% had visual acuity $\leq$ 6/36. **Conclusion:** Scleral tunnel suturing in MSICS results in surgically induced astigmatism. It affects the visual outcome significantly. With optical correction and suture manipulation, correction of astigmatism is possible. Hence scleral tunnel has to be attempted in unavoidable cases.

KEYWORDS

Post-operative astigmatism, scleral tunnel suturing, Manual small incision cataract surgery

INTRODUCTION

Cataract is the leading cause of avoidable blindness worldwide. Management of cataract is mainly surgical. Cataract surgery is one of the most common ocular surgeries performed in the world¹. Manual small-incision cataract surgery (MSICS) is the cataract surgical technique commonly used in developing countries as it achieves excellent outcomes with lower cost, less surgical time and is safer for advanced mature cataracts and other complicated cases.

SICS is characterized by early wound stability, less postoperative inflammation, few postoperative visits, and less damaging corneal endothelium effects. Ideally, SICS is a sutureless procedure². There are situations where suturing the tunnel is necessary like a leaking sclerocorneal tunnel, premature entry or button-holing of the tunnel, severe positive pressure after making the tunnel, myopic and pediatric patients because of thinner sclera and in case of posterior capsular rents¹.

The intraoperative and postoperative complications and the occurrence of surgically induced corneal astigmatism are the main factors influencing the visual acuity following manual SICS. Surgically induced changes in corneal morphology mainly cause postoperative surgically induced astigmatism(SIA)⁴. With optical correction and suture manipulation, reasonable correction of astigmatism is possible.

OBJECTIVES

To study postoperative astigmatism after manual SICS which require scleral tunnel suturing. To study the post op visual outcome in these patients.

Inclusion Criteria

Patients in age group between 30 to 80 years with any grade of cataract.

Exclusion Criteria

1. Pediatric cataract
2. Glaucoma
3. Posterior segment pathology

MATERIALS AND METHODS:

This is a prospective study of 120 cataract patients attending ophthalmology out patient department from December 2021 to May 2022 who is undergoing manual small incision cataract surgery which required scleral tunnel suturing. All surgeries were performed by a single surgeon.

Pre operative:

- Detailed history and examination was done in all the cases meeting the objectives of the study after a written informed consent.
- Detailed ocular examination including visual acuity, slit lamp biomicroscopic examination, intraocular pressure by rebound tonometry, refraction using auto-refractometer, keratometry, A-Scan and fundus examination by indirect ophthalmoscope was done.

Intra operative:

Cataract removal by manual SICS was performed under peribulbar anesthesia (lignocaine 2% with adrenaline). Under aseptic precaution betadine painting and draping was done. Fornix-based superior conjunctival flap raised. Site of incision was decided based on preop astigmatism. Superior incision was done with the rule astigmatism (WTR) and superotemporal incision in cases with against the rule astigmatism(ATR). Sclerocorneal tunnel was made. Side port entry done, followed by anterior capsule staining with sterile intracameral trypan blue stain through side port under air, followed by saline washing. Viscoelastic was injected to fill AC, and wide continuous curvilinear capsulorhexis was done. Entry was done. Hydrodissection was done. Nucleus was prolapsed in to AC, expressed out by visco and remaining cortical matter was removed by irrigation and aspiration. IOL was inserted and dialled into position. Remaining visco was removed. Intracameral moxifloxacin was given. In the end of surgery those in which AC is shallow or there is button holing or premature entry or iris prolapse or posterior capsular rent with vitreous disturbance, scleral tunnel suturing was done with interrupted 10-0 ethilon sutures. All cases were performed by single surgeon and with same protocol.

Post operative:

- Patients were followed up at 1 week, 4 weeks, 6 weeks and 8 weeks postoperatively.
- Evaluation of visual acuity, anterior segment examination, refraction measurement and keratometry using an auto-refractometer was done.
- Suture manipulation was done after 8 weeks by taking keratometric values into consideration.

RESULTS:

A total of 120 patients were included in this study. Out of this 74 patients (61.66%) were in the age group more than 60 years, 41 patients(34.16%) in the age group of 50-60 years and 5 patients (4.16%) were less than 50 years of age. 72 patients(60%) had WTR

astigmatism and 48 patient(40%) had ATR preoperatively. 87 cases (72.5%) were mature cataract and remaining 33 (27.5%) were immature cataract. 22 patients had pseudoexfoliation.

Table 1: Pre operative WTR astigmatism : Out of 120 patients 72 patients had WTR astigmatism. Superior sclerocorneal incision was made.

Pre-operative astigmatism	No: of patients	Percentage
<1 D	44	61.11%
1-2 D	20	27.77%
>2 D	8	11.11%

Table 2: Pre operative ATR astigmatism : Out of 120 patients 48 patients had ATR astigmatism. Supero-temporal sclerocorneal incision was made.

Pre-operative astigmatism	No : of patients	Percentage
<1 D	27	56.25%
1-2 D	14	29.16%
>2 D	7	14.58%

Table 3: Post operative astigmatism at 4 weeks

Post-op astigmatism	Superior incision group (WTR)	Percent age	Superotemporal incision group (ATR)	Percentage
	No : patients		No: patients	
< 1 D	32	44.44%	18	37.50%
1-2D	24	33.33%	19	39.58%
> 2D	16	22.22%	11	22.91%

Table 4: Post operative astigmatism after suture manipulation (> 8 weeks)

Post-op astigmatism	Superior incision group (WTR)	Percent age	Superotemporal incision group (ATR)	Percent age
	No : patients		No: patients	
< 1 D	53	73.61%	35	72.91%
1-2D	15	20.83%	10	20.83%
> 2D	4	5.55%	3	6.25%

Table 5: Pre- operative best corrected visual acuity

Pre-operative visual acuity (BCVA)	No: patients	Percentage
6/18 or better	6	5%
6/24 – 6/ 60	14	11.66%
< 6/60	52	43.33%

Table 6 : Post- operative best corrected visual acuity at 4 weeks : 40% had VA >= 6/12, 36.66% had VA 6/18-6/36 , 23.33% had VA <= 6/60

Post operative visual acuity (BCVA)	No: patients	Percentage
6/12 or better	48	40%
6/18 – 6/36	44	36.66%
<= 6/60	28	23.33%

Table 7: Post-operative best corrected visual acuity after suture manipulation (>8weeks) : 70% patients had VA >= 6/9, 25.83% had VA between 6/12 –6/24 and 4.1% had visual acuity < 6/24

Post operative visual acuity (BCVA)	No: patients	Percentage
6/9 or better	84	70%
6/12 – 6/ 24	31	25.83%
<=6/36	5	4.1%

DISCUSSION:

This study shows that 73.33% patients in whom MSICS with scleral tunnel suturing was done had < 1 D of astigmatism after suture manipulation(>8 weeks) where as study conducted by Mirza et al which shows that after 6 weeks, 62.5% of eyes in sutured group and none of eyes in unsutured group had more than 2.0D (diopter) SIA⁵.

Another study conducted by Ch. Javed Iqbal R. Gul M.S. Arshad M. Hussain to compare postoperative astigmatism following phacoemulsification with sutured versus un-sutured wound closure , concluded that surgically induced astigmatism is more common in when suture is applied for wound closure⁶.

In contrarary to this study a study conducted by Mohammed S. Ahmed Department of Ophthalmology, Sohag Teaching Hospital, Sohag,

Egypt to compare postoperative astigmatism after small-incision cataract surgery with sclera tunnel suturing and without scleral tunnel suturing, concluded that SICS performed either with or without scleral tunnel suturing was not associated with significant preoperative and postoperative astigmatism changes. Furthermore, no significant changes were found between sutured and sutureless groups regarding postoperative visual acuity or refraction³.

CONCLUSION:

We have concluded from this study that scleral tunnel suturing in MSICS results in surgically induced astigmatism i.e.57.5% had astigmatism between 1-2 D. It affects the postoperative visual outcome which was showing 53.3% patients had BCVA between 6/12 – 6/24. With optical correction and suture manipulation, correction of astigmatism is possible. Hence scleral tunnel has to be attempted only in unavoidable cases.

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