ORIGINAL ARTICLE

POST-OPERATIVE ASTIGMATISM WITH CONTINUOUS AND INTERRUPTED SUTURES IN CATARACT SURGERY

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ABSTRACT

Background: Cataract surgery has undergone revolutionary changes but the traditional extra-capsular cataract extraction is still practiced in the developing countries. The type of suture may greatly affect the outcome in terms of astigmatism. This study was conducted to compare the post-operative astigmatism using continuous versus interrupted sutures.

Material & Methods: This study was conducted in Ophthalmology Department, KUST Institute of Medical Sciences, Kohat, from January 2006 to June 2007. Two hundred patients were divided into two equal groups A and B. Group A patients had continuous 10/0 nylon sutures following extra-capsular cataract extraction whereas Group B had four interrupted sutures.

Results: Keratometric astigmatism in Group A patients was significantly higher (2.96+0.15D) as compared to Group B (1.70+0.73D) at six months post-operatively ($p<0.001$).

Conclusion: Interrupted sutures cause less astigmatism after extra-capsular cataract extraction than continuous sutures.

KEYWORDS: Cataract extraction, Sutures, Astigmatism.

INTRODUCTION

Blindness has posed great challenge to the quality of life since ancient times. World Health Organization is trying its level best to overcome this problem. But even then the results are not encouraging. WHO reports more than 38 million blind people globally and 110 million suffering from low vision.

Age related cataract accounts for almost 50% of blindness especially in developing countries. WHO reports a backlog of cataract of approximately 15.8 million with an annual increase of over 2 million new patients.[1]

In Pakistan the rate of blindness is even higher (i.e. 1.78% of total population). Blindness from cataract is more than 66%.[2]

In spite of the tremendous work performed by ophthalmologists throughout the world lack of cataract surgeons remains the leading cause of blindness in population based surveys.[3]

Cataract surgery has undergone revolutionary changes but the traditional Extra-capsular cataract extraction (ECCE) with continuous or interrupted sutures is still practiced in the developing countries. However post operative astigmatism in this technique is definitely a distressing challenge for patients and surgeons.[4]

The type of suture may greatly affect the outcome in terms of astygmatism.[5-7]

This study was conducted to compare the post-operative astigmatism using continuous or interrupted sutures in extra-capsular cataract extraction with intraocular lens (IOL) implantation.

MATERIAL AND METHODS

Total number of patients included in this study was 200, divided into two groups A and B, each of 100 patients. Patients with age related cataracts were included in the study. Those with dislocated or subluxated lens, traumatic cataract and secondary to uveitis orglaucoma were excluded.

All patients were pre-operatively evaluated after taking written informed consent. Pre operative keratometry readings were noted in all patients. All surgeries were performed by the principal author of study.

Suturing material used was monofilament 10/0 Nylon suture. Polymethylmethacrelate (PMMA) intra ocular lenses 6.5 mm were implanted.

Post-operative keratometric findings were recorded in diopters and axis mentioned on first post op day and then on all follow up visits (one week, 4 weeks, 8 weeks and 6 months). Sutures were removed after 8 weeks in all the cases and followed up to 6 months.

In all follow up visits, visual acuity unaided and best corrected was recorded.

Astigmatism was graded and classified according to the Holmstrom's gradation as,

No astigmatism: <0.25 D

Not significant: e"0.25 D but <1.00 D

High: e" 1.00 D

Astigmatism was classified according to axes as:

- With the rule (WTR) – Minus Cylinder at 180+20^0
- Against the rule (ATR) – Minus Cylinder at 90+20^0
- Oblique (OBL) – Minus Cylinder at other than 90+20^0 or 180+20^0

RESULTS

The age range of patients was from 40 to 80 years. The mean age of Group A patients was 57+6.6 and Group B 58+6.16 years.

The mean pre-operative kerotometric astigmatism of Group A and B was 0.75D and 0.89D respectively. The mean post-operative kerotometric astigmatism on first post-operative day in Group A patients was 6.95+0.56 D and in Group B 5.9+0.45 D. The declining astigmatism on follow-up visits is shown in Table 1.

Keratometric astigmatism in Group A patients was significantly higher (2.96+0.15D) as compared to Group B (1.70+0.73D) at six months post-operatively (p<0.001).

DISCUSSION

Post-operative keratometric astigmatism is mainly induced by sutures and suturing techniques. Several factors for surgically induced astigmatism have been identified, the most significant is tightness of the wound closure.[15]

Table 1: Pattern of decline of astigmatism in two groups.

Follow-up visits	Group A	Group B	t- values	p-value
First week	6.3+0.43 D	4.9+0.63 D	18.3544	<0.001
Fourth week	4.8+0.35 D	3.9+0.75 D	10.8742	<0.001
Eighth week (after removal of sutures)	3.79+0.59 D	1.9+0.23 D	29.8462	<0.001
Six months	2.96+0.15 D	1.7+0.73 D	16.9070	<0.001

The pattern of astigmatism was with the rule (WTR) in 65% of Group B and 60% in Group A.

Table: Comparison of current with previous studies.

Studies	Astigmatism in continuous sutures	Astigmatism in interrupted sutures
Thygeson et al[9] 1979	3.3 D 2 wks 3.0 D 4 wks	3 D 2 wks 2 D 4 months
Rowan et al[10] 1978	-	3.87 D 6 wks
Skubiszewska et al[11] 1996	1.78 D (3 months)	0.68 D 3 wks
Present Study	2.96+0.15 D	1.7+0.73 D

Table: Comparison of pattern of astigmatism in current study with past literature.

Studies	Initial astigmatism	Final astigmatism (6 wks – 3months)
Wishart et al[12] 1986	Mainly WTR (Both groups)	ATR in interrupted 8/0 virgin. silk sutures
		WTR in continuous 10/0 Nylon
Cataline et al[13]	WTR Both groups	ATR both groups
Archanasood et al[14] 2001	WTR Both groups	WTR both groups
Current study 2010	Mainly WTR both groups	Mainly WTR both groups

Loosely closed wounds allow the cornea to flatten with reduced curvature in vertical meridian causing against the rule astigmatism while tight suturing lead to stretching of the cornea vertically, increasing the curvature in vertical meridian and causing WTR astigmatism.[16]

Other factors that have been identified are the preoperative astigmatism,[16] the position, shape and length of incision,[17] method of suturing,[18] the number of sutures,[19] sidewise misalignment of section closure, and the post operative use of steroids,[20] the distance of incision from optical zone,[16] length of suture i.e. bite[21] and high IOP postoperatively.

The change in type of suturing material from 8/0 V silk to 10/0 Nylon has played a role in minimizing astigmatism.

The change in type of suturing material i.e. continuous or interrupted has also helped in this matter. In previous and current studies it is concluded that interrupted sutures are safer and can be manipulated easily[22].

Although this undesired postoperative astigmatism is a major reason for surgeons and patients dissatisfaction, but the gradual decline of astigmatism with passage of time and almost overcoming it after removal of sutures the results are encouraging. This concern regarding post op astigmatism and delayed rehabilitation have compelled ophthalmologists to shift the surgical techniques for cataract surgery from large incision to small incision and phaco emulsification.

CONCLUSION

It is concluded that interrupted sutures cause less astigmatism after extra capsular cataract extraction with intra ocular lens implant continuous sutures.

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