

Comparison of Post-Operative Astigmatism Followed by Extracapsular Cataract Extraction (ECCE) Surgical Procedure Demographically

Post-Operative
Astigmatism
Followed by
ECCE

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ABSTRACT

Objective: To compare post-operative astigmatism demographically between continuous and interrupted sutures in patients undergoing ECCE surgery.

Study Design: Longitudinal study

Place and Duration of Study: This study was a multicenter study conducted from March 2019 to September 2020.

Materials and Methods: 314 patients meeting the inclusion criteria were selected for the study and divided into two groups. In both the groups ECCE surgery was to be performed. Group A was to receive Limbal interrupted sutures, while group B Limbal continuous sutures. Astigmatism was recorded through keratometry and final outcomes were evaluated after 6 weeks. Data was analyzed using SPSS. Two groups were compared using Chi-square test, with level of significance being P-value ≤ 0.05 .

Results: 314 patients fulfilling the inclusion criteria were included in this study. The mean \pm standard deviation age of study population was 60.55 ± 6.612 years. No significant difference was seen between the group of continuous and interrupted sutures in terms of astigmatism ($P=0.32$), but the patients undergoing continuous suturing technique had more astigmatism. Astigmatism was found to be significant for males ($P=0.018$) and age less than 50 years ($P \leq 0.00$).

Conclusion: There is no difference in the amount of Post-operative astigmatism between continuous and interrupted suture technique, male gender and age group less than 50 is more predisposed to astigmatism after ECCE

Key Words: Astigmatism, ECCE, Surgical Procedure

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INTRODUCTION

The formation of an opacity on the lens is termed as a cataract. Cataract can be either unilateral or bilateral, congenital or acquired¹. It is regarded as the leading cause of blindness globally, with a survey in 2017 suggesting that cataract was regarded as the predominant reason for blindness (57%)². The blindness caused by cataract is one of the greatest public health dilemma in the 21st century³. If efforts are not increased to prevent the development of avoidable blindness worldwide there is a chance that by the year 2020, 76 million people will be affected by blindness globally⁴.

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Thus far, other than preventing cataract, the only way to treat cataract is by performing cataract surgery. The two most common types of surgeries for cataracts are Phacoemulsification and extracapsular cataract extraction (ECCE)⁵. In both of these surgical methods the aim is to create a wound that is penetrating on the sclera or the cornea which can then act as a weak point against the increased ocular pressure that arises through a blunt ocular injury. ECCE involves a scleral incision of 9-13mm. ECCE still remains the most preferred and cost-effective surgical method in developing countries in which economical barriers play a part in the decision making of the diseased burden patients. Furthermore, surgeons are trained more efficiently by their predecessors in this method in such countries. Although ECCE shows good prognosis, it has its drawbacks owing to large corneal incisions as well as a greater amounts of astigmatism in the short-term and a longer time-frame to achieve rehabilitation of visual function post-surgically⁶⁻⁷. Patients may also need to return back for suture removal to achieve the best visual acuity after surgery. In Pakistan Cataract accounts for more than half of the total blindness and cataract surgery is the

most common ocular surgery performed in this region. In regards to this we decided to conduct a study to assess the demographic data of the incidence of astigmatism between patients who have undergone ECCE using continuous suture, and those with interrupted suture technique.

MATERIALS AND METHODS

The study was conducted a multicenter study was conducted from March 2019 to September 2020, after gaining ethical approval from the institutional review board. 314 patients were selected through the calculation formula of two proportions. All patients diagnosed with mature cataract on slit lamp examination aged 45-70 years were selected. Patients that met our inclusion criteria were then selected for this study. The patients inducted into our study were informed about their involvement in this clinical study and a written informed consent was also taken. A proper history was taken of each and every patient being admitted who complained of decreased vision and blurring. A slit lamp examination was conducted to confirm the presence of mature cataract and exclude and other disorders. Through a draw method, patients were then divided into two groups. In both the groups ECCE surgery was performed by an experienced surgeon who had also previously done cataract surgeries. In Group A Limbal interrupted sutures were given and in group B Limbal continuous sutures were given. In both groups Nylon Sutures was used. Under Aseptic measures, the surgically treated eyes were padded in both groups. On the next day dressings were under strict aseptic conditions. Astigmatism was then recorded by Keratometry and noted. The final outcomes were then recorded 6 weeks post-operatively. Data was analyzed using SPSS version 20.0. data was presented through frequency and percentages. Two groups were compared for post-operative astigmatism by applying chi square test. Effect modifiers which included age and gender were controlled through stratification, chi square test was applied with the level of significance being kept at P-value ≤ 0.05 level of significance.

RESULTS

Table No.1: Shows the mean \pm standard deviation age of study population, which was 60.55 ± 6.612 years

Table No.2: Shows the frequency of Astigmatism between the two groups

Table No.3: Shows the stratification according to Gender

Table No.4: Stratification according to Age

Table No.1: Analysis of age of study population

	Minimum	Maximum	Mean	Std. Deviation
Age	45	70	60.55	6.612

Table No.2: Frequency of Astigmatism

		Astigmatism		Total
		Yes	No	
Type of technique	Continuous	69	88	157
	Interrupted	52	105	157
Total		121	193	314

P=0.32

Table No.3: Stratification according to gender

Gender			Astigmatism		Total
			Yes	No	
Male	Type of technique	Continuous	37	59	96
		Interrupted	22	72	94
	Total		59	131	190
Female	Type of technique	Continuous	32	29	61
		Interrupted	30	33	63
	Total		62	62	124

Significant for males P=0.018

Table No.4: Stratification according to age

Age			Astigmatism		Total
			Yes	No	
Less than 50	Type of technique	Continuous	31	2	33
		Interrupted	23	35	58
	Total		54	37	91
50 and above	Type of technique	Continuous	38	86	124
		Interrupted	29	70	99
	Total		67	156	223

For age < 50 years p <0.000

For age 50 year and above, p=0.472

DISCUSSION

To achieve optimal surgical results, it is crucial that there is a reduction in Surgically induced Astigmatism and correction of any residual astigmatism 8. Astigmatism also depends upon the size and site of incision, along with the presence of any pre-operative astigmatism⁹. The aim of our study was to see demographically if continuous or interrupted suturing technique have any effect on the post-operative astigmatism (POA). Although the amount of POA was found to be more in the continuous suture group (n=69), statistically this was found to be insignificant (p=0.32). However, there are other studies that have stated that astigmatic errors are more in interrupted suturing then in continuous suturing¹⁰. Raout et al (2021) also investigated in his study the influence of suturing technique and found that there is no significant different in visual or refractive outcome between continuous and interrupted suturing techniques¹¹. The finding of astigmatism was also seen as significant in the male gender population as compared to the female gender. This finding is similar to another finding conducted by Ninn-Pederson et al (1996) which showed men had developed more astigmatism then women. Mimouni et al (2019) in his study also showed that male population will tend to have more preoperative astigmatism than female and that male gender also

likely to have retreatment surgery for refractive correction¹³. On the contrary, Pontikos et al (2019) determined the frequency and distribution of corneal astigmatism, his results showed an association of astigmatism with females¹³. Age is also an important factor when considering the amount of POA astigmatism. A statistically significant finding was seen in age less than 50 years ($p < 0.00$). All of the following suturing was performed using Nylon. Nylon can induce with the rule (WTR) astigmatism in the meridian of incisions, this can help to explain the tendency of Limbal incisions in ECCE towards WTR astigmatism¹⁴⁻¹⁶. Future studies can be done to compare the effect of different suture materials after ECCE.

CONCLUSION

There is no difference in the amount of Post-operative astigmatism between continuous and interrupted suture technique, male gender and age group less than 50 is more predisposed to astigmatism after ECCE.

Author's Contribution:

Concept & Design of Study: Aiman Khan Panezai
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