

Effect of Pterygium Surgery on Keratometry Readings

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ABSTRACT

Introduction: In many case Pterygium is found to cause astigmatism. Study aimed to find the effect of pterygium excision on keratometry readings.

Material and Methods: The present Retrospective study was done on 50 eyes of 50 patients, who had primary pterygium and underwent pterygium surgery during period of October 2016 to October 2017 in a tertiary care hospital. Information that was reviewed included preoperative uncorrected and best corrected visual acuity, auto refraction, auto keratometry and detailed anterior segment and posterior segment examination.

Results: Mean astigmatism changed from preoperative 5.94 ± 3.82 Diopters (D) to 1.30 ± 1.07 D on 30th post operative day- showing 4.64 ± 2.75 D of change in astigmatism.

Conclusion: Pterygium can be a cause of low vision secondary to corneal astigmatism. Pterygium excision reduces corneal astigmatism significantly, which improves vision.

Keywords: Pterygium, Astigmatism, Keratometry, Pterygium Excision.

INTRODUCTION

Pterygium is a wing shaped fibrovascular growth which inducing significant corneal astigmatism. The probable mechanisms of corneal astigmatism secondary to pterygium are: the tractional force of contractile elements within the pterygium lead to mechanical distortion and flattening of the cornea leading astigmatism. The localised pooling of tears at the advancing edge-head of the pterygium is also responsible for corneal flattening.^{1,2} Excision of pterygium surgery leads to reduction in astigmatism which leads to significant improvement in vision.^{3,4} The objective with which this study was carried out were; to study the effect pterygium excision surgery over keratometric values; to study effect of change in astigmatism on vision.

MATERIAL AND METHODS

This retrospective was carried out on 50 eyes of 50 patients who had primary pterygium and underwent pterygium surgery during period of October 2016 to October 2017 in a tertiary care hospital. Information that was reviewed included preoperative uncorrected and best corrected visual acuity, auto refraction, auto keratometry and detailed anterior segment and posterior segment examination. Post operatively, uncorrected and best corrected visual acuity, auto refraction and auto keratometry were noted on 1st, 7th and 30th days. Patients with recurrent were excluded from the study. Data obtained from medical records. Keratometry values were obtained using an automated refractometer. All the surgeries were performed under peribulbar block with conjunctival autograft technique (Secure with 10-0 nylon

sutures). Post operative data obtained from medical records included Visual acuity; Autorefraction and Autokeratometry readings. These measurements were noted on 1st post operative day, 7th post operative day (1 week follow up) and 30th post operative day (1 month follow up).

RESULTS

In the present study, 50 eyes of 50 patients were studied during study period of 13 months. Demographic data are shown in Table 1. Gender distribution shows that 40% patients in this study were males and 60% were females. 48% patients in our study were operated for left eye and 52% were operated for right eye. Most of patients in present study had Type 2 pterygium (66.6%) followed by Type 1 pterygium (20%) and least had Type 3 pterygium (14%). All patients underwent pterygium excision with conjunctival autograft. Table 2 showed correlation between size of pterygium and amount of corneal astigmatism induced by it also increases. It also showed correlation between postoperative decrease in astigmatism, size of pterygium and amount of pterygium induced astigmatism. Pterygium excision with conjunctival autograft induced less astigmatism due to reduced inflammation and better healing post operatively. Table 3 shows comparison of pre-operative and post-operative range of best corrected visual acuity (BCVA) according to pterygium type. It shows improvement in post operative BCVA as compare to pre operative BCVA. This

Characteristic	Number (n=50)
Mean Age group	48.14±10.2 year.
Gender	
Male	40
Female	60
Operated Eye	
Right eye	24
Left eye	26
Morphological type of Pterygium	
Type 1 (0-2 mm)	10
Type 2 (2-4 mm)	33
Type 3 (> 4 mm)	7

Table-1: Baseline characteristics of patients operated for pterygium excision surgery

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Variable	Pre-op	1st post op day	7th post op day	30th post op day
Type 1 (0-2 mm)	3.8 D	1.90 D	1.90 D	0.56 D
Type 2 (2-4 mm)	6.0 D	2.10 D	2.02 D	1.19 D
Type 3 (>4 mm)	7.7 D	4.83 D	2.89 D	1.94 D

Table-2: Comparison of pre-operative and post-operative mean astigmatism according to morphological type of pterygium and type of pterygium surgery

Variable	BCVA 3/60-5/60		BCVA 6/60-6/24		BCVA 6/18-6/6	
	Pre-Operative	Post-Operative	Pre-Operative	Post-Operative	Pre-Operative	Post-Operative
Type 1 (0-2 mm)	0	0	6	0	4	10
Type 2 (2-4 mm)	8	0	22	2	3	31
Type 3 (> 4 mm)	3	0	4	2	0	5

Table-3: Comparison of pre-operative and post-operative best corrected visual acuity (BCVA) according to morphological type of pterygium

Day	Mean astigmatism
Pre operatively	6.20 D
1st post op day	3.51 D
7th post op day	2.19 D
30th post op day	1.30 D

Table-4: Comparison of change in preoperative and post operative mean astigmatism

improved vision is due to reduction in astigmatism following pterygium surgery. Mean astigmatism preoperatively was found to be 5.94 ± 3.82 D which subsequently decreased to 1.30 ± 1.07 D on 30th post operative day-showing 4.64 ± 2.75 D of change in astigmatism.(Table 4)

DISCUSSION

In present study, we reported that the preoperative astigmatism was positively related to size of pterygium. Lin and Stern also found same correlation between the pterygium size and astigmatism.¹ In present study we reported decrease in astigmatism following pterygium excision, this finding is similar to the study done by Maheshwari S. et al.² It is expected to increase in visual acuity after pterygium excision^{3,4}, we also noted same. In present study, we found a significant correlation on comparison of the size of the pterygium with the change in astigmatism. Thus, result of present study is similar to previous studies. We also found a significant correlation between the preoperative and postoperative astigmatism (paired t test, $P < 0.05$). Mean astigmatism preoperatively was found to be 5.94 ± 3.82 D which subsequently decreased to 1.30 ± 1.07 D on 30th post operative day-showing 4.64 ± 2.75 D of change in astigmatism. (paired t-test, $p < 0.05$). Soriano JM et al also reported same.⁵ On topography Cinal et al noted reversal of corneal changes after surgical removal of pterygium.⁶ Maheshwari S. in his showed corneal astigmatism reduced from 4.40 ± 3.64 diopter (D) to 1.55 ± 1.63 D (P value < 0.001) following pterygium excision, which is similar to present study. Asymmetry of the cornea reduced and regularity of corneal surface improved one month after surgery. Pterygium excision leads to significant positive changes in corneal refractive status.⁷ Pterygium excision can improve corneal symmetry however, in eyes with advanced pterygium, corneal distortion does not normalize completely

and irregular changes may persist.⁸ So, result of this study is different from present study. Changes in corneal stroma and Bowman's are the possible causes for these persistent refractive changes in eyes after large pterygium excision.⁹

CONCLUSION

Pterygium can cause significant corneal astigmatism, and this corneal astigmatism is positively related to horizontal length of pterygium. Pterygium excision resulted in significant decrease in corneal astigmatism. In present study we noted significant changes in preoperative and postoperative astigmatism.

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