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Study of Changes in Visual Acuity and Keratometric Readings after Pterygium Excision Surgery

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Abstract: ***Study of changes in visual acuity and keratometric readings after pterygium excision surgery; Purpose: To study changes astigmatism after pterygium excision surgery.; Materials and Methods: A prospective interventional case study carried out on 50 patients having primary pterygium;; Result: pterygium excision surgery improved corneal astigmatism from 2-10 D pre operatively to 0.50 -3 D post operatively with improvement in visual acuity of 4 lines of snellen's acuity chart in 36% of patients and 3 lines of snellen's acuity chart changes in 54% of patients. Conclusion: Pterygium leads to significant high corneal astigmatism, which hampers vision of the patient. Excision of pterygium leads to statistically significant reduction in astigmatism, which improves vision.***

Keywords: asrigmatism; keratometry

1. Introduction

Pterygium is a wing shaped fold of fibrovascular growth of subconjunctival tissue encroaching upon the cornea from the either side within the interpalpebral fissure area.[(1,2,3)] Pterygium is a very common degenerative condition of subconjunctival tissue that is associated with chronic ultraviolet rays (UV rays) exposure and its prevalence rates are higher in the tropics than in temperate climate with the equatorial countries having higher prevalence rates. [(2)] It is very common in India. Pterygium symptoms include blurring, irritation, lacrimation, and foreign body sensation. Significant astigmatism may be induced either 'with-the-rule' or 'against-the-rule'. Corneal astigmatism in an eye with pterygium is the result of cumulative effect of a naturally occurring astigmatism and that due to pterygium.

2. Objectives

1) To study changes in astigmatism after pterygium excision surgery
2) To study relationship between preoperative size of pterygium and its change post operatively
3) To study changes in vision postoperatively after ptrygium excision surgery.

3. Methods

This is a prospective interventional case study carried out in 50 eyes of 50 patients of age group from 25-79 years, selected by non probability convenient sampling out of which 24 were males and 26 females, who had primary pterygium.

Exclusion Criiteria

A patient with recurrent pterygium; past history of corneal surgery and other pathology. Each of the patient admitted for pterygiumsurgery; Detailed history taken about ocular complaints of the patient and previous treatment taken if any for the same anywhere. History elicited about any trauma, foreign body fall or other ocular pathology especially corneal pathology and treatment either medical or surgical taken if any Patient's visual acuity and best corrected visual acuity were recorded with each eye separately, using well illuminated Snellen's visual acuity chart with patient sitting at distance of 6 meters. Patient's anterior segment and posterior segment examination was done Auto refraction and Keratometry readings of each of the two eyes of the patient were taken using auto refractokeratometer and recorded Pterygium excision was done with superficial keratectomy and bare sclera covered with free limbalconjunctival autograft. Patient was discharged with antibiotic steroid eye drops. .keratometry and visual acuity was noted on 1st, 7th and 45thpost operative day

4. Results

Table 1: Comparison of change in mean astigmatism preoperatively, on 1st, 7th, and 45thpost operative day

Day	Mean astigmatism
Pre operatively	6.20 D
1st post op day	3.11 D
7th post op day	2.09 D
45th post op day	1.20 D

Table 1 shows that Mean astigmatism preoperatively was found to be 6.20 ± 3.58 D which subsequently decreased to 1.20 ± 1.27 D on 45thpost operative day-showing 5.09 ± 3.32 D of change in astigmatism which was statistically significant (paired t-test, $p<0.05$).

Table 2: Distribution of Post operative astigmatism

Astigmatism	Number of patients preop	No. of patients on 1st P.O.D.	No. of patients on 7th P.O.D.	No. of patients on 45th P.O.D.
0-4 D	15	37	44	46
4.1-8 D	25	09	06	04
8.1-12 D	05	01	0	0
>12 D	05	03	0	0

Table 2 shows that maximum number of patients preoperatively has astigmatism ranging from 4.1 to 8 D and patients were there having astigmatism >12 D(10%). And postoperatively there is decrease in amount of astigmatism with majority of (92%) patients having astigmatism <4 D and rest in between 4.1-8 D. No patients had >8D of astigmatism after surgery.

Table 3: Comparison of pre existing and post operative mean astigmatism in morphological types of pterygium

Morph-ological type	Preoperatively existing mean astigmatism	1st P.O.D. mean astigmatism	7th P.O.D. mean astigmatism	45th P.O.D. mean astigmatism
Type 1	4 D	2.20 D	2.20 D	0.54 D
Type 2	6.1 D	2.03 D	2.03 D	1.23 D
Type 3	8.9 D	5.03 D	2.89 D	1.78 D

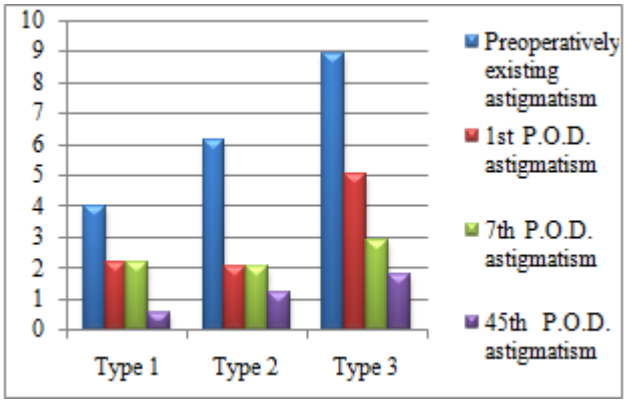

Table 3 shows that as the size of the pterygiumincreses, the amount of corneal astigmatism induced by it also increases in direct proportion and also, it shows that postoperative decrease in astigmatism also showed a positive correlation i.e. as the size increases, amount of astigmatism induced is more and postoperative decrease is more in those patients.

5. Discussion

In study of ***Hegab***, the pterygium size measured by the slitlamp ranged from 0.2 mm to 5mm. The induced astigmatism ranged from 0.5 D to 5.2 D.

Fong et al and Tomidokoro et al reported that before pterygium surgery the magnitude of regular astigmatism showed significant correlation with pterygium size where r square = 0.7.

Avisar concluded that when pterygium reach 1.1 mm it produce 1D WTR astigmatism in his study which increase with increase pterygial extension onto the cornea.

Seitz et al explained patients decrease in visual acuity before reaching the optical axis as increasing distance of head from limbus results in increase in amount and irregularity of preoperatively induced corneal astigmatism detected by topography and keratometry.

AshayeA o reported that the size of pterygia could be an important predictor of the amount of astigmatism in an eye.

Kampitak K determined the effect of pterygium on corneal astigmatism measured by corneal topography, where the size of pterygium extended from 0.5 mm to 8.1 mm and the diopter of corneal astigmatism ranged from 0.1 D to 14.6 D, the degree of corneal astigmatism was significantly correlated with the pterygium extension on the cornea. R square = 0.45 P< 0.001 & when the extension of pterygium exceeds 2.25 mm, there was a chance of developing corneal astigmatism of 2D considering that extension within the limits of surgery.

Also ***Maheshwari S, 2003*** reported similar result.

Current study also shows that as the size of pterygium increases, the amount of astigmatism increases proportionately with it and excision of pterygium leads to significant decrease in corneal astigmatism.

6. Conclusion

Pterygium leads to significant high corneal astigmatism, which decreases vision of the patient. As the size of pterygium encroaching on cornea increases, amount of induced astigmatism increases.Excision of pterygium leads to statistically significant reduction in astigmatism, which improves vision significantly.

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