



STUDY OF INDUCED ASTIGMATISM BEFORE AND AFTER PTERYGIUM EXCISION SURGERY.

Dr. Nizamuddin*

Assistant Professor ophthalmology, Department of Ophthalmology, Government Medical College, Kota, Rajasthan. *Corresponding Author

Dr. Anand Goyal

PG Resident Doctor, Department of Ophthalmology, Government Medical College, Kota, Rajasthan.

Dr. Jaishree Singh

Professor ophthalmology, Department of Ophthalmology, Government Medical College, Kota, Rajasthan.

ABSTRACT

Background: Pterygium is a wing shaped fibrovascular growth of subconjunctival tissue encroaching upon the cornea from the either side within the interpalpebral fissure area inducing significant astigmatism. Surgical intervention for excision of pterygium leads to reduction in astigmatism which significantly improves vision.

Aim: To study the changes in corneal astigmatism before and after pterygium excision surgery.

Material and Methods: The study was carried out on 109 eyes of 109 patients, who had primary pterygium and were admitted in the Department of Ophthalmology, Govt. Medical College, Kota, Rajasthan and underwent pterygium surgery during period of January 2016 to December 2019. All patients underwent preoperative assessment for visual acuity, refraction and keratometry. After pterygium surgery patients were reassessed for visual acuity, refraction and keratometry on 1st, 7th, 14th and 30th post operative day and the results were analyzed.

Results: Mean astigmatism preoperatively was found to be 2.37 Diopters (D) in type 1, 4.16 D in type 2 and 6.75 D in type 3 pterygium which subsequently decreased to 0.65 D, 1.10 D and 1.65 D respectively on 30th post operative day and showing change of 1.72 D, 3.06 D and 5.10 D in mean astigmatism correspondingly which was statistically significant (paired t-test, $p < 0.05$).

Conclusion: Pterygium causes significant corneal astigmatism, which hampers vision of the patient. Excision of pterygium leads to statistically significant reduction in astigmatism, which improves vision significantly.

KEYWORDS : Pterygium, astigmatism, visual acuity, keratometry.

INTRODUCTION

Pterygium is a wing shaped fibrovascular growth of subconjunctival tissue encroaching upon the cornea from the either side within the interpalpebral fissure area which causes tractional force on to the cornea and leads to mechanical distortion and flattening of the cornea in its horizontal meridian leading to hypermetropic with the rule astigmatism.

Pterygium induced with-the-rule corneal astigmatism is hemimeridional on the side of the pterygium resulting in a localized flattening of the cornea central to the leading apex.[1, 2].

Pterygium induced corneal astigmatism decreases following an excision [3].

OBJECTIVES

To study the changes in corneal astigmatism before and after pterygium excision surgery.

To study relationship of pre operative size of pterygium with the induced astigmatism and change in it after surgery.

MATERIAL AND METHODS

Sample size: A prospective study was carried out on 109 eyes of 109 patients in the Department of Ophthalmology, Govt. Medical College, Kota, Rajasthan. All the patients were in age group from 21 to 80 years, of which 69 were males and 40 were females. The study period extended from January 2016 to December 2019.

INCLUSION CRITERIA: The patients who had primary pterygium admitted in the Department of Ophthalmology, Govt. Medical College, Kota, Rajasthan and underwent pterygium excision surgery with autoconjunctival grafting were included in the study.

Exclusion criteria: Patients with recurrent pterygium i.e. having past history of pterygium excision, patients with

corneal scarring, patients with past history of corneal surgery and those with any other corneal degenerative pathology were excluded from the study.

METHODS:

All patients underwent preoperative assessment for visual acuity, anterior segment examination with emphasis on pterygium morphology, posterior segment examination, autorefractometry and keratometry[4,5].

Patient's pre operative unaided visual acuity and best corrected visual acuity were recorded for each eye separately using well illuminated Snellen's visual acuity chart with patient sitting at distance of 6 meters.

Preoperative horizontal length (size) of pterygium was measured by focusing the slit on the pterygium and using the ruler of the slit incorporated in the slit-lamp from limbus to the advancing edge of pterygium. Based on this size pterygium is classified into 3 types as[6, 7]:

Type 1- Pterygium encroaching up to 2 mm area on the cornea, i.e. crossing limbal margin but not reaching pupillary margin.

Type 2 - Pterygium encroaching 2-4 mm area on the cornea, i.e. reaching up to pupillary margin but not crossing it.

Type 3 - Pterygium encroaching > 4 mm area on the cornea, i.e. crossing pupillary margin and coming in visual axis.

Keratometry values were obtained using Bausch and Lomb keratometer.

Written and informed consent was taken from all the patients along with explained prognosis about recurrence of the pterygium and changes in astigmatism.

All the surgeries were performed under peribulbar block, containing 4 ml of 2% lignocaine and 2 ml of 0.5% bupivacaine. Head of the pterygium was excised with gentle

dissection and traction avulsion from the corneal surface, neck and body of pterygium were dissected and pterygium tissue was excised after delineating and separating it from overlying conjunctiva and underlying sclera[8, 9].

Conjunctival auto graft was placed and the defect was closed by suturing auto graft with adjacent conjunctiva by nylon 10-0 sutures[10]. Topical antibiotic eye ointment application with pad and bandage was done to the eye for 1 day. Conjunctival suture removal was done on 14th post operative day .

During follow up patients were reassessed for unaided and best corrected visual acuity, refraction and keratometry and readings were recorded as in pre operative assessment. These measurements were done on 1st, 7th, 14th, and 30th post operative day.

RESULTS

Table 1:- Sociodemographic characteristics of study population.

Age Group (In Years)	Number
21-30	20
31-40	37
41-50	25
51-60	16
61-70	09
70-80	02
Gender	
Male	69
Female	40
Operated Eye	
Right	57
Left	52
Morphological type of Pterygium	
Type-1	39
Type-2	66
Type-3	04

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

S.No.	Variable	Type 1	Type 2	Type 3
1.	Pre operative mean astigmatism (D)	2.37	4.16	6.75
2.	Post operative mean astigmatism(D)	Day 1	1.50	2.66
		Day 7	1.20	2.16
		Day 14	1.00	1.50
		Day 30	0.65	1.10
3.	Difference in mean astigmatism(D)	1.72	3.06	5.10

D- Dioptre power of cornea

Mean astigmatism preoperatively was found to be 2.37 Diopters (D) in type 1, 4.16 D in type 2 and 6.75 D in type 3 pterygium which subsequently decreased to 0.65 D, 1.10 D and 1.65 D respectively on 30th post operative day and showing change of 1.72 D, 3.06 D and 5.10 D in mean astigmatism correspondingly which was statistically significant(paired t-test, $p < 0.05$).

DISCUSSION

Pterygium causes flattening of the cornea to the leading apex and causes induced astigmatism.

In present study, we found that the degree of astigmatism was decreased significantly following pterygium excision. Maheshwari S. has also found decrease in astigmatism following pterygium excision [2]. The present study also revealed the fact that this decrease in astigmatism was related to the size of the pterygium, more the size of the pterygium causes more the change in astigmatism. Lin and

Stern also found a significant correlation between the size of pterygium and corneal astigmatism [1].

CONCLUSION

Pterygium leads to significant high corneal astigmatism, which hampers vision of the patient. As the size of pterygium encroaching on cornea increases, the amount of induced astigmatism also increases.

Excision of pterygium leads to statistically significant reduction in astigmatism, which improves vision significantly.

REFERENCES

1. Lin A, Stern GA. Correlation between pterygium size and induced corneal astigmatism. *Cornea* 1998;17:28-30.
2. Maheshwari S. Effect of pterygium excision on pterygium induced astigmatism. *Indian J Ophthalmol* 2003;51:187-8.
3. Tomidokoro A, Miyata K, Sakaguchi Y, Samajima T, Tokunaga T, Oshika T. Effects of pterygium on corneal spherical power and astigmatism. *Ophthalmology* 2000;107:1568-71.
4. Bahar I, Loya N, Weinberger D, Avisar R. Effect of pterygium surgery on corneal topography: A prospective study. *Cornea* 2004;23:113-7.
5. Stern GA, Lin A. Effects of pterygium excision on induced corneal topographic abnormalities. *Cornea* 1998;17:23-7.
6. Wu PL, Kuo CN, Hsu HL, Lai CH. Effect of pterygium surgery on refractive spherocylinder power and corneal topography. *Ophthalmic Surg Lasers Imaging* 2009;40:32-7.
7. Alison L, George AS. Correlation between pterygium size and induced corneal astigmatism. *Cornea* 1998;17:28-30.
8. Mohamad-Salih PA, Sharif AF. Analysis of pterygium size and induced corneal astigmatism. *Cornea* 2008;27:434-8.
9. Avisar A, Loya N, Yassar Y, Weinberger D. Pterygium induced corneal astigmatism. *Isr Med Assoc J* 2000;2:14-5.
10. Kampitak K. The effect of pterygium on corneal astigmatism. *J Med Assoc Thai* 2003;86:16-23.