

Evaluation of preoperative and postoperative corneal astigmatism after pterygium excision surgery with limbal autoconjunctival graft

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Abstract

Objectives: To evaluate the preoperative and postoperative corneal astigmatism after pterygium excision surgery with limbal autoconjunctival graft. To study relation between pterygium size with corneal astigmatism.

Keywords: pterygium excision, preoperative corneal astigmatism, postoperative corneal astigmatism.

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INTRODUCTION

Pterygium is a wing shaped fibrovascular growth of conjunctival connective tissue over cornea resulting in cosmetic problems, decrease in visual acuity, secondary astigmatism and blockage of the optical axis.¹ It is more frequently seen in areas with uv light², in hot dry and dusty environment. It is mainly seen in tropical country of India. Prevalence rate of pterygium is 0.7 % to 31% in various population around the world³. Pterygium can cause visual impairment due to induced astigmatism and blockage of visual axis. High grade of corneal astigmatism is considered an indication for pterygium surgery⁴. Pterygium excision is the treatment of choice. Pterygium surgery is also indicated if patient is symptomatic, presence of inflammation, restricted extraocular movements and cosmetic purpose. Pterygium induced astigmatism is due to pooling of the tear film at the head of pterygium⁵ and traction generated by the

pterygium^{6,7}. We conducted a study in patients with primary pterygium to assess effect of pterygium excision surgery with limbal autoconjunctival graft, on corneal astigmatism and relation between pterygium size with corneal astigmatism.

MATERIALS AND METHODS

It is a retrospective study. Patients attending ophthalmic OPD in MGM hospital were selected.

Exclusion Criteria

Patients with history of ocular trauma, history of ocular surgery were not included in the study. Also patients with presence of corneal scarring were not included in the study. Thirty eyes with primary pterygium were evaluated preoperatively and postoperatively. All patients were thoroughly examined preoperatively. In preoperative evaluation, visual acuity was measured on Snellen's chart. Refraction was done by mirror retinoscope and corneal astigmatism was measured by Jawal Schiotz keratometer. The surgical procedure were standardised and were performed by an experienced single surgeon. Size of pterygium measured vertically at limbus and horizontally on cornea by Castrovijo's Caliper. Pterygium is excised by removing body first and then head was bluntly removed followed by limbal autoconjunctival graft. In limbal autoconjunctival grafting, tenonfree, an oversized graft for 1mm of length and width relative to sclera bed was harvested from superotemporal limbus. Graft was sutured with 7.0 vicryl material. Postoperatively steroid antibiotic eyedrops were given for 6 weeks in tapering

doses with artificial eye drops 4 times a day. Postoperatively corneal astigmatism, refractrion and visual acuity were measured in 1st, 7th, 21st, 45th, 60th and 90th day. Preoperative and postoperative astigmatism were compared using the paired t test. Results were expressed as an arithmetic mean± standard deviation.

RESULTS

All eyes had nasal pterygium. The mean age of presentation was 44 (range 29 to 65) ± 11.6. The mean duration of pterygium was 35-46 mths. (±31.68).

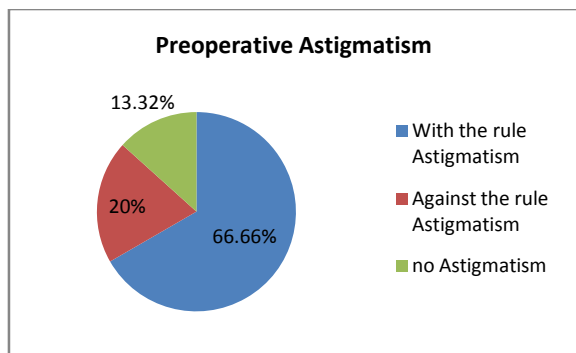


Figure 1:

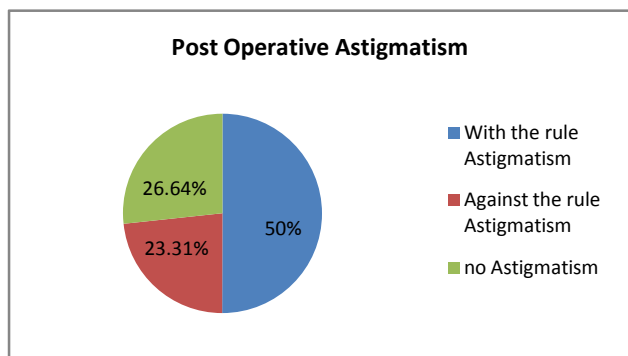


Figure 2:

Preoperatively, with the rule astigmatism were noted in 66.66 %, against the rule were in 20% and no astigmatism in 13.32 %. Postoperatively, with the rule astigmatism were noted in 50%, against the rule were in 23.31 % and no astigmatism were noted in 26.64%.

Comparision between preoperative and post operative astigmatism

Table 1: After pterygium excision surgery

Astigmatism	n	mean ±SD	t value	P value
Preoperative	30	0.85 D ±0.87 D	1.36	0.18
post of 21st day	30	0.617 D + 0.48 D		
preoperative	30	0.85 D ±0.87 D	2.23	0.034
post of 90th day	30	0.53 D + 0.56 D		

The astigmatism were calculated using paired t test. The mean preoperative astigmatic value was 0.85D ± 0.87 D (range of 0.0D to 4.0 D). The mean postoperative astigmatism on 90th day was 0.53 D±0.56D (range of 0.0 D to 2D). The difference was statistically significant.

Table 2: Mean astigmatism in relation to the length of pterygium

length (mm)	No. of eyes	Mean Astigmatism
2 to <3	14	0.428 ±0.541
3 to <4	10	0.85 ±0.530
≥ 4	6	1.833 ± 1.24

The amount of astigmatism were varied with the length of pterygium encroaching the cornea. Mean astigmatism in relation to the length of pterygium encroaching the cornea was as follows: for 2 to <3 mm length 0.428 ± 0.541D, for 3 to <4mm length 0.85± 0.530D, for ≥ 4 mm length 1.833± 1.24 D. The pterygium induced astigmatism was significantly related to the length of pterygium encroaching the cornea.(p value: 0.0019)

Table 3: Mean astigmatism in relation to the width of pterygium

width (mm)	No. of eyes	Mean Astigmatism
3 to < 4	5	0.5 ±0.5
4 to < 5	8	0.625 ±0.55
≥ 5	17	0.955 ±1.06

Mean astigmatism in relation to the width of pterygium were as follows: for 3 to <4mm mean astigmatism was 0.5±0.5 D, for 4 to < 5mm mean astigmatism was 0.625±0.55 D, for ≥ 5mm mean astigmatism was 0.955± 1.06 D. The relation of astigmatism with width of pterygium is not significant (p value: 0.5).

DISCUSSION

Pterygium results in high corneal astigmatism due to alteration in tear film caused by lesion. As the head of the pterygium approaches the apex of the cornea, a tear meniscus develops between the apex of the cornea and elevated pterygium. It along with mechanical traction of pterygium causes flattening of normal corneal curvature. The astigmatism which is induced by pterygium is with the rule astigmatism⁸. Lin andl have reported that the pterygium begins to induce significant degree of astigmatism once it reaches upto 45% of the distance from the limbus to the visual axis or within 3.2mm of visual axis⁷. In Tomidokoro A and Miyata study reported, pterygium results in high corneal astigmatism which decreases following an excision⁹. Accordingly in present study, we found that the degree of astigmatism decreased significantly following excision. Sejal Maheshwari⁶ and F.H. Oner⁸ reported that with increase in the degree of corneal involvement the astigmatism increased. Similarly in our study, increase in corneal encroachment ≥ 4mm shows statistically significant increase in corneal astigmatism. In F.H. Oner study, pterygium width ≥ 3mm

showed significant pterygium induced astigmatism⁸. Similarly in our study width ≥ 5 mm shows higher astigmatism.

CONCLUSION

Pterygium results in high corneal astigmatism which increases with the increase in length of pterygium encroaching the cornea and decreases to an acceptable level following excision.

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