

The impact of surgical excision on pterygium induced astigmatism

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Abstract

Objective: To Study the correlation between length and width of pterygium on induced astigmatism. To determine the relation between preoperative and postoperative astigmatism measured by keratometry and refraction.

Results: Total 60 patients were included with male predominance (75%) and majority of patients falling in middle age group (60%). There was a strong association of pterygium with outdoor workers as compared to indoor workers. The length of pterygium had strong correlation with corneal astigmatism as compared to width. Following excision of pterygium with Conjunctival autograft with suture, there is statically significant reduction in mean corneal and subjective astigmatism. (p value <0.001).

Keywords: Conjunctival Autograft, corneal astigmatism, Pterygium.

Introduction

Pterygium is a benign, elastotic degenerative condition of conjunctiva.⁽¹⁾ It is commonly seen in Indian subcontinent which is a part of pterygium belt.⁽²⁾ However its origin and development, tendency to relapse and reoccur, all offer problems which are yet to be solved by ophthalmic surgeons.^(1,3) With the rule astigmatism is the most common cause of diminished vision in pterygium.⁽⁴⁾ Many treatment modalities are available but, surgical excision, conjunctival autograft with suture showed most promising results.⁽⁵⁾ Autografting replaces the bare sclera with tissue that is surgically removed from the inside of the patient's upper conjunctiva. This autograft can be transplanted with sutures, tissue adhesive.

Materials and Method

Total 60 patients of pterygium were randomly selected. Detailed history, comprising of symptoms with duration, occupation, socioeconomic status, past history of ocular surgery (as it may also contribute to astigmatism) is taken. Thorough slit lamp examination was done, both pre and post operative keratometry, autorefractometry, and refraction was done. All relevant blood investigations like, hemogram, coagulation profile, random blood sugar, HIV, HbsAg were done (for safety of patient as well as surgeon) prior to the surgical excision.

Length and width (in mm) of pterygium is measured with one prong of caliper placed at the limbus and other at the head of pterygium

Inclusion Criteria: Patients having true pterygium reaching upto limbus or involving the cornea.

Exclusion Criteria: Temporal pterygium, double headed pterygium covering visual axis that preclude keratometric assessment, previous intraocular surgery, corneal opacity and scleritis.

Result

Amount of astigmatism is found to show proportionate increase with length and width of pterygium. In patients with length and width of pterygium more than and equal to 3mm, 100% of patients showed induced astigmatism.

Table 1: Pterygium length relation with Astigmatism

Length of Pterygium	No. of Patients	No. of Patients with astigmatism (>0.25D)	Percentage of Patients with astigmatism
1mm	14	8	57%
2mm	20	18	90%
3mm	22	22	100%
4mm	4	4	100%

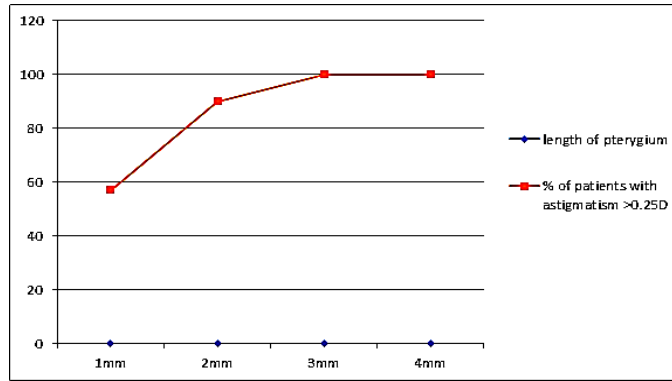


Fig. 1

Table 2: Pterygium width relation with Astigmatism

Width of Pterygium	No. of Patients	No. of Patients with astigmatism (>0.25D)	Percentage of Patients with astigmatism
2mm	10	6	60%
3mm	16	12	75%
4mm	16	16	100%
5mm	14	14	100%
6mm	4	4	100%

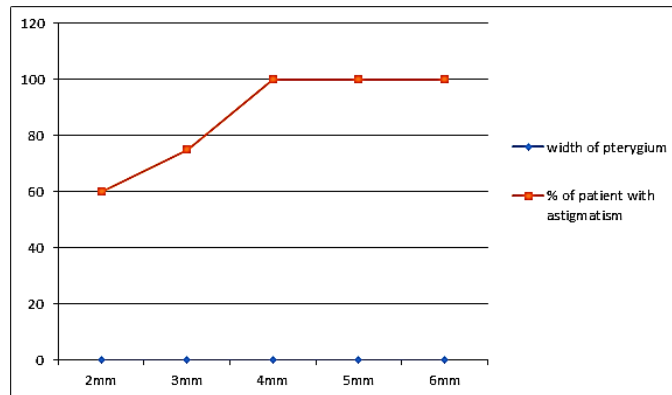


Fig. 2

In the current study mean post-operative corneal astigmatism reduction was 0.36 (67.91%), 0.50(41%), 0.66(41.5%), 2.50(71.4%) in 1mm, 2mm, 3mm and 4mm pterygium length groups respectively. This reduction was statistically significant P value (<0.01). Similarly mean subjective astigmatism reduction was 0.07(33.3%), 0.47(51%), 0.18(17%), 1.5(54.5%) in 1mm, 2mm, 3mm and 4mm pterygium length respectively. This reduction was also statically significant (P value <0.02). Mean corneal astigmatism reduction was 0.30D (50%), 1.03D(67.3%), 0.21D (57.2%), 0.52D(30.7%), 2.13D(65.5%), in the 2mm, 3mm, 4mm, 5mm, 6mm Pterygium width group respectively for the reduction in cylinder power after subjective refraction the result were 0.10D(33%), 0.16D(32%), 0.84D(58%), 0.75D(42.1%), 1.76D(61.1%), respectively for 2mm, 3mm, 4mm, 5mm, 6mm, width group. The result in the present study correlate with existing studies in literature. Wu PL et al⁽¹⁰⁾ (2009) studied 27 eyes of pterygium and found statically significant improvement in induced astigmatism (p value<0.001). Maheshwari et al⁽¹¹⁾ (2003) studied 36 patients and found that pterygium is associated with “induced astigmatism” and causes significant impact on vision.

Table 3: Relation of Length of pterygium with preoperative and post operative mean corneal and subjective astigmatism

Length (in mm)	Mean corneal Astigmatism			Mean Subjective Astigmatism		
	Pre op.	Post op.	Mean reduction	Pre op.	Post op.	Mean reduction
1	0.53	0.17	0.36 (67.9%)	0.21	0.14	0.7 (33.3%)
2	1.20	0.70	0.50 (41%)	0.92	0.45	0.47 (51%)

3	1.59	0.93	0.66 (41.5%)	1.04	0.86	0.18 (17%)
4	3.50	1.00	2.50 (71.4%)	2.75	1.25	1.5 (54.5%)

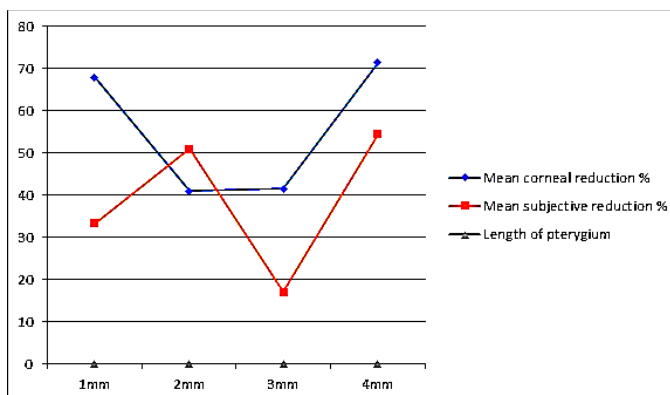


Fig. 3

Table 4: Relation of width of pterygium with preoperative and post operative mean corneal and subjective astigmatism

width (in mm)	Mean corneal Astigmatism			Mean Subjective Astigmatism		
	Pre op.	Post op.	Mean reduction	Pre op.	Post op.	Mean reduction
2	0.60	0.30	0.30 (50%)	0.30	0.20	0.10 (33%)
3	1.53	0.50	1.03 (67.3%)	0.50	0.34	0.16 (32%)
4	1.59	0.68	0.21 (57.2%)	1.43	0.59	0.84 (58%)
5	1.69	1.17	0.52 (30.7%)	1.78	1.03	0.75 (42.1%)
6	3.25	1.12	2.13 (65.5%)	2.88	1.125	1.76 (61.1%)

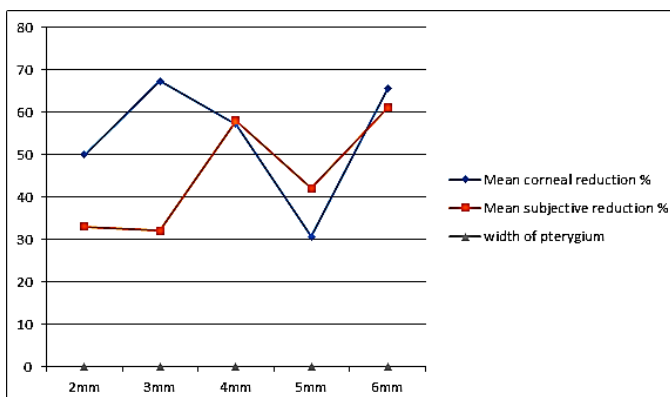


Fig. 4

Conclusion

There occurs a strong correlation between Pterygium size and induced astigmatism. The amount of induced astigmatism increases with increasing size of perygium. Pterygium causes with the rule astigmatism in majority of cases. Successful pterygium surgery causes statistically significant improvement in refractive and corneal astigmatism.⁽⁶⁾ Postoperative acceptable astigmatism is seen in maximum number of cases when size of pterygium is <3mm length & width <4mm.^(7,8,9)

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