

Comparative Study of Amniotic Membrane Graft

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ABSTRACT

Introduction: Surgical excision remains principal mode of treatment for pterygium. Various techniques have been tried like simple excision, bare sclera method, transplantation of conjunctival auto graft (CAG) or amniotic membrane transplantation (AMT) or mucous membrane to cover bare sclera and lamellar keratoplasty. Study aimed to compare the recurrence following Conjunctival autografting with Amniotic membrane grafting in pterygium surgery.

Material and methods: This study group consisted of 90 patients; the patients were followed up for 6 months. First group (45 cases) underwent pterygium excision with Conjunctival autografting, second group (45 cases) received pterygium excision amniotic membrane transplantation. All cases were followed up for 6 months.

Results: 51 (56.66%) were female patients and 39 (65.71%) were male patients. Highest prevalence of pterygium were seen in age group of 41-50 years 29 eyes (32.22%). Commonest presenting symptom was foreign body sensation. Out of 90 operated cases, 48 (53.33%) were right eye and 42 (46.66%) were left eye. Out of 90 patients, 84 cases had only nasal pterygium (93.33%), 4 case (4.44%) had only temporal pterygium. After surgery out of 90 patients, best corrected visual acuity remained same in 16 cases (17.77%), and improved in 74 cases (82.22%). The best corrected visual acuity of 16 (17.77%) patients remained same because of cataractous changes and ARMD changes. During the follow-up period of this study, in CAG group 3 cases (6.66%) had recurrence. In AMT group 7 cases (15.55%) had recurrence.

Conclusion: Amniotic membrane transplantation is associated with high recurrence rates than conjunctival autografting which is in accordance with literature.

Keywords: Amniotic Membrane Graft

INTRODUCTION

Pterygium which takes its name from the greek word 'pterygos' meaning "wing of an insect" was described by Hippocrates, Gallen and others. Etiology of pterygium is obscure. The prevalence of pterygium has been directly related with proximity to equator: the nearer to the equator, the greater the prevalence and to a lesser and milder degree in cooler climates. Most commonly seen on either side of the equator, pterygium has been endemic in the Indian subcontinent, Southeast Asia, Mexico, Caribbean and other places. Cameron's map summarises the prevalence rates of pterygium¹. Outdoorwork in situations with high light reflectivity, including from sand and water, enhances pterygium development, and the use of hats and sunglasses is protective². It may produce visual impairment, redness, irritation and cosmetic disfigurement.

Pterygium is a triangular fibrovascular subepithelial ingrowth

of degenerative bulbar conjunctival tissue encroaching over the limbus onto the cornea located commonly horizontally in the interpalpebral fissure on either nasal or temporal side of cornea or sometimes on both sides. It is a common clinical entity encountered in ophthalmic practice. It invades the cornea destroying the superficial stroma and Bowman's Membrane, the whole being covered by conjunctival epithelium. In early stages it is thick and vascular, becomes thin and pale when it ceases to progress but never disappears. The real problem is in its successful management which is indicated either for cosmetic reasons or progression towards the visual axis or inflammatory changes or induced astigmatism. Surgical excision remains the principal mode of treatment for pterygium. Various techniques have been tried like simple excision, bare sclera method, Transplantation of conjunctival auto graft (CAG) or amniotic membrane transplantation (AMT) or mucous membrane to cover bare sclera and lamellar keratoplasty.

Unfortunately none of these techniques are successful in all cases and recurrence still remains most enigmatic complication of pterygium excision. Almost all (91.6%) recurrences appear by 360 days after surgery.³ Bare sclera method has a very high recurrence rate of 23% to 75%^{4,5,6}. Currently the most widely used techniques are conjunctival autografting and amniotic membrane transplantation. This study was done to compare the recurrence following conjunctival autografting with Amniotic membrane grafting in pterygium surgery.

MATERIAL AND METHODS

This was a prospective observational study undertaken at Regional Eye Hospital Warangal during February 2015 to September 2016. A total of 90 pterygia of 90 patients were studied, who attended the outpatient department. Each patient was totally evaluated by complete history, total ocular and systemic examination with necessary investigations. They were diagnosed as various grades, depending on the extent of cornea involved. Of these 90 patients, randomly 45 patients were subjected to pterygium excision with Conjunctival

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autografting and 45 patients were subjected to pterygium excision with AMG and followed up for a duration of 6 months to compare recurrences and complication between both the groups.

Inclusion Criteria: All age groups and both sexes having pterygium

Exclusion Criteria: Patients with recurrent pterygium and which associated with ocular surface disorder and lid disorder.

History regarding age, sex, occupation, address, duration of complaints, H/o past treatment etc., were noted. Detailed ocular examination of anterior and posterior segment was done.

Vision and Refraction

The best corrected visual acuity and keratometry both preoperative and postoperative to detect any defect in vision or change in astigmatism. Slit lamp examination was eventually done for evidence of progression or any associated pathology. Systemic evaluation including blood pressure and routine investigations.

Postoperative Prescription: 0.5% Moxifloxacin with 0.1% Dexamethasone e/d 6 times a day for 2 weeks and 1% Cyclopentolate e/d 2 times a day for 3 days.

At each visit the following factors were examined and noted:

Age	No. of Patients	Percentage
20-30	17	18.89%
31-40	24	26.67%
41-50	29	32.22%
51-60	14	15.55%
Above 61	6	6.67%
Gender		
Males	39	43.33%
Females	51	56.67%
Site		
Only nasal	84	93.33%
Only temporal	4	4.44%
Double pterygia	2	2.22%

Table-1: Demographic details in study

Symptoms	No. of Eyes	Percentage
Foreign Body Sensation with Redness and Watering	39	43.33%
Diminution of Vision with Redness and Foreign Body Sensation	18	20%
Cosmetic Only	7	7.77%
Foreign Body Sensation, Redness and Watering + Cosmetic	26	28.89%

Table-2: Distribution of Symptoms of Pterygium

	GI	GII	GIII	Total	Percentage
Primary Progressive Pterygium	58	10	7	75	84.44%
Primary Atrophic Pterygium	5	-	-	5	5.55%
Primary Stationary Pterygium	10	-	-	10	11.11%

Table-3: Types of Pterygia Included in the Study

1. Recurrence: Recurrence was considered if fibrovascular growth of similar nature to that present pre-operatively took place, or if significant conjunctival vascularization causing cosmetic blemish occurred.
2. Vision, refraction and keratometry were also done to determine any diminution of vision or change in astigmatism.
3. Any complications.
4. Any other complaints.

RESULTS

In this study of total 90 patients, the patients were followed up for 6 months.

This study showed pterygium was more common in younger and middle age group because these age group persons were more active in outdoor work, so more exposure to the environmental factors and more incidence of pterygium was present. Pterygium was more common in female patients than male patients (table-1).

In 90 eyes, only nasal pterygia were present in 84(93.33%) eyes. Only temporal pterygium was present in 4(4.44%) eyes and double pterygia were present in 2(2.22%) eyes. This

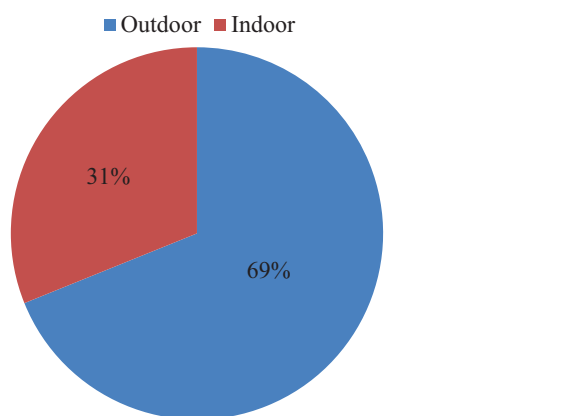


Figure-1: Occupational Incidence of Pterygium

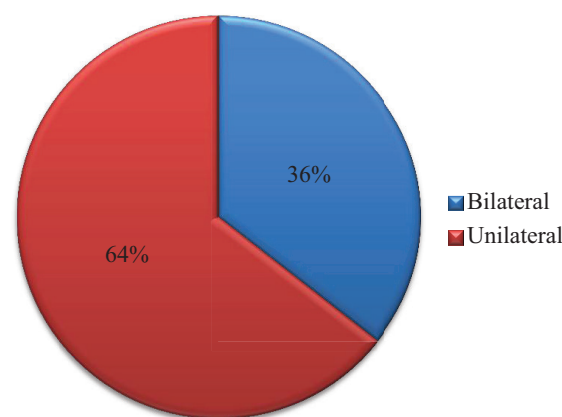


Figure-2: Laterality

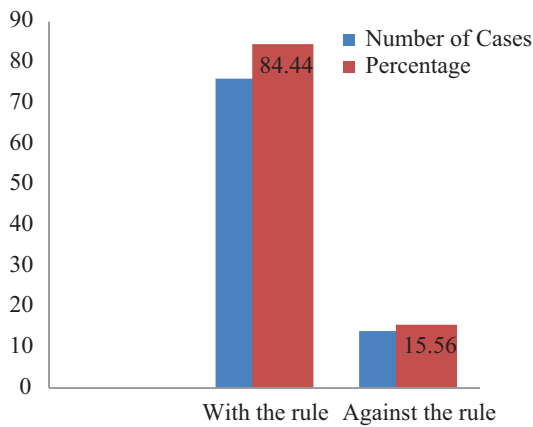
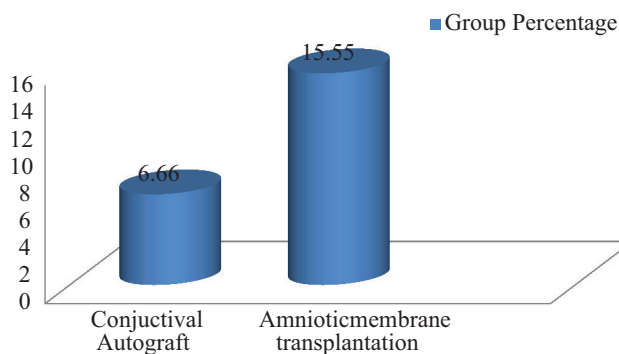


Figure-3: Analysis of Astigmatism Caused by Pterygium



Chi-square = 1.800; $p < 0.250$ not significant

Figure-4: Showing Analysis of Recurrence Rate

Number of eyes	Improved	Same	Worsened
CAG-45(50%)	39(43.3%)	6(6.66%)	Nil
AMG-45(50%)	35(38.8%)	10(11.11%)	Nil
Total - 90	74(82.22%)	16(17.77)	NIL

Table-4: Pre and post operative comparison of visual acuity

	In diopters	Number of Cases	Percentage
WTR	0-0.5 D	11	12.22
	0.5 -1 D	15	16.66
	1-2 D	28	31.11
	2-3 D	22	24.44
ATR	0-1 D	5	5.55
	1-2 D	7	7.77
	2-3 D	2	2.22
Post operatively			
WTR	0-0.5 D	35	38.9
	0.5 -1 D	27	30.0
	1-2 D	9	10.0
	2-3 D	5	5.55
ATR	0-1 D	11	12.22
	1-2 D	2	2.22
	2-3 D	1	1.11

Table-5: Analysis of Pre and postoperative Astigmatism

showed nasal site was the more common site than temporal site. The study showed symptoms of foreign body sensation, redness and watering were more common than diminution of vision or only cosmetic problem (table-2).

Method	Total no. of cases	No. of complications	Complications	%
CAT	45	2	Graft retraction Conjunctival cyst	2.22
AMT	45	4	Pyogenic Granuloma Graft edema Graft dislocation FBS	4.44

Table-6: Incidence of Complications in the Present Study

This study showed pterygium was more commonly seen in outdoor workers than in indoor workers. Incidence of pterygium was higher in outdoor workers due to more exposure to dust, winds and solar radiation. Increased exposure to heat, dust, wind causes rapid evaporation of tear film leading to drying of epithelium and increased vulnerability to damage by ultraviolet radiation (figure-1).

This study showed primary pterygium of progressive type especially the GI type where the cornea involved by the pterygium is less than 2mm are more than the atrophic pterygia and stationary pterygia (table-3).

The best corrected visual acuity of 16(17.7%) patients remained same because of cataractous lens and ARMD changes (table-4).

On analysis of the astigmatism preoperatively, it was found that 76 cases (84.44%) had with the rule astigmatism and 14 cases (15.56%) had against the rule astigmatism. This is due to the fact that pterygium causes flattening of the horizontal meridian of the cornea thereby producing with the rule astigmatism (figure-3).

In this study of 90 cases, pre operatively those with WTR astigmatism were divided into 4 categories—11 cases (12.22%) had 0-0.5D, 15 cases (16.66%) had 0.5-1D, 28 cases (31.1%) had 1-2D and 22 cases (26.6%) had 2-3 D of WTR astigmatism. Those with ATR astigmatism were divided into 3 categories, 5 cases (5.5%) had 0.5-1D, 7 cases (7.7%) had 1-2D and 2 cases (2.2%) had 2-3D of ATR astigmatism (table-5).

In this study, analysis of postoperative astigmatism showed 35 cases (38.88%) had 0-0.5D, 27 cases (30.0%) had 0.5-1D, 9 cases (10.0%) had 1-2D and 5 cases (5.55%) had 2-3D of WTR astigmatism. This shows that the number of patients with 0-1D WTR astigmatism increased from 26 cases (28.8%) to 62 cases (68.8%) postoperatively and those with 1-3D of WTR astigmatism 50 cases (55.5%) preoperatively decreased to 14 cases (15.5%) postoperatively demonstrating an effective decrease in WTR astigmatism following surgery. This study showed that post operatively 11 cases (12.22%) had 0-1 D, 2 cases (2.22%) had 1-2 D, 1 (1.11%) case had ATR astigmatism

This study showed that, out of 45 cases treated with pterygium excision with CAT, 2 cases (2.22%) had complications, where as those treated with AMG, 4 cases (4.44%) had complications (table-6).

In this study 90 cases were divided randomly into 2 groups

of 45 each. First group underwent pterygium excision with CAG, second group underwent pterygium excision with AMT. During the follow up period, in the group with CAG, 3 cases (6.66%) had recurrence and in the group with AMT, 7 cases (15.55%) had recurrences.

DISCUSSION

Pterygium is a common clinical entity seen in clinical practice. The success of management lies in relieving the person from symptoms due to progression towards visual axis or redness and irritation due to inflammatory changes or cosmetic problems. Different procedures have been proposed for treatment of this condition; the main complication common to all is recurrent disease which is more difficult to control.⁷ It is believed that surgical trauma and postoperative inflammation activate subconjunctival fibroblast and vascular proliferation, and deposition of extracellular matrix proteins, all of which contribute to recurrence of the lesion.⁸ Purpose of this study is to compare the recurrence rates after pterygium excision with Conjunctival limbal autograft transplantation and Amniotic membrane transplantation. In this study 90 cases were divided randomly into 2 groups of 45 each. First group underwent pterygium excision with Conjunctival autografting, second group received pterygium excision with amniotic membrane transplantation.

Age Distribution

In this study 90 cases of primary pterygium were evaluated. In this study, the patients were in the ages between 24-68 years. Highest numbers of patients were in the age group 41-50 years (32.22%). Lowest numbers of cases were in the age group above 61 years (6.67%). Mean age was 41.77 years in our study. In a study done by Riordan-Eva et al (1995)⁹, ages of patients ranged from 25-77 years. Mean age in that study was 47 years. In another study done by Philip Chen et al (1995)¹⁰, ages of patients ranged from 23-79 years. Mean age in that study was 45.6 years. This correlates with the present study.

Sex Distribution

In our study, number of males included were 39 (43.33%) and females were 51 (56.66%). Probably owing to the fact that females in this rural area also work in the farms, apart from being housewife's and getting exposed to the UV rays and dust and wind. In a study done by Riordan-Eva et al (1993)⁹, 66 cases (61%) were males and 42 cases (38.89%) were females.

Occupation

Literature documents more incidence of pterygium in outdoor workers. This correlated with our study findings were in 68.8% presented who were working outdoors exposing their eyes to heat, dust and sunlight.

Location of Pterygium

On studying the site of occurrence of pterygium, 84 (93.33%) cases were nasal pterygium, 4 cases (4.44%) were temporal pterygium, 2 cases (2.22%) were double pterygium. In a study by Donald Tan et al (1997)¹⁰, 90% of pterygium were located nasally. In another study by Philip Chen et al (1995)¹¹, 61

cases (95.31%) were nasally located, 2 cases (3.12%) were temporal and 1 case (1.56%) were both nasal and temporal with a mean corneal encroachment of 3x3.6

Pre and postoperative astigmatism:

In this study it was observed that most patients (88.8%) had with the rule astigmatism which is attributed to pterygium. The average with the rule astigmatism was 1.33D preoperatively which decreased to 0.71D postoperatively. This is in accordance with studies which states that pterygium causes with the rule astigmatism which is decreased to some extent after pterygium excision. The average degree of astigmatism is comparable to the value in studies by Ander Hansen.¹²

Complications: During post operative follow up, out of 45 cases treated with pterygium excision with CAT 2 cases (2.22%) had complications: 1 case of conjunctival cyst, 1 case of graft retraction where as those treated with AMG 4 cases (4.44%) had complications: 1 case of FBS, 1 case of pyogenic granuloma, 1 case of graft oedema, 1 case of graft dislocation. This is in accordance with the literature.

Recurrences: In this study 90 cases were divided randomly into 2 groups of 45 each. First group underwent pterygium excision with Conjunctival autografting, second group received pterygium excision amniotic membrane transplantation. All cases were followed up for 6 months. In the group with CAG, 3 cases (6.66%) had recurrence and in the group with AMT, 7 cases (15.55%) had recurrences. This study shows that conjunctival autografting is associated with lower recurrence rate than amniotic membrane transplantation

CONCLUSION

Conjunctival autografting is a safe and effective procedure in the management of pterygium. The recurrence rate following conjunctival autografting is significantly lower than that following amniotic membrane grafting. CAG is a better method with regard to visual outcome, improvement of astigmatism, incidence of recurrence and complications. The commonest complication of pterygium excision is recurrence, this can be overcome with CAG. The results proved that CAG is safe procedure with insignificant recurrence rate.

The advantages of Conjunctival Autografting over other modalities of treatments are Offers anatomical and physiological restoration of ocular surface, low recurrence rates, Fewer and no sight threatening complications, Simple procedure not requiring additional surgical skill or Instrumentation, Cost effective and Does not require any special post operative care.

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