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Comparative study between conjunctival limbal autograft with sutures and autologous blood

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Abstract

Introduction: Pterygium is a triangular encroachment of the vascularised granulation tissue covered by conjunctiva in the interpalpebral area. It is a degenerative condition of conjunctiva. This is a prospective and comparative study to assess the outcome of the pterygium surgery by conjunctival limbal autograft with suture and autologous blood.

Material and Methods: A prospective and comparative study of patients with primary pterygium attending ophthalmology outpatient department in our tertiary care hospital. Patients are divided into two groups randomly.

Group 1: Conjunctival limbal autograft with suture

Group 2: Conjunctival limbal autograft with autologous blood

Patients were followed up on day 1, day 7, 1 month, 3 months and 6 months postoperatively. On each visit graft retraction, graft displacement, inflammatory reaction, recurrence of pterygium and comfort of the patient were noted. All two groups were compared in terms of surgical time, postoperative discomfort and recurrence.

Results: The age was comparable between the groups. The Conjunctival limbal autograft with suture had a mean age of 45.38 ± 11.23 years and conjunctival limbal autograft with autologous blood group had a mean age of 43.38 ± 8.09 years. The surgical time was highest among Group 1. Conjunctival limbal autograft with suture had a mean surgical time of 43.06 ± 2.11 minutes and conjunctival limbal autograft with autologous blood group had a mean surgical time of 29.50 ± 2.68 minutes. Among conjunctival limbal autograft with suture recurrence was present among 6.3% on POD 180.

Conclusion: Concluding the study of comparison between two techniques of pterygium surgery, autologous blood procedure is time and cost effective with less postoperative discomfort. No recurrence was found in the autologous group in comparison to conjunctival limbal autograft with sutures. However beneficial the autologous blood procedure is, the complication of postoperative graft displacement arises, which is not found in conjunctival limbal autograft with sutures.

Keywords: Autologous blood, conjunctival autograft, pterygium

Introduction

Pterygium is one of the most prevalent ocular disorders that affects people in their middle and later years of life. It is a non-cancerous, degenerative, and proliferative disorder of the conjunctiva and subconjunctival tissue that has the potential to produce vision problems in some individuals^[1]. Clinical examination makes it simple to identify and classify. There is a strong correlation between pterygium growth and exposure to sunlight. Dry eyes, tobacco, prolonged outdoor recreation, low socioeconomic level, and high altitude are all variables that contribute. If the pterygium grows into the cornea's centre, it can obscure the eye's central visual axis. Vision loss can also be caused by irregular astigmatism, which develops when the cornea becomes flattened along the horizontal meridian^[2].

A triangle growth of bulbar conjunctiva on the cornea was described by Hippocrates, Galen, and Celsus as a pterygium hundreds of years ago. According to previous theories, pterygium was caused by a condition where the conjunctiva encroaches on the cornea. "Pterygos" means "wing" in Greek, and the name "Pterygos" means "feather". It got its name from the fact that it looks like an insect wing. Until recently, they were classified as degenerative disorders. These lesions aren't cancerous, but they do have tumor-like characteristics such as an invasion tendency and high recurrence rate after resection. As a result, modern research refers to it as a proliferative condition. Pinguecula, a degenerative disorder of the conjunctiva^[4], and conjunctivochalasis, a dry eye ailment, are other possibilities for its origin^[3].

Pterygium is a fairly frequent ocular ailment in our country, and it's part of what Cameron

Cameron calls the "pterygium belt. Our population is suffering from substantial visual morbidity as a result of this. An adequate knowledge of the prevalence and risk factors associated with this disease is necessary for developing effective prevention strategies and to decrease the resulting physical and monetary costs to society [4].

Pterygium is treated surgically. A conservative approach to treating pterygium is recommended unless one of the following situations occurs: visual acuity is lost due to astigmatism caused by the growth, marked cosmetic deformity, significant discomfort and irritation that are not alleviated by medical management or documented progressive growth toward the visual axis such that vision loss is reasonably assumed to occur in the future. In such cases, surgery is the only option [5].

Pterygium recurrence after surgery is still an issue. Various therapeutic techniques, including radiation, antimetabolite or antineoplastic medicines, conjunctival flap and conjunctival or limbal autograft transplantation, have been recommended as a result of the difficulty in treating this disease. Recurrences of pterygium are most common in the first six months following surgery. Pterygium type, patient age, the environment, and surgical technique are only a few of the variables that could play a role. In order to reduce the risk of recurrence after pterygia excision, patients should have strong indications for surgical removal before undergoing the procedure [5, 6].

With so many surgical treatment options available for pterygium, it is clear that no single strategy is guaranteed to be effective in all cases. The goal of this study is to assess the relative merits of two widely utilised approaches. This study is a prospective and comparative study to assess the outcome of the pterygium surgery by conjunctival limbal autograft with suture and autologous blood.

Material and Methods

A prospective and comparative study of patients with primary pterygium attending ophthalmology outpatient department in our tertiary care hospital. Patients are divided into two groups randomly. Group 1: Conjunctival limbal autograft with suture and Group 2: Conjunctival limbal autograft with autologous blood.

Patients were followed up on day 1, day 7, 1 month, 3 months and 6 months postoperatively. On each visit graft retraction, graft displacement, inflammatory reaction, recurrence of pterygium and comfort of the patient will be noted. The two groups were compared in terms of surgical time, postoperative discomfort and recurrence. All patients with uncomplicated primary pterygium were included. All patients with recurrent pterygium, ocular surface pathology, patients on anticoagulant and glaucoma were excluded.

Sample size was calculated on the basis of G*Power statistics to determine a sufficient sample size using an alpha of 0.05, a power of 0.80, and a large effect size (f=0.20). Based on the aforementioned assumptions, the desired sample size is 16 per group. Total sample size was 32. Comprehensive eye examination was done in all patients including visual acuity, refraction, slit lamp biomicroscopy, intraocular pressure measurement, ocular movements and dilated funduscopy.

Descriptive statistics were reported as mean (SD) for continuous variables, frequencies (percentage) for categorical variables. Chi-Square at 5% level of significance was used to find statistical significance. Fischer's exact test is when expected cell count is less than 5. Data were

statistically evaluated with IBM SPSS Statistics for Windows, Version 25.0., IBM Corp., Chicago, IL.

Results

Group 1: Conjunctival limbal autograft with suture

Group 2: Conjunctival limbal autograft with autologous blood

The conjunctival limbal autograft with suture group had a mean age of 45.38±11.23 years and conjunctival limbal autograft with autologous blood group had a mean age of 43.38±8.09 years. Among conjunctival limbal autograft with suture 50% were males and 50% females. Among conjunctival limbal autograft with autologous blood group 56.3% were males and 43.8% were females (Table 1, Figure 1).

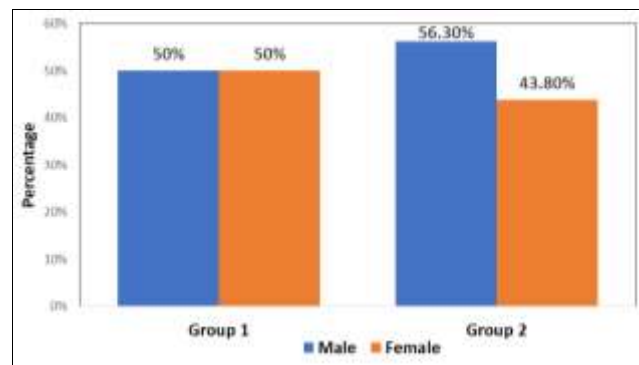


Fig 1: Distribution of gender among the study participants (N=32)

Table 1: Distribution of symptoms among the study participants (N=32)

S. No	Variable	Group 1	Group 2	p value
1	Age	45.38±11.23	43.38±8.09	0.56
2	Gender			0.13
	Male	8 (50)	9 (56.3)	
	Female	8 (50)	7 (43.8)	
3	Laterality			0.48
	Both eyes	0	2 (12.5)	
	Left eye	4 (25)	4 (25)	
	Right eye	12 (75)	10 (62.5)	
4	Fleshy Growth			0.72
	Yes	16 (100)	14 (87.5)	
	No	0	2 (12.5)	
5	Irritation			0.04
	Yes	14 (87.5)	9 (56.3)	
	No	2 (12.5)	7 (43.8)	
6	Redness			0.28
	Yes	7 (43.8)	10 (62.5)	
	No	9 (56.3)	6 (37.5)	
7	Cosmetic			0.72
	Yes	7 (43.8)	8 (50)	
	No	9 (56.3)	8 (50)	
8	UCVA			0.26
	6/12	2 (12.5)	2 (12.5)	
	6/18	3 (18.8)	1 (6.3)	
	6/24	3 (18.8)	2 (12.5)	
	6/36	0	4 (25)	
	6/6	6 (37.5)	6 (37.5)	
9	Operated Eye			0.69
	Right eye	12 (75)	11 (68.8)	
	Left eye	4 (25)	5 (31.3)	
10	Surgical time	43.06±2.11	29.50±2.68	<0.001

Among conjunctival limbal autograft with suture laterality was present among 25% in left eye and 75% on right eye. Among conjunctival limbal autograft with autologous blood group laterality was present on 12.5% on both eyes, 25% on left eye and 62.5% on right eye. Among conjunctival limbal autograft with suture 100% fleshy growth was present. Among conjunctival limbal autograft with autologous blood group 87.5% fleshy growth was present. Among conjunctival limbal autograft with

suture 88% irritation was present. Among conjunctival limbal autograft with autologous blood group 56.3% irritation was present. Among conjunctival limbal autograft with suture 43.8% redness was present. Among conjunctival limbal autograft with autologous blood group 62.5% redness was present. Among conjunctival limbal autograft with suture 43.8% were cosmetic purpose. Among conjunctival limbal autograft with autologous blood group 50% were cosmetic purpose.

Table 2: Distribution of complications among the study participants (N=32)

Variable	Group 1					Group 2				
	POD 1	POD 7	POD 30	POD 90	POD 180	POD 1	POD 7	POD 30	POD 90	POD 180
Pain	13(81.3)	7(43.8)	Nil	Nil	Nil	4(25)	2(12.5)	Nil	Nil	Nil
Foreign Body sensation	13(81.3)	11(68.6)	2(12.5)	Nil	Nil	3(18.8)	Nil	Nil	Nil	Nil
Sub Conjunctival Haemorrhage	10(62.5)	Nil	Nil	Nil	Nil	13(81.3)	8(50)	Nil	Nil	Nil
Graft retraction	2(12.5)	1(6.3)	1(6.3)	1(6.3)	Nil	Nil	1(6.3)	Nil	Nil	Nil
Graft displacement	Nil	Nil	Nil	Nil	Nil	3(18.8)	1(6.3)	Nil	Nil	Nil
Inflammatory retraction	6(37.5)	6(37.5)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
Recurrence	Nil	Nil	Nil	Nil	1(6.3)	Nil	Nil	Nil	Nil	Nil

Among conjunctival limbal autograft with suture pain was present among 81% on POD 1 and 44% on POD 7. Among conjunctival limbal autograft with autologous blood group pain was present on 25% on POD 1, 12.5% on POD 7. Among conjunctival limbal autograft with suture foreign body sensation was present among 81.3% on POD 1, 68.6% on POD 7 and 12.5% POD 30. Among conjunctival limbal autograft with autologous blood group foreign body sensation was present on 18.8% on POD. Among conjunctival limbal autograft with suture subconjunctival hemorrhage was present among 62.5% on POD 1. Among conjunctival limbal autograft with autologous blood group subconjunctival hemorrhage was present on 81.3% on POD 1 and 50% on POD 7. Among conjunctival limbal autograft with suture graft retraction was present among 12.5% on POD 1, 6.3% on POD 7, 6.3% on POD 30 and 6.3% on POD 90. Among conjunctival limbal autograft with autologous blood group graft retraction was present on 6.3% on POD 7. Among conjunctival limbal autograft with autologous blood group graft displacement was present on 18.8% on POD 1 and 6.3% on POD 7. Among conjunctival limbal autograft with suture inflammatory reaction was present among 37.5% on POD 1 and 37.5% on POD 7. Among conjunctival limbal autograft with suture recurrence was present among 6.3% on POD 180 (Table 2).



Fig 3: Post-operative picture of conjunctival limbal autograft with sutures



Fig 4: Post-operative picture of conjunctival limbal autograft with autologous blood

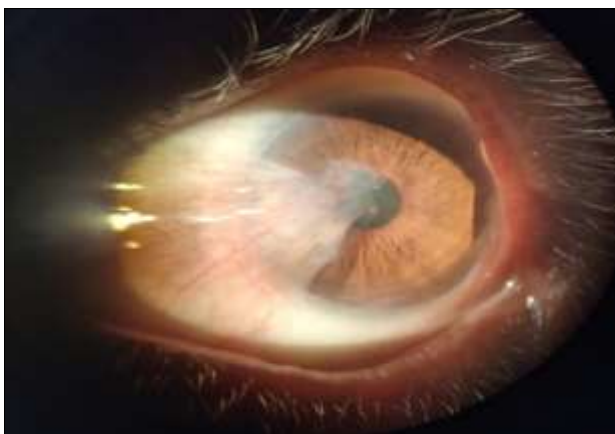


Fig 2: Nasal Pterygium

Discussion

Age

The mean age of pterygium was 48.3 in study by Alpay *et al.* In our study, we found a similar mean age. The conjunctival limbal autograft with suture had a mean age of 45.38±11.23 years and conjunctival limbal autograft with autologous blood group had a mean age of 43.38±8.09 years [7].

In our study, there was slight male preponderance. Among conjunctival limbal autograft with suture 50% were males and 50% females. Among conjunctival limbal autograft with autologous blood group 56.3% were males and 43.8% were females. This was similar to study by Alpay *et al.* which had 54.5% males and 45.4% females [7].

Laterality

In our study, among conjunctival limbal autograft with suture 25% in left eye and 75% on right eye. Among conjunctival limbal autograft with autologous blood group 12.5% on both eyes, 25% on left eye and 62.5% on right eye. It was more common in right eye. Previous study by Agahan *et al.* showed 49% bilateral, 25% left and 24% right eye involvement [8].

Fleshy growth

In our study, fleshy growth was seen in 100% of group 1 and 87.5% in group 2. Previous study by Das Av *et al.* found fleshy mass in 25.9% patients [9].

Irritation

In our study, among conjunctival limbal autograft with suture 88% irritation was present. Among conjunctival limbal autograft with autologous blood group 56.3% irritation was present. Previous study by Das AV *et al.* found irritation in 4.3% [9].

Redness

In our study, in conjunctival limbal autograft with suture 43.8% redness was present. In conjunctival limbal autograft with autologous blood group 62.5% redness was present. Previous study by Das *et al.* found redness in 7.7% patients [9].

Vision

In our study, 72.9% patients complained of vision problem. Previous study by Das. AV *et al.* found vision problem in 45.6% patients. Visual acuity was comparable in two groups [9].

Surgery time

In our study, the surgical time was highest among Group 1. Conjunctival limbal autograft with suture had a mean surgical time of 43.06±2.11 minutes and conjunctival limbal autograft with autologous blood group had a mean surgical time of 29.50±2.68 minutes. In a previous study by Karalezli *et al.* surgical time using fibrin glue was 15.7 min, suture group was 32.5 min [10].

Post-operative pain

In our study, among conjunctival limbal autograft with suture pain was present among 81% on POD 1 and 44% on POD 7. Among conjunctival limbal autograft with autologous blood group pain was present on 25% on POD 1, 12.5% on POD 7. Group C had least pain. In a previous study by Karalezli *et al.* fibrin glue group had least post operative pain [10].

Foreign body sensation

In our study, among conjunctival limbal autograft with suture foreign body sensation was present among 81.3% on POD 1, 68.6% on POD 7 and 12.5% POD 30. Among conjunctival limbal autograft with autologous blood group foreign body sensation was present on 18.8% on POD 1. It was maximum in suture group. Previous study by Karalezli *et al.* showed foreign body sensation in 48% of suture group [10].

Subconjunctival hemorrhage

In our study, among conjunctival limbal autograft with suture subconjunctival hemorrhage was present among

62.5% on POD 1. Among conjunctival limbal autograft with autologous blood group subconjunctival hemorrhage was present on 81.3% on POD 1 and 50% on POD 7. In previous study by Kumar S *et al.* subconjunctival hemorrhage was seen in 10% patients with conjunctival limbal autograft with suture and 5% or people with conjunctival limbal autograft with autologous blood [11].

Graft retraction

In our study, among conjunctival limbal autograft with suture graft retraction was present among 12.5% on POD 1, 6.3% on POD 7, 6.3% on POD 30 and 6.3% on POD 90. Among conjunctival limbal autograft with autologous blood group graft retraction was present on 6.3% on POD 7. This was comparable to previous study by Kumar S *et al.* in which graft retraction was seen in 5% with conjunctival limbal autograft with suture and 5% with conjunctival limbal autograft with autologous blood [11, 12].

Graft displacement

In our study among conjunctival limbal autograft with autologous blood group graft displacement was present on 18.8% on POD 1 and 6.3% on POD 7. In Kurian *et al.* [13] study graft displacement was 13%.

Inflammation

In our study, among conjunctival limbal autograft with suture inflammatory reaction was present among 37.5% on POD 1 and 37.5% on POD 7. This was similar to previous study by Srinivasan *et al.* in which inflammation was more in suture group compared to fibrin [13].

Recurrence

In our study, among conjunctival limbal autograft with suture recurrence was present among 6.3% on POD 180. Previous study by Kumar *et al.* showed recurrence of 5% in both conjunctival limbal autograft with suture and conjunctival limbal autograft with autologous blood [11].

Conclusion

Concluding the above study of comparison between two techniques of pterygium surgery, autologous blood procedure is time and cost effective with less post-operative discomfort. No recurrence was found in the autologous group in comparison to conjunctival limbal autograft with sutures. However beneficial the autologous blood procedure is, the complication of postoperative graft displacement arises, which is not found in conjunctival limbal autograft with sutures.

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