

Comparison of Pterygium Resection with Conjunctival Auto Graft Versus Amniotic Membrane Graft

Adnan Alam, Mubashir Rehman, Bilal Khan, Khurshid Alam, Adnan Ahmad

Pak J Ophthalmol 2015, Vol. 31 No. 4

See end of article for authors affiliations

Correspondence to:
Adnan Alam
Trainee Medical Officer,
department of Ophthalmology,
Lady Reading Hospital
Peshawar

Purpose: To compare the effectiveness of pterygium resection with conjunctival auto graft versus amniotic membrane graft in terms of recurrence rate.

Material and Methods: All patients were selected from eye OPD Lady Reading Hospital, Peshawar. Complete slit lamp examination was performed for pterygium. Patients were divided into two groups. e Group A who underwent pterygium excision with conjunctival autograft and Group B who underwent pterygium excision with amniotic membrane graft. Follow up was on 3rd month postoperatively at which patient was examined on slit lamp for recurrence of pterygium.

Results: The recurrence rate in conjunctival autograft was 10% while the recurrence rate in amniotic membrane graft was 18%. Conjunctival autograft was effective in 90% patients and was not effective in 10% patients, whereas amniotic membrane graft was effective in 82% patients and was not effective in 18% patients.

Conclusion: Our study concludes that performing pterygium surgery with amniotic membrane graft compared to conjunctival autograft had a higher recurrence rate.

Key words: Primary pterygium, Conjunctiva autograft, Amniotic membrane graft.

Pterygium is an abnormal fibrovascular conjunctival tissue which encroaches the cornea.¹ It is triangular in shape and is more frequently located nasally than temporally.² Ocular irritation, hyperemia and vision loss are the most common clinical symptoms of pterygium.³

Early complaints e.g. foreign body sensation and inflammation are treated conservatively with artificial tears and anti-inflammatory drops to give symptomatic relief.⁴ However surgical excision remains the main treatment for pterygium causing visual impairment, cosmetic deformity, restriction of ocular motility or marked irritation or discomfort unrelieved by medical management.⁵

Recurrence is the most common postoperative complication after pterygium excision.⁵ In the past

pterygium was treated surgically with bare scleral technique.² However this technique had a very high recurrence rate of about 24 – 89%.² Various techniques have been applied in the recent years to reduce the recurrence rate which include pterygium resection combined with conjunctival auto-graft, conjunctival resection with amniotic membrane graft and conjunctival resection with stem cell transplantation.⁶

Surgical excision with conjunctival auto graft is not only safe and effective but it also reduces the recurrence rate.⁷

Amniotic membrane transplantation after surgical excision of pterygium also appeared to be safe and effective with reduced rate of recurrence.⁸

Purpose of our study is to compare the efficacy of pterygium resection combined with conjunctival auto

graft versus pterygium resection combined with amniotic membrane graft in our population. Pterygium is a very common ocular disease presenting to eye department. Main treatment modality in our set up is surgical excision but majority of these patients presents again with complaints of recurrence which is the most common post-operative complication. It not only disturbs daily life of patient but also put economic restrain on them. Also these patients put extra burden on OPD and OT. So in this study we wanted to find out the surgical procedure which reduces the recurrence rate to reduce burden on both patients and hospital.

MATERIAL AND METHODS

All patients were selected from eye OPD, Lady Reading Hospital, Peshawar. Patients between the age of 20 to 50 years both males and females, with primary pterygium of size between 2 to 4 millimeter presenting within 6 months of onset were included in the study. (In our set up pterygium between 2 mm to 4 mm usually presents within 6 months of onset, long duration pterygium were excluded to avoid pterygium larger in size than 4 mm) Patients with recurrent pterygium, pterygium associated with other chronic ocular surface disease, patients on long term topical steroids or topical NSAIDS, patients with previous history of any surgery on conjunctiva and patients with pterygium of size less than 2 mm and greater than 4 mm were excluded from the study. (pterygium of size 2 mm to 4 mm are more common so included in the inclusion criteria so as to make sample collection easier).

Complete slit lamp examination was performed for pterygium. The purpose and benefits of the study was explained to all patients and if agreed upon a written informed consent was obtained. The amniotic membrane was only taken from those patients who have undergone cesarean section and properly screened out pre operatively.

Patients were divided into two groups. i.e Group A who underwent pterygium excision with conjunctival autograft and Group B who were underwent pterygium excision with amniotic membrane graft.

Follow up was on 3rd month postoperatively. (we have followed the patients every three monthly, so follow up of first visit mentioned. On postoperative visit patient was examined on slit lamp for recurrence of pterygium. Surgery was considered effective with no recurrence of pterygium and not effective with

recurrence of at least 2 mm.

The data was analyzed using SPSS version 16. Frequencies and percentages were calculated for categorical variables like gender, side of the eye and effectiveness. Mean and standard deviation were calculated for numerical variables like age and duration. Chi square test was used to compare the effectiveness of both groups. P value of less than or equal to 0.05 was considered significant. Effectiveness in both groups was stratified among age, side of the eye and gender to see the effect of modifiers. All the results were presented as tables and charts. Post stratification chi square test was applied.

DISCUSSION

Pterygium is one of the most common disorders in tropical and subtropical region including Pakistan⁹. The most important risk factors are exposure to sunlight, hot, windy dry weather and old age¹⁰. Short body height is also cited in literature as a risk factor for pterygium development.¹¹ (It has been mentioned in the literature for which reference no 11 is given) It causes irritation, redness and affects the visual acuity either by directly affecting the visual axis or by producing changes in the corneal curvature.¹²

Prabhasawatetal⁹ conducted study on a total of 120 eyes in which 106 eyes had primary and 14 eyes had recurrent pterygia and showed that at 6 month after surgery conjunctival auto grafts had a recurrence rate of 13.3%. In our study the recurrence rates in both groups were higher than those reported previously, possibly because of amount of subconjunctival tissue removal, race of our population, type of suture used and drug given after surgery.

Tananuvat N et al¹⁰ in their study showed the recurrence rate of 12% in conjunctival auto graft group and 22% in amniotic membrane graft group which is in accordance to our study.

Soloman A et al¹¹ conducted study on 167 eyes, which included 148 primary and 19 recurrent pterygia. They showed that after 6 months the recurrence rate in the amniotic membrane graft group was 28.1%. With the longer follow-up, the recurrence rates were 25.0% and 12.3% for amniotic membrane graft and conjunctival graft respectively.

Rahman L et al¹³ had shown that conjunctival auto grafts and amniotic membrane grafts differ in final appearance not only with respect to the rate of recurrence but also in the percentage of normal

appearance. They suggested that covering the defect area with normal conjunctival tissue also has a higher likelihood of promoting the restoration of a normal appearance.

In a study conducted by SaleemM et al¹⁴ it was shown that amniotic membrane contain a thick basement membrane and a vascular matrix. The basement membrane reinforces adhesion of basal epithelial cells, facilitates migration of epithelial cells, promotes epithelial differentiation and prevents epithelial apoptosis. All these features promote rapid epithelialisation.

Narsani AK et al¹⁵ in their study showed that after pterygium excision, amniotic membrane grafts are less effective than conjunctival auto grafts in reducing recurrences. Even if there is a recurrence conjunctival auto graft should be considered as the first choice for pterygium excision. However amniotic membrane graft can also be considered as first choice in certain situations e.g. those with advanced and diffuse conjunctival involvement or when it is needed to preserve the bulbar conjunctiva for glaucoma surgery.

In similar study Katbaab A et al¹⁶ first compared amniotic membrane graft (54) to a retrospective study using conjunctival auto graft (122) in both primary and recurrent pterygium. They noted that the recurrence rate is 10.9% using amniotic membrane graft, which is still higher than 2.6% of conjunctival graft. Nevertheless, both results of amniotic membrane grafts and conjunctival auto grafts are significantly better than the primary closer, which resulted in 45% high recurrence rate for primary pterygium which is comparable to our study.

Fallah MR et al¹⁷ showed in their study that by removing larger amount of subconjunctival fibrosis tissue and injecting long acting steroids, amniotic membrane grafts achieved a recurrence rate of 3.0%, as compare to conjunctival auto grafts with a recurrence rate of 2.6%. Similarly Lateefur-rehman et al¹³ during follow up period, showed that recurrence of pterygia was high 41.33% in the patients with Bare sclera method as compared to recurrence 33.33% while using 5-Fluorouracil antimetbolite. Ashok Kumar Narsani et al¹⁵ showed that there was 7.69% recurrences in conjunctival auto graft as compared to 16.13% recurrences with amniotic membrane graft.

RESULTS

Age distribution among two groups is shown in Table 1. In group A mean age was 38 years \pm 3.19, where as in group B mean age was 38 years \pm 3.77.

Gender distribution among two groups was analyzed as in group A 64(63%) patients were male and 38(37%) patients were female. Where as in group B 66(65%) patients were male and 36(35%) patients were female in Table 2.

Table 1: Age distribution (n = 204)

Age Group	Group A n (%)	Group B n (%)
20 - 30 years	23 (23)	20 (20)
31 - 40 years	38 (37)	36 (35)
41 - 50 years	41 (40)	46 (45)
Total	102 (100)	102 (100)
Mean and SD	38 years \pm 3.19	40 years \pm 3.77

Group A: Conjunctival autograft

Group B: Amniotic membrane graft

Chi square test was applied in which P value was 0.003

Table 2: Gender distribution (n = 204)

Age Group	Group A n (%)	Group B n (%)
Male	64 (63)	66 (65)
Female	38 (37)	36 (35)
Total	102 (100)	102 (100)

Group A: Conjunctival autograft

Group B: Amniotic membrane graft

Chi square test was applied in which P value was 0.002

Duration of pterygium between two groups was analysed as in group A 44 (43%) patients had pterygium form < 3 months while 58 (57%) patients had pterygium form > 3 months. Mean age was 3 months \pm 2.16. Where as in group B 48 (47%) patients had pterygium form < 3 months while 54 (53%) patients had pterygium form > 3 months. Mean age was 4 months \pm 2.99 Table 3.

Laterality of pterygium among two groups was analyzed as in group A 57 (56%) patients had pterygium in left eye and 45 (44%) patients had pterygium in right eye. Where as in group B 54 (53%) patients had pterygium in left eye and 48 (47%) patients had pterygium in right eye Table 4.

Efficacy among two groups was analyzed as conjunctival autograft was effective in 91 (90%) patients and was not effective in 11 (10%) patients. Whereas amniotic membrane graft was effective in 83 (82%) patients and was not effective in 19 (18%) patients Table 5.

Table 3: Duration (n = 204)

Duration	Group A n (%)	Group B n (%)
< 3 months	44 (43)	48 (47)
≥ 3 months	58 (57)	54 (53)
Total	102 (100)	102 (100)
Mean and SD	3 months ± 2.99	4 months ± 2.99

Group A: Conjunctival autograft

Group B: Amniotic membrane graft

Chi square test was applied in which P value was 0.002

Stratification of efficacy with age, gender and side of the eye is given in Table 6-8.

Table 6: Stratification of efficacy with age (n = 204)

Age	Efficacy	Conjunctival Autograft	Amniotic Membrane Graft	P-value
20 - 30 years	Effective	22	17	0.002
	Not effective	1	3	
Total		23	20	
31 - 40 years	Effective	34	29	0.003
	Not effective	4	7	
Total		38	36	
41 - 50 years	Effective	36	37	0.003
	Not effective	5	9	
Total		41	46	

Table 4: Laterality of pterygium (n = 204)

Laterality of Pterygium	Group A n (%)	Group B n (%)
Left eye	57 (56)	54 (53)
Right eye	45 (44)	48 (47)
Total	102 (100)	102 (100)

Group A: Conjunctival autograft

Group B: Amniotic membrane graft

Chi square test was applied in which P value was 0.002

Table 5: Efficacy (n = 204)

Efficacy	Group A n (%)	Group B n (%)
Effective (no recurrence)	91 (90)	83 (82)
Not effective (recurrence)	11 (10)	19 (18)
Total	102 (100)	102 (100)

Group A: Conjunctival autograft

Group B: Amniotic membrane graft

Chi square test was applied in which P value was 0.003

Table 7: Stratification of efficacy with gender (n = 204)

Gender	Efficacy	Conjunctival Autograft	Amniotic Membrane Graft	P value
Male	Effective	58	54	0.002
	Not effective	6	12	
Total		64	66	
Female	Effective	34	29	0.002
	Not effective	4	7	
Total		38	36	

Table 8: Stratification of efficacy with side of eye (n = 204)

Side of Eye	Efficacy	Conjunctival Autograft	Amniotic Membrane Graft	P value
Left eye	Effective	51	44	0.003
	Not effective	6	10	
Total		57	54	
Right eye	Effective	41	39	0.003
	Not effective	4	9	
Total		45	48	

CONCLUSION

Our study concludes that performing pterygium surgery with amniotic membrane graft compare to conjunctival auto graft had a higher recurrence rate.

Author's Affiliation

Dr. Adnan Alam
 Trainee Medical Officer
 Department of Ophthalmology
 Lady Reading Hospital, Peshawar.

Dr. Mubashir Rehman
 Department of Ophthalmology
 Lady Reading Hospital, Peshawar.

Dr. Bilal Khan
 Vitreoretina Trainee
 Department of Ophthalmology
 Lady Reading Hospital Peshawar.

Dr. Khurshid Alam
 Trainee Medical Officer
 Department of Ophthalmology
 Hayatabad Medical Complex, Peshawar.

Dr. Adnan Ahmad
 Junior Registrar,
 Department of Ophthalmology,
 Hayatabad Medical Complex, Peshawar.

Role of Authors

Dr. Adnan Alam
 Patient selection, data collection, results and discussion.

Dr. Mubashir Rehman
 Patient selection, data collection, results and discussion.

Dr. Bilal Khan
 Patient selection, data collection, results and discussion.

Dr. Khurshid Alam
 Literature search.

Dr. Adnan Ahmad
 Literature search.

REFERENCES

1. American Academy of Ophthalmology. Basic and Clinical Science Course. Section 8, External disease and cornea. San Francisco: American Academy of Ophthalmology 2004: 344.
2. **Khamar B, Khamar M, Trivedi N.** Degenerative conditions of the conjunctiva. In: Dutta LC, Dutta NK, eds. *Modern Ophthalmology*, 3rd ed. New Delhi: Jaypee. 2005: 127-30.
3. **Gupta V, Tandon R, Vajpayee RB.** Disorders of conjunctiva. In: **Agarwal S, Agarwal A, Apple DJ, Burato L, Alio JL, Panday SK, eds.** *Textbook of ophthalmology*, vol-2. Lids, adnexa and orbit external eye diseases, cornea and refractive surgery. 1sted. New Delhi: Jaypee Brothers. 2002: 862-9.
4. **Cameron ME.** Histology of pterygium: an electron microscopic study. *Br J Ophthalmol.* 1983; 67: 604-8.
5. **Sekelj S, Dekaris I, Kondza - Krstonijevic E, Gabric N, Predovic J, Mitrovic S.** Ultraviolet light -B (UV-B) and Pterygium. *CollAntropol.* 2007; 3: 45-7.
6. **Lu P, Chen X, Kang Y, Ke L, Wei X, Zhang W.** Pterygium in Tibetans: A population- based study in China. *Clin Experiment Ophthalmol.* 2007; 35: 828-33.
7. **Durkin SR, Abhary S, Newland HS, Selva D, Aung T, Casson RJ.** The prevalence, severity and risk factors for pterygium in central Myanmar: the Meiktila Eye Study. *Br J Ophthalmol.* 2008; 92: 25-9.
8. **Maheshwari P.** Pterygium-induced corneal refractive changes. *Indian J Ophthalmol.* 2007; 55: 383-6.
9. **Prabhasawat P, Barton K, Burkett G.** Comparison of conjunctival auto graft, amniotic membrane grafts and primary closure for pterygium excision *Ophthalmology.* 1997; 104: 974-85.
10. **Tananuvat N, Martin T.** The results of amniotic membrane transplantation for primary pterygium compared with conjunctival autograft. *Cornea.* 2004: 458-63.
11. **Soloman A, Pires RTF, Tseng SCG.** Amniotic membrane transplantation after extensive removal of primary and recurrent pterygia. *Ophthalmology.* 2001; 108: 449-60.
12. **Abraham LM, Selva D, Casson R, Leibovitch I.** The clinical applications of fluorouracil in ophthalmic practice. *Drugs* 2007; 67: 237-55.
13. **Rahman L, Baig MA, Islam Q.** Prevention of pterygium recurrence by using intra-operative 5-fluorouracil, *Pakistan Armed Forces Medical J.* 2008; 1: 23.
14. **Saleem M, Khan SB, Shah Z.** Managing pterygium by excision and amniotic membrane grafts. *Gomal Journal of Medical Sciences (GJMS).* 2008: 6.
15. **Narsani AK, Jatoi SM, Gul S.** Treatment of primary pterygium with conjunctival auto graft and amniotic membrane grafts. A Comparative Study. *Journal of Liaquat University of Medical & Health Sciences (JLUMHS) Hyderabad.* 2008: 184-87.
16. **Katbaab A, Ardekani HA, Khoshniyat H.** Amniotic membrane transplantation for primary pterygium surgery. *J OPTH Vis Res.* 2008; 3: 23-7.
17. **Fallah MR, Golabdar MR, Amozadeh J.** Transplantation of conjunctival limbal auto graft and amniotic membrane vs. mitomycin C and amniotic membrane in the treatment of recurrent pterygium. *Eye.* 2008; 22: 420-4.