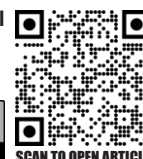


Comparison of Conjunctival Transposition Flap Versus Conjunctival Autograft in Pterygium Recurrence

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ABSTRACT

Purpose: To compare outcomes of conjunctival transposition flap versus conjunctival autograft techniques in terms of recurrence following primary pterygium excision.

Methodology: This prospective comparative study was conducted at the Department of Ophthalmology, Bakhtawar Amin Medical and Dental College, Multan from June 2023 to June 2024. A total of 144 patients with primary pterygium were enrolled and randomly assigned to undergo either conjunctival transposition flap (Group A) or conjunctival autograft (Group B). Surgeries were performed by a single experienced ophthalmologist. Patients were followed postoperatively at one, three, and six months to assess recurrence and complications.

Result: The mean age was 50.9 ± 10.5 years; 52.8% were male. The recurrence rate was 8.3% overall, with Group A showing 11.1% and Group B 5.6% ($p = 0.367$). A significantly lower mean operative time was observed in Group A (17.2 ± 1.0 minutes) compared to Group B (25.4 ± 1.0 minutes) ($p < 0.001$). Graft edema and dellen formation were slightly more frequent in Group B but did not reach statistical significance.

Conclusion: Both techniques had comparable recurrence and complication rates. However, the transposition flap technique offered the advantage of significantly reduced surgical time, making it a viable alternative in routine surgical practice.

Keywords: Pterygium, Conjunctival Autograft, Transposition Flap, Recurrence.

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INTRODUCTION

Pterygium is a prevalent ocular condition, especially in UV-intense environment. It is a fibrovascular growth that occurs below the conjunctiva and extends towards the cornea, occurring anywhere between 9.5% and 13% of the population in the Indian sub-continent.¹ The disorder is difficult to treat, as there is a high chance of recurrence. There are a number of surgical options, some of which include surgical excision followed by conjunctival or amniotic membrane grafting and primary closure.² However, no single method has been demonstrated to be definitively superior, and research is ongoing in the search for a method that is quick to employ and is associated with minimal complications.^{1,2} The conjunctival autograft is a method whereby a free graft is lifted from a different part of the same eye or from a different eye and placed over the defect left after a pterygium has been removed.³ A conjunctival transposition flap is a method whereby a flap is transposed onto the defect after being harvested from a region located close to the defect following pterygium removal surgery.⁴

Several studies have compared the outcomes of these two techniques, with varying results. Some have reported similar recurrence rates and complication profiles, while others have noted differences in surgical time and postoperative outcomes. A study showed that the rate of recurrence of pterygium was 15.4% with conjunctival autografts⁵ while another study observed 8% recurrence of pterygium after conjunctival rotational/ transposition flaps⁶. Studies reported a smaller difference in mean operation times between autograft and transposition flap surgery and comparable recurrence rates^{7,8}.

This study will help to determine which procedure is more efficacious to perform in terms of the aforementioned 6 parameters, in effort to establish best practice; the results can be used to establish guidelines as well as serve as a foundation for future research.

METHODOLOGY

This study was conducted at the Ophthalmology department, Bakhtawar Amin Medical and Dental college from June, 2023 till June, 2024. This was a prospective comparative study. Patients aged between 18-65 yrs were selected according to inclusion criteria of diagnosis of primary pterygium. Patients with previous ocular surgeries, recurrent pterygium and other ocular or systemic conditions that could affect the outcome were excluded. The study adhered to the Helsinki declaration of ethical research and ethical approval was taken from the hospital research committee prior to the start of the study. The sample size calculated was 534 per group using recurrence rate for conjunctival autograft and transposition flap, from Shakil et al⁹, with 5% level of significance (α), power of test ($1-\beta$), 80% and anticipated population proportion P1 and P2, 6.6 and 3.3 respectively. Due to the limited number of patients, 144 sample size was taken after supervisor verification.

After taking informed written consent from the eligible patients, a comprehensive ocular examination was performed and recorded. Patients were divided into two groups via the lottery method. Group A was randomized for conjunctival transposition flap and group B for conjunctival autograft. All surgeries were performed by a single consultant ophthalmologist with a minimum of five years post-fellowship experience. Follow-up was conducted with a slit lamp examination at one-, three- and six months, post-surgery. A predesigned proforma was used for data collection.

SPSS Version 26 was used for data analysis. Mean and standard deviation were calculated for continuous data (e.g., age, age, body mass index, duration of disease and total operation time). Frequency and percentages were calculated for the categorical data (like gender, duration of disease, complications like hematoma formation, recurrence, occurrence of graft/flap oedema and Dellen formation). All the data were presented in the form of tables and figures. Effect modifiers specifically age, gender, body mass index and

duration of disease were controlled by stratification. Comparison of recurrence between Group A and B was done via the Chi square test, and p value ≤ 0.05 was considered significant.

RESULTS

Our study compared conjunctival transposition flap and conjunctival autograft in pterygium surgery. The mean surgery time was significantly shorter for transposition flap (17.2 min) compared to conjunctival autograft (24.4 min). On another hand, similar complication rates were reported. However, graft edema was more frequent in non-hypertensive and non-obese patients. Pterygium recurrence was higher in the transpositional flap group for patients > 50 years old. In general, both procedures are effective, but transpositional flap may be a quicker option.

Table 1: Baseline Characteristics of Patients Undergoing Pterygium Corrective Surgery (N=144)

Characteristics	Overall (N=144)	Transpositional Flap (n=72)	Conjunctival Autograft (n=72)	p-value*
Age (years)	50.9 \pm 10.5	50.7 \pm 10.7	51.2 \pm 10.4	0.813
Gender				
Male	76 (52.8%)	37 (48.7%)	39 (51.3%)	0.738
Female	68 (47.2%)	35 (51.5%)	33 (48.5%)	0.738
Height (meter)	1.7 \pm 0.1	1.7 \pm 0.1	1.7 \pm 0.1	0.686
Weight (Kg)	76.4 \pm 12.2	76.3 \pm 12.1	76.4 \pm 12.4	0.984
BMI (kg/m ²)	26.3 \pm 4.7	26.2 \pm 5.1	26.4 \pm 4.4	0.794
Obesity				
Yes	61 (42.4%)	28 (45.9%)	33 (54.1%)	0.399
No	83 (57.6%)	44 (53.0%)	39 (47.0%)	0.399
Diabetes Mellitus				
Yes	60 (41.7%)	30 (50%)	30 (50%)	1.00
No	84 (58.3%)	42 (50%)	42 (50%)	1.00
Hypertension				
Yes	66 (45.8%)	28 (42.4%)	38 (57.6%)	0.094
No	78 (54.2%)	44 (56.4%)	34 (43.6%)	0.094
Duration of Diagnosis (months)	10.3 \pm 5.4	10.2 \pm 5.0	10.5 \pm 5.8	0.770

***Independent sample t-test for numerical comparisons and chi-square test for categorical comparisons.*

Table 2: Outcomes of Patients Undergoing Pterygium Corrective Surgery (N=144).

Outcomes	Overall (N=144)	Transpositional Flap (n=72)	Conjunctival Autograft (n=72)	p-value*
Operative time (minutes)	21.3 \pm 4.2	17.2 \pm 1.0	25.4 \pm 1.0	< 0.001
Any complication	38 (26.4%)	16 (42.1%)	22 (57.9%)	0.257
Hematoma (Yes)	0 (0.0%)	0 (0.0%)	0 (0.0%)	--
Graft Edema	20 (13.9%)	6 (8.3%)	14 (19.4%)	0.054
Dellen Formation	7 (4.9%)	2 (2.8%)	5 (6.9%)	0.441
Pterygium Recurrence	12 (8.3%)	8 (11.1%)	4 (5.6%)	0.367

***Independent sample t-test for numerical comparisons and chi-square test for categorical comparisons.*

DISCUSSION

Our study compared the outcomes, more specifically the recurrence rate of pterygium after conjunctival transposition flap and conjunctival autograft. The mean age of participants was 50.9 years with a slight male predominance. The demographic characteristics were similar in both groups. Mean age of our patients was similar to another study conducted in pakistan¹⁰ and comparable with some other international studies.^{11,12}

The mean operative time was significantly high in conjunctival autograft compared to transpositional flap (25.4 \pm 1.0 vs. 17.2 \pm 1.0 minutes). This finding is consistent with many international studies that have reported mean operating time for conjunctival autograft procedure.^{13,14,15}

The overall complication rate was 26.4%, the most common being graft edema (13.9%). However, there was no significant difference in the complication rates between the two groups. Exception to this is the complication of graft edema in the subgroup of patients without obesity and hypertension was more frequent in the conjunctival autograft group. Previous studies reveal comparable outcomes for conjunctival rotation flap and conjunctival auto-graft technique with rare exceptions.^{16,17,18}

This study reports recurrence rate 5.6% for conjunctival autograft and 11.1 for transpositional conjunctival flap. The overall recurrence rate was 8.3%. A Previous study found that the rate of pterygium recurrence after rotating flap surgery and free autograft treatment ($p=0.46$) was similar in a sample of 45 patients.¹⁸

Pterygia recurrence typically occurs within the first six months following surgery.¹⁹ There is no statistically significant difference in the rate of recurrence between the two groups when longer postoperative periods are observed.^{17,18} For a sample size equivalent to our study, another study reported statistically equal recurrence rates (8.0% for the auto-graft group versus 8.6% for the transpositional flap group).¹⁷

The recurrence rate has been recorded at various rates and varies depending on the procedure. Recurrence rate of 3%– 28% in conjunctival autograft technique, and 3%–33% in conjunctival flap technique.^{16,20} Interestingly, in patients > 50 years old, the recurrence rate was significantly higher in the conjunctival transposition flap group compared to the conjunctival autograft group (14.3% vs. 0.0%).

Our study suggests that both procedures are effective for pterygium surgery, with similar complication rates. However, conjunctival transposition flap may be a more efficient option due to its shorter operating time. The choice between the two procedures may depend on individual patient needs and surgeon preference.

CONCLUSION

Our study demonstrated similar rates of recurrence and complications between the two procedures. However, given the relatively shorter surgical time associated with the conjunctival transpositional flap, we recommend it as the preferred technique. Transpositional flap technique has no risk of graft loss and inversion, less time consuming and the vessel structure is preserved so the healing process is quick. So, this is a good alternative for conjunctival autografting, and it should be

considered in almost all pterygium cases except larger ones which need large size of graft material.

Conflict Of Interest: None to declare

Ethical Approval: The study was approved by the Institutional Review Board / Ethical Review Board No. 0926/22/E.C/BAM&DC Dated 23.05.2022.

Authors' Contributions:

Mutee ul Qaim: Concept, Design, Literature search, Data acquisition, Data analysis, Statistical analysis, Manuscript preparation, Manuscript editing.

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Safeet Shahbaz Khan: Concept, Design, Literature search, Statistical analysis, Manuscript preparation, Manuscript editing, Manuscript review.

Nazia Iqbal: Concept, Design, Literature search, Data analysis, Manuscript preparation, Manuscript editing, Manuscript review.

Syed Hassan Raza Jafri: Concept, Design, Literature search, Data acquisition, Data analysis, Manuscript review.

Syeda Mehak Batool Rizvi: Concept, Design, Literature search, Data acquisition, Statistical analysis, Manuscript preparation, Manuscript editing.

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