

ANCHORED CONJUNCTIVAL ROTATION FLAP VS CONJUNCTIVAL AUTOGRAFT TECHNIQUE IN PRIMARY PTERYGIUM SURGERY AT COMBINED MILITARY HOSPITAL, PESHAWAR

Kinza Shakil, Zaheer Uddin Babar, Zulfiqar Uddin Syed, Bushra Akbar, Farhan Halim, Adnan Halim

Combined Military Hospital Peshawar/National University of Medical Sciences (NUMS) Pakistan

ABSTRACT

Objective: To compare the frequency of complications and recurrence rate among two different techniques used in primary pterygium surgery (anchored conjunctival rotation flap and autograft technique).

Study Design: Comparative prospective study.

Place and Duration of Study: Study was conducted at Combined Military Hospital (CMH), Peshawar, over a period of 6 month (September 2016 to March 2017).

Methodology: All the patients reporting for elective primary pterygium surgery were considered for the study. sixty (60) patients presenting with primary pterygium characterized with corneal invasion, measured from corneal limbus, of at least 4mm in size consented study. Patients were divided into two groups and assigned to either of the surgical technique i.e., anchored conjunctival rotation flap (group A) or Autograft technique (group B) in 1:1 ratio. Surgery was performed by a dedicated surgeon and outcomes were recorded on first post-operative day followed by reassessment at every 1, 2, 4 and 8 weeks. All the patients were followed up for 12 months post-operatively for assessing recurrence of pterygium.

Results: Before surgery, the baseline characteristics were similar for both the groups. After 8 weeks of follow-up, the comparison revealed that the major complication of pterygium surgery i.e. edema, was statistically significantly more common among patients belonging to autograft group as compared to rotation flap group (63.3% vs 16.6%, $p < 0.002$). On the other hand, no significant difference was observed in recurrence rate among two techniques (3.3% vs 6.6%, $p > 0.55$).

Conclusion: Both the techniques used in primary pterygium surgery were safe for performing a meticulous pterygium excision

Keywords: Anchored conjunctival rotation flap technique, Edema, Conjunctival autograft, Pterygium surgery, Recurrence.

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INTRODUCTION

Pterygium is characterized by a pinkish triangular winged-shaped fleshy growth over the cornea comprising of sub-conjunctival tissue with superimposed epithelium¹. The prevalence of this condition has been reported to vary between 0.7 to 31% in literature². It is predominantly more prevalent among males as compared to females and a study reported that Pterygium occurred 79.3% in males out of which 77.7% were between the ages of 25-45 years³.

Although Pterygium is a corneal degenera-

tive disorder, however, it can spread due to some provoking factor such as sunny/hot weather, UV light as radiation can cause damage to cellular RNA/DNA/extracellular membrane; dryness in eyes or family history⁴. It is reported in the literature that among proliferative cases, the most common etiological factors were hot/dry weather (86.63%), toxic chemical exposure (60.31%), family history (34.31%) and dry eyes (29.67%)⁵. Most of the cases of Pterygium, present with mild irritation/redness and most of the patients generally do not seek treatment at the beginning of the disease. It has been observed that Pterygium with more than a few millimeters of extended membrane on to the cornea might lead to astigmatism causing impairment of vision⁶.

Correspondence: Dr Kinza Shakil, Graded Eye Specialist, Combined Military Hospital, Bannu Pakistan

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Initially Pterygium is managed conservatively, until it starts affecting the visual acuity significantly⁷. Decline in the visual acuity usually results because of prevailed astigmatism or invasion of cornea to an extent that it overlies visual axis and becomes a cosmetic blemish for the patient. This condition is usually accompanied by evident irritation and discomfort that is not even relived by medical treatment⁸. Other symptoms may include limitation in the ocular motility due to fibrotic restriction of globe by extended membrane. Progressive growth of extended membrane onto the visual axis may ultimately render the patient functionally blind, which then requires surgical intervention^{9,10}. So far, there is no medical treatment/management available for preventing or reducing the progression of pterygium and surgical removal of the membrane is the only currently available option. Pterygium has high recurrence rate and this long term follow up is usually required to effectively manage the condition¹¹.

Pterygium surgery comprising of simple excision of the over-grown membrane is the most commonly employed conventional method but it has been associated with various complications that can include mild irritation, loose sutures, minimal edema that usually resolves with medical management with high recurrence rate^{12,13}. Now-a-days various methods are being used including latest surgical techniques, flap modifications, post-op mitomycin C application, radiation exposure, application of fibrin glue and cyclosporine etc in order to reduce the post-op complications and recurrence rates¹⁴⁻¹⁶. Literature reports similar results for both these techniques in terms of post-op complications and recurrence with reduced surgery time in rotation-flap techniques^{17,18}. In our settings, the most commonly employed method to reduce the recurrence rate is the use of autograft and anchored rotation flap surgical techniques. we in this study aimed to report results from a single-centered tertiary care hospital in order to compare the frequency of complications and recurrence rates of different

techniques being used in primary Pterygium surgery.

METHODOLOGY

This comparative prospective study was conducted at Combine Military Hospital Peshawar, between September 2016 to March 2017, in which all consecutive patients reporting for elective primary Pterygium surgery were considered for enrollment. The study protocol was presented to Institutional Review Board of the hospital and ethics approval was obtained. The sample size was calculated by WHO online calculator, using formula $n = z^2(p)(1-p) / \alpha^2$; where prevalence (p) of pterygium recurrence was taken to be 4.3%¹⁵. The minimum required sample size was 60 participants (30 in each group). In six-months study period, sixty (60) patients presenting with primary pterygium were consented and enrolled in the study. Patients were divided into two groups depending upon the type of technique used in the surgery i.e., anchored conjunctival rotation flap (group A) or autograft technique (group B). The choice of technique employed for individual patients was on surgeon's will and all the surgeries was performed by a single dedicated surgeon. Study outcomes were recorded on first post-operative day followed by reassessment at every 1, 2, 4 and 8 weeks post-operatively. All the patients were followed up for 12 months post-operatively for assessing recurrence of pterygium.

Inclusion criteria comprised of patients between 18 to 60 years of age, diagnosed with primary pterygium, defined as "a fibrovascular ingrowth of degenerative bulbar conjunctival tissue involving up to 4mm or more than 4mm of cornea with complaints of foreign body sensation, visual deterioration and undesired cosmesis". All eyes of the patients with corneal opacities including corneal dystrophies, recurrent pterygia, keratoconjunctivitis sicca eye syndrome, auto-immune collagen vascular diseases and/or previous ocular surgeries were excluded from the study.

Single Surgeon (K.S), performed all the surgeries under local anesthesia and the general surgery procedure was kept same for all the patients belonging to either group. 0.2ml of lignocaine 20mg/ml and adrenaline HCl 0.0125 mg/ml combination were injected subconjunctivally. Blade no. 15, mounted on bard parker was used to separate the pterygium head from the cornea and rest of the pterygium tissue was dissected from the normal overlying conjunctiva and sclera beneath¹⁸. Cautery was applied minimally for hemostasis. However, the next step involving the use of either a superior temporal conjunctival autograft or a rotational flap to cover the scleral bed identified two groups in this study. In the anchored conjunctival rotational flap group (group A), conjunctival flap was fashioned at superior nasal conjunctiva by leaving behind frill of 1mm of perilimbal conjunctiva as anchoring point. It was then rotated at an angle of 90° around the anchoring hinge, flap was then secured with interrupted 7/0 polyglactin 910 sutures (Vicryl, Ethicon Inc, USA) to cover the bare scleral area. The eye was then patched with sterile eye pad, after completing the surgery. In the conjunctival autograft group (group B), superior nasal conjunctival graft was harvested, 1 mm larger than the bare scleral area, after injecting 0.2 ml of lidocaine HCl 20mg/ml and epinephrine HCl 0.0125mg/ml combination subconjunctivally. Conjunctival tissue was then bluntly dissected with Westcott scissors from the underlying tenon. The free conjunctival autograft was sutured with appropriate orientation (limbus to limbus) to the surrounding conjunctiva with interrupted 7/0 polyglactin 910 sutures (Vicryl, Ethicon Inc., USA)¹⁸. Post operatively topical antibiotic drops moxifloxacin 0.05% (Vigamox, ALCON) were advised 3 times a day for a week. Topical steroid drops flourometholone 0.1% (FML 0.1%, ALLERGAN) were prescribed 4 times a day for a week and then tapered over next 1 week.

First post-operative follow-up was done for all patients, further monitored for complete ophthalmological examination at 1, 2, 4 and 8

weeks post-operative follow-up. The dependent variable that is presence of edema (swelling/congestion/hyperemia of conjunctival layers) was physically examined using slit lamp for all eyes in both group on each follow-up visit. Similarly, recurrence of Pterygium, defined as "encroachment of the cornea 1 mm or more by fibrovascular tissue derived from the surgical site" was assessed over a long follow-up period of 12 months¹⁸.

Statistical analysis was performed using statistical package for social sciences version 20.0 software (IBM SPSS). Continuous variables were presented as mean and standard deviation, while categorical variables were presented as frequency and percentage. The independent samples t-test and chi square test were used to compare quantitative and qualitative variable groups respectively. A *p*-value of less than 0.05 was considered to be statistically significant.

RESULTS

Mean age of the patients was found to be 35.1 ± 11.07 years; and 35.67 ± 10.03 & 36.00 ± 10.26 years for group A and B respectively. There were 39 (65.0%) males and 21 (35%) females enrolled in the study with female to male ratio of 1:1.85. There were 20 (66.67%) vs 19 (63.33%) males while 10 (33.33%) vs 11 (36.67%) females in group A and B respectively. The distribution of patients in both groups was not significantly different in terms of age ($p=0.740$) and gender ($p=0.786$) as shown in table-I. Duration for follow-up was 12 months for each group and there was no patient who lost to follow-up.

Of 30 eyes of patients receiving conjunctival auto-graft (group B), recurrence was reported in 2 (6.6%) eyes, while in conjunctival rotational flap (group A) recurrence was reported in only 1 (3.33%) eye. Two groups were comparable in terms of frequency of recurrence at 12 months follow up, which was found to be not statistically significant ($p>0.553$) as shown in table-II. Post-operative flap edema was seen in 5 (16.67%) eyes in group A in contrast to graft edema that was witnessed in 19 (63.33%) eyes in group B

postoperatively, and the difference was statistically significant ($p=0.002$) (table-II).

Table-I: Distribution of demographic data between two groups in terms of age and gender.

Parameters	Study Groups		p-value
	Group A (n=30)	Group B (n=30)	
Mean Age (Mean \pm SD)	35.67 \pm 10.03	36.00 \pm 10.26	0.740
Gender n(%)			
Male	20 (66.67)	19 (63.33)	0.786
Female	10 (33.33)	11 (36.67)	

Table-II: Comparison of both groups in terms of frequency of complications.

Complications	Study Groups		p-value
	Group A (n=30)	Group B (n=30)	
Edema	5 (16.67)	19 (63.33)	0.0002
Recurrence	1 (3)	2 (7)	

DISCUSSION

In this study, we observed and compared two popular surgical techniques; conjunctival rotational flap and conjunctival auto-grafting, employed in primary pterygium surgery to compare the frequency of complications and recurrence. Among patients belonging to rotation flap technique group, significantly less number of patients experienced edema as compared to patients belonging to auto-graft technique group (16.67% vs 63.33% respectively, $p=0.002$) while, both groups were equivalent for recurrence at the follow up of 12 months.

Recurrence of Pterygium after surgery is a well-known common complication¹⁴. After primary surgery, recurrence of pterygium is quite common and there are few well known risk factors that are accounted for leading to or causing recurrence, some of which includes age, race, clinical features of pterygium, surgical technique, suture/glue material used and/or use of an adjunctive agent/antimetabolite such as mitomycin¹⁶. In some of the trials, the rotational flap technique is reported to have significantly lower recurrence rate as compared to auto-graft technique^{15,16}, Bilge¹⁷, compared safety, efficacy and surgical time of conjunctival auto-grafting

with conjunctival transpositional flap that revealed both procedures are safe with low recurrence rates, and no associated severe complications. It was reported by Bilge¹⁷ that conjunctival transpositional flap was had minimal torsion effects on surrounding tissues presenting better cosmetic results in postoperative follow up as compared to autografting. Bilge¹⁷ reported a recurrence rate of 3.3%, that is similar to 6.66% and 3.33% recurrence in our study with conjunctival autograft technique and conjunctival rotational flap technique respectively. In recurrent Pterygium excision relatively high recurrence rates were observed (ranging from 31.3% to 33.3%).

Many surgeons related factors such as experience and technique, are also reported to significantly influence the recurrence rate of Pterygium¹⁸. At present, the most commonly reported post-operative complications of primary Pterygium surgery includes graft edema, necrosis, pyogenic granuloma and graft displacement. Conjunctival auto-graft technique requires technical proficiency and prolonged operative time because of the need for graft fixation especially when sutures are used¹⁹. This may explain much higher percentages of eyes with graft edema as opposed to anchored rotational flap in our study. Recently, there has been a replacement of fibrin glue in place of sutures for conjunctival flap surgery. Clinical trials provide evidence of low recurrence rate with the use of fibrin glue as compared to sutures²⁰.

The results of our study showed that the anchored conjunctival rotation flap has a lower frequency of complications as compared to conjunctival auto-graft technique and it must be emphasized here that flap edema may be statistically significant, still it is not notorious in clinical perspective, when considering the additional outcome of similar recurrence for both the techniques. The major limitations of current study are that firstly, it is descriptive in nature which may not truly depict the scenario, secondly we included patients of primary Pterygium only, which could also have affected the outcomes, thirdly the sample size was relatively small. But

the current study has provided sufficient baseline data which can be used to further drive the hypothesis and test the hypothesis by using sophisticated study designs including randomized controlled clinical trials, with larger sample size and including diverse study population in order to get valid results with deeper insights related to the issue.

CONCLUSION

It is concluded that both the techniques used in primary Pterygium surgery were safe for performing a meticulous Pterygium excision. However, graft edema was significantly higher as opposed to flap edema which seems to be of little clinical significance, keeping in view similar recurrence rate between the two groups, that is considered a more notorious complication.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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