

Original Article

COMPARISON OF PTERYGIUM EXCISION WITH AUTO-GRAFTING USING SUTURE VS SUTURE LESS, GLUE FREE (BURIAL TECHNIQUE)

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Objective: To compare the efficacy and safety of suture less glue free limbal conjunctival auto graft and conventional sutured auto graft for the management of primary pterygium.

Methods: The study was conducted in Department of Ophthalmology, in Nishtar Hospital on 96 patients with primary nasal pterygium. Patients aged between 25 to 50 years with primary pterygium, Both gender and having pterygium covering ≥ 2 mm of cornea were included in the study. Patients with history of systemic or neurological deficit, Ocular trauma, pseudopterygium, Recurrent pterygium, Ocular surface disorder, pregnancy and pterygium covering less than 2 mm of cornea were excluded. Group A was consist of 48 eyes underwent sutureless and glue free limbal conjunctival autograft and Group B was also consist of 48 eyes underwent free limbal conjunctival autograft with suturing. Informed consent was taken. A through ocular examination including visual acuity, fluoresce in staining, keratometry, refraction, ocular movements, and slit-lamp examination was done. Post-operatively a pressure eye patch was applied. Analgesia was prescribed two times daily. All patients were followed up after 48 h, weekly for one month then for 3, 6, 9, 12 and 24 months postoperatively. The postoperative outcomes noted were the recurrence rate which was defined as fibro vascular proliferation invading the cornea more than 1.5 mm at the site of previously excised pterygium, graft dehiscence, graft retraction, granuloma and dellen.

Results: Age range in this study was from 25 to 50 years with 19 (39.6%) in 25-35 years age group, 16 (33.3%) in 36-45 years and 13 (27.1%) in >45 years in group A while 15 (31.3%) in 25-35 years, 20 (41.7%) in 36-45 years and 13 (27.1%) in >45 years in Group B. No difference regarding outcome was seen in both groups. Recurrence rate was (6.3% in group A versus 6.3% in group B, $p=1.000$), graft dehiscence (4.2% versus 0%, $p=0.153$), graft retraction (8.3% versus 6.3%, $p=0.694$), granuloma (0% versus 6.35%, $p=0.557$) and dellen was (2.1% versus 4.2%, $p=0.557$).

Conclusions: Suture-less and glue free limbal conjunctival autograft is safe, effective, economical, and its surgical outcomes following primary pterygium surgery are comparable to conventional suture limbal conjunctival autograft with lower post-operative suture related complications.

Keywords: suture less glue free limbal conjunctival auto graft, conventional sutured auto graft, pterygium.

Introduction

The word pterygium derived from a Greek word "Pterygos" which means "wing". Pterygium is a degenerative condition of sub conjunctival tissue characterised by a triangular portion of the bulbar conjunctiva encroaching onto the cornea. It is slightly vascular and seen in the inter palpebral fissure in the horizontal meridian; most often from the nasal side.¹ A pterygium occurs with higher frequency in warm, sunny areas between 30 degrees latitude north and south of the equator called as "pterygium belt" where there is hot, dry, dusty environment with more ultraviolet radiation.^{2,3} It is more common in agricultural workers, young adults doing more outdoor activities, people working in dusty and sunny environment.⁴ Some researchers

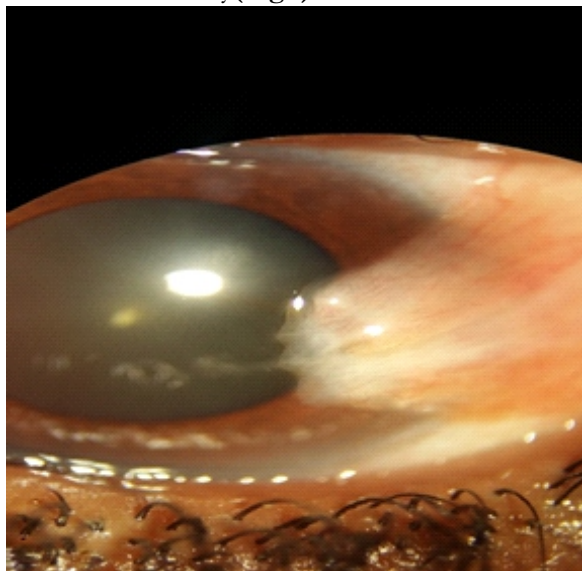
have also shown that mutation of chromosome 17 on gene P53 can also be one of the predisposing factor.⁵ Prevalence rate of pterygium varies from 0.3% to 37.46% in different parts of the world.⁶ Pterygium is a slowly progressive condition with minimal symptoms like redness and foreign body sensation after exposure to sunlight during initial stages.

As pterygium progresses and encroaches up to cornea, visual symptoms arise. Diminution of vision in progressive pterygium is mainly due to flattening of horizontal meridian of cornea, giving rise to "with the rule astigmatism".⁷ Vision gets severely impaired if pterygium encroaches the visual axis. Surgical removal is still the main treatment available for pterygium.⁸ The main reason for surgical excision is cosmetic and for visual purposes, but the main challenge of pterygium

surgery is prevention of recurrence. The recurrence rate after pterygium surgery may vary according to type of surgery done. The rate of recurrence is reported around 25% to 45% after simple excision.⁹ Few studies have shown the favorable results of fibrin glue as compare to sutures. The benefits of fibrin glue are reduced complications, less procedure time and less recurrence.¹⁰⁻¹³ Moreover suture cause infection, increased procedure time and granuloma which results in chronic inflammation and due to which second surgery may be performed.^{14,15} Grafting without suture provide successful results in gingival grafts,¹⁶ and same environment of mucosal membrane tissue to the conjunctiva of the eye can be achieved. In this study, we compared the efficacy and safety of suture less glue free limbal conjunctival auto graft and conventional sutured auto graft for the management of primary pterygium.

Methods

A randomised controlled trial was conducted in Department of Ophthalmology, in Nishtar Hospital Multan, from 20th September 2016 to 20th March 2017. The study was conducted on 96 patients with primary nasal pterygium. Patients aged between 25 to 50 years with primary pterygium, Both gender and having pterygium covering ≥ 2 mm of cornea were included in the study (Fig 1).



Patients with history of systemic or neurological deficit, Ocular trauma, pseudopterygium, Recurrent pterygium, Ocular surface disorder, pregnancy and pterygium covering less than 2 mm of cornea were excluded. Randomization was performed by block design. Randomization was 1:1 for Group A and Group B. Group A was consist of 48 eyes

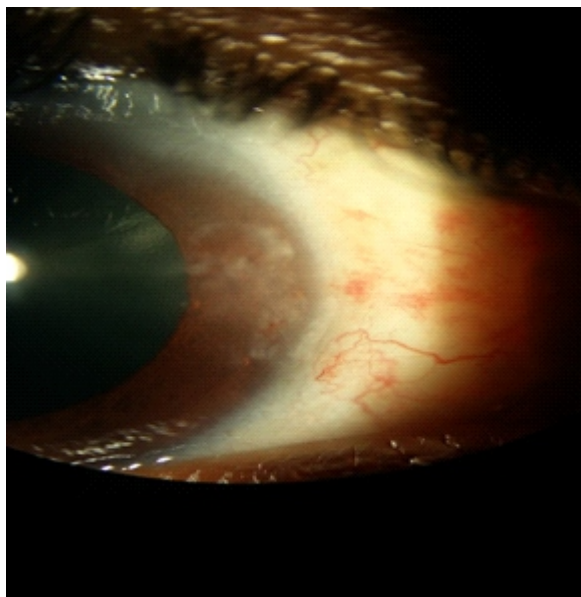
underwent sutureless and glue free limbal conjunctival autograft and Group B was also consist of 48 eyes underwent free limbal conjunctival autograft with suturing. Informed consent was taken. A through ocular examination including visual acuity, fluorescein staining, keratometry, refraction, ocular movements, and slit-lamp examination was done.

Simple pterygium excision was performed under peribulbar anesthesia (Xylocaine 2%). After an eyelid speculum was inserted, a traction suture (60 Vicryl on a spatulated needle) was placed proximal to the limbus at the "6-o'clock position". Hand held cautery was used to outline the edge of the pterygium to be excised usually 4 mm from the limbus. Local anesthesia was used to balloon the pterygium separating it from the sclera. Excision consisted of detachment of the pterygium head using a crescent knife and dissection of the body from the overlying conjunctiva in a smooth clear plane as possible using blunt and sharp dissection. Subsequently, the subconjunctival pterygium tissue and the thickened segment of conjunctiva and adjacent Tenon's capsule were excised leaving bare sclera. Then the size of bare sclera was measured with calipers and the area documented in mm². For harvesting the conjunctival autograft, the globe is rotated upward with a limbal traction suture. The inferior temporal quadrant of bulbar conjunctiva was injected with 1 cc of local anesthesia (Xylocaine 2%) to facilitate separation of the conjunctiva from Tenon's capsule then, a marker was used to mark the four corners of the conjunctival limbal graft to be created 2 mm larger in width and length than the recipient bed. A small opening was created and careful blunt dissection with Wescott scissors was performed until the entire graft was free from Tenons reaching the limbus to include limbal stem cells that act as a barrier to the conjunctival cells migrating onto the corneal surface. Subsequently, the edges of the graft were cut by Vannas scissors. Forceps is used to gently slide the graft to the recipient bed with the epithelial side up and keeping the limbal edge toward the limbus.

In group A, hemostasis was allowed to occur spontaneously without use of cautery to provide autologous fibrin to glue the conjunctival autograft naturally in position without tension and the scleral bed was viewed through the transparent conjunctiva to ensure that residual bleeding did not lift the graft. Small central hemorrhages were tamponed with direct compression. The graft was held in position for 10 min by application of gentle pressure over the graft with fine non-toothed forceps. The stabilization of the graft was tested with a Merocel spear centrally and on each free edge to ensure firm adherence to the sclera.

The eye was bandaged for 48 h.

In group B, the graft was sutured in position with 10/0 nylon. First the two limbal corners were sutured into the episclera and then into the conjunctiva keeping the limbal edge of the graft on gentle stretch then the posterior corners of the graft were sutured to the bulbar conjunctiva and additional sutures were placed to close the wound edges. Both groups received subconjunctival injection of corticosteroid and antibiotic at the end of the procedure. Post-operatively a pressure eye patch was applied. Analgesia was prescribed two times daily. All patients were followed up after 48 h, weekly for one month then for 3,6,9,12 and 24 months postoperatively (**Fig 2**).



The postoperative outcomes noted were the recurrence rate which was defined as fibrovascular proliferation invading the cornea more than 1.5 mm at the site of previously excised pterygium, graft dehiscence, graft retraction, granuloma and dellen.

Data was computed with statistical analysis program (IBM-SPSS-V-22). Analysis was done to compare proportion of both groups. Frequency and percentage was computed for qualitative variables like recurrence rate, graft dehiscence, graft retraction, granuloma and dellen. Chi-square test was applied to compare efficacy in both groups taken $p \leq 0.05$ as significant.

Results

Age range in this study was from 25 to 50 years with 19 (39.6%) in 25-35 years age group, 16 (33.3%) in 36-45 years and 13 (27.1%) in >45 years in group A

while 15 (31.3%) in 25-35 years, 20 (41.7%) in 36-45 years and 13 (27.1%) in > 45 years in Group B as shown in Table-I. While male and female frequency in both groups as shown in **Table-I**. No difference regarding outcome was seen in both groups. Recurrence rate was (6.3% in group A versus 6.3% in group B, $p=1.000$), graft dehiscence (4.2% versus 0%, $p=0.153$), graft retraction (8.3% versus 6.3%, $p=0.694$), granuloma (0% versus 6.35%, $p=0.557$) and dellen was (2.1% versus 4.2%, $p=0.557$) as shown in **Table-II**.

Table-1: Basic Demographics n=96

| Demographics | | Group A n=48 n(%) | Group B n=48 n(%) |
|--------------------|--------|-------------------|-------------------|
| Age groups (years) | 25-35 | 19 (39.6%) | 15 (31.3%) |
| | 36-45 | 16 (33.3%) | 20 (41.7%) |
| | >45 | 13 (27.1%) | 13 (27.1%) |
| Gender | Male | 25 (52.1%) | 23 (47.9%) |
| | Female | 23 (47.9%) | 25 (52.1%) |

Table-2: Comparison of outcomes in both groups n=96

| Outcomes | Group A n=48 n(%) | Group B n=48 n(%) | P-value |
|------------|-------------------|-------------------|---------|
| Recurrence | 3 (6.3%) | 3 (6.3%) | 1.000 |
| Retraction | 4 (8.3%) | 3 (6.3%) | 0.694 |
| Dehiscence | 2 (4.2%) | 0 (0%) | 0.153 |
| Dellen | 1 (2.1%) | 2 (4.2%) | 0.557 |
| Granuloma | 0 (0%) | 3 (6.3%) | 0.557 |

Discussion

While performing surgery the surgeon should keep in mind the possibility of more aggressive recurrent pterygium, so that the operative procedure chosen should be such that it minimizes recurrence. Hence, the aim of pterygium surgery should not only be excision of pterygium but also prevention of its recurrence. Generally, the pterygium recurrences occur within the first 6 months after surgery.¹⁷ One such method to prevent recurrence is autologous limbal conjunctival grafting. Limbal conjunctival autograft transplantation re-establishes the barrier function of limbus and hence significantly lowers the recurrence rate. It is either attached with sutures, or with biological adhesive like fibrin glue, which is derived from pooled human plasma, or with autologous fibrin. In my study Recurrence rate was (6.3% in group A versus 6.3% in group B, $p=1.000$), graft dehiscence (4.2% versus 0%, $p=0.153$), graft retraction (8.3% versus 6.3%, $p=0.694$), granuloma

(0% versus 6.35%, $p=0.557$) and dellen was (2.1% versus 4.2%, $p=0.557$). A similar study by Elwan showed conjunctival oedema in 8 patients (16%) and 6 patients (6%), recurrence in 3 patients (6%) and 8 patients (8%) and granuloma formation in 0 (0%) and 3 patients (3%) for sutureless and glue-free (group 1) and sutured (group 2) limbal conjunctival autograft respectively. The patients were followed for a period of 2 years. All cases of recurrence in group 1 occurred after 3 months and in group 2 after 6 months.¹⁸ Malik et al., reported recurrence in 1 eye (2.5%) and no granuloma formation at 6 months in case of sutureless and glue-free autograft.¹⁹ As per Hall et al., there was no recurrence at the end of 3 months in the glue group and 2 recurrences in the

suture group.²⁰ Foroutan et al., observed a 8 recurrence rate of 13.33% in three years follow up with autologous fibrin.²¹

Conclusion

Suture-less and glue free limbal conjunctival autograft is safe, effective, economical, and its surgical outcomes following primary pterygium surgery are comparable to conventional suture limbal conjunctival autograft with lower post-operative suture related complications.

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