

## Efficacy of glue free and sutureless limbal conjunctival autograft for primary pterygium surgery

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### Abstract:

**Background:** There are numerous adjunctive measures described to reduce the recurrence rates after pterygium excision. Sutureless glueless conjunctival autografting in pterygium surgery is gaining popularity due to short surgical time, no recurrence and good cosmetic outcome. The main objective to study the efficacy and complications of sutureless and glue free limbal conjunctival autograft for the management of primary pterygium.

**Materials and methods:** A prospective interventional case series was carried out in 50 consecutive eyes with primary nasal pterygium requiring surgical excision. Pterygium excision with limbal conjunctival autografting without using glue or sutures was performed in all the patients followed by bandaging for 48 hours. The patients were followed up post operatively on 2nd day, 1 week, 6 weeks, 6 months and 12 months. They were examined for haemorrhage, wound gape, graft shrinkage, chemosis, graft dehiscence, recurrence or any other complication.

**Results:** The mean age of the patients was 41.14 years (range 25-60), 66% were males. Total graft dehiscence occurred in 2 eyes (4%), graft retraction in 2 eyes (4%). No recurrence and no other complication was noted.

**Conclusions:** Sutureless and glue free limbal conjunctival autografting following pterygium excision is a safe, effective and economical option for the management of primary pterygium.

**Keywords:** Pterygium, conjunctiva, limbal-conjunctival autograft, fibrin glue, pterygium surgery

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Date of Submission: 08-11-2020

Date of Acceptance: 21-11-2020

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### I. Introduction

Pterygium is a wing shaped fold of conjunctiva encroaching upon the cornea from either side within the interpalpebral fissure<sup>1</sup>. It is more common in adult male involving in outdoor activities. The exact cause of pterygium is still not known, but ultra violet radiation of sunlight is supposed to be most common cause. This explains why pterygium occurs with increasing frequency in climate approaching the equator. Other causes include continuous exposure to dry and dusty environment. When eye is continuously exposed to such factor, the conjunctiva may thicken to form pterygium. This is basically degenerative as well as hyperplastic condition of conjunctiva. The subconjunctival tissue undergoes elastotic degeneration and proliferates as vascularized granular tissue under epithelium which ultimately encroaches cornea<sup>2</sup>. This process causes redness, irritation and visual disturbances by disrupting the normal smooth surface of cornea<sup>3</sup>. In severe cases, pterygium can block patient's vision altogether.<sup>3</sup> Initially redness and irritation can be controlled by lubricant eye drops but when vision is affected by its growth and astigmatism, surgery is considered. Pterygium surgery has evolved significantly over time. The outcomes are significantly better than conventional pterygium surgery. In bare sclera technique, pterygium mass is excised and the underlying sclera left exposed. Unfortunately recurrence is upto 50% of the cases. This recurrence was reduced by filling the bare sclera<sup>4</sup>. Conjunctival autografting in conventional autograft surgery; the stitches are used to secure the graft in place. But this technique takes more time for stitching and produces discomfort for several weeks. These complications lead to development of NO STITCH surgery using fibrin glue as an adhesive to secure the graft<sup>5-8</sup>. The fibrin glue causes risk of transmitting infections and reactions. All these lead to the development of sutureless glueless conjunctival autografting for covering bare sclera. Pterygium excision with sutureless glueless conjunctival autografting is gaining popularity due to its simpler technique and no recurrence.

## **II. Materials And Methods**

This prospective comparative study was carried out on patients of Department of ophthalmology, Guntur government hospital, Guntur, Andhra Pradesh from October 2018 to April 2019. A total of 50 subjects (both male and females) of age ranging from 25-60 years were included in this study.

**Study Design:** Prospective interventional case series

**Study Location:** This was a tertiary care hospital based study done in Department of ophthalmology, Guntur government hospital, Guntur, Andhra Pradesh

**Study Duration:** October 2018 to April 2019

**Sample size:** 50 patients.

**Subjects & selection method:** This prospective interventional case series included consecutive 50 eyes with primary nasal pterygium requiring surgical excision selected randomly. The inclusion criteria were as follows: age ranging from 25-60 years, no previous ocular surgery, and no systemic disease. The primary outcome measures included graft dislocation and pterygium recurrence. Graft success was defined as an intact graft by the end of 6 weeks after operation without need for sutures. Recurrence was defined as any growth of conjunctiva exceeding 1mm onto the cornea. A detailed medical and ophthalmic history, including gender, age and previous eye surgery was taken. Exclusion criteria included recurrent pterygium, glaucoma, retinal pathology requiring surgical intervention, history of previous ocular surgery or trauma. Preoperative ophthalmic evaluation comprised of uncorrected and best corrected visual acuity (BCVA), digital anterior segment photography, slit lamp examination and funduscopy.

### **Inclusion criteria:**

1. Either sex
2. Age ranging 25-60 years
3. The indication for surgical intervention was one or more of the following: diminution of vision either because of induced astigmatism or encroachment onto the pupillary area, marked cosmetic deformity, marked discomfort and irritation unrelieved by medical management, limitation of ocular motility secondary to restriction or documented progressive growth towards the visual axis so that ultimate visual loss could reasonably be assumed.

### **Exclusion criteria:**

1. Recurrent pterygium
2. Patients with glaucoma
3. Patients with retinal pathology requiring surgical intervention
4. History of previous ocular surgery or trauma.

### **Procedure methodology:**

After written informed consent was obtained, under aseptic conditions, operations were performed under peribulbar anaesthesia using 2% Xylocaine injection. The body of the pterygium was dissected 4 mm from the limbus, down to the bare sclera. Blunt and sharp dissection by Westcott scissors (Geuder, Germany) was done for separating the fibrovascular tissue from the surrounding conjunctiva. The pterygium was removed from the cornea (superficial keratectomy) using a crescent knife. Only the thickened portions of conjunctiva and the immediate adjacent and subjacent Tenon's capsule showing tortuous vasculature were excised. Where possible, haemostasis was allowed to occur spontaneously without the use of cautery. The size of the defect was measured with Castovetjo callipers (Bausch & Lomb Storz; Storz instruments, St Louis, MO, USA). For harvesting the donor limbal conjunctival autograft, 0.5ml of Xylocaine was injected using 30 G needle subconjunctivally to allow dissection between the conjunctiva and Tenon's layer in the superior bulbar conjunctiva. An oversized graft with an additional 2.0mm of length and width relative to the dimensions of the bare sclera was dissected including the superior limbal stem cells. The graft was placed on the bare sclera in such a way so as to maintain the original orientation of the juxtalimbal border towards the cornea. The scleral bed was viewed through the transparent conjunctiva to ensure that residual bleeding does not lift the graft. Small central haemorrhages were tamponaded with direct compression. The free graft was held in position for 10 minutes by application of gentle pressure over it with a lens spatula. The stabilization of graft was tested with a Meroceal spear centrally and on each free edge to ensure firm adherence to the sclera. The eye was bandaged for 48 hours. Postoperative regimen: After removal of the patch, the patient was advised not to rub the eye and topical Loteprednol eye drops were administered four times a day which was tapered over 6 weeks, Moxifloxacin and lubricant eye drops were instilled four times a day for 2 weeks. The patients were followed up post-operatively on 2nd day, 1 week, 6 weeks, 6 months and 12 months. Refraction was performed at 6 weeks. The

patients were examined for haemorrhage, wound gape, graft shrinkage, chemosis, graft dehiscence, recurrence or any other complication.

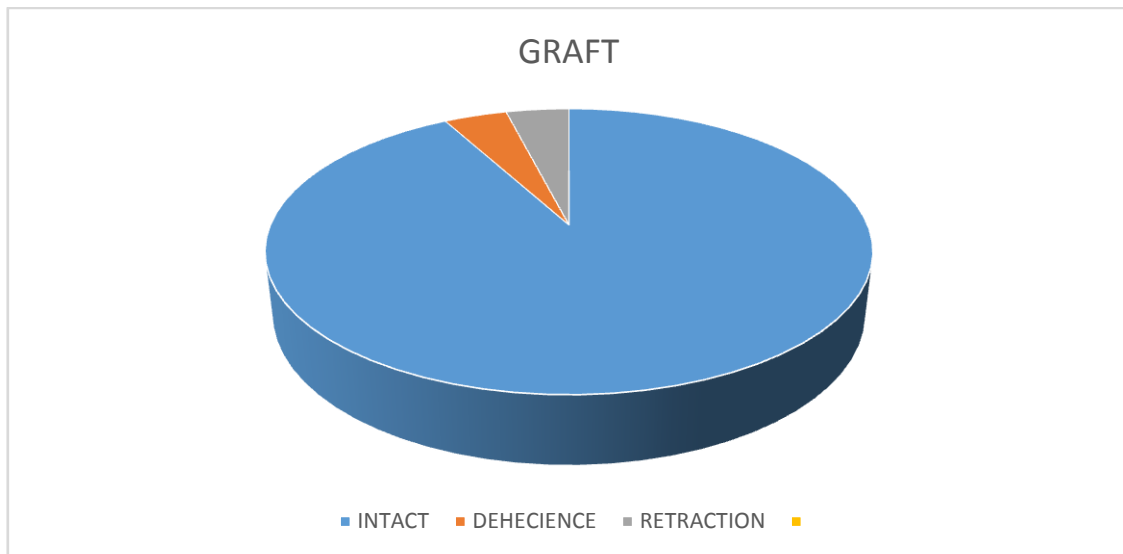
### III. Result

Variables	Sub-groups	Number	Percentage(%)
Type of pterygium	Nasal	50	100
	Temporal	0	0
Gender	Male	33	66
	Female	17	34
Operative time	8 minutes	22	44
	10 minutes	20	40
	15 minutes	8	16

Table 1 shows that all the patients had nasal pterygium, majority of them were male and most of the surgeries (44%) took only 8 minutes.

Variables	Sub-groups	Number	Percentage
Graft dislocations	Present	2	4%
	Absent	48	96%
Graft retraction	Present	2	4%
	Absent	48	96%
Post-operative pain	Mild pain	15	30%
	Moderate pain	0	0
	No pain	35	70%

Table 2 shows , 2% patients had graft retraction,2% patients had graft dislocations, 30 % cases complained of mild pain during the early post- operative period and all the cases had good cosmetic outcome. Two patients with graftdehiscence was noticed on the 7th day. Both the patients were managed by securing the same graft using 8,0 vicryl suture There wastwopatients with graft retraction on the 7th post-operative day. This was treated with topical steroid drops with tapering dose. On the 1st post-operative day complain of mild pain was noted. All the patients were comfortable with good cosmetic outcome during the subsequent follow ups.



#### **IV. Results:**

The mean age of the patients was 41.14 years (range 25-60), 75% of which were males. All the patients were followed up for one year after surgery and there were no drop outs. Table 1 summarizes the patient profile and outcomes. Total graft dehiscence occurred in 2 eyes (4%). In one patient, it developed following injury with a finger on the 4th postoperative day. In the other there was lack of adhesion due to accidental inclusion of Tenon's in the free limbal conjunctival graft. Postoperative on day 3 showing a thickened and congested graft where Tenon's was accidentally included. The removal of Tenon's also caused delayed healing of the donor site. The graft appeared thickened and congested on the 3rd postoperative day and the dehiscence was noticed on the 7th day. Both the patients were managed by securing the same graft using 8,0 vicryl suture. Graft retraction occurred in 2 eyes (4%) on the conjunctival side. There was mild chemosis in all these patients. All the three patients were managed conservatively by bandaging for 48 hours. The chemosis disappeared by the end of 7th postoperative day. There was no recurrence at 6 months followup. None of the patients developed button hole of conjunctival graft, excessive bleeding, perforation of the globe with suture needle, injury to medial rectus, dellen, pyogenic granuloma, symblepharon formation or scleral necrosis.

#### **V. Discussion:**

Recurrence after a successful excision continues to remain a challenge in pterygium surgery. Various adjunctive therapies like radiotherapy, antimetabolite or antineoplastic drugs, conjunctival flap, amniotic membrane, lamellar keratoplasty, conjunctival and limbal conjunctival grafts have been proposed to prevent recurrence. Ex-vivo expanded conjunctival epithelial sheet on an amniotic membrane substrate has been shown to achieve immediate epithelialisation of ocular surface, reduced postoperative inflammation and faster ocular rehabilitation. The procedure is especially useful for closing large surgical defects following excision of extensive pterygium (Ang et al., 2003). Generally, the pterygium recurrences occur during the first 6 months after surgery (Adamis et al., 1990). Currently practiced surgical methods of pterygium excision include conjunctival autografting using suture or glue and sutureless glueless autografting. The presence of sutures may lead to prolong wound healing and fibrosis<sup>7,9</sup>. Subsequent complications such as pyogenic granuloma formation are easily treated. Others such as symblepharon, forniceal contracture, ocular motility restriction, diplopia and sclera sclerosis and infection are much more difficult to manage and may be sight threatening<sup>10,11</sup>. As the fibrin glue is manufactured from human plasma, it carries the risk of transmitting diseases<sup>12</sup>. Most commonly hepatitis A and parvovirus B19 are prone to get transmitted through glue. The fibrinogen compounds may also be susceptible to inactivation by iodine preparations such as those used for conjunctival disinfection before pterygium surgery. Sutureless glueless conjunctival autografting in pterygium surgery is a simple technique with less surgical time. In this study approximately 10 minutes were required for each case. This noble technique is also less costly as no requirement of suture or glue. Our study was a non-randomised study performed among a small population with a relatively shorter period of follow up for 6 months. In our study Graft dehiscence occurred in two of our eyes of which one resulted following trauma and the other was the result of accidental inclusion of Tenon's tissue in the free graft. The importance of a thin graft with careful dissection from the Tenon's capsule is mandatory for a successful graft take up. Two cases of graft dislocation was found. Till the 6th month of follow up, no recurrence of pterygium mass was detected. The preference for the site of donor graft in our series was superior as this area gets covered by the upper lid enabling better cosmesis and healing.

Some authors prefer inferior bulbar conjunctiva, considering that the superior conjunctiva may be required for a future filtration surgery (Broadway et al, 1998). None of our patients developed corneal ulcer, scleral melting, conjunctivitis, dellen, symblepheron formation, excessive bleeding, injury to medial rectus muscle, secondary glaucoma, iritis, corneal perforation or corneal ulcer. All the patients were happy with good cosmeses.

#### **VI. Conclusion:**

Sutureless and glue free limbal conjunctival autografting following pterygium excision is a safe, effective and economical option for the management of primary pterygium requiring surgical intervention.

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Dr.D.Haritha, et. al. "Efficacy of glue free and sutureless limbal conjunctival autograft for primary pterygium surgery". *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 19(11), 2020, pp. 13-17.