

Suture Less and Glue Free Conjunctival Autograft in Pterygium Surgery

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Abstract

Objective: To report complications and recurrence rate of pterygium excision after suture less and glue free conjunctival autograft.

Methods: This prospective and quasi experimental study was carried out from January 2017 to December 2017 in the Department of Ophthalmology department of Baqai Medical University, hospital. Patients were recruited with consecutive sampling techniques. Patients 16 years of age or above with primary progressive pterygium, 2 mm or more encroaching cornea, and interfering with the vision were included. Patients who had not given consent for the procedure, had recurrent pterygium, old central corneal opacities, severe dryness, and poor vision secondary to other causes like glaucoma were excluded from the study. All the patients were operated under sub tenon's anesthesia by the two surgeons, pterygium was excised with a surgical blade, and a conjunctival autograft taken from the superior limbus was placed without suture and glue. Primary outcomes measures included graft loss, granuloma, and any other complications noted within six months. Recurrence was also noted at 6 months.

Results: There were 30 eyes of 22 patients with nasal pterygium. There were 4 females (18.18%) and 18 male patients (81.81%). The mean age was 31.28 years \pm 9.4 SD. The right eye was seen in 16 (53%) cases. The mean pterygium size was 2.87 from the limbus. The complications which were recorded in 6 months period of time were graft loss in 1 patient (4.5%), conjunctival pyogenic granuloma in 1 patient (4.5%), and graft retraction was seen in 1 (4.5%) case. The recurrence rate was none at 6 months postoperatively.

Conclusion: Conjunctival autograft without suture and glue is a simple technique that can be done with minimal expenses and limited resources. It has fewer complications and no recurrence rate.

Keywords: Pterygium, Autograft, Surgery

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Introduction

Pterygium is defined as a triangular fleshy vascular mass in the inter-palpebral region. The classic pterygium has a body and base. It occurs very often on the nasal side rather than the temporal side of the conjunctiva¹. There is no known cau-

se of pterygium but those who work outside in the sun for a longer duration are more prone to develop pterygium². The prevalence of 2 to 7% is reported in tropical and subtropical regions worldwide³. People living in areas with more ultraviolet radiations, especially UVR-A and UVR-B (290-400nm) are more prone to develop pterygium⁴.

Pterygium excision is the mainstay of its treatment. There are various surgical procedures to treat pterygium. One of the most commonly practiced procedures in historic days, was the total excision of the lesion with bare sclera and is still one of the methods of treatment. It was thought to be safe and simple.

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It became apparent that the recurrence rate was unacceptably high ranging from 24% to 89%⁵ with the passage of time. Secondary pterygium were often worse after treating primary ones⁶ including decreased visual acuity due to involvement of visual axis and irregular astigmatism, extraocular motility restriction and symblepharon formation⁷.

Many other methods were introduced to get a better outcome including, amniotic membrane grafting, transplantation of the head of the pterygium, conjunctival flaps, lamellar keratoplasty, mucous membrane grafts, chemotherapy by Thiotepa, radiation therapy by radon bulbs, radium plaques, beta irradiation, ablation with erbiu YAG laser⁸ and smoothing the corneal surface with the excimer laser⁹. Antimetabolites such as 5-Fluorouracil, and Mitomycin C¹⁰ have also been tried to reduce the recurrence rate. The recurrence rate was decreased by many of the above techniques at the cost of sight-threatening complications from the tissue damage associated with the treatment¹¹.

In 1985, a conjunctival autograft was introduced by Kenyon et al¹² who reported a recurrence rate of 5.3% and relatively a few minor complications. They used fibrin glue or suture for adherence of conjunctival autograft over the bare sclera.

Many techniques regarding pterygium excision with conjunctival autograft are already being published in the literature. We are reporting the frequency of complications and recurrence rate seen with suture less and glue free conjunctival autografts. It is a modified version which is a less expensive technique. It can be performed in remote areas with limited resources and expertise available, especially in third world country. The objective of the study is to report complications and recurrence rate of pterygium excision after suture less and glue free conjunctival autograft. Our experience will be beneficial for ophthalmologists to treat our population.

Material and Method

This is a prospective and quasi experimental study. It was conducted in the Ophthalmology Department of Baqai Medical University, Hospital from January 2017 to December 2017. The study was started after written approval from the ethical review committee. This study adheres to the tenets of the Declaration of Helsinki. We selected 30 eyes of 22 patients from the outpatient department. We included patients 16 years of age or above with primary progressive pterygium, with 2 mm or more encroaching cornea and interfering with the vision. We excluded patients who had not given consent for the procedure, had recurrent pterygium, old central corneal opacities, severe dry eye, and poor vision secondary to other causes. Glaucoma patients were also excluded because they might need to undergo trabeculectomy and their conjunctiva is fibrosed because of continuous topical anti-glaucoma medication. Similarly, patients who had trabeculectomy, and had other posterior segment surgeries done, were also excluded because of the limited and diseased conjunctiva that is available.

History was taken on a proforma in which important questions were made about the chief complaints including occupation, duration of growth, and previous medical or surgical treatment. Best-corrected visual acuity was checked on Snellen's chart. Lids were assessed for blepharitis, meibomitis, lashes for any misdirection; conjunctiva and cornea for pterygium were examined on a slit lamp. The size of pterygium was measured in mm by making a slit on the slit lamp. Eyes were checked for abnormal tear film with the help of tear film break-up time and fluorescein staining for punctate corneal erosions. Fundoscopy was done where required.

Written informed consent was taken from all the patients after explaining the procedure and its possible complications.

All surgeries were performed in an operating room (OR), under an operating microscope by both researchers.

All surgeries were executed under sub-Tenon anesthesia to give an excellent akinesia and surface anesthesia.

Povidone-iodine 10% solution was used to sterilize periocular skin. A plastic drape was used to isolate the operating field from eyelids. Topical anesthetic drops of proparacaine (Alcon) were instilled and a lid speculum was inserted. The conjunctival sac was sterilized with a 5% povidone-iodine solution and then rinsed with normal saline after two minutes. Sub-Tenon anesthesia was given in the inferior nasal quadrant consisting of 1.5 cc of 2% xylocaine with adrenaline and bupivacaine in a ratio of 1:1. The pterygium was ballooned by injecting 0.2 to 0.4 cc of xylocaine underneath its body. The pterygium head was excised from the cornea using Bard-Parker knife with a number 15 blade. The remains of pterygium on the cornea were scrapped with help of a blade. The body of the pterygium was dissected using conjunctival Westcott scissors. Extensive dissection was avoided and natural hemostasis was encouraged.

The Castroviejo-caliper was used to measure the size of the defect. The autologous conjunctival graft was taken from the superior bulbar conjunctiva. It was done by injecting 2% xylocaine mixed with adrenaline under the conjunctiva to get it separate from the underlying Tenon’s capsule. A careful dissection between the conjunctiva and Tenon’s layer was done with the help of Westcott conjunctival scissors to acquire a graft free of Tenon’s capsule, keeping it 1 mm oversized. The conjunctival autograft was brought to the defect with the epithelial side up and limbal stem side towards the limbus. The graft was then spread over the defect carefully without sutures and glue. It was observed carefully for 10 to 12 minutes by applying firm pressure on the graft with cotton-tipped applicator to achieve hemostasis. The stabilization of the graft was checked centrally and on four edges to ensure firm adherence to the sclera. The removal of the lid speculum was done carefully. After putting an antibiotic ointment and drops, an eye pad was applied for 24 hours.

Post-operatively, a combination of dexamethasone and moxifloxacin eye drops was given four times a day along with the same combination of ointment at night for 2 weeks. It was later replaced by a mild steroid (aFluorometholone 0.1%) and artificial tears for 2 more weeks.

The eye pad was removed after 24 hours. All patients were followed up post-operatively at one week, 2nd week, one month, 3rd month, and 6th month. Primary outcome measures included graft loss, displacement, contraction, subconjunctival hemorrhage, and granuloma formation.

Results

There were 30 eyes of 22 patients that underwent suture free and glue free autologous conjunctival graft after primary pterygium excision. All the cases presented with nasal pterygium. The mean age of the patients was 31.28 years ± 9.4 SD. The minimum age was 16 years and maximum age was 45 years old. There were four females (18.18%) and eighteen male patients (81.81%) in this study. The right eye was seen in 16 (53%) of patients. All the demographic features are given in Table 1

The mean size of the pterygium was 2.87 mm from the limbus and the mean required graft size was 7.5 mm². There was no pterygium recurrence observed within six months follow up period. Complications of conjunctival autograft after pterygium excision are given in table 2.

Table 1. Demographics of patients for pterygium surgery

No. of Eyes	30
Nasal pterygium	30
Laterality	
Right eye	16 (53%)
Left eye	14 (47%)
Gender	
Males	18 (81.81%)
Females	4 (18.18%)
Mean age	31.28 years ± 9.4 SD

Table 2. Frequency distribution of complications of conjunctival autograft after pterygium excision

Complications	Frequency N (%)
Graft lost	1 (4.5%)
Conjunctival granuloma	1 (4.5%)
Graft recession	1 (4.5%)

Discussion

The most widely practiced procedure for pterygium excision is the bare sclera technique as it is safe and simple but on the other hand, associated with a high recurrence rate of 24-89%^{11, 13}.

Sutureless and glue free conjunctival autograft is a newer technique. It uses CryoSeal FS System. It is a modified system that produces fibrin sealant from autologous blood.¹² Thatte S also found in his study that autologous serum is efficient in securing conjunctival autografts of various sizes with satisfactory results¹³. Lids will serve as a physical barrier, provide compression, a smooth frictionless surface, and avascular bed with immune capability in close proximity to the injury site¹⁴.

In our study, the time period for follow up was 6 months. During this period, recurrence was none. Goswami and Sharma et al also reported 0 recurrences after 6 months and 3 months^{15, 16}. Both of them have used the same technique i.e. gluefree and sutureless. Our results are similar to them. During the same period of follow up, Suryawanshi MP had found no recurrences¹⁷. Kurian A had reported 6.25% recurrence at 1 year¹⁸. No recurrence in our study might be due to the shorter duration of follow up. On the other hand, Suryawanshi had reported recurrence in 7 cases out of 90 patients i.e. 7.78% in 6 months in whom nylon sutures were used¹⁷, instead of autologous blood to fix the conjunctival autograft. There was another study done by Karalezli A¹⁹, who had observed 4% recurrence in his study in which he had used fibrin glue to fix the conjunctival graft and 12% in which he had used sutures, at the

end of his 6 month follow up. However, Zeng W did not find any difference in terms of recurrence between the suture and autologous blood used to fix the conjunctival autograft²⁰. The reason for having no recurrence in our study could be attributed to reduced postoperative inflammation associated with no sutures and an immediate adherence to the graft, which plays an important role in inhibiting fibroblast ingrowth, encouraging earlier vascularization of the graft, and reducing the recurrence²¹. Also, the use of the suture-less and gluefree grafting techniques results in an even tension across the whole of the graft interface. Instead, sutures can only fix the edges of the graft, having no direct apposition of the graft in proximity to the underlying episclera.

In our study, there were only a few complications. A graft loss was seen in one patient (4.5%) in the current study on the first postoperative day. The study conducted by Kurian A reported graft loss in 3 eyes (3.13%) out of 96 patients on a day after surgery²⁰. Goswami did not experience graft loss in his study of 37 eyes of primary pterygium¹⁵. Kurian A had found graft loss in 2.04% of patients using glue¹⁸. On the other hand, Nadarajah G found a total of 15 (24.2%) graft loss in autologous blood and no graft loss in glue used to fix the conjunctival autograft²². There was 5.71% graft loss in the study of Suryawanshi MP¹⁷ in which autologous blood was used to adhere the conjunctival autograft and observed no loss in the group of patients in which sutures and glue were used. Graft loss can be avoided in our opinion by proper placement of graft i.e. without wrinkles and the patience of the surgeon in firmly applying pressure to the graft to achieve hemostasis and releasing fibrin of blood to act as a natural glue. This is followed by closing the lids, a natural biological dressing provided by the apposition between lids and graft. Furthermore, the eye is padded for the next 24 hours which will also contribute to compressing the graft.

Graft recession was seen in 1 (4.5%) of the patient. It is reported in 2 (5.4%) by Goswami, and not at all in other studies^{15, 18, 20}. On the other ha-

nd, there was no graft recession observed in the study of Karalezli A, who compared the use of fibrin glue versus suture for fixating conjunctival autograft¹⁹. Hall RC had not found this complication in his study who compared sutures and glue for conjunctival autograft²³. Graft recession can be evaded if the surgeon successfully separates the conjunctiva from the tenon's capsule completely. Conjunctiva is a mucous membrane and tenon's is composed of fibrous tissue which has the ability to contract.

The drawbacks of suturing are trauma to the injury site, loose or broken sutures requiring removal, and additional working time. They also irritate the patient making his eye very uncomfortable. The autologous fibrin glue for graft adherence has not become widespread because of the high expense, high risk of transmission of infection, and also loss of adherence property of fibrin glue, if iodine preparations are used for conjunctival disinfection and not washed up properly. Sutures and fibrin glue both are costly if compared with autologous blood.

Another complication noted in our study was conjunctival pyogenic granuloma in one patient (4.5%). Goswami and Kurian A had also not reported this complication in their study of glue-free and suture-free conjunctival autograft^{15,18}. Sharma A et al had not reported granuloma with glue-free and suture-less grafting but 4% with nylon sutures.¹⁶ Grafting with sutures has a nidus for inflammation at an injured site which can lead to granuloma formation. The lesser the manipulation, the lesser the inflammation, the lesser is the chance of developing conjunctival granuloma. Granuloma responds to steroid drops and ointment. Sub conjunctival haemorrhage is also a known complication²⁰ but we did not experience it.

Keeping in mind these advantages and disadvantages surgical techniques should be tailored for each patient to provide maximum benefit. The limitation of the study is the short duration of follow up and a small number of patients.

Conclusion

Conjunctival autograft without sutures and glue is a new simpler technique that can be safely done with minimal expenses within limited resources. It has fewer complications including graft loss, retraction, and granuloma formation and they can be avoided by improving surgical practice. The recurrence rate is negligible within a six-month postoperative time.

Conflict of Interests

Authors have no conflict of interests and received no grant/funding from any organization.

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