



Original Article

Sutureless and Glue-Free Conjunctival Autograft in Pterygium Surgery: A Case Series

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Abstract

Foreign materials used in ocular surface surgery may lead to local complications such as discomfort, scarring, or infection. Plasma-derived products such as fibrin glue may produce possible hypersensitivity reactions whereas the risk of viral transmission remains. We describe a simple method of achieving conjunctival autograft adherence during pterygium surgery avoiding potential complications associated with the use of fibrin glue or sutures.

Pterygium excision with limbal conjunctival autografting without using glue or sutures was performed in all the patients followed by bandaging for 24 hours. The patients were followed up post operatively on 2nd day, 1 week, 1 month, 3 month and 6 months. They were examined for haemorrhage, wound gape, graft shrinkage, chemosis, graft dehiscence, recurrence or any other complications.

Total 100 cases were included in this case series. Patient age in ranged from 23 to 78 years (mean 50.08 ± 12.76 years). Surgical Time was (in Minutes) from 20-28; mean & SD 23.76 ± 1.89 . Total graft dehiscence occurred in 1 eye (1%), graft retraction in 12 eyes (12%) and recurrence was seen in 1 eye (1%). At 3 month postoperatively, the gain in uncorrected visual acuity ranged from 2-3 line in Snellen chart in 13 eyes. No other complication was noted.

This simple technique for pterygium surgery may prevent potential adverse reactions encountered with the use of foreign materials and in this case series provided safe and comparable results to current methods.

Key Words: Pterygium surgery, sutureless glue free, conjunctival autograft

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Introduction

Pterygium is an abnormal overgrowth of fibrovascular tissue arising from the subconjunctiva toward the cornea. Although it can be easily excised, it has a high rate of recurrence ranging from 24% to 89%.¹ In 1985, Kenyon et al² proposed that a conjunctival autograft of the bare sclera could be used in treatment of recurrent and advanced pterygium. Recently, with the popularity of conjunctival autograft and use of

antimetabolites such as mitomycin C and 5-Fluorouracil the incidence of recurrence has been greatly reduced up to 12%³⁻⁵ The role of carbon dioxide and eximer lasers in pterygium surgery remains uncertain.

Therefore, a simple surgical procedure that can reduce the recurrence rate to an acceptable level with minimal complications and without the use of potentially toxic drugs or radiotherapy would be ideal for the management of pterygium.

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Sutureless grafting has been used successfully in gingival grafts,⁶ and represents a similar mucosal membrane tissue environment to the conjunctiva of the eye.

Aims & Objectives

Foreign materials used in ocular surface surgery may lead to local complications such as discomfort, scarring or infection. Plasma-derived products such as fibrin glue may produce possible hypersensitivity reactions whereas the risk of viral transmission remains. We describe a simple method of achieving conjunctival autograft adherence during pterygium surgery avoiding potential complications associated with the use of fibrin glue or sutures.

Materials and Methods

The study sample was comprised of 100 eyes of 100 patients with primary pterygium underwent surgical procedure in Pabna General Hospital, Pabna & Makka Eye Hospital, Rajshahi. Study was conducted during the period of 1st January 2017 to 31st December 2018 for the period of 2 years. It was approved by the IRB, PMC & Regional Director of Makka Eye Hospital. All clinical information was noted on structured proforma and consent was obtained from all patients.

Inclusion criteria: Patients of all ages and of either sex presenting with primary pterygium. Bilateral pterygium was not excluded.

Exclusion criteria: Recurrent pterygium, glaucoma, retinal pathology requiring surgical intervention, history of previous ocular surgery or trauma and were inability to complete the six month follow up period.

Preoperative ophthalmic evaluation:

Uncorrected and best corrected visual acuity, digital anterior segment photography, slit-lamp examination, funduscopy and measurement of intraocular pressure were done in all patients.

Surgical technique

Peribulbar anaesthesia with 2% lignocaine and 0.5% bupivacaine in 1:1 ratio was given preoperatively. Incision was made with spring scissor over pterygium in a line 1 mm medial to

limbus cutting only conjunctiva then dissection of the body from the overlying conjunctiva in a smooth clear plane as possible using blunt and sharp dissection. The body of the pterygium was dissected 4 mm from the limbus down to the bare sclera. The subconjunctival pterygium tissue and the thickened segment of conjunctiva and adjacent Tenon's capsule were excised leaving bare sclera. Pterygium was removed from the cornea by avulsion. Then the size of bare scleral was measured with calipers and the area documented in mm².

Graft was taken from the superior temporal quadrant of bulbar conjunctiva. The globe was rotated downwards with a forcep by assistant when necessary. For harvesting the conjunctival autograft, the four corners was marked with tip of the calipers the conjunctival limbal graft to be created 1 mm larger in width than the recipient bed but same as length. Two small opening was created at the limbal site and careful blunt dissection with Wescott tenotomy 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 was used to gently slide the graft to the recipient bed with the epithelial side up and keeping the limbal edge toward the limbus.

Hemostasis was allowed to occur spontaneously with minimal 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.

The graft was kept in position for 10 min, In this 10 minute usually another pterygium surgery was started in another OT table to minimize operation time. After 10 minute 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 24 hours.

Total surgical time was from first conjunctival cut to removal of lid speculum i.e. the time taken from

the excision of pterygium to the time to secure the graft on the bed.

Post-operatively a pressure eye patch was applied. Analgesia was prescribed two times daily. Post-operative medication included Tab. ciprofloxacin 500 mg bid for 5 days. T Mycin Plus Eye ointment (Aristovision, Bangladesh) three times daily was used for 1 week then gradual tapering for 3 weeks and liberal use of topical lubricating eye drops four times daily for 4 weeks. The patients were instructed to avoid rubbing their eyes and avoid dust, heat, direct sun exposure. The patients were also advised to wear sun glasses to reduce UVB exposure.

All patients were followed up after 24 h, after 1 week, after one month, after three month, then after 6 month. Patients completed a questionnaire at each follow-up visit, especially during the first 3 visits grading pain, foreign body (F. B) sensation, photophobia, hyperemia and chemosis into four grades according to the intensity. The questionnaire was scored from (0 to 3)

Results

Case series was carried out in 100 consecutive eyes with primary pterygium.

Table 1 Demographic Profile of the Study Population

Demographic Data	(n=100)
Range of age in (years)	23-78
Mean age in (years)	50.08 ± 12.76
Sex	
Males	38
Females	62
Laterality	
Right	58
Left	42
Site of pterygium	
Only Nasal	96
Nasal +Temporal	04
Size of pterygium in mm length mean & SD	4.398 ± 1.534
Surgical Time in minutes mean & SD	23.76 ± 1.89

0 = nothing; 1 = mild; 2 = moderate; 3 = severe. The data were collected as mean scores and recorded.

The main 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 and the gain in uncorrected visual acuity (UCVA). The secondary outcomes were duration of surgery, postoperative pain, foreign body sensation, photophobia, hyperemia, chemosis, overall satisfaction and the complications as, persistent epithelial defect, dellen, inclusion cyst, pyogenic granuloma, conjunctival edema, corneo-scleral necrosis, infective scleritis, keratitis and endophthalmitis.

Statistical analysis

Data are expressed as mean ± SD. Statistical analysis was performed using SPSS 16 for Windows (IBM Corp., New York, NY, USA).

Table 2: Showing postoperative main and secondary outcomes.

	<i>N</i> = (100 eyes)
Recurrence rate	1(1%)
Graft dehiscence	1 (1%)
Early graft retraction	12 (12%)
Medial side	10(10%)
Upper side	2(2%)
Early Graft oedema	14(14%)
Haemorrhage underneath the graft	
On 1 st Follow up	20(20%)
On 2nd Follow up	4(4%)
On 3rd Follow up	0(0%)
Gain in UCVA	13 (13%)
Conjunctival edema	6 (6%)
Conjunctival granuloma	0 (0%)
Corneal scar (faint nebula)	8 (8%)
Dellen	0 (0%)
Operative time in minutes (mean, SD)	23.76 ± 1.89
Conjunctival cyst	0 (0%)
Graft necrosis	0 (0%)
Symblepharon	0 (0%)
Scleral necrosis	0 (0%)
Scleral thinning	0 (0%)

The gain in uncorrected visual acuity (UCVA) occurred 3 months post operatively and ranged from 2-3 line in 13 eyes. All cases with a gain in UCVA were due to clearance of visual axis occupied by pterygium pre-operatively.

Conjunctival edema occurred in 6 eyes (6%). Most cases of conjunctival edema resolved gradually within the first post-operative week. Faint corneal nebula occurred in eight eyes (8%)

Figure 1: Nasal pterygium before & after surgery, after 1 month & after six month



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.⁷ 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.

In this study the recurrence rate (1%). Massaoutis et al.⁸ stated that the concept of surgical success in pterygium surgery can be defined as the provision of a white cosmetic conjunctiva, with no persistent symptoms and a low recurrence rate (less than 10%). The recurrence rate in our study agrees with The Massaoutis et al.'s criteria. The recurrence rate is also similar to Malik et al.⁹ who reported recurrence rate of 2.5% using a similar procedure of sutureless and glue free graft.

Graft dehiscence is a recognized complication of techniques using glue.^{10,11} Froutan et al.¹² reported 13.33% rate of graft dehiscence using autologous fibrin and attributed this to a low concentration of thrombin and fibrinogen in autologous glue compared to a commercial preparation. In our study graft dehiscence occurred in 1 eyes (1%) that was due to patient rubbing his eye vigorously. Hence, we instruct patients to use a protective glass and not to rub the eye in the 1st week post-

operatively. Additionally, meticulous dissections of thin donor limbal conjunctival autograft free of Tenons capsule are mandatory for successful graft uptake.

Graft retraction was reported by Tan¹³ who advocated sub-conjunctival fibrosis and recommended meticulous dissection of sub-epithelial graft tissue. Foroutan et al.¹² reported 20% of cases with graft retraction, in our study graft retraction occurred in 12 eyes out of 100 (12%) eyes, among them 10 from medial side and 2 from upper side. All the cases of graft retraction were due to conjunctival chemosis and edema and were resolved with conservative treatment. In comparison, Wit et al.¹⁴ reported no graft displacement and postulated that sutureless and glue free graft resulted in even tension across the whole graft interface and no direct tension on the free edges resulting in reduced stimulus for sub-conjunctival scar formation. Wit et al.¹⁴ also proposed that the apposition of the eye lids to the bulbar conjunctiva provides a natural biological dressing, compression, and a smooth frictionless surface.

Pyogenic granuloma and dellen did not occur. Conjunctival edema occurred in our study in 6 eyes (6%). All cases resolved spontaneously with conservative treatment.

The mean operative time in was 23.76 ± 1.89 min. This times are comparable however they are longer than other studies^{15,14} using fibrin glue which reported average operative time of 16 min (range 14–16) and 20 min (range 20–29) in suture group and reported 14 (± 1.4) min in suture-less and glue free conjunctival autograft. But actually

this time is much less if we reduce 10 minutes while operating another case. None of our patients developed serious complications such as scleral necrosis, sclera thinning, graft necrosis, symblepharon, excessive bleeding, medial rectus muscle injury, or globe perforation.

Conclusion

Sutureless and glue-free limbal conjunctival autograft is safe, effective, economical, and its surgical outcomes following primary pterygium surgery are comparable to other procedures.

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