ORIGINAL ARTICLE

Suture Less and Glue Free Limbal Conjunctival Autografting following Pterygium Excision

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Abstract

A prospective interventional self-control study to analyse the profile and outcome of suture less and glue free limbal conjunctival autograft for the management of primary pterygium was carried out in 80 eyes with primary nasal pterygium requiring surgical excision. Pterygium excision with limbal conjunctival autografting without using glue or sutures was performed in all the eyes followed by bandaging for 24 hours. The patients were followed up post operatively after 24 hrs., on 3rd day, after 1, 3, 6 weeks and at 3 months. They were examined for visual acuity, hemorrhage, wound gape, graft retraction, graft edema, recurrence or any other complication among the study population. The mean age of the patients was 40.78 years (range 19-80), 56.25% of which were females. Graft retraction occurred in 3 eyes (3.75%) and recurrence was seen in 1 eye (1.25%). Hemorrhage was seen in 26 (32.5%) eyes at 24 hours, which persisted in only 06(7.5%) eyes at 3 weeks and resolved completely in 100% of eyes at 6 weeks. Edema was also noted in 4 (5%) eyes, persisted only in 1(1.25%) eye at 3rd day and resolved completely by 1 week. At 6 weeks postoperatively, three (3.75%) eyes showed gain in best corrected visual acuity by one line and one (1.25%) eye by three lines on snellen's drum. No other complication was noted. Suture less and glue free limbal conjunctival autografting following pterygium excision is an effective and safe option for the management of primary pterygium.

Key Words

Suture Less, Glue Free, Limbal Conjunctival, Autografting, Pterygium

Introduction

Pterygium is a degenerative ocular surface disorder with wing-shaped fibrovascular growth of the subconjunctival tissue onto the cornea. Surgical removal is the treatment of choice but no single technique is universally successful due to high recurrence rate. There are numerous adjunctive measures described to reduce the recurrence rates after pterygium excision but they are also associated with severe, sometimes sight threatening complications. Numerous adjunctive measures have been described to reduce the recurrence rates after its excision. These may be broadly classified as medical methods, beta irradiation and surgical methods. Limbal-conjunctival autograft is currently the most popular surgical procedure as it has been suggested that including the limbal stem cells act as a barrier to the conjunctival cells migrating onto the corneal surface. The most common method of autograft fixation is suturing, with drawbacks of prolonged operating time, postoperative discomfort, suture abcesses, buttonholes, and granuloma formation which usually requires a second operation for removal. Replacing sutures with tissue adhesives may shorten the operating time, improve postoperative comfort, and avoid suture related complications. However, the major concern of the commercial fibrin glue is the cost and the potential risk of transmitted infection (1).

Scanty data exists evaluating success of suture less and glue free limbal conjunctival autograft for the management of primary pterygium. The results of these studies were very encouraging as they suggested that suture less and glue free limbal conjunctival autografting following pterygium excision is a simple, safe, effective, without much complications and economical option for the management of primary pterygium (1-3). Thus, in

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view of encouraging results of the said technique and to establish it as first line of surgical action over conventional technique, the first study from our setup (a tertiary care teaching hospital) from North India was undertaken.

Material and Methods

The present study was conducted on patients attending the Out Patient Department of Upgraded Department of Ophthalmology, Government Medical College, Jammu over a period of one year after due clearance from Institutional Ethics Committee. The informed consent from all the patients was undertaken before inclusion in the current study. All principal of bioethics were followed in totality as per ICMR and CDSCO advocated Good clinical Practice guidelines. The data was recorded by independent observer.

Inclusion Criteria

Patients of all ages and of either sex presenting with primary nasal pterygia were included in the study.

Exclusion Criteria

a) Recurrent pterygia
b) Glaucoma
c) Retinal pathology requiring surgical intervention
d) History of previous ocular surgery or trauma

1. A detailed medical and ophthalmic history with special reference to first appearance of the condition, progress and previous surgery were noted.
2. Uncorrected and Best Corrected Visual Acuity was recorded with Snellen's Chart.
3. Digital anterior segment photography
4. Slit lamp examination
5. Fundoscopy
6. Tonometry- by a non-contact tonometer was performed in all cases.

Operative Procedure

Hematological examination such as Hemoglobin (Hb), Bleeding time (BT) and Clotting time (CT) was performed in each patient. All patients were explained about the procedure, and an informed consent was obtained.Topical instillation of antibiotic with anti-inflammatory eye drops 4 times, one day before surgery was advised.Peribulbar anesthesia was given with 50:50 mixture of 5ml of 2% Lignocaine and 0.5% Bupivacaine with 150 units/ml of Hyaluronidase injection. A universal eye speculum was placed and the body of the pterygium was dissected 4 mm from the limbus, down to the bare sclera.Blunt and sharp dissection by spring action scissors was done for separating the fibrovascular tissue from the surrounding conjunctiva.The pterygium was removed from the cornea by avulsion.Only the thickened portions of conjunctiva and the immediate adjacent and subjacent Tenon's capsule showing tortuous vasculature was excised. Where possible, hemostasis was allowed to occur spontaneously without the use of cautery.The size of the defect was

Table 1. Age and Sex Distribution of Patients

Age Groups (years)*	No. of Patients.					
	Male	**%age**	**Female**	**%age**	**Total**	**%age**
10-20	02	2.5	0	0	02	2.5
21-30	14	17.5	07	8.75	21	26.25
31-40	10	12.5	16	20.0	26	32.5
41-50	06	7.5	11	13.75	17	21.25
51-60	01	1.25	04	5.0	05	6.25
61-70	01	1.25	04	5.0	05	6.25
71-80	01	1.25	03	3.75	04	5.0
Total	**35**	**43.75**	**45**	**56.25**	**80**	**100**

**Mean age: 40.78 years; Range : 19-80 years*

Table -2 Post-operative Complications

Post-operative	Complications*							
Follow up	**Hem.**	**%age**	**Retr.**	**%age**	**Oed.**	**%age**	**Rec.**	**%age**
24hrs.	26	32.5	03	3.75	04	5.0	0	0
3rd Day	26	32.5	03	3.75	01	1.25	0	0
1 Week	22	27.5	03	3.75	0	0	0	0
3 Weeks	06	7.5	0	0	0	0	0	0
6 Weeks	0	0	0	0	0	0	0	0
3 months	0	0	0	0	0	0	01	1.25

**Hem.-Haemorrhage, Retr.-Retraction,Oed.-Oedema,Rec.-Recurrence*

Table -3 Post-operative Complications (with Subgroup Statistical Analysis)

Post-operative Follow up	Complications*											
	Hem.	No Hem	p-value	Retr.	No Retr.	p-value	Oed.	No Oed.	p-value	Rec.	No Rec.	p-value
24hrs.	32.5	67.5	0.05	3.75	96.25	0.001	5	95	0.001	0	100	0.001
3rd Day	32.5	67.5	0.05	3.75	96.25	0.001	1.25	98.75	0.001	0	100	0.001
1 Week	27.5	72.5	0.05	3.75	96.25	0.001	0	100	0.001	0	100	0.001
3 Weeks	7.5	92.5	0.001	0	100.00	0.001	0	100	0.001	0	100	0.001
6 Weeks	0	100	0.001	0	100.00	0.001	0	100	0.001	0	100	0.001
3 months	0	100	0.001	0	100.00	0.001	0	100	0.001	1.25	98.75	0.001

The chi-square test $p<0.05$; $p<0.001$***

Table 4 Distribution of Patients According to Visual Acuity at 6 Weeks

BCVA	Pre-Operative		Post-Operative		p-value
	No. of Patients	%age	No. of Patients	%age	
6/6-6/12	67	83.75	71	88.75	NS
6/18-6/36	09	11.25	06	7.5	NS
≤6/60	04	5.0	03	3.75	NS

Fig 1.Showing Pre Operative Pterygium Before Excision

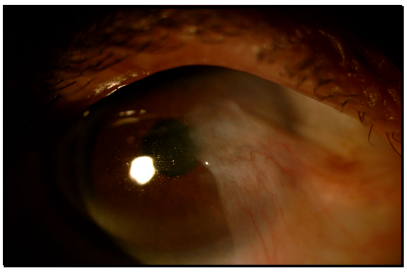
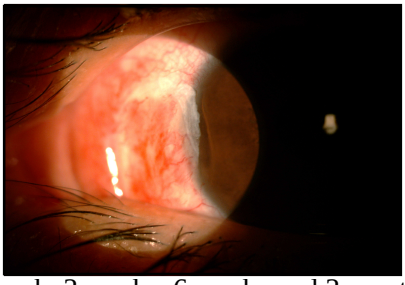


Fig 2. Showing Post Operative After Pterygium Excision



measured with calipers. Careful dissection between donor graft conjunctiva and Tenon's layer was done while fashioning the 1mm oversized conjunctivo-limbal graft from the superior bulbar conjunctiva. 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 hemorrhages were tamponaded with direct compression. The free graft was held in position for 8-10 minutes by application of gentle pressure over it with a lens spatula.The eye was bandaged for 24 hours.

Post Operative Care: After the removal of the patch, the patient was advised not to rub the eye and topical Antibiotic & Steroid combination (Gatifloxacin & Dexamethasone) eye drops were administered 4 times a day for 2 weeks and tapered over the next 4 weeks. The patients were followed up post operatively after 24 hours, 3 days, 1 week, 3 weeks, 6 weeks and 3 months. Visual acuity, Slit lamp examination, Digital anterior segment photography and Tonometry were done to assess for complications, pterygium recurrence and cosmetic result. Refraction was performed at 6thweek.

Statistical Analysis

Descriptive statistical analysis was carried out with the help of computer software SPSS Version 15 for windows.The data was expressed in n (%).The subgroup analysis was carried out by dividing the study population in two groups as per the outcome parameters. The chi-square test was applied and p-value less than 0.05 was considered significant.

Results

The present study was carried out on 80 patients with primary pterygia who attended Eye OPD, GMC Hospital, Jammu over a period of one year. During the study following observations were made. Of the 80 patients, 35(43.75%) were males and 45(56.23%) were females.

The patients were arranged in age groups varying from 10 years to 80 years. The mean age of the study population was 40.78 years (range, 19-80 years). Maximum number of patients (58.75%) were in the age group of 21 to 40 yrs. Sixty six patients (82.5%) were <43 years of age (*Table 1*)

Of the eighty eyes, the pterygium was present in 35(43.75%) right eyes and 45(56.25%) left eyes.

Sixty seven(83.75%) eyes had BCVA of 6/6 to 6/12 on snellen's drum,9 (11.25%) eyes had 6/18 to 6/36, whereas 4(5%) eyes had advanced pterygium with BCVA of ≤6/60 (*Table 4*)

No significant intraoperative complications were noted except for button-holing of the conjunctival flap in three patients (3.75%).

Graft retraction occurred in 3 eyes (3.75%) and recurrence was seen in 1 eye (1.25%) after 3 months of follow up. In eyes with graft retraction, no active treatment was instituted and the exposed area epithelialized adequately on follow up without compromising surgical or cosmetic results. Hemorrhage was seen in 26(32.5%) eyes at 24 hours, which persisted in only 06(7.5%) eyes at 3 weeks and resolved completely in 100% of eyes at 6 weeks. Edema was also noted in 4 (5%) eyes, persisted only in 1(1.25%) eye at 3rd day and resolved completely by 1 week (*Table 2&3: Fig. 2*).The donor site re-epithelialized completely within ten days after surgery; its epithelial healing was not associated with shrinkage or malformation in any of the eyes.

At 6 weeks postoperatively,3(3.75%) eyes showed gain in BCVA by one line whereas one (1.25%) eye by three lines on snellen's drum (*Table 4*). No other complications were noted.

Discussion

In general, recurrences after pterygia excision are frequent and aggressive. Limbal conjunctival autograft is currently the most popular surgical procedure with drawbacks of prolonged operating time, postoperative discomfort, suture abscesses, buttonholes, and granuloma formation. The major concern of the commercial fibrin glue is the cost and the potential risk of transmitted infection. Thus, suture less and glue free limbal conjunctival autograft following pterygium excision has emerged as a safe, effective and economical option for the management of primary pterygium in recent practise.

In a prospective, randomized, clinical trial (2) the outcomes were evaluated of a novel technique of suture less and glue less conjunctival autografting in pterygium surgery by electro cautery pen and compared with suture group. The mean surgical time for the glue group was significantly shorter at 20.4 minutes compared with the suture group at 27.1 minutes ($P < 0.001$). Postoperative pain, irritation, and epiphora were significantly less at postoperative days 5 and 7 ($P < 0.05$). Postoperative foreign body sensation was significantly less at postoperative days 2, 3, 5, and 7 ($P < 0.05$). Two patients in the ECP group had partial graft dehiscence; 2 patients in the suture group developed granulomas. During the follow-up period, conjunctival recurrence (grade 3) developed in 1 (2.5%) eye in the ECP group, and in 2 (5%) eyes in the suture group. Both groups had 1 (2.5%) corneal recurrence (grade 4).Thereby suggesting, the procedure to be safe, fast, simple, and economical with less postoperative discomfort in accordance to the results of our study.

In an study (3) a total of 15 eyes of 12 patients (mean (SD) age 73.7 (11.2) years), 8 females underwent SGF autologous conjunctival graft post-pterygium excision. Mean graft area was 24(1.5) mm^2. Mean follow-up time was 9.2 (2.2) months. Cosmesis was excellent in all cases and visual acuity improved in one patient. There were no intra- or post-operative complications requiring further treatment. Thereby, indicating that this simple technique for pterygium surgery may prevent potential adverse reactions encountered with the use of foreign materials and in this small series provided safe and comparable result to conventional methods. The results of the current study are also in accordance to this study. Although, the number of cases studied in our study in relatively large in comparison to their study

Current study is also in accordance to the results of a prospective interventional case series (1) carried out in 40 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 mean age of the patients was 42.8 years (range 23-61), 75% of which were males. Total graft dehiscence occurred in 2 eyes (5%), graft retraction in 3 eyes (7.5%) and recurrence was seen in 1 eye (2.5%). At 6 weeks postoperatively, the gain in uncorrected visual acuity ranged from 0.18 to 0.5 log MAR in 7 eyes. No other complication was noted like our study.

In another prospective interventional case series (4), 15 eyes from 13 patients with primary nasal pterygium were included for conjunctival autograft surgery. Of the 13 patients, 76.9% were male. The mean age of the patients was 37.26±12.61 (SD) years (range 23-60). The mean follow-up period was 34.67±2.96 months (range 25-36). Three eyes (20%) developed autograft retraction that resolved completely with continued eye patching.

Two eyes (13.33%) developed total graft dehiscence, and sutures were used for reattachment of the graft in its correct position. Two eyes (13.33%) developed recurrence of pterygium, one of them had already a total graft dehiscence. In 13 eyes (86.66%), the conjunctival grafts were appropriately adhered to the bed and surrounding conjunctiva without suturing in the final visit. In the first postoperative day, ocular pain was recorded as grade 1 in 11 eyes (73.3%), grade 2 in 3 eyes (20%), and grade 3 in 1 eye (6.6%). In all patients, ocular pain disappeared during the 5 days after operation, except for two patients who needed suturing for graft reattachment, in whom ocular pain continued for 2 weeks. No other complications were found during follow-up. The results are similar to our study.

A prospective randomized controlled trial (5) comparing Limbal-conjunctival vs conjunctival autograft transplant for recurrent pterygia suggested Limbal-conjunctival transplant to be safe and more effective than free conjunctival transplant in preventing recurrence after excision of recurrent pterygia (P = .004).Thus, it could be a favoured option for managing advanced recurrent pterygia in young high-risk patients. However, the current study was carried in fresh patients of pterygia only and proved to be safe and effective intervention.

Whereas, study (6) comparing conjunctival limbal autograft versus simple excision with intra-operative mitomycin C (MMC) in pterygium surgery found more pterygium recurrences in the MMC group. Indeed, seven patients (23.3%) in the MMC group experienced a recurrence unlike only a single recurrence (3.33%) in the AGCL group with a statistically significant difference (P=0.026). In the MMC group two cases (6.66%) of delayed corneal healing with superficial punctate keratitis and epithelial defect and one case (3.33%) of symblepharon was recorded. There was no statistically significant difference in mean visual acuity gain between the two groups (AGCL: 1.76 lines; MMC: 2.82 lines; P=0.133). Thereby, suggesting pterygium surgery by excision with conjunctival limbal autograft is an effective technique offering a low rate of long-term recurrences and few complications.

Similarly in a recent review (7) on the subject demonstrated that the conjunctival or limbal autograft procedure is more efficacious than amniotic membrane placement. Use of conjunctival or limbal autografts or mitomycin C during or after pterygium excision reduced recurrence compared with bare sclera excision alone in most studies of primary or recurrent pterygium. The outcomes of conjunctival or limbal autograft were similar to outcomes for intraoperative mitomycin C in the few studies that directly compared the 2 techniques. There is evidence that increased concentration and duration of exposure to intraoperative mitomycin C is associated with increased efficacy. Of the adjuvants studied, only mitomycin C was associated with vision-threatening complications, including scleral thinning, ulceration, and delayed conjunctival epithelialization; there is some evidence of increasing complications with increased concentration and duration of exposure.In a recent Meta-analysis (8) to compare pterygium surgery outcomes using limbal conjunctival autograft (LCAG) and other techniques recurrence rates after pterygium excision with LCAG has been suggested lower when compared with the use of bare sclera, bulbar conjunctival autograft, or intraoperative mitomycin C. The current study has some limitations as well as it is not a comparative study with the conventional techniques and number of eyes is relatively less and no attempt has been made to study correlation of study outcome with epidemiological and socio-demographic factors.

Conclusion

Suture less and glue free limbal conjunctival autografting following pterygium excision is an effective and safe option for the management of primary pterygium.

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