

Original Research Article

A Comparative study of Conventional Sutures versus Fibrin Glue for Conjunctivo - Limbal Autograft in Pterygium Surgery

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Abstract: Fibrin glue for securing conjunctivo-limbal autograft in pterygium excision is gaining popularity but suturing is still practiced widely. This study was carried out to compare the outcome of sutures with fibrin glue for conjunctivo-limbal auto grafting in management of pterygium. A prospective study was carried out in sixty eyes of sixty patients with pterygium requiring surgical excision. Simple excision under local anaesthesia was performed followed by closure of bare sclera by conventional method of suturing conjunctivo-limbal autograft using interrupted sutures in 30 patients (group I) and glued conjunctival autograft in 30 patients (group II) and then bandaged for 24 hours in both the groups. Surgical time was recorded for both techniques. Postoperative discomfort was assessed in terms of pain, foreign body sensation and lacrimation in both groups. The patients were followed up for six months. During follow up, graft related complications and recurrence were noted. Mean surgical time for group I (34.70±7.96 minutes) was significantly more as compared to group II (25.83±6.23). Postoperative discomfort were seen in less number of patients and were of shorter duration in group II as compared to group I. Use of fibrin glue for securing conjunctivo limbal autograft after pterygium excision is simple, easy, safe, effective and less time consuming than sutured autograft. It also causes less postoperative discomfort and adverse events as compared with sutured conjunctivo limbal autograft technique. Hence fibrin glue can be good alternative to sutures for securing conjunctivo-limbal autograft in management of pterygium.

Keywords: Anaesthesia, conventional, discomfort, excision, prospective, surgical

INTRODUCTION

Pterygium is a wing shaped overgrowth from subconjunctival tissue over cornea [1, 2]. Limbal stem cell deficiency allows conjunctivalization of corneal epithelium [3]. In conjunctivo-limbal autograft technique; limbal tissue is fixated on scleral bed after pterygium excision. Most common method of fixation is suturing. It has drawbacks like increased operating time, papillary conjunctivitis and granuloma formation [4]. These complications lead to development of NO STITCH surgery using fibrin glue to secure the graft [5,6]. Glue is widely used due to advantages like easy fixation of graft, shorter operation time, reduced complications and postoperative discomfort. We aimed to assess the comparative outcomes and success rates of pterygium excision with conjunctivo-limbal autograft using sutures and glue.

MATERIALS AND METHODS

This prospective interventional clinical study was undertaken to compare the outcome of sutures with

fibrin glue for conjunctivo-limbal auto grafting in management of pterygium. Clinical data collection was undertaken following appropriate ethical approval. There was no financial burden incurred on any group of patient. Sixty eyes of sixty patients who presented at the outpatient department of our hospital were included after obtaining a well informed consent, explaining the purpose and potential risks of the surgical intervention.

The criteria for inclusion were

- a) Uncomplicated primary pterygium

The exclusion criteria were

- a) Recurrent pterygium
- b) Pseudopterygium
- c) Dry eye
- d) Subjects on anticoagulants
- e) Ocular surface disorder

All patients were randomly assigned into one of two groups: group 1 underwent use of sutures for

limbal conjunctival autograft (n = 30 eyes) and group II underwent free limbal conjunctival autograft with fibrin glue (n = 30 eyes). Patients were randomised using random table number method. The goals of pterygium surgery were to remove the pterygium, restore the conjunctival anatomy, leave the cornea as smooth and clear as possible, and prevent recurrence.

A comprehensive evaluation of patients was undertaken including patient's age, gender, medical and ocular history, visual acuity assessment and slit lamp examination. Duration of surgery was noted from the first incision until the lid speculum was removed. Patients were divided into two groups. In both group of patients, pterygium excision with conjunctivo-limbal auto grafting was done. In group I (30 patients), autograft was secured in place with the help of sutures while in group II (30 patients), fibrin glue was used to secure the autograft in place.

SURGICAL PROCEDURE

All the surgeries were performed by a single surgeon, Peri bulbar anaesthesia with 2% lignocaine and 0.5% bupivacaine in 1:1 ratio were given preoperatively. It was supplemented by facial block. A surgical blade No.11 was used to excise the head of pterygium from cornea and body of pterygium along with the underlying tenons was excised using conjunctival scissors. Same sized graft was used after measuring with the Castroviejo caliper. The graft was taken from superior 12 o'clock position. The graft was resected with the help of conjunctival scissors. Care was taken to include as little as possible of Tenon's tissue in the graft. The graft was moved over to the area of conjunctival defect, with care taken to maintain limbal-limbal orientation. Then in the first group of 30 patients, autograft was secured in place with help of sutures while in second group of 30 patients, fibrin glue was used to secure the autograft in place. Eye was bandaged for 24 hours.

Postoperatively, subjects in both the groups were treated with antibiotic-steroid eye drops six times a day, which was gradually tapered over a period of one and a half months and systemic antibiotics and analgesics for five days. All subjects were followed up at day one, one week, two weeks, one month, three months and six months postoperatively.

STATISTICAL ANALYSIS

The data was coded and compiled on Microsoft excel spread sheet. Categorical data was expressed in terms of rates, ratios and percentages. Continuous variables were expressed as mean ± standard deviation. The data was analysed by test of proportion and chi square test.

OBSERVATIONS

A total of sixty eyes of sixty patients were studied. Patients were divided into two groups; group I consisted of patients who underwent conjunctivo-limbal auto grafting with sutures and group II comprised of patients who underwent use of fibrin glue for conjunctivo-limbal auto grafting.

Table 1 shows the demographic profile of the patients.

Table 2 shows occupation of the patients in both the groups. Majority of them were farmers (66.67% in both groups).

Table 3 shows chief complaints of the patients.

Table 4 shows that the mean surgical duration for group I was 34.70±7.96 minutes and for group II was 25.83±6.23 minutes. This difference was statistically significant.

Table 5 shows postoperative signs and symptoms of patients in both the groups.

Table 1: Demographic Profile

DEMOGRAPHIC DATA	GROUP I (n=30)	GROUP II (n=30)
Range of age in (years)	30-75	30-75
Mean age in (years)	51.74±13.65	45.74±13.75
SEX		
Males	15 (50%)	11 (36.66%)
Females	15 (50%)	19 (63.33%)
LATERALITY		
Right	18 (60 %)	15 (50%)
Left	12 (40%)	15 (50%)
Site of pterygium	Nasal (100%)	Nasal (100%)

Table 2: Occupation of the Patients

OCCUPATION	GROUP I (n=30)		GROUP II (n=30)	
	NUMBER	PERCENTAGE	NUMBER	PERCENTAGE
BUSINESS	04	13.33	3	10
FARMER	20	66.67	20	66.67
HOME MAKER	01	3.33	3	10
LABOURER	03	10.0	3	10
SERVICE	02	6.67	1	3.33
TOTAL	30	100%	30	100%

Table 3: Chief Complaints

COMPLAINTS	GROUP I (n=30)		GROUP II (n=30)	
	NUMBER	PERCENT	NUMBER	PERCENT
FLESHY MASS	30	100	30	100.00
DIMINUTION OF VISION	08	26.66	11	36.66
REDNESS	13	43.33	12	40
PAIN	0.00	0.00	0.00	0.00

Table 4: Mean Surgical Duration

	GROUP I (n=30)	GROUP II (n=30)	p-value
MEAN SURGICAL DURATION(mins)	34.70±7.96	25.83±6.23	0.001

Table 5: Postoperative Signs and Symptoms

SIGNS AND SYMPTOMS	POSTOPERATIVE DAY 1		ONE WEEK		SIX WEEKS		24 WEEKS	
	GP I (%)	GP II (%)	GP I (%)	GP II (%)	GP I (%)	GP II (%)	GP I (%)	GP II (%)
PAIN	30 (100%)	25 (83.3%)	12 (40%)	11 (36.6%)	5 (16.6%)	4 (13.3%)	4 (13.3%)	2 (6.6%)
FOREIGN BODY SENSATION	30 (100%)	27 (90%)	25 (83.3%)	12 (40%)	10 (33.3%)	06 (20%)	03 (10%)	0 (0%)
LACRIMATION	30 (100%)	27 (90%)	25 (83.3%)	12 (40%)	06 (20%)	04 (13.3%)	05 (16.6%)	02 (6.6%)
SUBCONJUNCTIVAL HEMORRHAGE	10 (33.3%)	5 (16.66%)	5 (16.66%)	1 (3.33%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
GRAFT DISPLACEMENT	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

DISCUSSION

Pterygium is a common ophthalmic condition easy to diagnose but difficult to tackle. Various surgical techniques and their modifications have been described to manage this condition with prevention of recurrence as underlying aim. It is still an ongoing debate regarding the “ideal” pterygium surgery.

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 adhesives like fibrin glue, which is derived from pooled human plasma or with autologous fibrin.

Suturing of the autograft is rather difficult and necessitates surgical experience and technical skills. Suzuki *et al.*; reported that use of suture causes conjunctival inflammation and Langerhans’s cell migration into the cornea [7]. Increased operation time required for suturing is another problem for many surgeons [8]. In addition, sutures may cause patient discomfort, dellen formation, symblepharon or graft rupture [9].

Another alternative is to use biological tissue glue, like fibrin glue, for securing the graft. Koranyi and associates (2004) were the first to report the use of fibrin glue for conjunctival transplantation in pterygium surgery in a prospective randomized study [10]. They used Tisseal in 20 eyes of 20 patients and sutures in 23 eyes of 23 patients to secure the grafts. They demonstrated that the use of fibrin glue was associated

with significantly less postoperative discomfort, shorter surgery time and pterygium recurrence compared to sutures. Advantages of using it are easy fixation of the graft, shorter operation time and reduction in complications and postoperative discomfort. But certain disadvantages are also associated with its use like high cost. Moreover, the risk of transmission of infections is there with its use. Virus removal and inactivation procedures that are used in its manufacturing process are of limited value against non-enveloped viruses such as hepatitis A virus and Parvovirus B19 [8]. The direct application of any of the apparently effective methods of prion decontamination to plasma products is inappropriate because the methods are harsh and denaturing [11]. Also, it is seen that fibrinogen compounds are susceptible to inactivation by iodine preparations like those used for conjunctival disinfection before pterygium surgery [12].

In present study, age of all patients in both groups ranged from 30 years to 75 years with mean age in suture group being 51.74 ± 13.65 years and in glue group being 45.74 ± 13.75 years. These findings are in agreement with Viso *et al.*; [13] and Kheirkhah *et al.*; [14]. The prevalence of pterygium in present study was highest in farmers (66.67%). This is in agreement with Sekelj *et al.*; [15] who found that persons working in outside environments were more likely to have pterygia than those working indoors.

In present study, all the patients in both the groups presented with fleshy mass. Diminution of vision was noticed in 26.66% of patients in group I and 36.66% in group II and redness was present in 40% of patients in each group. However, no patient complained about pain in both the groups. Previous study by Garg *et al.*; [16] has reported that the commonest signs and symptoms of pterygium include discomfort, foreign body sensation, redness, irritation, dryness and lacrimation.

The advantages of using fibrin glue for attaching graft include ease of use, shorter operating times, less postoperative discomfort and fewer complications. In the present study, there was marked reduction of the mean operation time when using fibrin glue (25.83 ± 6.23 minutes) compared to (34.70 ± 7.96 minutes) for conjunctivo limbal autografting secured with suturing. The mean surgical time was shorter when fibrin glue was used instead of sutures. This difference was statistically significant (p value = 0.001). This is in agreement with the result of Harvey *et al.*; [17] and Kim *et al.*; [18] who reported 27.8 ± 1.0 minutes and 18.0 ± 5.7 minutes as a mean operation time for fibrin glue technique in attaching conjunctivo limbal autograft compared to (67.0 ± 3.6 minutes) for conjunctivo limbal auto grafting attached with suturing. Studies by Bahar *et al.*; and A Karalezli *et al.*; also showed shorter operating time with fibrin glue as against sutures [19]

In present study, post-operative symptoms of pain, foreign body sensation and epiphora were significantly lower with fibrin glue on the 1st and 7th postoperative days. In present study patients were more comfortable in fibrin group than those in suture group on subsequent follow up which is corroborative with the findings of previous studies by Koranyi G *et al.*; Harvey S *et al.*; [17], Uy *et al.*; [20] and Irit Bahar *et al.*; [21].

Important issues with fibrin use are the risk of infection with parvovirus B19, HIV, Hepatitis B virus, and prions and considerably increased cost compared to sutures. In our study, no anaphylaxis or infectious disease occurred in any patient during follow-up.

CONCLUSIONS

- Fibrin glue is an effective and safe method for securing conjunctival autograft during pterygium surgery.
- The use of fibrin glue can ease the surgical procedure, shorten operating time and produces less post-operative discomfort.

LIMITATIONS

- Smaller sample size
- Short follow up period. Long term studies are needed to determine whether the rate of pterygium recurrence is affected by use of fibrin glue.
- Lack of a cost-effectiveness analysis.

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