Autologus Fibrin Glue versus Sutures for Conjunctival Autografting in Pterygium Surgery: A Prospective Comparative Study

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Research Article

Abstract: **Aim**: To compare the use of autologus fibrin glue versus sutures for fixating conjunctival autografts in patients undergoing pterygium excision. **Methods:** Forty six patients (46 eyes) with primary pterygium were randomised to undergo pterygium surgery using either autologus fibrin glue (23 eyes) or 10-0 nylon sutures (23 eyes) to attach the conjunctival autograft. The patients were followed up for 6 weeks. Outcome measures were duration of surgery, adherence of graft and postoperative discomfort. **Results:** In the autologus fibrin glue group, the mean operation time was 13.96 (SD 3.2) min (range 10-20 min) and in the suture group ($p<0.001$) it was 29.78 (sd4.6) min (range 20-35 min). Two patients in the autologus fibrin glue group had partial graft dehiscence; it was successfully reattached with autologus fibrin ($p>0.05$). One patient in sutured group had partial graft dehiscence, which was successfully reattached with sutures ($p>0.05$) the intensity of the postoperative watering, foreign-body sensation, were significantly lower in the autologus fibrin glue group than in the suture group ($p<0.001$). Postoperative congestion was absent in 47.82%. (11cases) and mild in 52.18% (13 cases) 2 weeks postoperatively in the autologus fibrin group while in sutured group 17.4% (4 cases) had mild congestion and 82.6% (19 cases) had moderate congestion 2weeks postoperatively. **Conclusion:** The new method of using patient's own blood (autologus fibrin) as a glue in pterygium surgery with conjunctival auto grafting significantly reduces surgery time with successful adherence of the auto graft and improves postoperative patient comfort without economical burden on the patient.

Key words: Pterygium, Autologus fibrin, sutures, conjunctival autograft, operating time, lacrimation, foreign body sensation.

Introduction

Pterygium is a degenerative condition(elastotic) of bulbar subconjunctival tissues which proliferate as vascularized granulation tissue to invade the cornea, destroying the superficial layers of the stroma and Bowman's membrane, the whole being covered by conjunctival epithelium.

It is either on nasal/ temporal side in interpalpabral area which is maximally exposed to ultraviolet rays.

It is common in dry sunny climates. So also in India.(2.4 to 30%)[1]

Surgical excision is indicated in

1 Extreme irritation

2 Diminished vision due to Astigmatism/ progression towards pupillary area

3 Restriction of eyeball movement

4 Cosmetic blemish

Pseudo pterygium occurs after chemical injury, corneal ulceration, or other inflammatory problems in which conjunctiva become scarred and drawn over the cornea. It comes at any site on cornea, at any age, and a probe can be passed between this conjunctival bridge and sclera underneath, a feature that distinguishes it from true pterygium.

Need for study

Age old procedure is simple excision leaving behind bare sclera. It has a significant recurrence rate (24 – 89%)[2] Conjunctival autograft of the bare sclera was used in 1985, by Kenyon et al[3] in treatment of recurrent and advanced pterygium. Autologus conjunctival transplantation has been shown to decrease the incidence of recurrence to about 5%.

Sutures have been traditionally used to adhere graft in position but it requires longer operating time, surgical expertise, postoperative discomfort, and local complications like scarring, infection, foreign body granuloma and chronic inflammation.[4,5] Later fibrin glue was used in place of sutures which reduced operating time and post operative complications associated with sutures. The use of fibrin glue[6,7,8,9] above sutures improved comfort, decreased surgical time, reduced complication and recurrence rates have been reported. Fibrin glue since it is a plasma derivative it may produce hypersensitivity reactions in susceptible individuals, and there is a risk of transmission of viral diseases. Its high cost prevents its use for all sections of population. Sutureless grafting has been used successfully in gingival grafts[10] and represents a similar mucosal membrane tissue environment to the conjunctiva of the eye

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The new method of using patient's own blood **(Autologus fibrin)** to adhere graft to recipient site reduces the operating time, suture related post operative complications, over comes complications of glue, reduces economic burden.

Aims & Objectives

1 To compare operating time in two groups (Autologus fibrin &sutures)
2 To study efficacy of autologus fibrin (blood) versus sutures in graft adherence
3 To compare post operative discomfort in two groups

Materials & Methods

Source of data

Patients having pterygium attending Ophthalmology OPD at Krishna Hospital, Malkapur, Karad, Maharashtra.

Study design

Randomized clinical trial

Duration

1 year (Feb. 2012 to Jan. 2013)

Sample size

Group 1 Autologus fibrin N = 23, Group 2 Sutures N = 23

Inclusion Criteria

Patients having true pterygium who gave consent for the study

Exclusion criteria

Patients giving H/O Ocular surface infections, Ocular trauma
H/O Bleeding disorder, anticoagulant therapy

Methodology

Patients having true pterygium were enrolled into study after taking informed & written consent.
All preliminary Ophthalmological examination along with slit lamp examination was carried according to proforma
Preliminary investigations (CBC, BSL, Routine urine, ECG) were done in each & every patient
Physical fitness was taken by Physician to undergo surgery under local anaesthesia.
Patients were then randomized into two groups
1 Conjunctival autograft with autologus fibrin (blood)
2 Conjunctival autograft with sutures

Procedure

Single surgeon performed all surgeries under Zeiss operating microscope.
Pterygium was excised and bare sclera was replaced by conjunctival autograft harvested from upper bulbar part of conjunctiva under peribulbar anaesthesia.
In group 1 haemostasis was allowed to occur spontaneously without the use of cautery & autograft was adhered to underlying episcleral bed by autologus fibrin (patient's own blood from limbal vessels)

In group 2 autograft was sutured by 10-0 Nylon sutures (interrupted) to the surrounding conjunctiva
At the end of surgery subconjunctival Gentamicin along with dexametasone was injected.
The Operation duration was considered as the time from when the lid retractor was placed until its removal at the end of surgery
After surgery, all patients were prescribed topical prednisolone and topical Ofloxacin 4 times daily for 2 weeks.

All patients were examined on slit lamp 24 hrs, 1week, 2weeks, 6weeks postoperatively
Efficacy of surgery was noted by
Noting operating time in both groups
Noting graft dehiscence by slit lamp examination in both groups
Noting congestion as absent, mild, moderate,& severe by slit lamp examination comparing with clinical photographs.(Srinivasan et al [11] also used standardized slit lamp photographs)
Noting post operative discomfort like lacrimation, foreign body sensation in both groups.

Statistical analysis

Graft adherence and post operative comfort were summarized by rates and analyzed by Chi Square test
Operating time was summarized by mean and standard deviation and was analyzed by 't' test.

Results

There were 23 patients in each group.
In the group undergone sutured surgery there were 5males & 18 females. Minimum age in females was 26years & maximum was 70 years. Minimum age in males was 36years & maximum was 76years.

Table 1: Gender wise age (in years) of patients in Sutured group

Gender	N	Minimum	Maximum	Mean	Median	Std. Deviation	't' value (p value)
Male	5	36	76	56.00	55.00	14.883	0.416
Female	18	26	70	52.94	60.00	14.465	(0.682)
Total	23	26	76	53.61	60.00	14.269	

In the group undergone surgery autologus fibrin glue there were 10males & 13 females. Minimum age in females was 30years & maximum was 65 years. Minimum age in males was 36years & maximum was 65years.

Table 2: Gender wise age (in years) of patients in Autologus fibrin group

Gender	N	Minimum	Maximum	Mean	Median	Std. Deviation	't' value (p value)
Male	10	36	65	46.10	46.50	8.452	1.539
Female	13	30	65	52.69	55.00	11.309	(0.139)
Total	23	30	65	49.83	50.00	10.495	

Table 3: Gender wise comparison of Age [Sutured v/s Autologus fibrin]:

Gender	't' value	p value
Male	1.667	0.119
Female	0.052	0.959
Total	1.024	0.311

Table 4: Operating time in minutes in both groups

Type of Surgery	Number	Minimum	Maximum	Mean	Std dev.
Autologus fibrin	23	10	20	13.96	3.212
Sutured	23	20	35	30	4.641

The operation duration was 13.96 (sd 3.212) minutes in the Autologus fibrin group while it was 30 (sd 4.641) in sutured group

Operative time was significantly lower in autologus fibrin group as compared to sutured group. (p < 0.001)

All cases were followed up 1day, 1week, 2week & 6 weeks postoperatively for severity of congestion (on slit lamp), lacrimation, & foreign body sensation

Congestion on slit lamp

Mild Moderate Severe

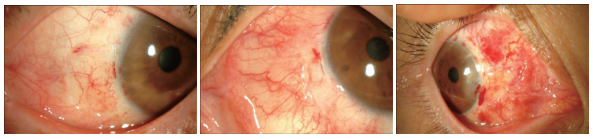


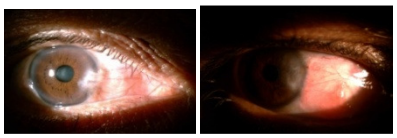
Table 5: Postoperative severity of congestion in Autologus Fibrin group

Congestion	1 day p.o.	1wk. p.o.	2wk. p.o.	6wk. p.o.
Absent	0	1	11	0
Mild	1	10	12	0
moderate	7	12	0	0
Severe	15	0	0	0

In autologus fibrin group 15(65.21%) cases had severe congestion on first follow up while none of the case had it on further follow-ups. 7(30.43%) cases were having moderate congestion on first follow up which increased to 12(52.17%) on second but none of the cases were having it on next follow-ups. Only one(4.34%) case was having mild congestion on first follow up. The number increased to 10(43.47%) & 12(52.17%) on successive follow-ups & there was no case having mild congestion on 6week's follow up.

Thus on first follow up all cases were having mild to severe congestion but **in 1 (4.34%) case on 1week & in 11(47.82%) cases on 2week follow up congestion was absent.** On last 6week's follow up congestion was absent in all (100%) cases.

Photographs showing pre operative (A) & post operative 2weeks (B) of autologus fibrin group

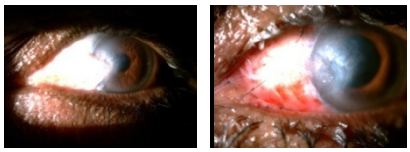


A **B**

Table 6: Postoperative severity of congestion in sutured group

congestion	1 day p.o.	1wk.p.o.	2wk.p.o.	6wk.p.o.
Absent	0	0	0	22
Mild	0	0	4	1
moderate	0	4	19	0
Severe	23	19	0	0

In sutured group all cases (100%) were having severe congestion on first follow up. The number decreased to 19(82%) on 1week follow up & on 2week, 6week follow up there was no case with severe congestion.
There was no case with moderate congestion on first follow up, but 4(17.39%) & 19(82%) cases were on 1week & 2week follow up respectively. On last follow up not a single case was having moderate congestion.
On first two follow ups there was no case with mild congestion but 4(17.39%) cases on 2week & 1(4.34%) case on 6week follow up was having mild congestion.
Congestion was absent only on last follow up in 22(95.65%) cases. In first 3 follow ups there was not a single case without congestion in the sutured group.
Photographs showing preoperative (A1), & post operative 2weeks (B1) in sutured group



A1 **B1**

Table 7: Postoperative lacrimation in Autologus Fibrin group

Lacrimation	1 day p.o.	1wk.p.o.	2wk. P.o.	6wk. P.o.
Absent	9	23	23	23
Present	14	0	0	0

In autologus fibrin group lacrimation was absent in 9(39.13%) cases on first follow up and **was absent in all (100%) cases from 1week onwards.(p<0.001)**

Table 8: Postoperative lacrimation in sutured group

Lacrimation	1 day p.o.	1wk.p.o.	2wk. P.o.	6wk. P.o.
Absent	0	0	0	20
Present	23	23	23	3

In sutured group all cases (100%) were having lacrimation on first 3 follow ups. Only on last follow up of 6week only 3(13,04%) cases were having lacrimation while it was absent in remaining (86.95%) cases**.**

Table 9: Postoperative foreign body sensation in Autologus Fibrin group

F.B. sensation	1 day p.o.	1wk.p.o.	2wk. P.o.	6wk. P.o.
Absent	13	23	23	23
Present	10	0	0	0

In autologus fibrin group foreign body sensation was absent in 13(56.52%) on first follow up(1day p.o.) and **was absent in all cases (100%) from 1week onwards.(p < 0.001)**

Table 10: Postoperative foreign body sensation in sutured group

F.B. sensation	1 day p.o.	1wk.p.o.	2wk. P.o.	6wk. P.o.
Absent	0	0	10	19
Present	23	23	13	4

In sutured group all (100%) had foreign body sensation on first two follow ups. Number of cases having foreign body sensation reduced to 13(56,52%) on 2week (p>0.001) follow up & to 4(17.39%) on last follow up.
Postoperative dehiscence of the graft
In autologus fibrin group graft was displaced in two cases (temporally & superotemporally) which was replaced immediately, while in sutured group it was displaced inferiorly on first follow up in one case which was successfully replaced immediately.

adherence	Sutured	auto.fibrin	Total
Good	22(95.70%)	21(91.30%	43
Displaced	1(4.34%)	2(8.69%)	3
Total	23	23	46

There were no intra- or post-operative complications requiring further treatment. Visual acuities were not affected in any of the patients.

From all above observations it is seen that patients in whom autologus fibrin was used were almost recovered at the end of 2weeks except mild congestion in 55.18% cases which is insignificant. Operating time

was also significantly less (p<0.001) in this group. While patients in whom sutures were used operating time was significantly more as well as post operative discomfort was also significantly more at the end of 2weeks(p< 0.001)

Discussion

There are various methods to prevent pterygium recurrence which include conjunctival autograft, limbal and limbal–conjunctival transplant, conjunctival flap and conjunctival rotation autograft surgery, amniotic membrane transplant, cultivated conjunctival transplant, lamellar keratoplasty, and the use of fibrin glue.[12] All of these techniques involve the use of sutures or fibrin glue and are therefore vulnerable to associated complications. Sutures have been traditionally used to adhere graft in position but it requires longer operating time, surgical expertise, postoperative discomfort, and it has local complications like scarring, infection, foreign body granuloma [8,4,9.] Complications such as symblepharon formation, forniceal contracture, ocular motility restriction, diplopia, scleral necrosis,and infection are much more difficult to manage and may be sight threatening.[13,14] Fibrin glues though safe are manufactured from human plasma and therefore carry the theoretical risk of transmissible disease[12]. Fibrinogen products are deactivated by iodine solutions used to prepare conjunctiva[15] Srinivasan et al[11] reported no difference in inflammation between the fibrin glue or suture group at 1 week, but inflammation was reduced significantly in the fibrin glue group after 1 to 3 months. On the contrary, we reported significantly less inflammation in the autologus fibrin glue group than suture group at 1 week, and no difference in inflammation between these groups at 1 month. This could be due to use of autologus fibrin in our study. Our study has limitations of small sample size & short follow up. But our aim was to study surgical time & post operative discomfort by using autologus fibrin. Surgical time in our small series appears no greater than current published literature.[16] A prospective randomised controlled trial is required to investigate the long-term efficacy of this autologus grafting technique in reducing recurrences

Conclusion

The new method of using patient's own blood (autologus fibrin) as glue in pterygium surgery with conjunctival auto grafting significantly reduces surgery time with successful adherence of the auto graft and improves postoperative patient comfort without economical burden on the patient.

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