

# Comparative Study to Analyse the Results in Sutureless Pterygium Surgery with Fibrin Glue versus Without Glue by Autoconjunctival Graft

Dr. Sajjan Sangai<sup>1</sup>, Dr. J.P.Mishrikotkar<sup>2</sup>, Dr. S.R.Thakre<sup>3</sup>, Dr. Sarika Gadekar<sup>4</sup>, Dr. Yogita Phadke<sup>5</sup>,  
Dr. Sankalp Rao<sup>6</sup>

**Abstract:** Among various methods for pterygium surgery, Conjunctival autografting is a promising technique. "Autoconjunctival graft" can be placed over the cornea by sutures, fibrin glue and autologous blood. The present study was undertaken to analyse the results of sutureless pterygium surgery with and without glue and to provide us valuable data, postoperative results and complications. **Aims:** To compare the results of sutureless pterygium surgery by autoconjunctival graft with and without glue. **Subjects and methods:** 60 patients underwent pterygium surgery from June 2014 attending the Ophthalmology O.P.D and were divided in 30 each patients of with and without glue. The operated were evaluated for lid edema, graft edema, SCH, graft position, recurrence. **Results:** The graft position was statistically significant in both the groups postoperatively; occurrence of subconjunctival haemorrhage was significant in the groups & Lid edema, graft edema and recurrence was not statistically significant. **Conclusions:** Present study showed equally good both post-operative results of glueless and with glue conjunctival autografting, hence making the sutureless procedure without glue easier.

**Keywords:** Conjunctival auto graft, Fibrin glue, Pterygium

## 1. Introduction

Among various methods, conjunctival autografting is a promising technique for pterygium surgery and has gained popularity in last 2-3 decades because of its easy accessibility, low recurrence rates and fewer complications.

The various surgical techniques developed for pterygium are Conjunctival autografting, bare sclera technique, transposition of pterygium to fornix, excision with simple closure of wound with adjuvant therapies to reduce recurrence (5-FU, MMC,  $\beta$  irradiation, limbal stem cell transplant, amniotic membrane graft and buccal mucosal graft)

"Autoconjunctival graft" can be placed over the sclera by sutures, fibrin glue and autologous blood. To date only a few study have reported efficacy of fibrin glue for attaching conjunctival auto graft in pterygium study and results were inconsistent.

Hence the present study was undertaken to analyse the results of sutureless pterygium surgery by autoconjunctival graft with and without glue and expected to provide us valuable data, postoperative result, complications and recurrence.

## 2. Subjects and Methods

Prior to commencement, the study was approved by the ethical and research committee of MGM Medical College and Hospital, Aurangabad. Written consent was taken from patients participating in the study.

This study was a prospective randomised control study

This study was conducted in randomly selected patients in Department of Ophthalmology, MGM Medical College and Hospital, Aurangabad. Total 60 patients from the age group of 20 to 65 having unilateral or bilateral pterygium,

satisfying the inclusion criteria were selected and divided into 2 groups each having 30 patients.

### Inclusion criteria:

Patients in the age group of 20 to 65 years having unilateral or bilateral pterygium 2mm or more

### Exclusion criteria:

- 1) Recurrent pterygium
- 2) Other ocular surface disorder
- 3) Patient not consenting
- 4) Any previous ocular surgery

The study group was randomly selected into 2 groups

- Group A – Glue less autoconjunctival graft, n=30
- Group B – Fibrin glue, n=30

## 3. Methodology

Complete ocular history including signs and symptoms at the time of presentation, Visual acuity with Snellen's, Anterior segment evaluation under slit lamp, size of pterygium measured on slit lamp, detailed fundus evaluation, random blood sugar, blood pressure were noted.

Informed consent of all patients fulfilling selection criteria were explained about the nature of the study and its complications and written informed consent was obtained before entailment.

### Surgical technique:

The surgical procedures were standardized and were performed by a single surgeon. The procedure was carried out under peribulbar anaesthesia (xylocaine 2% with 1:100,000 epinephrine)

All procedures were performed using a single operating microscope, under aseptic precautions. The universal lid speculum was inserted; a superior rectus bridle suture was

taken. Size of pterygium measured on cornea with Castroviejo calliper, vertically at limbus and horizontally from limbus to tip of head. Then a superotemporal graft was taken and placed accordingly with or without glue in the borders of conjunctiva on the bare sclera.

**Group – A (With Fibrin Glue) Reliseal Glue:**

It is mainly a biological glue and haemostatic agent which can be used in variety of surgical procedures to arrest bleeding, seal tissues and as an adjunct to wound healing. It is mainly derived from human blood plasma with haemostatic sealing and adhesive properties. The kit is available in 0.5 ml and 1ml pack size.

**Surgical Technique of Group – A with Fibrin Glue:** The graft was placed on the cornea with the stromal side facing upwards. Two-three drops of the reconstitutes fibrin sealer was placed on conjunctival graft, and the conjunctival graft was quickly smoothed out with a non-toothed forceps and the edges were opposed and keep for 10 sec then finally eye was padded.

**Surgical Technique of Group B with Autoconjunctival Graft:** Peribulbar block given. Pterygium tissue scrapped from the cornea and excised. A superotemporal graft taken and placed over the bare sclera with Graft edges embedded in the borders of conjunctiva. Eye is padded.

**Follow Up**

All patients were followed on post- operatively day 1, 1 wks., 3wks, 6 wks., 3month, and 6 month. The operated eye was evaluated for - Lid edema, Graft edema, Subconjunctival haemorrhage, Graft position, Recurrence.

**Statistical analysis:**

The collected data were filled in Microsoft Excel spread sheet. Data were analysed using SPSS (Statistical Packages of Social Science version 19th). Categorized data were represented in form of percentage quantitative data was represented in the form of Mean, Standard Deviation, to find out significant difference two groups. In qualitative variables unpaired “t” test was applied. For comparing categorical variables between two groups chi square test applied. P – Value was compared check at level of significance P= 0.050.

**4. Observations and Results**

In Present Study 60 patients were included in two groups, Group – A was without Glue of 30 Patients Group – B was with Glue of 30 Patients.

Distribution of patients according to gender:

Out of 30 patients Group I (without Glue), 10(33.33%) were male and 20 (66.67%) were females. In Group – 2 (with Glue), 11 (36.67%) & 19 (63.33%) were male & female respectively

**Table 1:** Distribution of patients in groups according to Gender

Gender	Group 1 (Without Glue)		Group 2 ( With Glue)	
	Number	Percentage	Number	Percentage
Male	10	33.33	11	36.67
Female	20	66.67	19	63.33
Total	30	100	30	100

**Distribution of patients according to age groups:**

In Group 1 (Without Glue): The maximum patients i.e.12 (40%) was from age-group 41-50 years & minimum i.e. 02(6.67%) was from age group of 20-30 years. The mean age of group 1 patients was 45.83±12.83 years. In Group 2 (With Glue): The maximum patient’s i.e.11 (36.67%) was from age-group 31-40 years. The mean age of group 2 patients was 45.20±11.24 years. In Group 1(without glue): The youngest patients found in the age group 20-30 years were 2 (6.67%), the youngest being 22 years. Whereas 6 patients were found in eldest age group more than 60 years ( 20%),the eldest being 62 years. In Group 2(with glue): The youngest patients were found in the age group 20-30 years were 3 (10%), the youngest being 24 years. Whereas 3 patients were found to have more than 60 years of age (10%), the eldest being 68 years.

**Table 2:** Distribution of patients in groups according to Age-Group

Age-group	Group 1 (without Glue)		Group 2 ( with Glue)	
	Number	Percentage	Number	Percentage
20-30	02	6.67	03	10.0
31-40	07	23.33	11	36.66
41-50	12	40.00	03	10.00
51-60	03	10.00	10	33.33
>60	06	20.00	03	10.00
Total	30	100%	30	100%
Mean ± SD	45.83±12.83		45.20±11.24	

**Post-operative lid edema:**

On day 1 in Group 1 (without Glue) 20 (66.67%) patients were found to have lid edema compared to Group 2 (with Glue) 17(56.67%) patients. The occurrence of lid edema was not statistically significant in Group 1 (without Glue) and Group 2 (with Glue) [p=0.426]. No patients of lid edema were reported at 1 week, 3 week, 6 week, 3 Months & 6 Months.

**Table 3:** Distribution of patients in groups according to postoperative Lid Edema

Lid Oedema at		Group 1 30 patients		Group 2 30 patients		Chi-Square Value	p- Value
		No.	Percentage	No.	Percentage		
Day 1	Present	20	66.67	17	56.67	0.635	p=0.426 NS
	Absent	10	33.33	13	43.33		
1 week	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
3 week	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
6 week	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
3 months	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
6 months	Present	00	00	00	00	--	--
	Absent	30	100	30	100		

**Post-operative graft edema:**

On day 1 in group 1 (without glue) 11 (36.67%) patients were found to have graft edema compared to group 2 (with glue) 9 (30%) patients. The occurrence of graft edema was not statistically significant in group 1 and group 2 (P=0.584). One patient of graft edema in group 1 was reported at week 1 (3.33%) which was not statistically significant. (P=0.313). No patients of graft edema were reported at week 3, week 6, 3 month and 6 month.

**Table 4:** Distribution of patients in groups according to postoperative Graft Edema

Graft edema at		Group 1 30 patients		Group 2 30 patients		Chi-Square Value	p- Value
		No.	Percentage	No.	Percentage		
Day 1	Present	11	36.67	09	30.00	0.300	p- 0.584 NS
	Absent	19	63.33	21	70.00		
1 week	Present	01	3.33	00	00	1.02	p- 0.313 NS
	Absent	29	100	30	100		
3 week	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
6 week	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
3 months	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
6 months	Present	00	00	00	00	--	--
	Absent	30	100	30	100		

**Post-operative subconjunctival haemorrhage:**

On day 1 in Group 1 (without glue) 13 (43.33%) patients were found to have SCH compared to group 2 (with glue) 3 (10%) patients. The occurrence of SCH was found statistically significant in group 1 and Group 2 (P=0.032). No patients of SCH were reported at week 1, week 3, week 6, 3 month and 6 month.

**Table 5:** Distribution of patients in groups according to Postoperative SCH

Sub-Conjunctival Haemorrhage at		Group 1 30 patients		Group 2 30 patients		Chi-Square Value	p- Value
		No.	Percentage	No.	Percentage		
Day 1	Present	13	43.33	03	10.00	4.36	p-0.032 Significant
	Absent	17	56.67	27	90.00		
1 week	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
3 week	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
6 week	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
3 months	Present	00	00	00	00	--	--
	Absent	30	100	30	100		
6 months	Present	00	00	00	00	--	--
	Absent	30	100	30	100		

**Post-operative graft position:**

On Day 1 in Group 1 (without glue) all 30 (100%) patient's grafts were well placed, compared to Group 2 (with glue) where 4 (13.37%) patient's grafts were displaced, which was reposted on Day 1. The Graft position was found statistically

significant in Group 1 and Group 2 (P=0.038) None of the patients grafts was displaced at end of 1 week, 3 weeks, 6 weeks, 3 months and 6 months

Complications at		Group 1 30 patients		Group 2 30 patients		Chi-Square Value	p- Value
		No.	Percentage	No.	Percentage		
Day 1	Well placed	30	100	26	86.67	4.29	p-0.038 Significant
	Displaced	00	00	04	13.33		
1 week	Well placed	30	100	30	100	--	--
	Displaced	00	00	00	00		
3 week	Well placed	30	100	30	100	--	--
	Displaced	00	00	00	00		
6 week	Well placed	30	100	30	100	--	--
	Displaced	00	00	00	00		
3 months	Well placed	30	100	30	100	--	--
	Displaced	00	00	00	00		
6 months	Well placed	30	100	30	100	--	--
	Displaced	00	00	00	00		

**Recurrence:**

No recurrence of pterygium in Group 1 (without glue) and Group 2 (with glue) was found.

**Table 7:** Distribution of patients in groups according to Recurrence of pterygium

Recurrence	Group 1 (Without Glue)		Group 2 (With Glue)	
	Number	Percentage	Number	Percentage
Present	00	00	00	00
Absent	30	100	30	100
Total	30	100	30	100

**5. Discussion**

Among various methods, conjunctival autografting is a promising technique for pterygium surgery and has gained popularity in last 2-3 decades because of its easy accessibility, low recurrence rate and less complications. Conjunctival autografting after pterygium excision is associated with very low rates of recurrence and complications when compared with other techniques. "Autoconjunctival Graft" can be placed over the cornea by sutures, fibrin glue and autologous blood.

Pterygium excision with autoconjunctival graft with sutures - Cost-effective and patient discomfort was found to be higher. Pterygium excision with autoconjunctival graft with glue -No discomfort postoperatively, less cost effective, patients may experience allergic reactions. Pterygium excision with autologous blood-simple technique, cost effective procedure and least time consuming procedure. Hence the present study was undertaken to analyse the results sutureless pterygium surgery by autoconjunctival graft with and without glue and expected to provide us valuable data, post-operative result, complications and recurrence. Sayli Bhalchandra Kulthe, et al studied a total of 79 eyes of 74 patients who underwent sutureless and glue-free autologous conjunctival limbal auto graft after



pterygium excision. There were 53 female (mean age- 46.85 years standard deviation (SD) -10.59) and 26 male (mean age-45.04 Years SD-17.27) patients similar to the present study. In the present study, Group 1 (Without Glue) the maximum patients i.e. 12 (40%) were from age-group 41-50 years & minimum i.e. 02(6.67%) 49 from age-group of 20-30 years. The mean age of group 1 patient was  $45.83 \pm 12.83$  years. In Group 2 (With Glue): The maximum patient's i.e.11 (36.67%) was from age-group 31-40 years. The mean age of group 2 patient was  $45.20 \pm 11.24$  years. In the present study on Day 1 in Group 1 (without glue) all 30(100%) patient's grafts were well placed, compared to Group 2 (with glue) where 4 (13.37%) patient's grafts were displaced, which was repositioned on Day 1. The Graft position was found to be statistically significant in Group 1 and Group 2 ( $P=0.038$ ) None of the patients grafts was displaced at end of 1 week, 3 weeks, 6 weeks, 3 months and 6 months.

A study done by Hall RC, Logan AJ, Wells AP et al showed the complications in the fibrin glue group, included one patient with an absent graft at week 1 that required revision of the graft. No recurrences were noted at the end of three months. A study by Miranda -rollon, Martinez -Rodríguezes showed that 1 patient of glue group lost the graft. In the present study on Day 1 in Group 1 (without Glue), 20 (66.67%) patients were found to have lid edema, compared to Group 2 (with Glue) 17(56.67%) patients were found to have lid edema. This occurrence of lid edema wasn't statistically significant in Group 1 (without Glue) and Group 2 (with Glue) [ $p=0.426$ ]. No patient with lid edema was reported at the end of 1 week, 3 weeks, 6 weeks, 3 Months & 6 Months.

In Dr. Mitra's study<sup>112</sup> - a prospective, no comparative, interventional case series conducted in India - 19 patients underwent graft fixation with autologous blood. The mean surgical time was 11 minutes, no grafts were displaced, few cases of lid edema were found only on first few days and none of the pterygium recurred in the study on six months of follow up.

In Dr. Ashok K Sharma's study<sup>113</sup> out of 150 cases, who underwent graft fixation with autologous blood, recurrence during the follow up period was seen in 4 patients - 2.6%, 2 patients had graft retraction on nasal side. In the present study on Day 1 in Group 1(without glue)11(36.67%) patients were found to have graft edema compared to Group 2 (with glue) 9 (30%) patients had graft edema. The occurrence of graft edema was not statistically significant in Group 1 and Group 2 ( $P=0.584$ ). One patient of graft edema in Group 1 was reported at week 1 (3.33%) which was not statistically significant ( $p=0.313$ ). No patients of graft edema were reported at week 3, week 6, month 3 and month 6.

Sarnicola et al. indicated that 40.5% of eyes fulfilled the clinical diagnosis of graft edema 7 days after surgery, yet all cases resolved during the 1st month of follow-up. On the other hand, Dadeya et al. reported graft edema in only 2.8% of eyes.

In the present findings and the findings of Kheirkhah et al., it seems that all conjunctival grafts exhibit some visible degree of graft edema. This study seems to suggest that self-

limiting conjunctival graft edema invariably occurs in early post-operative period of all patients. Although the exact mechanism of post-operative graft edema remains unknown, this edema has been attributed to excessive surgical manipulation. In the present study on Day-1 in Group-1 (without glue) 13 (43.33%) patients were found to have SCH compared to 3 (10%) patients in Group-2 (with glue). The occurrence of SCH was found to be statistically significant in Group-1 and Group-2 ( $P=0.032$ ). No patients of SCH were reported at week 1, week 3, week 6, 3 month and 6 months and Tseng demonstrated that increased inflammation during the postoperative period increases the risk of pterygium recurrence<sup>116</sup> and also showed in their study that there was no significant difference in the degree of SCH between the groups at any point during the follow-up period ( $p = 0.417$ ,  $p = 1$  and  $p = 1$ , at 1 week, 1 month and 3 months, respectively). In the present study, recurrence of pterygium in Group 1 (without glue) and Group 2 (with glue) was not found. Also similar finding was noted by Sayli Bhalchandra Kulthe, et al de with whereas these findings were contradicted by Shaaban A.M. Elwan. In adults, previous studies had shown the good outcome of sutureless glue-free autografting. Pterygium excision with conjunctival auto graft is a well-accepted technique and is currently one of the most commonly used methods for pterygium surgery. It has been shown to be safe and effective at reducing post-operative recurrences. Sutureless and glue free conjunctival auto graft technique is easy, safe, effective, prevents potential adverse reactions encountered with the use of foreign materials. This technique has an acceptable pterygium recurrence rate that is comparable to conventional sutured conjunctival auto graft for primary pterygium.

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Nil

## 7. Conflict of interest

There are no conflicts of interest

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