# A Comparative Study to Evaluate the Outcome of Sutures versus Fibrin Glue In Conjunctival Autograft Technique For Primary Pterygium Excision

Dr. Ajay Tammewar[1], Dr. Sonali G. Biradar[2], Dr. Roopa Naik[3]

[1]Professor, [2]Resident, [3]Professor & Head, Department of Ophthalmology, DVVPF's Medical College & Hospital, Ahmednagar-414111, Maharashtra, India.

**Corresponding Author:** Dr. Sonali G. Biradar

**Email ID:** sonalibiradar175@gmail.com

**Address:** Department of Ophthalmology, DVVPF's Medical College & Hospital, Ahmednagar-414111, Maharashtra, India.

**Abstract :**

**Background:** Pterygium is degenerative condition of the subconjunctival tissue which proliferates as vascularized granulation tissue and is characterized by formation of a triangular fold of conjunctiva encroaching on the cornea leading to visual impairment, restriction of ocular motility, chronic inflammation and cosmetic concerns. Surgical removal is the treatment of choice, but recurrence can be a problem. Now, Fibrin glue is being tried since few years to secure grafts in place of the sutures. The objective of this study was to compare duration of surgery, immediate postoperative complications which includes an inflammation, subconjunctival haemorrhage, patient comfort, graft stability between the uses of fibrin glue versus sutures. **Methods:** A total of 40 patients having primary pterygium were included in the study. 20 patients were underwent pterygium excision surgery and conjunctival autografting using absorbable vicryl 8-0 suture and 20 patients underwent pterygium excision surgery and conjunctival autografting using fibrin glue. These 2 groups were compared in terms of duration of the surgery, inflammation, degree of postoperative discomfort, subconjunctival haemorrhage and graft stability at postoperative day 1. **Results:** The mean surgery time in fibrin glue group was 15 minutes and mean surgery time in suture group was 28 minutes ($p=0.000$). Fibrin glue group had significantly lesser inflammation ($p=0.001$) as well as postoperative discomfort ($p=0.000$) compared to suture group at postoperative day 1. There was no significant difference found in the degree of subconjunctival haemorrhage between the fibrin glue versus sutures groups ($p=0.887$ and $p=0.797$ at day 1). The grafts secured with fibrin glue were as stable as those secured with the sutures ($p=0.745$, 0.644 at day 1). **Conclusion:** The fibrin glue group in conjunctival autografting had significantly less surgery time, which also produces significantly less postoperative discomfort as well as inflammation with grafts being as stable as those secured with sutures. Fibrin glue can be used regularly if patients can be pooled together and operated on, by making it cost effective procedure.

**Keywords:** Pterygium; Conjunctival autografting; Fibrin glue.

**Introduction:**

Pterygium takes its name from the Greek word, pterygos meaning "wing" and was described by Hippocrates, Galen and others.[1,2] The term pterygium was introduced to the English language in 1875 by Walton.[3] Pterygium is a degenerative condition of the subconjunctival tissues which proliferate as vascularised granulation tissue to invade the cornea, destroying the superficial layers of the stroma and Bowman's membrane, the whole being covered by conjunctival epithelium.[4] It usually occurs at the nasal limbus on the horizontal axis. Occasionally they occur at the corresponding position on the temporal limbus. Pterygium is more common in people living in hot climates and in those who work outdoors. Therefore, the most accepted view is that it is a response to prolonged effect of environmental factors such as exposure to sunlight (ultraviolet rays), dry heat, high wind and abundance of dust.

Parts of a fully-developed pterygium are as follows:

- Head: Apical part present on the cornea,
- Neck: Constricted part present in the limbal area,
- Body: Scleral part, extending between limbus and the canthus.
- Cap: Semilunar whitish infiltrate present just in front of the head.



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Types- Based on the extent, pterygium has been described of three types:

- Type I pterygium extends less than 2 mm onto the cornea.
- Type 2 pterygium involves upto 4 mm of the cornea.
- Type 3 pterygium encroaches onto more than 4 mm of the cornea and involves the visual axis.

The difficulty in treating this deceptively benign disease stems from our lack of understanding of this condition, and its propensity for recurrence after surgical excision. There is a plethora of surgical and medical measures currently available for pterygium, with no consensus regarding the "ideal" treatment.[5]

Conjunctival autografting after pterygium excision is associated with very low rates of recurrence and complications when compared with other techniques. Nevertheless graft suturing has the disadvantage of longer surgery time and complications such as granuloma formation, giant papillary conjunctivitis and significant patient discomfort after surgery.[6] Lately fibrin based glues for conjunctival autografting have been used to minimize operating time and discomfort associated with sutures.[7]

**Materials & Methods:**

Objective: The fibrin glue versus sutures for fixating conjunctival autografts after primary pterygium excision were used to compare the duration of surgery, immediate postoperative complications, patient comfort and graft stability.

**Study design:** This is Hospital based, prospective, comparative study.

**Duration of study:** September 2019 to January 2020

**Sample Size:** Forty (40) cases of primary pterygium attending the outpatient department.

**Sampling Method:** Simple random sampling

**Inclusion Criteria:**

1.Patients willing to participate in the study.

2.Patients ready to give written informed consent.

3.Patients with primary pterygium consenting for surgery and with any of the following denotements for surgery like Pterygium with encroachment upon visual axis, inducing visually significant astigmatism of 1 D or more than 1D , leading recurrent inflammation or cosmetically nettlesome to the patients.

**Exclusion Criteria:**

1.Recurrent pterygium

2.Atrophic pterygium

3.Patients which are on anticoagulants

4.Patients having pre-existing glaucoma

5.Patients with immune system disease and also with eyelid or ocular surface diseases eg- blepharitis, sjogren syndrome and dry eye.

6.Patients which have known hypersensitivity to any component which are present in the fibrin glue.

**Method of study:** After informed consent, data was collected using a piloted proforma meeting the objectives of the study by means of personal interview with the patients. Patients who fulfill the inclusion and exclusion criteria were included in the study. Routine ophthalmic examinations like visual acuity, slit lamp examination, fundus evaluation and keratometry readings were taken in all patients those included in the study.

**Grading of Post-Operative Discomfort**[8]

Grade 0: None or no symptoms

Grade 1: Very mild or that symptom is easily tolerated

Grade 2: Mild or that symptom causes some discomfort

Grade 3: Moderate or that symptoms partially interferes with daily activities

Grade 4: Severe or that symptoms interferes completely with usual activities or sleep.

**Grading of Inflammation**[8]

Grade 0- No dilated corkscrew vessel in graft

Grade 1- 1 bright red,dilated corkscrew vessel crossing the graft bed margin.

Grade 2 : 2 bright red dilated corkscrew vessels crossing the graft bed margin.

Grade 3 : 3 bright red dilated corkscrew vessels crossing the graft bed margin.

Grade 4 : ≥3 bright red dilated corkscrew vessels crossing the graft bed margin.



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**Grading of Graft Stability**[8]

Grade 0:All four sides of the graft margin are well apposed

Grade 1:Gaping/displacement of one side of the graft-bed junction

Grade 2:Gaping/displacement of two sides of the graft-bed junction

Grade 3: Gaping/displacement of three sides of the graft-bed junction

Grade 4: Graft completely displaced from the bed.

**Grading of Sub conjunctival Haemorrhage**[8]

Grade 0- none

Grade 1- ≤25% of size of the graft

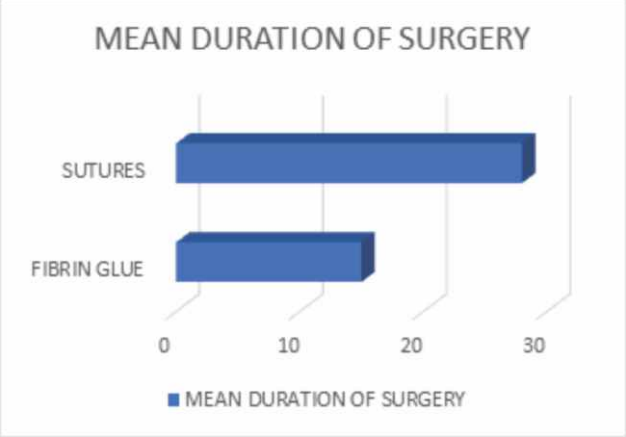
Grade 2 - ≤50% of size of the graft

Grade 3- ≤75 of size of graft

Grade 4- Haemorrhage involving the entire graft.

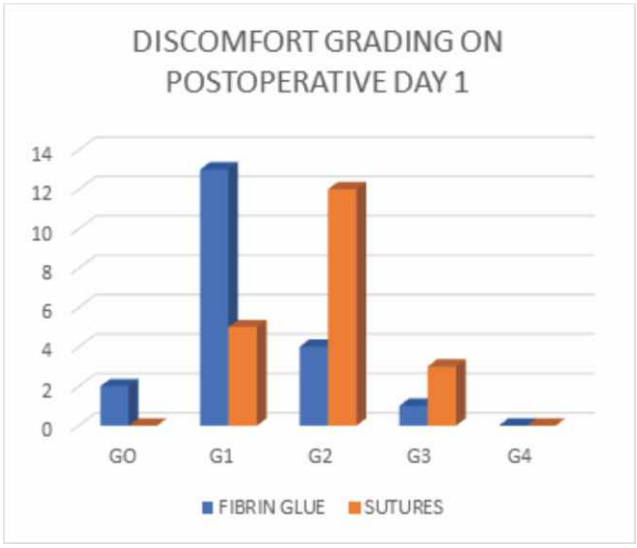
**Observation & Results:**

The mean duration of surgery was found to be 15 minutes in the fibrin glue group. (Range 13-19 min). The mean duration of surgery was found to be 28 minutes in the suture group (range 21-30 min).The difference between the two groups was found to be highly statistically significant(p=0.000)



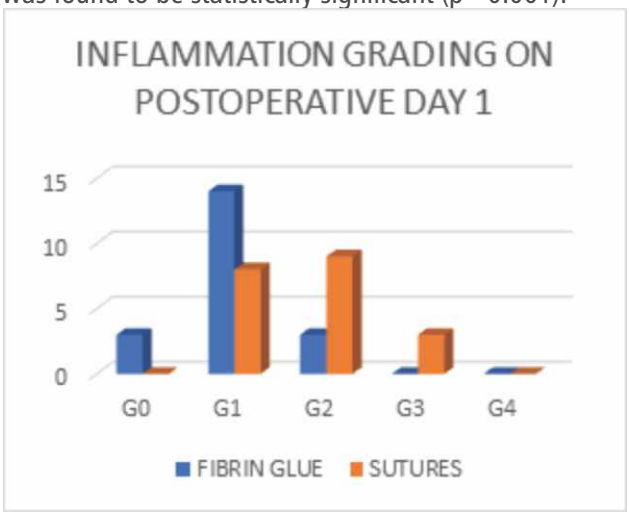

**Discomfort Grading On Postoperative Day 1**

On post-operative day 1, 2 patients had grade 0, 13 patients had grade 1, 4 patients had grade 2 and 1 patient had grade 3 discomfort in fibrin glue group. In suture group, no patient had grade 0, 5 patients had grade 1, 12 patients had grade 2 and 3 patients had grade 3 discomfort. The difference between the two groups was found to be statistically significant (p=0.000).




**Inflammation Grading On Postoperative Day 1**

On post-operative day 1, 3 patients had grade 0, 14 patients had grade 1, 3 patients had grade 2 and no patient had grade 3 inflammation in fibrin glue group. None had grade 0, 8 patients had grade 1, 9 patients had grade 2 and 3 patients had grade 3 inflammation in suture group. The difference between the two groups was found to be statistically significant (p=0.001).




**Subconjunctival Haemorrhage(SCH) Grading On Postoperative Day 1**



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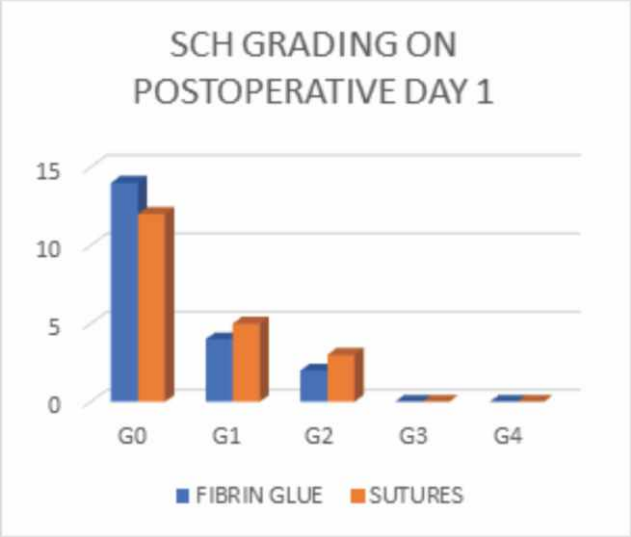
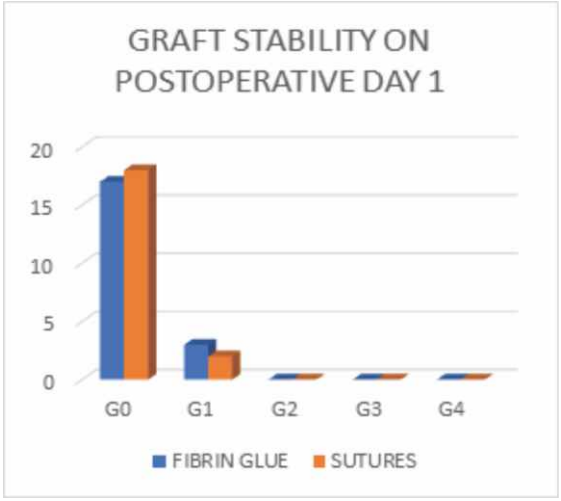
On post operative day 1, in fibrin glue group, 14 patients had grade 0, 4 patients had grade 1, 2 patients had grade 2 and no patient had grade 3 and 4 subconjunctival haemorrhage. In suture group, 12 patients had grade 0, 05 patients had grade 1, 3 patients had grade 2 and no patient had grade 3 and 4 subconjunctival haemorrhage. The difference between the 2 groups was not found to be statistically significant (p=0.887).




**Distribution According To Graft Stability Grading On Postoperative Day 1**

On post operative day 1, 17 patients had grade 0, 3 patients had grade 1, and none had grade 2, 3 and 4 graft stability in fibrin glue group. 18 patients had grade 0, 2 patients had grade 1 and none had grade 2,3 and 4 graft stability in suture group. The difference between the 2 groups was not found to be statistically significant (p=0.745).




**Discussion:**

Total forty (40) patients were studied who underwent primary pterygium excision and conjunctival autografting. The patients were selected randomly and divided into two groups of 20 patients in each group. One group who underwent autografting using fibrin glue and the other group using absorbable 8-0 vicryl suture. The 2 groups were compared in terms of duration of surgery, post-operative discomfort, inflammation, sub-conjunctival haemorrhage, graft stability at postoperative day 1.

The mean duration of surgery was found to be 15 minutes (range 13-19 min) in fibrin glue group and in the suture group mean duration of surgery was found to be 28 minutes (range 21-30 min). The operation time was significantly shorter in the fibrin glue group than in the suture group (p=0.000). In the study by Koranyi et al[9], the average surgery time was 9.7 minutes (range 6-13) for glue and 18.5 minutes (range 12-30) for sutures, p<0.001). Uy et al[10] also concluded in their study that the average operating time for the fibrin glue group was significantly shorter (p<0.001) compared to suture group.

In the present study, a significant difference was found in the degree of postoperative discomfort between the two groups at postoperative day 1 (p=0.000 both at post op day 1), with suture group being associated with more discomfort than fibrin glue group. Ozdamar et al[11] in their study concluded that patient comfort was significantly higher in the tissue glue group than the vicryl suture group (p<0.05).

In the present study, a significant difference was present in the degree of postoperative inflammation between the two groups at postoperative day 1 (p=0.001 both at post op day 1), with suture group being associated with more postoperative inflammation than fibrin glue group. Arora et al[12] in their study reported that postoperative inflammation was less often seen with fibrin glue compared to suture, similar to results of present study.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In the present study, there was no significant difference found in the degree of postoperative sub conjunctival haemorrhage between the 2 groups at post operative day 1($p=0.887$). Srinivasan et al[8] in their study, concluded that there was no significant difference in degree of postop SCH between the fibrin glue and suture groups at any point of time in the follow-up period.

In the present study, the conjunctival autografts secured with fibrin glue were as stable as those secured with sutures at post operative day 1, ($p=0.745$). Koranyi et al[9], in their study reported no transplant losses or dislocations either in fibrin glue or suture group.

**Conclusion:**

In the literature for pterygium surgery, various types of surgical techniques have been described. To achieve complete pterygium excision these various techniques having been devised.

In this study we found that fibrin glue use was associated with significantly shorter duration of surgery, also lesser postoperative discomfort and inflammation compared to suture. Grafts secured with fibrin glue were as stable as those secured with sutures. There was no difference found in the degree of subconjunctival haemorrhage. Fibrin glue use was also found to be safe.

The high cost of fibrin glue may become a drawback. This drawback can be overcome by pooling patients together and operating on many patients on a single day by using single kit thus making it as a cost effective procedure.

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