A COMPARATIVE STUDY OF FIBRIN GLUE & SUTURES FOR ATTACHING CONJUNCTIVAL AUTOGRAFT AFTER PTERYGIUM SURGERY

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ABSTRACT: The purpose of this study is to compare the surgical outcome, complications and recurrence and recurrence rate between limbal conjunctival autograft with suturing and fibrin glue.

METHODS: 50 eyes of 50 patients suffering from unilateral or bilateral pterygium were randomly divided in two groups. Group A patients were surgically treated by conjunctival autograft with suturing and group B patients by conjunctival autograft with fibrin glue. **RESULT:** Out of 25 patients in group A graft edema was found on day 1 following surgery in 22 patients while in group B it was observed in 2 patients. In group A Sub conjunctival haemorrhage was found in 11 patients while in group B it was found in 4 patients; similarly in group A Graft dehiscence was found in 1 patient and in group B it was found in 2 patients. In group A, recurrence was found in 4 patients and in group B, it was found in one patient only. There were 56% males & 44% female patients in group A and 68% males and 32% females in group B. In maximum cases right eye was involved (64% in group A & 60% in group B) Mean time duration in surgery for group A is 21-25 minutes & mean time duration in surgery for group B is 16-20 minutes. **CONCLUSION:** This study support the superiority of fibrin glue can significantly reduce the recurrence rate without increasing the risk of complications.

KEYWORDS: Fibrin glue, Sub conjunctival haemorrhage, Pterygium, Graft dehiscences, Graft edema, Recurrence.

INTRODUCTION: Pterygium surgery is one of the most common surgery for continued research among Ophthalmic surgery to avoid post-operative complication of recurrence of pterygium.

The pterygia were graded according to the system used by Tan et al:

1. Grads I (Atrophic) episcleral vessels under the body of the pterygium are obscured and clearly distinguished.
2. Grade 2 (Intermediate) all other pterygia not falling into the 1st and 3rd stages.
3. Grade 3 (Fleshy) episcleral vessels totally obscured.

Pterygium creates many problems for patients as irritation, foreign body sensation, cosmetic disfigurement, reduced visual acuity, problems in fitting contact lenses.

Some adjunctive treatment for pterygium surgery might induce severe complications, such as scleral necrosis and corneal ulcer. Autologous conjunctival grafting or limbal conjunctival autografting is demonstrated by many studies to be the best method with and low recurrence rate and high safety and limbal conjunctival autografting is considered to be more effective in recurrent pterygium.

Kenyon et al (1950) introduced the surgical technique of using conjunctival autograft in the management of primary advanced and recurrent pterygium.^[1]

The use of fibrin glue (FG) during pterygium surgery was first described by Cotien et al in 1993.^[2]

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Since then, there have been several reports on the safety and efficacy of FG during pterygium surgery. FG leads to significantly lower recurrence rate when compared with the use of sutures. Although it is conceptualized that pterygium surgery with FG produces less postoperative inflammation when compared with sutures.

The conjunctival autograft attached to the sclera by suturing, which prolongs operation time and is associated with drawbacks, such as postoperative discomfort and suture-related complications. Thus, fibrin glue, as an alternative for suturing for conjunctival closure has been applied in pterygium surgery because of its advantage in decreasing operation time, improving postoperative comfort and avoiding suture related problems.

AIMS AND OBJECTIVE:

- To study the efficacy and safety of limbal conjunctival autograft transplantation after use of conjunctival suturing.
- To compare the surgical outcome between limbal conjunctival autograft with suturing and fibrin glue.
- To study and compare the complications and recurrence rate in two groups.
- To use the study as a mean and measure to document the role of fibrin glue as an ancillary and in the management of patients with pterygium.

REVIEW OF LITERATURE: Robert cohen and Mc Donald et al (1993) studied the effectiveness and safety of fixation of conjunctival auto graft with an organic tissue adhesive in 6 patients with pterygium. The tissue adhesive was prepared 15 minutes before surgery starts and was applied in layer to the denuded area. The graft was carefully positioned and secured with four absorbable corner sutures in addition. The main advantage of this technique is that it reduces the duration of surgery by about one third compared with suturing alone.^[2]

Riordan – Eva P, Kielhorn I, Ficker LA et al (1993) in a retrospective survey of 117 operations for primary or recurrent pterygium, conjunctival auto grafting was compared with both excision without conjunctival closure (Bare sclera excision) and excision with complete conjunctival closure.

The probability of corneal recurrence at 36 months after surgery was determined by survival cure analysis. In previously unoperated cases conjunctival auto grafting (n=15) resulted in a 14% probability of recurrence, compared with 82% for bare sclera excision (n=15). Hazard, ratio analysis confirmed the statistical significance of the results at the 95% confidence level. Conjunctival auto grafting was more likely to produce an improvement in visual acuity than other forms of surgery.^[3]

Chen PP et al (1995) in his prospective study of 64 patients of which 24 patients received Mitomycin –c (0.2mg/ml twice daily for 5 day), 23 conjunctival autograft and 17 placebo after bare sclera excision, studied the rate of recurrence and complication. The recurrence rate after mitomycin-c and conjunctival autograft was 38% and 39% of eyes respectively after mean follow up period of 12.3 and 13.5 months respectively. The recurrence rate follow up of 9.3 months. He found that increasing age was associated with significantly fewer recurrence after controlled for pterygium type and treatment. He found the mean time of recurrences varied from 3.7 to 4.8 months. No group had significantly more complications except recurrence. He concluded that mitomycin-c and conjunctival autograft are equally effective as adjunctive treatment after excision of primary pterygium and the increasing patients age is associated with significantly less risk of recurrence.^[4]

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Rao S. K. et al (1998) retrospectively studied efficacy of conjunctival limbal autografts for primary and recurrent pterygia in 53 eye of 51 patients. All the surgeries were performed under peribulbar anaesthesia. The graft was taken from supero temporal conjunctival and sutured in sclera bed with 10-0 nylon sutures. Post- operatively topical betamethasone eye drops were used for 5-6 weeks of the 51 patients analysed, 74.5% were men and 25.4% were women, Mean age of study population was 42.7% years and 60.4% of the right eyes and 39.6% of the left eyes were involved 67.9% of the patients had primary pterygia while 32- 17 had recurrent pterygia. Ptenygium was nasal in 86.8% while 7.5% were temporal and 5.7% were having both nasal and temporal pterygium.

Mean follow up period was 18.9 months ranging from 1.5 to 43 months. At least follow up, 43.4% eyes had improvement in best corrected visual acuity, in 52.8% eyes, best correct visual acuity remain stable, while 3.8% of eyes show deterioration. Recurrence was noted in 2(3.8%) eyes are 3.5 months. Both the patients were 40 years or younger in age and had primary pterygium. Bottom holing of graft in one patient, sutures cut through in 2 eyes, corneal dellen in one eye while graft edema was seen in all patients. No sight threatening complications were noted.^[5]

Angus KK Wong, Srinivas Rao et al (2000) studied the safety and efficacy of inferior limbal conjunctival autograft transplantation in 11 eyes with recurrent pterygium in a prospective non-comparator case series. A standard surgical technique essentially similar to that described by Kenyon et al was performed under perbulbar anaesthesia. A limbal conjunctival autograft with approximately 20% of corneal stroma extending 0.5–1mm into dear cornea of about 0.5mm larger than the exposed scleral bed was secured with 10-0 nylon suture at limbal margin and 8-0 vicryl sutures for conjunctival margins. The mean age of the patients treated was 63.3±3.1 years. The mean post-operative follow up was 16.2 ±0.9 months. At last follow- up, 7(63.6%) eyes had an improvement in best corrected visual acuity and was maintained in 4(36.7%) eyes postoperative complications in the form of pseudopterygium formation (5eyes), corneal dellen (1 eye) and recurrence was seen in 2(18.2%) eyes, recurrences were across the graft, non-progressive and did not require further surgery. They concluded that inferior limbal conjunctival autograft transplantation is safe and effective option in management of recurrent pterygium, recurrences after superior limbal conjunctival autograft transplantation and in patients undergoing filtering surgery.^[6]

Fayez AL (2002) studied 79 patients with advanced primary and recurrent pterygia underwent conjunctival autograft in 36 patients and conjunctival limbal autograft in 43 patients. The mean follow up period was 49 months. Corneal epithelial defects healed within 4 days and graft sites within 10 days in both groups. All grafts showed mild transient edema, no operative or post-operative complications were encountered in either group. Out of 36 patients, 6 recurrences, 2 occurred in patients with primary pterygia (8%) and 4 occurred in recurrent pterygia (33%), of the 43 patients in the conjunctivo-limbal auto graft there were no recurrences. This they found that conjunctivo–limbal autograft transplantation safe and effective in preventing recurrence of advanced and recurrent pterygia.^[7]

UY HS, Reyes JM, Flores JD, Lim Bon Siong R. (2005) conducted a study compare the efficacy and safety of fibrin glue and suturing for attaching conjunctival autograft among patients undergoing pterygium excision. Superior conjunctival autograft was harvested and transferred onto bare sclera after pterygium excision- fibrin glue (Beri plast P) was used to attach the auto graft in 11 eyes. The patients were followed up for 2 months. All conjunctival autografts in both groups were successfully attached and were in fact after 2 months. The average operating time for the fibrin glue group was significantly shorter ($p<0.001$).

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Postoperative symptoms were fewer for the fibrin glue group than the suture group. One patient (9%) from the fibrin group experienced subconjunctival hemorrhage and 1 patient (9%) from the suture group experienced partial graft dehiscence. They concluded that fibrin glue is a safe and effective method for attaching conjunctival autografts. The use of fibrin glue results in shorter operating times and less postoperative discomforts.^[8]

Srinivas S (2009) compared the use of fibrin glue verses sutures for fixating conjunctival autografts in patients undergoing pterygium excision fifty patients (950eyes) with pterygium undergo pterygium surgery using either fibrin glue (25eyes) or 8-0 vicryl suture (25eyes) to attach the conjunctival auto graft. The patients were followed up for 12 months. Outcome measures were postoperative patient comfort, duration of surgery and recurrence of pterygium. He found that in the fibrin glue group the mean operation time was 15.7(SD2.4) minutes (Range 12-18min) and in the suture group ($p<0.001$) it was 32.5(6.7) minutes (range 25-40min).

METHOD: In the present study, 50 eyes of 50 patients were thoroughly examined, visual acuity, condition of the conjunctiva, sight, laterality & type of pterygium (Progressive/atrophic).

PROCEDURE: Under aseptic precaution facial block was given, surgery was carried out under sub conjunctival infiltration of anaesthetic agent (2% Lignocaine with adrenaline). A small incision is made in conjunctiva just medial to head of pterygium and is dissected from the body toward canthus. Corneal epithelium 1mm ahead of head is scraped off with knife to remove degenerated tissue.

Pterygium is excised with involved tenon to leave bare area of sclera. Size of conjunctival autograft required to resurface the exposed sclera surface is determined by using caliper. Graft is excised from superior conjunctiva and flipped over to cornea slide on it without lifting to maintain limbus to limbus orientation and towards inversion of epithelial surface.

Graft is then secured in position by using 10-0 nylon suture or fibrin glue pad and bandage with antibiotic steroid drop.

Post-operative treatment:

- Antibiotic steroid drop 6 times 1 day for the first week then tapered over next 5-6 weeks.
- Sutures were removed after 2 weeks.

Follow up:

Patients were followed up at regular interval upto six months.

OBSERVATION AND RESULTS:

Sex	Group A		Group B	
	No. of patient	% Age	No. of patient	% Age
Male	14	56%	17	68%
Female	11	44%	8	32%
Total	25	100%	25	100%

Table 1: Sex Distribution of Cases

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Figure 1

Eye Involved	Group A		Group B	
	No. of patient	% Age	No. of patient	% Age
Right	16	64%	15	60%
Left	9	36%	10	40%
Total	25	100%	25	100%

Table 2: Distribution of Eyes Involved

Figure 2

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Time	Group A	Group B
10-15 Min	-	3
16-20 Min	1	19
21-25 Min	17	3
26- 30 Min	7	-

Table 3: Average Time Distribution of Surgery

Figure 3

Sl. No.	Post-operative complications	Day 1	Day 7	1 Month	3 Month
1.	Foreign body sensation	25	22	5	-
2.	Graft edema	22	18	11	-
3.	Subconjunctival Haemorrhage	11	9	8	1
4.	Granuloma formation	-	-	-	-
5.	Graft Dehiscence	1	-	-	-
6.	Scleral ulceration	-	-	-	-
7.	Recurrence	-	-	-	4

Table 4: Post-Operative Complications in Group A

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Figure 4

Sl. No.	Post-operative complications	Day 1	Day 7	1 Month	3 Month
1.	Foreign body sensation	25	15	1	-
2.	Graft edema	21	11	6	-
3.	Subconjunctival Haemorrhage	4	4	2	-
4.	Granuloma formation	-	-	-	-
5.	Graft Dehiscence	2	-	-	-
6.	Scleral ulceration	-	-	-	-
7.	Recurrence	-	-	-	1

Table 5: Post-Operative Complications in Group B

Figure 5

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DISCUSSION: In Group A, 56% of the patients were male and 44% were female and in group B 68% patients were male and 32% were female (As shown in table 1).

Angus Wong KK (2000) observed 63.33% patients were male and 36.36% patients were female.^[6]

Srinivas et al (1998) observed the mean age of study was 42 ± 14.5 yrs while 74.5% of the patients were male and 25.4% of the patients were females.^[9]

Table No. 2 shows the distribution of eyes involved. In the group A, 64% have involvement of their right eye and in group B, 60% have their right eye involved.

Srinivas et al (1998) observed pterygium was present in 60.4% of right eyes and 39.6% of the left eyes.^[9]

Table No. 3 depicts time required during surgery. In the present study in group A, maximum required is 21-25 minutes (mean time required was 23.94 minutes with SD of ± 2.41 & in group B maximum time required is 16-20 minutes (mean time required was 17.92 minutes with S.D. of ± 1.98)

Uy HS, Reyes JM (2005) found that in the fibrin glue group, the mean operation time was 15.7 (SD 2.4) minutes 9range 12-18 min. and in the suture group, it was 32.5 minutes (SD 6.7) (range 25-40 min).

Table No. 4 shows the post-operative complications in group A. Early postoperative complication was F.B. sensation, sub conjunctival haemorrhage and graft dehiscence. F.B. sensation and sub conjunctival haemorrhage resolve with time.

Table No. 5 depicts post-operative complication in group B which was F.B. sensation subconjunctival haemorrhage and graft dehiscence F.B. sensation and sub conjunctival haemorrhage resolve with time.

Our results were consistent with the studies conducted by Wong et al (2000) and Al Fayed et al (2006) who reported similar results.^{[6],[7]} Al Fayed showed subconjunctival haemorrhage in 2 (5.5%) patients.

The highest complication rate 9% in both the fibrin glue group (1/11) and suture group (1/4) was reported in the same study by UY et al.^[8] Kenyon et al (1985) in their study noted 0% recurrence in primary pterygium following conjunctival autograft transplantation.^[1]

Rao S. K. et al (1999) reported 5.5% recurrence for primary pterygium following conjunctival autograft transplantation.^[5]

CONCLUSION: The following conclusions were drawn from this study;

- Male preponderance was seen as in group A 56% of the patients were male and 44% were female. In group B, 68% were male and 32% were females.
- Right eye was predominantly involved as in group A 64% and in group B, 60% patients have their right eye involved.
- The average operating time for fibrin glue group was significantly shorter. The mean time required was 23.94 minutes with SD of ± 2.41 in suturing group and in fibrin glue group, mean time required was 17.92 minutes with SD of ± 1.98 .
- Post-operative complications were fewer for the fibrin glue group than the suture group.

Fibrin glue is more effective in reducing the recurrence rate and significantly reduce the operating time for conjunctival autografting surgery. Therefore we conclude that the use of fibrin glue in pterygium surgery has a better surgical outcome and is recommended.

Figure 6

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