FIBRIN ADHESIVE VERSUS SUTURES FOR CONJUNCTIVAL AUTOGRAFTING IN PTERYGIUM SURGERY- A PROSPECTIVE COMPARATIVE STUDY
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ABSTRACT

BACKGROUND

Pterygium is a common ocular surface lesion. High rates of recurrence make its management challenging. Use of fibrin bio-tissue adhesive (fibrin glue) for attaching the grafts may shorten operating time, improve postoperative comfort and avoid suture-related complications.

The aim of the study is to reveal the effectiveness and safety of using fibrin glue in place of sutures during conjunctival autograft surgery for primary pterygium.

MATERIALS AND METHODS

A randomised clinical trial of 132 patients (132 eyes) admitted at Regional Institute of Ophthalmology, Trivandrum, for excision of primary pterygium was selected for a period of 9 months (January 2010 - September 2010).

RESULTS

Mean duration of surgery was 15.80 ± 1.56 minutes in fibrin group compared to 36.17 ± 2.44 minutes in suture group and was found to be statistically significant. The postoperative inflammatory response, so the intensity of the postoperative complaints were significantly lower in patients treated with fibrin glue.

CONCLUSION

The duration of surgery was significantly shorter in the fibrin group than in the suture group. The postoperative discomfort was significantly low in the glue group compared to other group. Signs of postoperative inflammation subsided earlier in the glue group, while they lasted longer in the suture group. Rate of recurrence was observed to be statistically insignificant between the two groups.

KEYWORDS

Pterygium, Fibrin Bio-Adhesive, Autograft, Conjunctival autograft.

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BACKGROUND

Pterygium is a very common ocular surface lesion in our country characterised by wing-shaped growth encroaching from conjunctiva on to the cornea. UV light-induced localised damage to limbal stem cells and its deficiency has been the most recent concept for its causation.¹,²

Although, simple to excise, high rates of recurrence make its management challenging. The transplant of conjunctival autograft seems to be a preferable method giving both low recurrence and high safety.³ The common method of autograft fixation by means of suturing has drawbacks of prolonged operating time, significant postoperative discomfort and potential suture-related complications like buttonholes, tissue necrosis and granuloma formation. Hence, it is logical to search for a material that can be applied to the ocular surface just like a glue to substitute for sutures.

In this situation, the importance of fibrin glue, a bio-tissue adhesive as alternative means of attaching the grafts, which may shorten operating time, improve postoperative comfort and avoid suture-related complications. Here comes the relevance of the study to compare the above two methods. Fibrin glue is a two component material-fibrinogen and thrombin that initiates final stage of coagulation pathway. These are used in various ophthalmologic surgeries and other surgeries for tissue adhesion, blood coagulation and wound healing.⁴ The purpose of this study is to reveal the effectiveness and safety of using fibrin glue in place of sutures during conjunctival autograft surgery for primary pterygium.

Aims and Objectives

• To make a comparative study in excision of primary pterygium with conjunctival autograft using fibrin adhesive and sutures.
To evaluate effectiveness and safety of fibrin adhesive in conjunctival autograft fixation in pterygium surgery in terms of duration of surgery, postoperative comfort, postoperative inflammation and recurrence of pterygium.

MATERIALS AND METHODS
It is a randomised clinical trial of 132 patients (132 eyes) in the age group 18-80 years of both genders admitted for excision of primary pterygium. The study period is 9 months (January 2010 - September 2010).

Inclusion Criteria
- Primary pterygium encroaching ≥2 mm onto the cornea.
- Patients in the age group of 18-80 years of both genders.
- Patients willing to undergo excision and to participate in study and follow-ups.

Exclusion Criteria
- Pseudopterygium.
- Recurrent pterygium.
- Uncontrolled systemic diseases.
- Patients with history of ocular surgery or ocular trauma.

Methodology: After obtaining an informed written consent, a detailed history including past medical and ocular diseases are taken from selected patients. Ocular examination including Best Corrected Visual Acuity (BCVA) by Snellen’s chart, ocular movements, fundus examination and slit-lamp examination of anterior segment are done.

These 132 patients (132 eyes) are allocated into 2 groups of 66 patients (66 eyes) each by block randomisation.

Group A: Patients with primary pterygium who has undergone excision with conjunctival autografts attached in scleral bed with fibrin adhesive.

Group B: Patients with primary pterygium who has undergone excision with conjunctival autografts attached in place with 10-0 nylon sutures.

Surgical Technique: All the surgical procedures were done by the same surgeon. The procedures were carried under a combination of topical paracaine eye drop and subconjunctival lignocaine with adrenalin injection. Under aseptic precautions, following the insertion of lid speculum, pterygium was excised. An oversized, Tenon-free graft for 1 mm of length and width relative to the graft bed was harvested from the superotemporal limbus. The dissection of the conjunctiva is extended by 0.5 mm into clear cornea to include the limbal element of the graft. The graft was subsequently attached to the excised conjunctival edges and episclera with FG in one group and by using 10-0 silk in suture group. The operating time was measured starting from the placement of lid speculum to its removal at the end of surgery.

All patients were followed up on days 1, 7, 14 and at months 1, 3, 6 and 9 months. In suture group, sutures were removed by 14th week after surgery. Patients were asked to fill out a questionnaire on 1st postoperative day and during every follow up visit until the 1st month. Detailed slit-lamp examination is performed on each occasion to observe and record the integrity of conjunctival autografts (graft oedema, graft loss or displacement), carefully looking for any evidence of recurrence and complications such as corneal defects, symblepharon formation, giant papillary conjunctivitis, allergic dermatitis, suture-related complications like suture granuloma, button holing and suture dehiscence.

Postoperative Comfort is analysed by 3 factors - Pain, foreign body sensation and watering. It is assessed on 1st postoperative day, 1st week, 2nd week and 1st month by a scoring system\(^5\). 0, 1, 2, 3, 4 (by giving a questionnaire to fill up in each visit).

0 No symptoms.
1 Very mild (symptoms present, but easily tolerated).
2 Mild (causes some discomfort, but not interfering with daily activities).
3 Moderate (symptoms partially interfering with usual activities/sleep).
4 Severe (interferes completely with usual activities/sleep).

Surgery time: Recorded from placement of lid speculum at start of operation to its removal at end of the operation.

Postoperative inflammation: Assessed by graft oedema and surrounding Conjunctival Congestion (CC) and SCH (subconjunctival haemorrhage).

Graft survival/success: Defined as an intact graft by 4th week after surgery.

Graft failure: Defined as absence of the graft by 4th week.

Graft recurrence: Defined as growth of fibrovascular tissue into the cornea by slit-lamp examination in a case after pterygium excision.

Statistical analysis was done using SPSS version 10. To elucidate the associations and comparison between different parameters, Chi-square was used. Student’s t-test was used to compare the mean values between two groups. A probability value of <0.05 was considered significant for evaluation.

OBSERVATIONS AND RESULTS

Statistical analysis was done using SPSS version 10. To elucidate the associations and comparison between different parameters, Chi-square was used. Student’s t-test was used to compare the mean values between two groups. A probability value of <0.05 was considered significant for evaluation.

Figure 1. Analysis of Age Distribution in Both Groups
Most of the patients (34.1%) were in the 41-50 years age group in both groups. Mean age was 45.92 ± 10.95 in fibrin group and 47.27 ± 10.19 in suture group.

Figure 2. Analysis of Cases According to Sex

78 cases (59.09%) were females and 54 cases (40.91%) were males.

Figure 3. Analysis of Exposure of UV Light

87 patients were outdoor workers giving history of UV light exposure. Among these, 54 cases were females and 33 cases were males.

Figure 4. Analysis of Type of Pterygium

In both groups, pterygium on nasal side of bulbar conjunctiva was most common. 97 cases (73.5%) had nasal pterygium.

Table 1. Analysis of Duration of Surgery Between Both Groups

Mean duration was 15.80 ± 1.56 minutes in fibrin group compared to 36.17 ± 2.44 minutes in suture group showed statistically significant difference between the 2 groups with p value <0.001.

Analysis of Postoperative Discomfort - Postoperative discomfort assessed by analysis of pain, foreign body sensation and watering.

In both groups, grade 2 (intermediate) pterygium was more common. Fleshy type of pterygium was more common among the cases <40 years.

Figure 5. Analysis of Grades of Pterygium

81 eyes (61.4%) had 2-4 mm extension into the cornea. 12% eyes showed >4 mm extension into the cornea.

Figure 6. Analysis of Corneal Encroachment of Pterygium

Mean duration was 15.80 ± 1.56 minutes in fibrin group compared to 36.17 ± 2.44 minutes in suture group showed statistically significant difference between the 2 groups with p value <0.001.

Analysis of Postoperative Discomfort - Postoperative discomfort assessed by analysis of pain, foreign body sensation and watering.

Figure 7. Analysis of Pain between Fibrin and Suture Group during 1 Month Period of Follow-up
Intensity of the pain was significantly low at 1st week and 2nd week postoperatively in patients treated with fibrin group.

Intensity of the foreign body sensation was significantly low at 1st week and 2nd week postoperatively in patients treated with fibrin group. After 2nd week, there was sudden decrease in FB sensation in suture group following suture removal.

Analysis of Postoperative Inflammation
Postoperative inflammation assessed by graft oedema and surrounding Conjunctival Congestion (CC) and Subconjunctival Haemorrhage (SCH).

Signs of inflammation was significantly low at 1st week and 2nd week postoperatively in patients treated with fibrin group (p value <0.001).

On 1st postoperative day, all had graft oedema and conjunctival congestion with SCH. Both graft oedema and conjunctival congestion were significantly less among the fibrin group (p value <0.001).

Two cases had graft failure in fibrin group, but none had failure in suture group.

One eye (1.5%) showed graft recurrence in fibrin group at 4th month of follow up. Four eyes (6.1%) had graft recurrence in suture group. Two eyes were shown recurrence at 4th month. The other 2 eyes had recurrence at 5th month and 6th month,
respectively. This showed no statistically significant difference between the two groups.

**Analysis of Recurrence**

| Age Groups (Years) | Group   | Total |
|--------------------|---------|-------|
|                    | Fibrin  | Suture|       |
| 18-30              | 0       | 0     | 0     |
| 31-40              | 1       | 2     | 3     |
| 41-50              | 0       | 1     | 1     |
| 51-60              | 0       | 0     | 0     |
| 61-70              | 0       | 0     | 0     |
| 71-80              | 0       | 0     | 0     |

**Table 2. Age Distribution**

Recurrence were common in the age group 31-40 years in both groups. One recurrence was in the 41-50 years age group seen in the suture group.

| Grade          | Group   | Total |
|----------------|---------|-------|
|                | Fibrin  | Suture|       |
| Atrophic       | 0       | 0     | 0     |
| Intermediate   | 0       | 1     | 1     |
| Fleshy         | 1       | 3     | 4     |

**Table 3. Grade of Pterygium**

Recurrences were commonly seen with fleshy type of pterygium in both groups. None of these associations showed statistical significance between the two groups.

**Figure 15. Analysis of Suture Complications**

Two cases had suture granuloma and three cases had suture dehiscence. None of the cases had suture abscess or button holing.

No fibrin glue-related complications were seen in eyes using fibrin adhesive. Complications like giant papillary conjunctivitis, symblepharon, scleritis or peripheral ulcerative keratitis were not seen in either group.

**DISCUSSION**

In our study, 132 eyes of 132 patients, who underwent pterygium surgery during the study period were analysed. All the patients completed 9 months of follow up.

In our study, pterygium was more common in the age group, 41-50 years (34.1%). A decline in prevalence rate of pterygium was found in patients over 60-70 years. Of the 132 cases (132 eyes), 78 (59.1%) were females and 54 (40.9%) were males. No significant difference was found between the two groups with regard to sex or age distribution.
suture removal that entails considerable extra effort in time and additional pain for patients. Finally, unlike the tedious suturing process, the FG is very easy to use by any surgeon, experienced or a beginner.

CONCLUSION
• The duration of surgery for primary pterygium excision with conjunctival autograft was significantly shorter in the fibrin group than in the suture group.
• Postoperative discomfort was analysed in terms of pain, foreign body sensation and watering. The postoperative discomfort was significantly low in the fibrin glue group compared to other group.
• Signs of postoperative inflammation subsided earlier in the glue group, while they lasted longer in the suture group.
• Rate of recurrence was observed to be statistically insignificant between the two groups.

In conclusion, the use of fibrin glue for the attachment of conjunctival autografts in pterygium surgery is safe and effective in reducing patient discomfort and early postoperative complications. In our study, recurrence was found to be more in the suture group, though not statistically significant. On the whole, use of fibrin glue in pterygium excision significantly shortens the duration of surgery and therefore is seen to be a more rapid and efficient technique reducing the risk of infection at the same time saving valuable time for the surgeon. From the patient’s standpoint, greater comfort allows faster return to their normal lifestyle and productivity.

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