

A Study to Compare Conjunctival Autografting with Sutures and Glue Free Sutureless Technique after Primary Pterygium Excision

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Abstract

Pterygium is a fibrovascular proliferation of subconjunctival tissue, more commonly found in tropical and subtropical climatic condition. Conjunctival excision with bare sclera technique was used for years but high recurrence rate was the major point of concern. Amniotic membrane grafting and limbal conjunctival autografting are commonly used techniques these days and results are far more satisfactory in terms of recurrence. In our study we have done comparison between conjunctival autografting with sutures and glue free sutureless technique after primary pterygium excision. Study was performed in 80 eyes of 80 patients, 40 patients in each group. We observed that in sutureless glue free group, patients were significantly less symptomatic and postoperative complications were also less or at par with sutured conjunctival autografting. It is also a cost effective technique.

Key words: Conjunctival autograft, Glue free sutureless grafting, Amniotic membrane grafting, 10-0 nylon suture, Antimetabolite drugs

INTRODUCTION

The word **pterygium** derived from Greek word *pterygion* means wings. It is a fleshy fibrovascular growth of conjunctiva arising from subconjunctival tissue with extension on cornea and this extension may vary from patient to patient. As far as aetiology is concerned apart from tropical environmental conditions and dry and dusty climate, deficiency of the stem cells is considered as one of the reason in various studies.⁽¹⁾ Diminished vision of the patient, irritation, foreign body sensation, photophobia and redness are the major complaints of the patients. Various techniques have been used but recurrence is the major point of concern. Technique of simple excision of pterygium with bare sclera was commonly used but it was associated with more recurrences so we looked for other methods. Conjunctival rotation with and without betaradiation, use of excimer laser or use of mitomycin C or 5 fluorouracil

after simple excision was associated with many drawbacks. In 1977 Thoft, first time described the use of conjunctiva for damaged ocular surface.⁽²⁾ Amniotic membrane is another option for grafting but technique of using patient's own conjunctiva is found easier. Fixation of conjunctival autograft is done with the help of sutures or glue or by sutureless glue free technique where we use patient's own blood oozing on bare sclera. Sutureless grafting is also used successfully in gingival grafts and both the situations are comparable.⁽³⁾

With sutured grafting postoperative discomfort is more. Buttonhole, necrosis, inflammation, giant papillary conjunctivitis and granuloma formation is more commonly seen while with non sutured technique all these problems are less commonly seen. Fibrin glue is also used for dural leaks and in atrophic rhinitis.⁽⁴⁻⁶⁾ With fibrin glue, fixation is easy and surgical time is also less but it is costly and in remote areas it's not easily available and chances of transmission of infection are more. Anaphylactic reactions have also been reported with fibrin glue.⁽⁷⁾ In house preparation of autologous blood requires minimum of 24 hours and laboratory equipments and then there is variable proportion of thrombin and prothrombin^(8,9,10) while with sutureless glue free conjunctival grafting, patient's own collected blood after excision is used. So it's inexpensive

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Month of Submission : 10-2017
Month of Peer Review : 11-2017
Month of Acceptance : 11-2017
Month of Publishing : 12-2017

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and chances of infection are also less. So sutureless glue free limbal conjunctival autografting is economical as well as having good results.

MATERIAL AND METHODS

A prospective study was done comparing the results of conjunctival autografting with sutures and glue free sutureless conjunctival autografting. It was carried out in RKDF Medical college hospital & RC after taking consent of the patients and total 80 patients were selected from November 2014 to January 2016 and 1 year follow up was done. Preoperative vision, slitlamp examination, extraocular muscle movements, intraocular pressure and thorough fundus examination done prior to surgery.

Inclusion Criteria

Patients of all age groups and both the sexes were included. All the patient had primary nasal pterygium. We included all cases of pterygium upto grade 2 pterygium with encroachment on cornea between pupillary margin and limbus.

Exclusion Criteria

Recurrent pterygium cases, cases of trauma, glaucoma patients, diabetic patients, vascular disorders and patient who had retinal intervention were not included

Excision of primary pterygium on nasal side in 80 eyes of 80 patients was done followed by conjunctival autografting. Two groups were made.

Group A - Conjunctival autografting with 10-0 nylon suture (total 40 patients)

Group B - Conjunctival autografting with glue free sutureless technique (40 patients)

Surgical Technique

Local peribulbar anaesthesia with 2% lignocaine and 0.5% bupivacaine given (3ml lignocaine + 1ml bupivacaine with hyaluronidase) given. Iris repositor is passed beneath the neck portion and head portion is lifted from the cornea with one toothed forcep. Only thick and fleshy portion was excised with the help of corneal scissors followed by corneal shelving by BP knife blade. Graft taken from superotemporal quadrant and it was kept 1mm larger in size. Graft was measured with calliper. Conjunctival scissors were used. No cautery was used. Graft cleaned thoroughly from sub conjunctival side to avoid tenon's tissue. Limbal to limbal orientation was maintained.

In Group A graft was kept on bare area and four interrupted 10-0 nylon sutures were applied at four corners.

In group B graft was kept pressed on bare area with even strokes for 10 minutes with IOL holding forcep

(Mc Pherson's forcep). Larger bleeds are not preferred as it displaces the graft. With little amount of oozing, graft is kept pressed for some time. Pressure from eyelids also helps.

Total surgical time was noted from starting of conjunctival dissection to final fixation of graft in both the groups. Patching was done with local antibiotics and steroid drops for 24 hours. In Group A sutures were removed after 2 weeks. Postoperative follow up was done on 2nd day, 1 week, 2 weeks, 4 weeks, 3 months, 6 months and 1 year.

Parameters Studied

1. Duration of surgery
2. Symptoms of the patients
 - a. Waterying
 - b. Foreign body sensation
 - c. Redness
 - d. Photophobia
 - e. Pain
3. Graft odema
4. Giant papillary conjunctivitis
5. Graft related problems
 - a) Dehiscence
 - b) Retraction
 - c) Button hole
 - d) Sub conjunctival haemorrhage
 - e) wrinkling
6. Conjunctival granuloma
7. Infectious keratitis
8. Epithelial defect
9. Preoperative and postoperative vision
10. Recurrence

Post operatively patients satisfaction score was also evaluated on the basis of symptoms such watering, photophobia, FB sensation, redness and irritation. It was graded as Grade 0 - dissatisfied, Grade 1 as moderate satisfaction, Grade 2 is highly satisfied. Recurrence was considered as fibrovascular proliferation encroaching the cornea more than 1.5 mm at the site of previous excision.

Statistical Analysis

In present study comparative groups matching was done and all data were entered in excel sheet. Statistical analysis was done by using SPSS 16, test of significant applied whenever applicable. P value <.05 considered to be significant [Figures 1-3].

RESULTS

This study was done in 80 eyes of 80 patients. Patients were divided into two groups. In Group A we included patients with limbal conjunctival autografting with sutures

Damle: Comparison of Conjunctival Autografting with Sutures and Glue-free Sutureless Technique after Primary Pterygium Excision

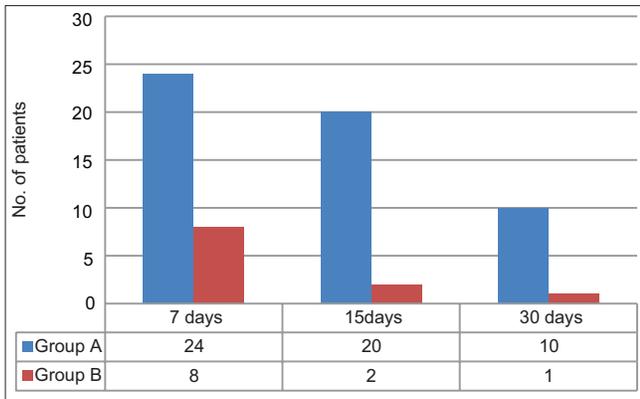


Figure 1: Comparison of symptoms with duration

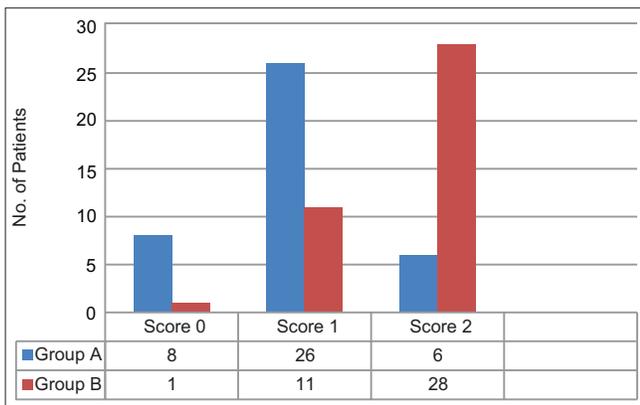


Figure 2: Satisfaction score at 1 month

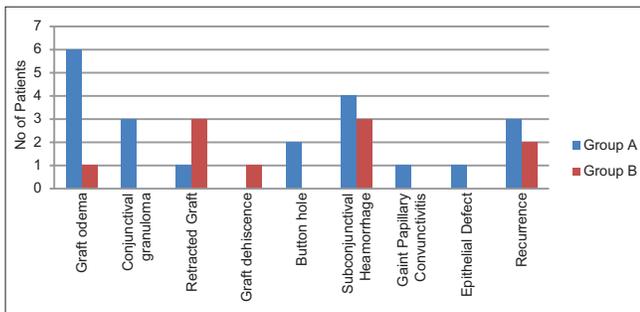


Figure 3: Comparison of different post-operative complications

and in Group B we included patients with glue free sutureless limbal conjunctival autografting. Demographic profile is given in Table 1. Follow up was done on 1st and 3rd postoperative day, 1st week, 2nd week, 4th week, 3 months, 6 months and at the end of 1 year. In all cases pterygium was on nasal side. Mean age was 43.12 years, In Group A 43.82 years and 43.6 years in Group B. This difference was not significant. Total intraoperative time was 22.025 minutes in Group A and 21.025 minutes B. Difference in operating time is not statistically significant between 2 groups. Probable explanation is in Group B though time required for suturing was saved but we had to wait for 10 minutes so that graft can get fixed properly.

Symptoms of pain, irritation, photophobia, foreign body sensation were reported by almost all the patient in both the groups on 1st postoperative day. At the end of 1 week, 2 weeks and 4 weeks patients were more symptomatic in Group A in comparison to Group B. Satisfaction score at the end of 4 weeks was also found higher in Group B which is statistically significant ($P < .0001$). (Details shown in Table 2 and Bar charts).

Graft oedema was noticed in 6 patients in Group A and in 1 patient in Group B at the end of 1st week and gradually subsided with medical management only.

Conjunctival granuloma was noticed in 3 patients in Group A only and in 1 patient surgical intervention was required.

Retracted graft was seen in 1 patient in Group A and in 3 patients in Group B and no intervention was required. Difference between 2 groups is not statistically significant.

In 1 patient in Group B graft dehiscence was noticed on follow up on 3rd day and which was resutured. It was probably due to rubbing.

Button holing was found in 2 patients in Group A which may due to excessive traction on the graft due to sutures and none of the patient had buttonholing in Group B.

Sub conjunctival haemorrhage is noticed in 4 patients in Group A and 3 patients in Group B which is not statistically significant.

Giant papillary conjunctivitis was seen in 1 patient only in Group A.

Recurrence was seen in 3 patients in Group A and 2 patients in Group B at 3rd month follow up which is not statistically significant.

Epithelial defect was found in one patient in Group A and it was found healed at 4th week.

Difference in graft related problems between 2 groups is not stastically significant.

Complications like graft necrosis, wrinkling, symblepheron, infectious keratitis, extraocular muscle involvement and globe perforation were not seen.

DISCUSSION

Various surgical techniques have been advocated for treatment of pterygium but recurrence of pterygium

Table 1: Demographic profile

	Number of patients	Group A (with sutures)	Group B (glue-free sutureless)
Age group			
25-35	26	14	12
36-45	23	11	12
46-55	18	08	10
56-65	08	05	03
66-75	05	02	03
Total No. of patients	80	40	40
Mean age	43.12	43.82	43.6
Sex			
Males	43	21	22
Females	37	19	18
Laterality			
RE	51	26	25
LE	29	14	15
Site of pterygium			
Nasal	80	40 (100%)	40 (100%)
Temporal	0	0	0

Table 2: Comparison between two groups

	Group A	Group B	P value
Average surgical time	22.025 min	21.125 min	
Postoperative assessment			
Postoperative symptoms			
At the end of 1 st week	24 patients (60%)	8 patients (20%)	P value 0.0577, t=2.6383
At the end of 15 days	20 patients (50%)	2 patients (5%)	df=4
At the end of 4 th weeks	10 patients (25%)	1 patients (2.5%)	Standard error of difference=2.906
Patient satisfaction score at the end of 1 month	Score 0 – 8 patients (20%) Score 1 –26 patients (65%) Score 2-6 patients (15%)	Score 0-1 patient(2.5%) Score 1-11 Patients (27.5%) Score 2-28 patients (70%)	Chi-square 25.761, df-2, P value 0.00000255
Graft related problems			P value equals 0.2378 t=1.2210 df=18 Standard error of difference=0.737
Graft oedema	06 patients	01 patient	
Conjunctival granuloma	3 patients	Nil	
Retracted graft	1 patient	3 patients	
Graft dehiscence	Nil	1 patient	
Button hole	2 patients	Nil	
Subconjunctival haemorrhage	4 patients	3 patients	
Giant papillary conjunctivitis	1 patient	Nil	
Infectious keratitis	Nil	Nil	
Epithelial defect	Nil	1 patient	
Recurrence	3 patients	2 patients	

has been a major point on concern. Pterygium excision with bare sclera has been used for years but it was associated with very high incidence of recurrence rate. Recurrence rates following bare sclera resection range from 24% to 89%.^(11,12,13) Recurrences are commonly seen within 6 months.⁽¹⁴⁾ Inflammation is caused by surgical trauma which leads to fibroblastic proliferation of subconjunctival tissue ultimately resulting in recurrence. Now resurgery of this recurrent pterygium is difficult as there is already some amount of corneal thinning

out of previous surgery and secondly due to scar tissue formation involving recti muscles and symblepheron formation.⁽¹⁵⁾

Other adjunctive therapies such as mitomycin C, 5 Fluorouracil, Beta irradiation or excimer laser are also used to reduce the recurrence rate. Reported recurrence rate following bare sclera resection with mitomycin application is between 0% and 38%^(16,17,18) and is far less in comparison to bare sclera technique alone although it can lead to sight

threatening complications like scleral melting, ulceration or delayed epithelization.^(19,20)

Amniotic membrane or direct suturing is also used to cover this bare sclera. Amniotic membrane is available commercially and also it is costly. Higher incidence of recurrence has also been reported with amniotic membrane grafting.⁽²¹⁾

Role of limbal stem cells in the aetiology of pterygium has been mentioned in various studies and apart from this it plays a barrier role against the overgrowth of conjunctiva over cornea and prevents the recurrence also. Reported recurrence rate following pterygium resection with conjunctival graft placement varies between 2% and 39%.⁽²²⁻²⁵⁾ In our study also recurrence rate was 7.5 % in group A and 5 % in Group B. One of the way to fix conjunctival autografts or amniotic membrane to bare sclera is by using sutures. These sutures initiate a mild inflammatory reaction which can lead to pain, watering, foreign body sensation or photophobia in postoperative period and from view point of symptoms, patient's satisfaction score goes downside. These sutures also exert unequal tension on edges of the graft and can lead to button holing. Then removal of sutures after 2 weeks is another disadvantage against sutureless glue free technique or auto grafting with glue.

In our study also we found patient satisfaction score on higher side in Group B and difference in this score between 2 groups was statistically significant. Buttonholing was also noticed in Group A in 2 patients and it is suppose to be due traction at the edges of graft.

Autografting with sutures is comparatively more cost effective than autografting with glue though glue free sutureless autografting is most economical one.

Then time required in sutured autografting is more in comparison to conjunctival autografting with glue though at par with sutureless glue free conjunctival autografting as we keep the graft pressed for 10 minutes. In our study intraoperative time required in Group A was slightly more in comparison to Group B. The time difference was not much and not statistically significant. The probable explanation is that in Group A time was required for suturing while in Group B graft was pressed for 10 minutes.

Inflammatory reaction with sutures can lead to more recurrences and sometimes associated with granuloma formation. In our study we found conjunctival granuloma in 3 patients in Group A and it can be because of inflammatory reaction at suture site. In 1 patient giant papillary conjunctivitis was also seen in Group A.

Graft retraction and dehiscence was noticed in more number of cases in Group B though not statistically significant. Retraction was seen In 3 patients in Group B and in 1 patient in group A. This difference indicates better fixation with sutures. Although in all the patients with retraction no intervention was required but better cleaning of subtenon's tissue, avoiding large bleeds and giving sufficient time for the graft to get adhered can avoid postoperative retraction. Dehiscence in 1 patient was reported in Group B and there was a history of rubbing.⁽²⁶⁾

Fibrin glue is a blood derived product and it has two components, one is fibrinogen component and another is thrombin component and used after mixing both the components. Advantages of glue over sutures is that time required is less but it's costly. Few studies reports formation of pyogenic granuloma with glue also and the probable reason is abnormal vascular endothelial growth and fibroblast activation.^(27,28) Then apart from the cost, it is not easily available in remote areas and from view point of sterilisation one time use is recommended. Secondly inactivation procedures used during manufacturing do not cover viruses like hepatitis A and parovirus so there is always risk of transmission of these infections. Also these compounds can be deactivated by iodine preparation used at the time of surgery for cleaning purpose. In comparison to this, glue free sutureless autografting is most economical

CONCLUSION

Sutureless glue free limbal conjunctival autografting is a very cost effective economical technique for pterygium surgery. Recurrence rate is also less and can be done in any setup as glue is not available everywhere. Complications related to sutures are also less.

ACKNOWLEDGEMENT

I will like to acknowledge positive support given by Dr. Sanjeev Gupta (Associate Prof. Community medicine), Dr. Rakesh Kumar (Associate Prof. ENT), Dr. Gaurav Batni (Assistant Prof. ENT) and Department of Ophthalmology in RKDF Medical college H&RC.

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How to cite this article: Damle V. A Study to Compare Conjunctival Autografting with Sutures and Glue-free Sutureless Technique after Primary Pterygium Excision. *Int J Sci Stud* 2017; 5(9):142-147.

Source of Support: Nil, **Conflict of Interest:** None declared.