



A COMPARATIVE STUDY OF USE OF FIBRIN GLUE AND VICRYL SUTURE AND SUTURELESS CONJUNCTIVAL AUTOGRAFT TRANSPLANTATION FOLLOWING PTERYGIUM EXCISION.

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ABSTRACT

INTRODUCTION: Use of sutures for securing conjunctival autograft following pterygium excision has several drawbacks. This study compares different techniques being used for fixing conjunctival autograft in patients undergoing pterygium surgery.

MATERIALS AND METHODS: A retrospective clinical study was carried out in a tertiary eye care hospital. 60 eyes which underwent primary pterygium surgery were grouped in 3 categories. The patients were followed up for 12 months. Outcome measures were duration of surgery, complication, post operative discomfort and recurrence of pterygium.

OBSERVATIONS AND RESULTS: In the non suture group mean operation time was 25.5 minutes (range 25-30 minutes). In the suture group the mean operation time was 34.5 minutes (range 30-40 minutes) and in fibrin glue group it was 13.5 minutes (range 11-17 minutes). Post operative discomfort was significantly lower in the fibrin glue group than in the suture group. Graft expulsion was seen in only group 1 in 2 cases and in one case in group 3. At the end of follow up pterygium recurrence was observed in 2 eyes in both group 1 and group 2 and in 1 eye in the fibrin glue group i.e group 3.

CONCLUSION: Application of fibrin glue instead of sutures for attaching the free conjunctival graft in pterygium surgery is the best method out of the three having advantage of a shorter surgical time, less post operative discomfort and lower recurrence.

KEYWORDS : Pterygium, Conjunctival degeneration, fibrin glue, conjunctival autograft.

INTRODUCTION

Pterygium is defined as a degenerative ocular surface disorder with wing shaped fibrovascular growth of the subconjunctival tissue on to the cornea. The epithelium may be normal, thick, and thin but it may occasionally show dysplasia.^[1] Localized limbal stem cell deficiency is thought as a positive factor for pterygium formation.^[2] A small pterygium causes only slight irritation, cosmetic blemish, and slight heaviness or redness in the eyes but as it gets advanced it can cause impairment of vision. Once it invades the cornea, it causes corneal opacity.^[3] A number of surgical techniques have been described as methods for management of pterygium, including bare sclera resection,^[4] bare sclera resection followed by mitomycin C application,^[5,6] and pterygium excision plus conjunctival autografting or amniotic membrane placement.

Conjunctival autografting has also been advocated for the management of recurrent pterygium.^[7] Limbal conjunctival autograft is currently the most popular surgical procedure.^[8] Glue is widely used due to many advantages like easy fixation of the graft, shorter operation time, reduction in complication and post operative discomfort but at the same time has some disadvantages also like high cost, the risk of transmission of infection and inactivation by iodine preparations.^[9-11] The most common method of auto graft fixation is suturing, but it has its own drawbacks like increased operation time, post operative discomfort, inflammations, button holes, necrosis, giant papillary conjunctivitis, scarring and granuloma formation. Sutureless conjunctival autograft is a new, easy and cheaper technique for the management of the pterygium.^[12]

MATERIALS AND METHODS

In this study, autologous limbal conjunctival grafting was done without sutures in 20 cases, sutured conjunctival autograft in 20 cases and using fibrin glue in 20 cases. Thus 3 groups were formed with 20 eyes in each group. Approval from institutional ethical review committee was taken.

- Sutureless technique - Group 1
- Interrupted 8-0 vicryl sutures - Group 2
- Use of fibrin glue - Group 3

INCLUSION CRITERIA:

Patients of all ages and of either sex presenting with primary nasal pterygium were included. Temporal pterygium was not included as it is very rare. Size of pterygium ranging from 2-4 mm was taken and none of pterygium covering pupillary area was taken.

EXCLUSION CRITERIA:

Recurrent pterygium, glaucoma, retinal pathology requiring surgical

intervention, history of previous ocular surgery or trauma.

Preoperative ophthalmic evaluation was done for uncorrected and best corrected visual acuity and digital anterior segment photography, slit-lamp examination, and funduscopy.

After full pre operative assessment, 20 patients underwent pterygium excision with conjunctival auto graft in group 1. In group 2 conjunctival auto graft was secured with 8-0 vicryl sutures. The remaining 20 patients underwent pterygium excision with conjunctival auto graft secured with fibrin glue and were allocated to group 3.

SURGICAL TECHNIQUE:

Local anaesthesia was given by injecting in the peribulbar space a mixture of 4- 5 ml of 2 % Lignocaine with Adrenaline and 0.5 % Bupivacaine premixed with hyaluronidase. The head of pterygium was completely excised from the cornea by crescent blade and body of pterygium excised with conjunctival scissor. Abnormal scar tissue from cornea was polished. Limbo-conjunctival defect was measured with the help of calipers and 1mm oversized free limbo-conjunctival graft was harvested from the superotemporal bulbar conjunctival quadrant of the same eye. Careful dissection was done to remove all tenon tissue and subsequently graft was moved to nasal area and placed over the bare sclera with stromal side down and limbus to limbus orientation. Surgical methods thus far were similar in all three groups. In group 1 where no sutures were applied blood served as a glue and conjunctival autograft was left as it is for 5 min after which very gently speculum was removed. In Group 2 patients, 8-0 vicryl sutures were used so that four corners of the graft were anchored to the episclera with single sutures. Three sides were then sutured to the recipient conjunctiva with numerous sutures sparing the limbal side. The sutures were cut flush to minimize irritation. In Group 3, a drop of sealer protein solution (human fibrinogen concentrate in aprotinin) and that of thrombin solution (thrombin in water for injection) which constitutes the fibrin glue was applied to the bare sclera area. The prepared conjunctival autograft was slid onto the bare sclera in proper anatomical orientation. Wick cell sponges were used to smoothen the graft and a three minute interval was given to allow the graft to adhere. The eye speculum was removed carefully. The eye was padded with a sterile eye pad in all the three groups.

Post-operative follow up: All patients were put on steroid (moxifloxacin 0.5% and prednisolone 1% combination) eye drops 4 times daily for two weeks followed by twice daily for two weeks and a lubricating eye drops for four weeks. The first dressing was done on the

next day and patients were followed up after 1, 4, and 8 weeks and every 2 months thereafter for a total duration of 12 months. Patients were asked to fill out a questionnaire on postoperative day 1 and during every follow-up examination until the first month, grading their symptoms (pain, foreign body sensation, stinging and epiphora) on a scale of 1 to 3 with 1 being minimal symptom and 3 being maximum. Recurrence was evaluated after 1 month and was defined as any fibrovascular growth that passed the corneal limbus by more than 1 mm.

RESULTS:

A total of 60 patients (60 eyes) underwent surgical excision of nasal pterygium and 50 patients completed the 12 month follow-up. In group 1 suture less technique was used (20 eyes) and group 2 sutures was used (20 eyes) and fibrin glue was applied to 20 eyes in group 3 .The mean age was 44.75± 11.2 years (range 21 years to 62 years) and 51.00% of patients were males while 49.00% of patients were females. 80% patients were from a rural background compared to 20% from urban population. No significant difference was found between the two groups with regard to age or sex (p>0.05).

The mean surgical time for group 1 was 25.5 minutes. The mean surgical time for group 2 was 34.5 minutes ranging from 30-40 minutes and in group 3 it was 13.5 minutes ranging from 11-17 minutes. (p<0.001)

Intra operatively 5 cases had severe bleeding which were controlled by thermocauterisation. Graft expulsion was seen in 2 cases of group 1 and 1 case of group 3. Pterygium recurrence was seen in 2 eyes in group 1, 2 eyes in group 2 and in 1 eye in group 3.

Patients complaining of pain, foreign body sensation, stinging and watering were scored for each group and values were compared with Mann-Whitney U test. It was found to be maximum in group 2. Graft expulsion was maximum in group 1. All the four complaints scores at the 1st and 7th days were significantly lower in fibrin group (p<0.05). Recurrence was found in 2 cases in group 1, in two cases in group 2 and in 1 case in group 3.

Table 2 shows comparative visual acuity in preoperative and postoperative cases. Grossly it can be seen that visual acuity has improved in postoperative cases in all the 3 groups. Only in few cases where visual acuity has not improved is due to early lenticular changes and ARMD in 2 cases in group 1 and 3. All cases of cataract were operated later after one month by phacoemulsification technique.

Table 3 shows that there is no difference in axial length in pre and postoperative cases of all the three groups

DISCUSSION:

Treatment of pterygium with conjunctival auto grafts or amniotic membrane grafts after pterygium excision is reported to have the best and comparable success rates.^[13] These grafts have traditionally been affixed to the bare sclera bed using sutures the presence of these sutures is believed to initiate a mild inflammatory response giving rise to symptoms of pain, grittiness and watering postoperatively and therefore negating the purpose of the surgical intervention. The inflammatory response to these suture is also believed to be the cause of recurrence, albeit low, in these patients.^[14,15] The time consumption for the placement of sutures during surgery and the need to remove them later makes it a lengthy and tedious process.^[16] Fibrin glue is a two-component tissue adhesive that mimics the natural fibrin formation and is prepared from banked human blood. Fibrin glue has widely been used in ophthalmology in areas like conjunctival wound closure, cataract surgery, oculoplastic or orbital surgery, filtering bleb dehiscence, lamellar keratoplasty and amniotic membrane transplantation.^[17]

Koranyi and associates were the first to report the use of fibrin glue for conjunctival transplanting in pterygium surgery in a prospective randomized study.^[8] They used tisseel in 20 eyes of 20 patients and 7-0 vicryl sutures in 23 eyes of 23 patients to secure the grafts. The authors demonstrated that the use of fibrin glue was associated with significantly less postoperative, shorter surgery time and pterygium recurrence compared to sutures.^[19] Studies by Bahar et al and A karalezli et al also showed shorter operating time with fibrin glue as against sutures. In our study, surgery time was significantly shorter when using fibrin glue in comparison to 8-0 vicryl sutures which is consistent with previous studies.

Increased bleeding than usual was seen in a similar number of patients (4) in both groups 2 & 3, interestingly haemostasis was achieved

earlier with fibrin glue compared to thermocautery which could be an added benefit of the use of this tissue adhesive. Post-operative symptom of pain, foreign body sensation, stinging and epiphora were significantly lower with fibrin glue on the 1st and 7th post-operative days which is in accordance with the findings of previous studies by Koranyi G et al, Harvey Setal and Irit Bahar et al.^[18,19,20,21]

Within the first four months of follow-up graft-related complication were seen in 4 patients in each group. The incidence of sub-conjunctival haematoma was found to be higher in the group 1 (30%) than in the group 2 (3.33%). Graft loss was noted in 2 patients (6.67%) in Group 2 but none in Group1 for which we could find no probable explanation. Graft loss with fibrin glue has not been reported earlier in other studies. Sub-conjunctival haematoma resolved spontaneously in about 2 week. The patients with conjunctival cyst formation (1 in each group) were initially treated with fluorometholone drops for 2weeks but following non resolution had to be taken up for re-surgery . Re-surgery was also done in 2 patients with graft loss. Overall, no serious complication were noted during the follow-up period of 12 months suggesting that fibrin glue may be considered safe for attaching conjunctival autograft as shown in previous studies by Harvey S et al,^[21] Ozdamar Y et al,^[22] Pfister et al,^[23] etc.

Prospective series in the literature report recurrence rates of 2-39% after pterygium surgery using sutured conjunctival autografts. More severe inflammation may cause higher recurrence rates, and silk and nylon sutures placed in the conjunctival can cause inflammation and migration of the langerhans cells to the cornea. In a study of 461 eyes of 381 patients , Koranyi and associates reported that the recurrence rate was 5.3% in a fibrin glue group and 13.5% in a suture group over a mean follow-up of 23 months and similar finding were echoed in several other studies.^[24] In contrast to these result, Bahar found recurrence rate of 11.9% in fibrin group and 7.7% in suture group which they suggested to be due to the fibrin coat leading to increased collagen accumulation and scar formation.^[25] In our study, recurrence rate was low in the fibrin glue group 5% compared to the 8-0 vicryl suture group 10% over a follow up period of 1 year. This finding is particularly significant given the fact that most of our patients were from a high-risk group for pterygium occurrence (exposure to ultraviolet light and dry hot weather as they were all farmers).

At the end of the study we have reached to the conclusion that the use of fibrin glue to attach the free conjunctival autograft in pterygium surgery leads to a shorter operating time, less post-operative discomfort and lower recurrence rate compared to 8-0 vicryl sutures. With 8-0 vicryl sutures patient has great discomfort for 1 week post-operatively at the same time it also involves a tedious suturing procedure. In glue less and suture less graft the reoccurrence rate was high 10% and the expulsion was also more compared to other groups.

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Conflicts of interest:-
There is no conflict of interest.

**TABLE: 1
COMPARISON BETWEEN THREE GROUPS**

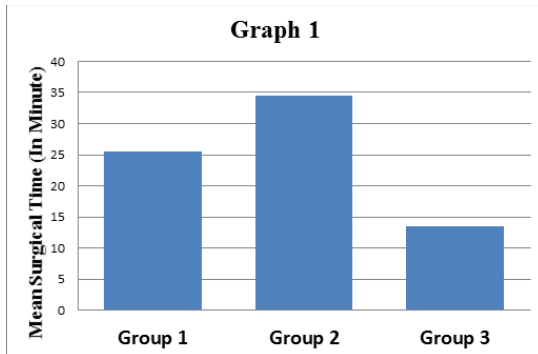
	Group 1	Group 2	Group 3
Mean surgical time (in minute)	25.5 (20-30)	34.5 (30-40)	13.5 (11-17)
Complication rate	Intra-operative		
Bleeding	1	2	2
	Post-operative		
Graft expulsion	2	0	1
Recurrence rate	2 (6.66%)	2 (6.66%)	1 (3.34%)

TABLE: 2

	Group 1		Group 2		Group 3	
VISUAL ACUITY	PRE OP CASES	POST OP CASES	PRE OP CASES	POST OP CASES	PRE OP CASES	POSTOP CASES
< 6/60	5	2	2	0	1	0
6/60-6/36	4	0	3	0	2	2
6/24-6/18	6	0	14	1	9	1
6/12-6/9	5	3	1	3	8	3
6/6	0	15	0	16	0	14

TABLE: 3

	Group 1		Group 2		Group 3	
AXIAL LENGTH	PREOP CASES	POSTOP CASES	PRE OP CASES	POSTOP CASES	PREOP CASES	POST OP CASES
≤21	3	3	4	4	2	2
22-23	15	15	14	14	15	15
≥24	2	2	2	2	3	3



Group 1 – Sutureless technique.

Group 2 – Interrupted 8-0 vicryl sutures.

Group 3 – Use of fibrin glue.

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