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Original Research Article

Comparative Study between Sutureless and Glue Free Versus Suture for Limbal Conjunctival Autografting in Primary Pterygium Surgery

Kunjlata Sethi[1], Swati Tomar[2], Neha Jain[3]
[1]Assistant Professor, [2]Professor, [3]Senior Resident, NIMS Medical College and hospital, Rajasthan

***Corresponding author**
Kunjlata Sethi
Email: drkunjlata@gmail.com

Abstract: Pterygium excision and conjunctival autografting is preferred modality of treatment to prevent recurrence. Sutureless glue free technique is a novel way to reduce time, cost and complications. The aim of this study is to compare the outcome of sutureless and glue free technique with suture for limbal conjuntival auto grafting in primary pterygium. A comparative prospective study was carried out in 60 consequetive eyes with primary nasal pterygium. They were randomized to undergo pterygium surgery using with 8-0 vicryl interrupted sutures(30 eyes group -1) or sutureless, glue free conjuntival auto grafting (30 eyes group -2). Surgical time was recorded for both the techniques. Outcome assessment was performed on day 1, 7 & 14 days, 1 month, 3 months and 6 months. Outcome measured under following headings: duration of surgery, complication, postoperative discomfort and reccurence of pterygium. Mean surgical time for group 2 (25.20± 1.67 minutes) was significantly less as compared to group 1 (39.76±1.91) minutes (P<0.001). the symptoms like watering , irritation , pain were less. In group 2 as compared to group 1 (P>0.001) the duration of symptoms was less for group 2. Three cases in sutured group and 2 cases in glue free had recurrence and two case had pyogenic granuloma in group. Sutureless and glue free conjuntival autograft technique is easy safe fast and cost effective technique than sutured method. The postoperative adverse effects due to suture material are significantly less. The novel technique is effective and less time consuming than sutured limbal autograft technique with less postoperative discomfort and adverse reaction encountered, with the use of foreign material. This technique has an acceptable pterygium recurrence rate that is comparable to conventional sutured conjunctival autograft for primary pterygium.
Keywords: Pterygium excision , glue free conjuntival autograft

INTRODUCTION

Pterygium (derived from pterygion ancient Greek word for wing) is fibro vascular information which arises in the conjunctiva and grows toward the surface of the cornea; almost always in the palpebral fissure and thought to be caused by increased light exposure, dust, dryness, heat and wind [1].Localized limbal stem cell deficiency is thought as a causative factor for pterygium formation [2].

A pterygium causes foreign body sensation redness, burning, cosmetic blemish and blurred vision if advanced [3]. Therapeutic options for pterygium are surgical. A number of techniques have been described including bare sclera [4], pterygium excision followed by mitomycin and 5- fluorouracil application [5,6], pterygium excision plus conjunctival autografting or amniotic membrane placement[6]. The limbal conjunctival auto grafting has reduced the recurrence [7,8]. Therefore a simple procedure that can reduce the recurrence rate to an acceptable level with minimal complications and without the use of potentially toxic drugs would be ideal for the management of pterygium. Recent reports favor the use of fibrin glue above suture. The use of fibrin glue has been reported to improve comfort , decrease surgical time, reduce complications and recurrence rates [1,9,10,11] suture related complication include infection, prolonged operating time postoperative discomfort, suture abscesses, button holes and pyogenic granuloma. But plasma derived glue has the potential risk of prior disease transmission and anaphylaxis susceptible individuals along with high cost[1]. Sutureless glue free conjunctival autograft is a new, easy and cheaper technique for the management of pterygium [8]. The purpose of this study is to compare and evaluate the safety and efficacy of suture less glue free limbal conjunctival auto graft and conventional

sutured autograft for the management of primary pterygium.

MATERIALS AND METHODS

The study was conducted as per national and international guidelines for conducting research in human subjects. The protocol was submitted to the department and institutional review boards and study was initiated only after obtaining the approval fromboard.

The study sample was comprised of 60 eyes of 60patients with diagnosis of primary pterygium attending the ophthalmology OPD of a medical college and attached hospital. Well informed consent was taken from patients after explaining the purpose and potential risk of surgical intervention. In this prospective interventional case study patient were randomly allocated in group 1 8-0 vinyl suture group (30 patients) & group 2 – suture less and glue free group (30 patients).

INCLUSION CRITERIA

Patients of all ages and of either sex presenting with primary unilateral nasal pterygium consenting for surgery & with any of the following indication for surgery – encroachment on visual axis , inducing visually significant astigmatism, causing recurrent irritation or cosmetically bothersome to the patient The pterygium growth should be > 1mm over the cornea horizontally from the limbus.

EXCLUSION CRITERIA

Patient with preexisting glaucoma, retinal pathology requiring surgical intervention history, of previous ocular surgery or trauma. All patients underwent a comprehensive opthalmic examination including visual acuity, refraction, extraocular muscle movements, slit lamp biomicroscopy, measurement of intraocular pressure and dilated fundoscopy. Anterior segment photography was performed for documentation of pterygium size and morphology.

SURGICAL TECHNIQUES

After taking consent, patients were allocated by coin toss method in each group. Peribulbar anesthesia with 2% lignocaine was given preoperatively after testing for sensitivity. After an eyelid speculum was inserted a traction suture (6-0) vicryl on a sporulated needle) was placed at limbus at 6 o' clock position. Pterygium body was dissected 4 mm from limbus, down to the bare sclera. Pterygium was removed from the cornea by avulsion and fine dissection was done by crescent and only the remaining, thickened conjunctiva and adjacent and subjacent tenon's capsule were excised. Haemorrhages were tempnade with direct compression cautery was avoided. Oversized graft by 1 mm was used after measuring with the Castroviejo caliper. The graft was taken from superotemporal conjunctiva one cc of 2% xylocaine was injected to facilitate separation of conjunctiva from tenon's capsule. Sterile marker was used to mark over graft to distinguish limbal side while placing it on bare sclera. Careful blunt dissection was done by Westcott scissors to harvest the graft. Limbal stem cells were tried to include in the graft as it acts as barrier to conjuntival cells migrating on to the corneal surface.

In group 1, the graft was sutured with 8-0 vicryl. At first two limbal corners were sutured into episcleral. The rest of graft was sutured with bulbar conjunctiva. In group 2, no cautery was used. Hemostasis was allowed to occur spontaneously to provide autologous fibrin to glue the conjunctival graft naturally in position. The graft was undermined with the help of iris repository as graft size was 1 mm more than the defect. The graft was held in position for10 mins by application of gentle pressure over the graft with fine non-toothed forceps. The stabilization of the graft was tested with the forceps centrally and on each free edge.

In both the groups the eye was bandaged for 24 hours. Topical antibiotic steroid eye drops along with topical lubricants were given six times in a day for 1 week and then antibiotic steroid groups were tapered weekly upto 3 weeks. oral analgesic, anti-inflammatories were given for five days. All patients were instructed to avoid rubbing their eyes and avoid dust, heat and water. The patients were also advised dark goggles. All patients were followed up after 24 hours 1 wk, 2wk, 1 month, 3 month and upto 6 months. Patients completed a questionnaire at each follow up visit. Especially upto first month grading pain grittiness, redness watering into four grades according to the intensity. The questionnaire was scored from (0-3) 0 = nothing; 1= mild; 2 = moderate; 3 = severe. The data was collected as mean scores and recorded. Recurrence was evacuated at every follow up and was defined as any fibro vascular proliferation that passed the corneal limbus by more than 1mm at the site of previously excised pterygium.

STATISTICAL ANALYSIS

Data are expressed as mean ± SD. Data were evaluated by using unpaired test, square test. Mann Whitney u test. Mann whiting u test for comparison of symptoms and signs of two groups. Unpaired test was

used to compare two groups In terms of surgical time as well as recurrence rates.

RESULTS

A total number of sixty patients (sixty eyes) underwent surgical excision of nasal pterygium. All patients completed the 6 month follow up. Patient age in both groups ranged from 25 to 70 years (mean 41± 15 years). There were 40 males and 20 females enrolled in this study. The above demographic profile is summarized in (table1)

Table 1: Demographic Profile Of Study Population

Demographic data	**Group 1 (n=30)**	**Group (n=30)**
Range of age in (years) mean age in years	25-70 40.68± 14.77	25-70 42.12±15.31
Sex Males Females	 20 10	 20 10
Laterality Right Left	 17 13	 15 15
Site of pterygium	Nasal (100%)	Nasal (100%)
Length of pterygium from limbus (mm)	2.34mm ±(1.52mm)	2.42mm±(1.41mm)

Patients were followed up post operatively on day 1, 1 wk, 2 wks, 4 wks, 3 months and 6 months. Both the groups were compared (table2) the average surgical time for group 2 was (25.20+_1.67 minutes) and for group 1 was (39.76±1.91 minutes)(p value <0.001). The operating time was significantly less in group 2.

Post operative complaints of pain

Grittiness, redness, watering were scored for each group at 1, 7 and 14 post op. day redness was non-significant in both groups.

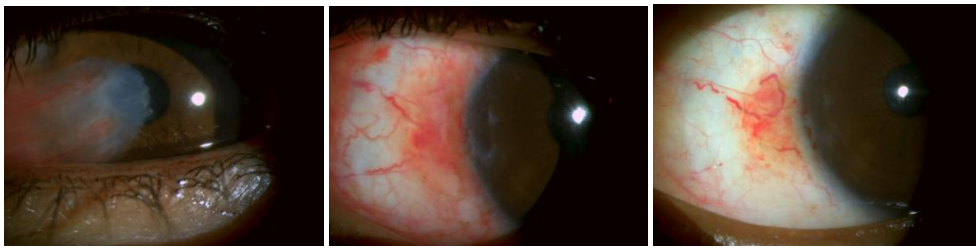
Table 2:Scoring Of Symptoms

	Day 1								Day 14							
	Group 1				Group 2				Group 1				Group 2			
	0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
Pain	0	3	15	12	5	18	7	0	20	4	6	0	25	5	0	0
Grittiness	0	0	5	25	10	15	5	0	17	13	0	0	26	4	0	0
Redness	0	0	10	20	0	7	13	10	29	1	0	0	29	1	0	0
Watering	0	5	10	15	12	15	3	0	22	8	0	0	26	4	0	0

The duration for symptoms lasted was 2 wks for group 2 and 4 weeks for group 1 (p –value < 0.001) graft edema was noted in 5 (≈15 %) patients in group 1 and group 2 (≈ 6%) eyes in group 2 which resolved after 1 week. Two patients (≈ 6%) were found having conjunctival granuloma and 3 patients (≈9%) had recurrence in group 1 (statistically in significant) .Graft related other complications like graft displacement , shrinkage were not observed in the current study.

Table 3: Comparison of Study Parameters

	GROUP 1	GROUP 2	P- VALUE
Average Surgical Time (In Minutes)	39.76±1.91	25.20±1.67	<0.001
Duration of symptoms(in weeks)	4 weeks	2 weeks	<0.001
Graft edema	5(≈15%)	2(≈6%)	0.423
Conjuntival granuloma	2(≈6%)	0(0%)	0.491
Recurrence ratio	3(≈9%)	0(0%)	0.237



Pre- op **day 1** **day 8**

DISCUSSION

Only pterygium excision has major disadvantage of recurrence. As it is established that limbal stem cell deficiency can lead to pterygium formation. To prevent recurrence. excision of the pterygium with conjuntival auto grafting is considered to be the procedure of choice [12, 13]. It was reported that recurrence rate in the case of conjuntival auto grafting was much lower than that in the case of primary closure or amniotic membrane grafting [2]. Adjunctive therapies such as nitomycin c, beta-irradiating and excimer laser have also been used to decrease the recurrence ratio of pterygium in spite of potentially sight threatening side effects [14, 16]

Treatment with limbal conjuntival autograft transplantation re-establishes the barrier function of limbus and has comparable success rate. The graft is attached with sutures or Bioadhesive. Like fibrin glue or with autologous fibrin. Suturing of graft is rather difficult and time consuming procedure which demands surgical skill also, Suzuki*et al.;* surgical reported that use of silk or nylon suture causes conjunctival inflammation and [2] longer have cell migration into the cornea [17]. In addition sutures may cause patient discomfort dellen formation simplepharos or graft rupture [18].

Bioadhesive fibrin glue is also being used to secure graft. Advantages of using it are easy fixation of graft, less surgical time and less complication and discomfort. But high cost is a big disadvantage as highlighted by Koranyi *et al.;* [9]. Moreover the risk of transmission of infection is also there. Virus removal and inactivation procedures that are used in its manufacturing process are of limited value against non-enveloped viruses such as hepatitis A virus and parvovirus B 19 [19]. Apart from these options there are studies which have shown successful outcome with sutureless and glue free conjunctival autograft [8, 10]. We did a comparative study between sutured technique (group 1) and suture free glue free conjuntival limbal autograft method (group 2)

In our study the average surgical time for group 1 was 39.76±1.91 minutes and for group 2 it was 25.20 ±1.67 minutes. It was comparable with other studies in terms of operating time for sutured autograft [2, 20] and sutureless and glue free conjunctival limbal autograft [10].

Postoperative symptoms like pain grittiness, watering wassignificantly less in group 2 than group 1. The symptoms were maximum on day 1 and then gradually disappeared within 2 weeks in group 2 and within 4 weeks in group 1. The results were comparable to the study conducted by Elwan on similar 2 groups where postoperative symptoms like pain watering photophobia hyperemia is were less and patient satisfaction was higher in sutureless and glue free group (1) Kim *et al.;* reported tha t patient symptoms disappeared in 23 out of 36 eye (64%) in one week and all the symptoms gone within two weeks after surgery in all patients [18].

Complication like graft edema was seen in 5 (≈15%) patients in group 1 and 2 (≈6%)patients in group 2. Conjunctival granuloma was seen in 2(6%) patients in sutured group. Recurrence was noted in 3(≈9%) patients in group 1 (statistically insignificant).Eleven has conducted a similar study showing conjuntival edema – 8 patients (16%) and 6 patients (6%), recurrence in 3 patients (6%) and 8 patients (8%) and granuloma formation in 0(0%) and 3 patients (3%) for sutureless and glue free (group 1) and sutured (group 2) limbal conjunctival autograft respectively.

Similar findings were noted in other studies done by Malik *et al.;*Foroutan*et al.;* [8,10] Wit *et al.;* reported no recurrence in 15 eyes within a mean follow up period of 9.2 months. Sutureless and glue free technique provides even tension on free graft edges

which causes excellent adhesion of graft to the bed and less conjunctival scarring. A thin, oversized graft is needed with meticulous dissection from tenon's capsule is needed for perfect outcome.

CONCLUSION

Sutureless and glue free limbal conjunctival auto grafting causes shorter surgical time, less postoperative complication and discomfort along with minimal recurrence. Adverse reaction caused by suture material along with cost factor makes sutureless and glue free technique superior. Although a larger sample size with longer follow up is required.

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