Postoperative Outcomes of Pterygium Excision Surgery with Autograft using Autologous Blood versus Conventional Sutures

ABSTRACT

INTRODUCTION- Pterygium is an extremely common ocular condition believed to be occurring due to proliferation and overgrowth of abnormal epithelial and fibro vascular tissue onto the cornea. They are characterized by cellular proliferation, neovascularisation and inflammation. Ultraviolet rays (UVR) induced elastoid degeneration of sub epithelial connective tissue, genetic alteration associate altered cytokine expression plays an important role in pathogenesis of pterygium. The recent treatment entities include conjunctival autograft with good results. The most commonly used means of fixating conjunctival autografts is by sutures or fibrin glue.

AIM – This study aimed at comparative assessment of postoperative outcomes of pterygium excision surgery with autograft using autologous blood versus conventional sutures.

METHODS- Forty post-operative cases of pterygium excision surgery with conjunctival autograft were enrolled in the study and serially followed-up. The study included two groups of 20 patients each. Group-A included cases of pterygium excision with autograft using autologous blood; and Group-B included cases of pterygium excision with autograft and sutures. Post-operatively, patients were examined on 1^{st}, 7^{th} and 30^{th} day to document the graft loss. Graft stability was also assessed on day 1 in both groups. Final comparison were documented in terms of graft edema, stability and recurrence. Also suture related complications like foreign body sensation, watering, discomfort, granuloma formation and suture abscess were assessed in follow-up.

RESULTS- Group-B (suture group) revealed better graft stability whereas displacement of graft was documented in six cases of Group-A. Graft edema was reported in 10 cases from Group A and 7 cases from Group B. On 30^{th} day, all patients of both the groups presented with similar findings. However, subjective discomfort was reported to be more in group-B as compared to group-A during each follow up.

CONCLUSION- Issue of graft displacement was a critical challenge with autologous blood group (Group A) patients compared to suture related complications in the group B. Looking towards the evidence of less remarkable complications and almost similar outcomes, the surgeons dilemma on pterygium management still persists.

KEYWORDS- Pterygium, Conjunctiva, excision, Autologous blood, Sutures.

Introduction:

Pterygium is a degenerative condition of subconjunctival tissue which proliferates as vascularized granulation tissue to invade the cornea, destroying the superficial layers of stroma and Bowman's membrane. As a result of tissue fibrosis it leads to alteration of corneal curvature resulting in astigmatism and corneal opacity. The pathophysiology includes Ultraviolet rays (UVR) induced elastoid degeneration of subepithelial connective tissue, genetic trauma and consequent altered cytokine expression.Indications for treatment of pterygium may vary from minor cosmetic concerns to significant visual loss. The main stay of management includes various surgical techniques including simple resection without any graft which leaves bare sclera or resection followed by covering the sclera with primary closure by conjunctival autograft from another site on the bulbar conjunctiva of the same eye, or with use of human amniotic membrane (HAM) along with mitomycin C or 5-fluorouracil to reduce recurrence.[1] Conjunctival autograft is giving good results in pterygium surgery [2,3]. The most commonly used means of fixating conjunctival autografts is by sutures or fibrin glue [4,5].

A new method of adhering graft to recipient site by patient's own blood reduces complications associated with other surgical technique like use of sutures and fibrin glue.[6]

AIM :

The Aim of the present Case series was to study the stability of auto-conjunctival graft with and without sutures and to document the immediate postoperative outcome in both group- with and without sutures.

METHOD:

This was a prospective follow-up study, undertaken in ophthalmology department of tertiary eye care center in Ahmedabad, Gujarat. Forty patients with primary nasal pterygium were included in the present study . The patients were randomly divided into two groups A and B with the help of lottery method. Pterygium excision with conjunctival autograft using autologous blood was carried out in Group-A (n=20 patients) while in Group-B Pterygium excision with conjunctival autograft was done using sutures (20 patients). A thorough preoperative assessment was done in all 40 patients including blood homeostasis parameters. The purposive samples of 40 based on administrative feasibility were included in the present study. All patients were given peribulbar anesthesia during the procedure. The conjunctival auto graft was placed on bare sclera with patients' autologous blood as adhesive in 20 patients of group-A, while in 20 patient's of group-B, graft was sutured.

Inclusion criteria

- Only nasal pterygium.
- More than 18 years .

Exclusion criteria

- Patient with any coagulation disorder.

- Temporal pterygium.
- Bilateral pterygium.
- Atrophic pterygium.
- Recurrent pterygium.
- Glaucoma.
- Retinal pathology requiring surgical intervention.
- History of previous ocular trauma or surgery.
- Less than 18 years

All the patients were assessed on day-1 in terms of patient's comfort and graft stability. Operationally patient comfort was defined as subjective perception of foreign body sensation and watering.

Postoperatively observations for watering, redness, foreign body sensation, graft edema, graft congestion, suture related complications were assessed and documented. Postsurgical complications were observed on day1, day 7 and day 30 and after six months for recurrence. Based on the symptoms and signs, a stratified subjective scores were decided on five point likers scale. Last follow up was done on day 30 and both groups were compared for: graft edema, graft stability, recurrence and suture related complications like granuloma formation, suture abscess, pyogenic granuloma.

RESULTS:

There were 28 (70%) males and 12 (30%) females with gender ratio (M:F= 2.3:1). The age ranged from 27 years to 72 years with mean age was 47.27 years. The 30% of the participants were in the age group 41-50 years followed by 51-60 years which is 25%. The right eye was affected in 17(42.5 %) patients, while left eye was in 23 (57.5%) patients.

In Group A, there were 13 males (65%) and 7 females (35%). The age of patients in the group ranged from 27 years to 72 years, with average being 50.7 years.

In Group B, there were 15 males (75%) and 5 females (25%). The age of patients in the group ranged from 28 years to 65 years, with average being 43.5 years.

The average surgical time taken for Group A was 45 minutes and for Group B was 58 minutes.

Table 1 describes the comparison of post-operative findings as panel data. The immediate postoperative complications included watering (18, 90%) and foreign body sensation (20,100%) were more in group B. While wound gap was documented in 8 (40%) patients & displaced graft in 6 (30%) patients of group-A.

Table-1: Comparison of Post operative Ophthalmic findings between groups

Symptoms and Signs	Day 1		Day 7		Day 30		6 Months	
	Group A	Group B	Group A	Group B	Group A	Group B	Group A	Group B
Sub-conjunctival haemorrhage	14(70%)	10(50%)	12(60%)	7(35%)	0	0	0	0
Graft Haemorrhage	15(75%)	5(25%)	6(30%)	2(10%)	0	0	0	0
Graft oedema	10(50%)	7(35%)	2(10%)	2(10%)	0	0	0	0
Wound gap	8(40%)	2(10%)	0	0	0	0	0	0
Displaced graft	6(30%)	0	0	0	0	0	0	0
Watering	9(45%)	18(90%)	2(10%)	14(70%)	0	3(15%)	0	0
Foreign body sensation	11(55%)	20(100%)	1(5%)	18(80%)	0	5(25%)	0	0
Need for Resuturing	6(30%)	0	0	0	0	0	0	0
Recurrence	NA	NA	NA	NA	0	0	0	1(5%)
Subjective discomfort	10(50%)	20(100%)	2(10%)	12(60%)	1(5%)	7(75%)	0	0

On first post-operative day, pain and foreign body sensation were present in 100% cases of Group B while only in 55% of cases from Group A. On 7th postoperative day , 80% of patients of group-B reported foreign body sensation while in Group A it was reduced to only 5% cases.

It was also observed that on Post-operative day 1, graft oedema was seen in 35% of the patients in group B whereas 50% of group A patients. Wound gap in Gp B was seen in 10% of cases and 40% in Gp A (10%). On the contrary watering was seen more in Group B (90%) which reduced to 70% on 7th Post Operative day.

Subconjunctival hemorrhage was seen more in Group A (70%) when compared to Group B(50%) on immediate Post Operative day. On Six months follow up, recurrence was not seen in any member belonging to group A , while it only one patient had recurrence in Group B.

DISCUSSION:

Although there are various surgical options are available for management of pterygium, there are debate regarding the “ideal” pterygium surgery.[7] There are evidences that conjunctival graft to cover the bare sclera post pterygium excision is reported to be an effective method of lowering recurrence rate (2%–9%) as well the complications.[8]

Although autologous limbal conjunctival grafting is an effective method for prevention of recurrence after pterygium surgery, suturing of the autograft is difficult and necessitates surgical experience and technical skill and also there are evidences that sutures may cause patient discomfort, symblepharon, or graft rupture.[9,10]

Attaching conjunctival autograft using autologous blood is a new approach, also known as "suture and glue free autologous graft." This procedure has excellent results without any complications associated with sutures and glue. In a prospective, noncomparative, interventional case series conducted in India – 19 patients underwent graft fixation with autologous blood with substantial low mean surgical time of 11 min and no grafts loss.[11]

In a similar study by Sharma *et al*., – out of 150 cases, who underwent graft fixation with autologous blood – recurrence during the follow-up period was seen only in 4 patients (2.6%).[12] In present study the recurrence in group B was seen only in 1 out of 20 cases.

In present study, graft was displaced in 6 cases (30%) in autologous blood group, while stable in all cases of suture group. However , in a study by Moizuddin et al the graft was found stable in all cases in suture group where as it was displaced in 10% of cases in autologous blood group.[6] A Sharma et al study also shows that two eyes (13.33%) developed total graft dehiscence, and sutures were used for reattachment of the graft in its correct position.[13]

Graft oedema as well as graft haemorrhage were more common in autologus blood group which was 10 (50%) and 15 (75%) respectively as compared to suture group which has 7 (35%) cases of graft oedema and 5 (25%) cases of graft haemorrhage. In Moizuddin et al study graft oedema was there in 8 (40%) cases in autologus blood group as compared to 2 (10%) cases in suture group.[6]

Pain and foreign body sensation were present in all 20 cases of pterygium surgery with suture (gp-2) on 1st postoperative day in our study. While in a study by Kumar et al pain and foreign body sensation were present in all 20 cases of group-1(autograft with suture) on 1st postoperative day which continued for 1 week though intensity decreased progressively and finally patients were pain-free on around 3 months. In the Group- A (autograft with autologous blood) pain and foreign body sensation were seen in few cases which vanished earlier as compared to Group B. [14,-16] On 30th day, there were no symptoms or graft related complications in either group. All grafts were clear and stable with no suture related complications. Few of the related studies and cases were reviewed [17-20].

CONCLUSION:

The suture related complications like foreign body sensation and watering are more common in group-B patients in 1st postoperative day, while graft displacement was more common in group-A, which required re-suturing on 1st operative day. Overall postoperative outcome in terms of graft clarity and stability after one week was good in both the groups. Fibrin glue and autologous blood both seem to be equally options to sutures in attaching conjunctival autograft in pterygium surgery. While sutures have a huge disadvantage of causing postoperative discomfort and other complications, where autologous blood seems to be much better. The use of autologous blood not only eases the surgical procedure, reduced surgical timings and also leads to less immediate postoperative discomfort. To conclude surgical techniques, pterygium excision with conjunctival autograft using

autologous blood and suture are effective and safe. However, a larger sample size might be required to substantiate the observations.

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