Original Article

Autologous Serum for Fixation of Limbal Conjunctival Autograft in Primary Pterygium Surgery

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ABSTRACT

Purpose: To find out the efficacy and structural stability of autologous serum for the fixation of limbal conjunctival Autograft in the management of pterygium surgery.

Study Design: Quasi-experimental study.

Place and Duration of Study: Orbit and Oculoplastic department of LRBT Hospital, Karachi, from June 2020 to November 2020.

Methods: This study included 100 eyes of 100 patients with primary pterygium. Eyes with nasal Pterygium of grade III were included. Patients with ocular surface disorders, infection, inflammation, pseudo pterygium, pterygium at temporal side and coagulation disorders were excluded. After pterygium excision, a free limbal conjunctival Autograft was taken from superotemporal quadrant of bulbar conjunctiva of same eye and was used to cover the bare sclera with autologous serum. Subconjunctival injection of antibiotic and steroid was given followed by 24 hour of eye pad. Postoperative outcomes of the graft were noted at the end of the six months period of follow up.

Results: The mean age of the patients was 46.5 ± 8.97 years (range 20 – 60 years). Male to female ratio was 3:1 (75 males and 25 females). Graft loss was found in five patients, graft edema in one patient, graft retraction in three patients, graft overriding in two patients, recurrence of pterygium in six patients, granuloma in two patients and subconjunctival hemorrhage in 10 patients.

Conclusion: Autologous serum for fixation of limbal conjunctival Autograft is a safe, efficient and cost-effective method of treatment for primary pterygium surgery.

Key words: Orbit, Autologous serum, Pterygium, Mitomycin C

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INTRODUCTION

A pterygium is a triangular wedge shaped fibro vascular growth of degenerative bulbar conjunctival tissue to invade the corneal surface. It is generally situated on the nasal.[1] Pterygium needs to be surgically removed when it causes visual impairment by encroaching the visual axis, induce significant regular or irregular astigmatism and become cosmetically upsetting. The primary aim of pterygium surgery is to excise it and prevent its recurrence. The rates of recurrence after simple pterygium excision is around 25% – 45% within 6 months. Recurrent pterygium is more violent, asymmetrical, have severe inflammatory response and difficult to excise.[2] To prevent recurrence many other techniques are available, such as use of mitomycin C (MMC), beta irradiations, amniotic membrane graft and conjunctival Autograft after bare sclera technique.[3-5]

Limbal conjunctival Autograft is another technique to prevent recurrence of pterygium.[6] This technique was first described by Kenyon *et al.*[7] It is much more challenging in terms of surgical expertise

and proper graft orientation. However, the discussion is now focused on the most effective method to attain maximal patient comfort and faster rehabilitation after the adherence of the conjunctival autograft to the bare sclera by using either suture, fibrin glue, or autologous serum. The autologous serum has been proposed to be equal or comparable to that of suture and fibrin glue techniques.[8-11]

Sutures have disadvantages of long surgical time, risk of complications like granuloma formation, and significant patient discomfort. On the other hand, the technique of graft fixation with commercial fibrin glue has the potential risk of transmitted infection and high cost.[12]

The rational of this study is to find out the efficacy and structural stability of autologous serum for the fixation of limbal conjunctival Autograft in the management of pterygium surgery and to see complications associated with this procedure.

METHODS

This Quasi-experimental study was carried out at Orbit and Oculoplastic department of LRBT Hospital, Karachi, from June 2020 to November 2020 and included 100 eyes of 100 patients with primary pterygium. Age range was 20 to 60 years. Informed verbal consent was obtained from each patient. Permission was taken from the ethical review committee of the institution. A thorough ocular and systemic history was taken and complete eye exam was done prior to the operation. Eyes with nasal Pterygium of grade III (Pterygium head extending beyond the point midway between the limbus and the pupillary margin, but not crossing the pupillary margin) were included. Patients with ocular surface disorders, infection, inflammation, pseudo pterygium, pterygium at temporal side and coagulation disorders were excluded. The patients underwent pterygium excision. A free limbal conjunctival autograft was taken from supero temporal quadrant of bulbar conjunctiva of same eye and was used to cover the bare sclera with autologous serum (as a bio adhesive). Postoperative outcomes of the graft (graft edema, graft retraction, graft displacement, graft overriding and graft loss), recurrence of the pterygium and any other complications (granuloma, subconjunctival hemorrhage, pain, foreign body sensation, discomfort and conjunctival cyst) were noted at the end of the six months period of follow up.

One oculoplastic surgeon (GM) performed all surgeries using the standard conjunctivo-limbal autograft. Under aseptic conditions, speculum was applied and sub-pterygium 0.5 ml lignocaine solution (Xylocaine 2%) was injected. Head of the pterygium was dissected from the cornea with a No 15 Bard–Parker blade. The corneal surface was further smoothed with a crescent knife. The body of the pterygium was separated from the overlying conjunctiva using Westcott's scissors and then excised. Tenon's tissue was also removed from the conjunctiva. Bare scleral defect at the limbus was measured with a Castroviejo caliper. To take the required graft, marking of more than one mm than the defect was done on the superior temporal bulbar conjunctiva of the same eye. Sub conjunctival lignocaine injection was given under the superior temporal bulbar conjunctiva, thus raising the intended size of graft. Westcott's scissors were used to harvest the free conjunctival limbal autograft. Care was taken to include the limbal stem cells. Three to four drops of autologous serum were sprinkled on the bare sclera and the free graft was placed on the bare sclera. Care was taken to keep the epithelial side of the graft up, and cotton tipped applicator was held gently onto the graft surface for 5 minutes followed by waiting of seven minutes for adherence of the graft. Sub conjunctival injection of antibiotic and steroid was given followed by 24 hour of eye pad. Oral NSAID was given for 24 hours to manage the pain. The total Time taken for each procedure was noted from placing of lid speculum to its removal at the end of surgery. After the operation, antibiotic and steroid drops were prescribed. First follow up was on the first post operative day and then at one week, four weeks, three months and six months. Slit-lamp examination was carried out at each visit to assess the conjunctival autograft integrity and any signs of complications. Statistical analysis was done using SPSS version 25.

RESULTS

The mean age of the patients was 46.5 ± 8.97 years (range 20 – 60 years). Male to female ratio was 3:1 (75 males and 25 females). Each of the enrolled patient was evaluated for a follow up period of 120 days; at the end of the which, graft loss was found in five patients, graft edema in one patient, graft retraction in three patients (3%), graft overriding in two patients (2%), recurrence of pterygium in six patients (6%), granuloma in two patients (2%) and subconjunctival hemorrhage in 10 patients (10%).

DISCUSSION

In this study, graft loss was seen in 5%.Similarly in a study conducted by Rafe A et al, graft loss was commonest complication seen. It was noted in eight eyes (40%) in group A treated with fibrin glue and one eye (5%) in group B treated with autologous serum.[13]

It has been known that thick grafts not covering the limbus may increase the risk of recurrence.[14] Sabahattin Sul et al, used autologous serum drops in pterygium surgery. They found it better than conventional tears in accelerated corneal epithelial healing following pterygium surgery.[15]

In another study, the operating time in the fibrin glue group was significantly less as compared with the autologous serum group. The cost of surgery was more with fibrin glue. Graft edema, graft loss, graft retraction, and displacement of the graft were more with the use of fibrin glue.[16] when compared with suture technique, Conjunctival autograft with autologous serum was found safe and fast method. It was equally effective as conventional sutured autograft technique.[17]

In a study by Ashok Sharma et al, conjunctival granuloma was not seen in autologous blood group, although suture group reported granuloma formation in one eye (4%). In this study granuloma formation was present in two eyes which is (2%).[18] In this study graft instability was found in 5 patients (5%) and it was comparable with the study performed by khan et al.[19] Ozer et al, found that recurrence was 14.29% in a 5-year follow-up study. Our follow up was only six months.[20]

Limitations of this study was small sample size, short follow up and lack of comparison group.

CONCLUSION

This study concludes that Autologous serum for fixation of limbal conjunctival autograft is a safe, efficient and cost-effective method of treatment for primary pterygium surgery. The recurrence rate is minimum. Suture related complications and the fibrin glue associated risks can be avoided by this technique. We hope that this study would also add to the growing knowledge, easily availability, time saving and complication free management of pterygium surgery.

Conflict of Interest: Authors declared no conflict of interest.

Ethical Approval

The study was approved by the Institutional review board/Ethical review board (**LRBT/TTEH/ERC/3884/01).**

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Authors' Designation and Contribution

Ghulam Mustafa Memon; Consultant Ophthalmologist: *Concepts, Design, Literature search, Data acquisition, Data analysis, Statistical analysis, Manuscript preparation, Manuscript editing, Manuscript review.*

Zeeshan Kamil; Consultant Ophthalmologist: *Design, Statistical analysis, Manuscript preparation, Manuscript review.*

Sabeen Abbasi; Consultant Ophthalmologist: *Literature search, Manuscript preparation, Manuscript review.*

Hina Loya; RMO: *Data acquisition, Data analysis, Manuscript review.*