ORIGINAL ARTICLE

SUTURELESS AND GLUE FREE CONJUNCTIVO-LIMBAL AUTOGRAFT IN PRIMARY PTERYGIUM SURGERY: OUTCOME S AND RECURRENCE RATE

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ABSTRACT: AIM: Evaluation of the benefits of suture less and glue free conjunctivo-limbal autograft for primary pterygium management. **MATERIALS AND METHODS:** This was clinical outcome study of 50 consecutive eyes with primary nasal pterygium requiring surgical excision. Autologous conjunctival graft taken at the superotemporal limbus was used to cover the sclera after pterygium excision. Sutureless and glue free conjunctivo-limbal autograft was performed in all the patients followed by bandaging for 24 hours. The patients were followed up post operatively on 2nd day, 1 week, 4weeks, 3 months, 6 months and 12 months. They were examined for subconjunctival hemorrhage, granuloma formation, graft dehiscence, graft rejection, graft retraction, chemosis, recurrence or any other complication. **RESULTS:** The study included 28 females and 17 males (mean age 39.3 years). Recurrence was seen in one eye (2.2%) of a patient at one year. Graft retraction on conjunctival side occurred in 5 eyes (11.1%). Partial Inferior flaps dehiscence in 2 patients (4.4%) and one conjunctival granuloma (2.2%) were noticed during 1st week follow up. No any major postoperative complications occurred. **CONCLUSION:** The described technique is fast, safe, and effective and as well as economical while giving results without any increased chances of complications for the management of primary pterygium.

KEYWORDS: Pterygium, conjunctivo-limbal autograft, fibrin glue, pterygium surgery.

INTRODUCTION: Pterygium is a fibrovascular growth arising from the conjunctiva onto the cornea. A number of surgical techniques have been described as methods for pterygium treatment, including bare sclera resection,¹ bare sclera resection followed by mitomycin C application at different time points, doses, and concentrations,²⁻³ and pterygium excision plus conjunctival autograft (with or without limbal tissue) or amniotic membrane placement.

Post-operative pterygium recurrence is a relatively common problem. Recurrence rates following bare sclera resection range from 24% to 89%,⁴⁻⁵ following bare sclera resection with mitomycin application between 0% and 38%,^{3-6,7} and following pterygium resection with conjunctival graft placement between 2% and 39%.^{4-8,9} Surgical removal is the treatment of choice. Autologous conjunctival grafting seems to be the best method, giving both low recurrence rate and high safety.⁸

Limbal stem cells act as barrier between the conjunctival and corneal epithelia & Destruction of this barrier limbal tissue leads to the growth of the conjunctival tissues onto the cornea.^{10,11} This made logical to include limbal tissue in the graft which have been used successfully to correct limbal dysfunction, acting as a barrier against conjunctival invasion of the cornea and supplying stem cells of the corneal epithelium.¹² Limbal stem cell transplantation together with conjunctival autografting

ORIGINAL ARTICLE

proved to be more effective in prevention of pterygium recurrence and in rapid restoration of normal epithelial morphology.¹³ For graft tissue fixation, suturing or applying tissue adhesive were used commonly but drawbacks are many like of prolonged operating time, postoperative discomfort, suture abscesses, buttonholes, and granuloma formation and the major concern of the commercial fibrin glue is the cost and the potential risk of transmitted infection.

This study was undertaken to evaluate the outcome of conjunctivo-limbal autograft in primary pterygium without using foreign materials for fixation of graft.

MATERIALS AND METHODS: A prospective clinical study of consecutive cases undergoing nasal pterygium excision with conjunctivo-limbal autograft without using human fibrin tissue adhesive or suture was conducted from June to November 2012. Patients referred to our hospital (Department of Ophthalmology) for pterygium surgery were enrolled in the study. Informed consent was obtained from all the patients.

Only nasal, primary pterygia were included in the study. Recurrent pterygium and patients with history of ocular diseases predisposing to ulceration or poor wound healing like dry eye syndrome, rheumatoid arthritis and herpetic keratitis, glaucoma were excluded from the study. The cases were followed up to a period of 12 months for recurrence and other complications.

Recurrence was defined as fibrovascular tissue crossing the corneoscleral limbus onto clear cornea in the area of previous pterygium excision. All surgeries were performed by a single experienced surgeon. Pre-operatively the patients were treated with topical antibiotic drops from one day prior to surgery four percent lignocaine drop was applied to the affected eye for 20 minutes preoperatively.

The eyelids were disinfected with 5% povidone-iodine, and the eyelids and skin were covered with a sterile plastic drape. After insertion of a lid speculum, 1% subconjunctival xylocaine with adrenaline with a ratio of 1:100, 000 was injected under the body of the pterygium [figure 1]. Pterygium was then cut vertically along limbus down to the bare sclera [figure 2] and the head of the pterygium was removed by blunt dissection from the base to the apex using Westcott scissors and crescent knife.

The head of the pterygium was now avulsed from its corneal attachment by reverse stripping [figure 3] using slow and deliberate traction holding its free end parallel to the cornea. The conjunctiva was reflected backward, fibrovascular tissue underneath the cut end of the conjunctiva was dissected as far as possible on the canthus side and excised [figure 4], leaving the sclera and the muscle free from episcleral tissue. Tenon tissue was carefully removed from the region of the conjunctival defect and from under the surrounding conjunctiva and bleeding allowed to achieve natural hemostasis. Excessive hemorrhage in the graft bed is tamponaded.

No cautery was applied on the bare sclera. The dimensions of the resulting conjunctival defect were measured using a caliper. The donor tissue was harvested from the same eye. The area of conjunctiva at supero temporal area, (1-2 mm larger) to the size of bare sclera, was measured with calipers and marked with Gentian violet. The conjunctiva was elevated with the subconjunctival injection of saline. 15 degree knife was used to make two parallel radial incisions along the marked lines [figure 5] and conjunctival scissor to undermine the conjunctiva from the lateral borders [figure 6].

ORIGINAL ARTICLE

The use of plane conjunctival forceps helped in preventing buttonholing of the graft. When the posterior and lateral ends of the graft were free, conjunctiva was cut along posterior border. The free conjunctiva which is still attached anteriorly is reflected upon cornea and blunt dissection was continued anteriorly till the limbus [figure 7]. Westcott scissor and crescent knife were used to carry out further blunt dissection towards peripheral cornea for about 1 mm beyond the vascular arcade.

The conjunctival piece was then excised using a sharp Vannas scissors. The conjunctival graft was then placed on the scleral bed, with epithelial side up without losing the limbal orientation [figure 8] and the whole graft was compressed gently into position with lens spatula for 5 to 6 minutes to counter any small hemorrhage or fluid accumulation beneath the graft [figure 9] then after stabilization [figure 10] antibiotic-steroid ointment was inserted into the conjunctival sac and the eye was bandaged for 24 hours. The donor site was left open for spontaneous healing.

Post-operative care included antibiotic-steroid eye drops four times a day from the next day after surgery. The same was continued for two weeks and tapered in next 2 weeks. The patients were followed up post operatively on 2nd day, 1 week, 4weeks, 6 months and 12 months. The patients were examined for graft dehiscence, graft rejection graft retraction, chemosis, recurrence or any other complication.

RESULTS: Fifty participants were recruited for the study of which 45 (forty-five) participants returned for follow up visits. Five participants therefore excluded from further analysis. They were 28 females (62.22) and 17 males (37.77) whose age ranges between 28 -52years (mean age 39.3 years).

During follow up period, graft retraction on conjunctival side occurred in 5 eyes (11.1%). A slight yellowish transplant edema [figure 12] was observed in 25 (55.55%) on first post-op day. All the patients are managed conservatively with topical antibiotic steroid combination eye drop only (No more bandaging). The edema resolved later by the 2nd follow up visits (end of 1st week postoperative day). There was recurrence in one eye (2.2%) of a patient at six month.

Conjunctival granuloma [figure 11] was noticed in one eye (2.2%) at the end of one week which was managed by simple excision.

Hemorrhage during surgery at the site of conjunctival dissection was the commonest complication that was controlled by pressure alone. Complications like graft rejection and wound dehiscence were not encountered in our study. The transplant healed with good cosmetic result.

DISCUSSION: Pterygium is a common worldwide external eye disease affecting populations especially in tropical and subtropical areas. There have been many attempts to optimize pterygium surgery. Recurrence following surgical treatment of pterygium is common and remains a challenge. Apart from surgical treatment adjunctive measures like beta irradiation postoperatively, thiotepa postoperatively, intraoperative mitomycin, and postoperative mitomycin have been used to reduce recurrence. Simple excision of primary pterygia is associated with a high recurrence rate (33–45%), then conjunctival autograft transplantation was popularized.⁸ bringing down the rate of recurrence to less than 7%.⁹

Bare scleral closure (recurrence rates, which may range as high as 80%). and simple conjunctival closure (recurrence rates range from 45–70%).¹⁴ without adjunctive therapy no longer remain treatments that should be offered to patients. The recurrence rates after these two forms of

ORIGINAL ARTICLE

treatment are unacceptable. The place of beta irradiation, Mitomycin has been studied for many years and though it reduces recurrence rate (comparable to conjunctival autograft) it carries potential sight threatening complications including scleral or corneal necrosis. Fibrin glue has been used as an alternative to sutures for securing the conjunctival grafts.

Recurrence rate of 5.3% with glue versus 13.5% with sutures has been demonstrated.¹⁵ and suggested that immediate adherence of the graft and lack of postoperative inflammation may inhibit fibroblast ingrowth and reduce the recurrence. Main issue in using commercial fibrin glue, is transmission of infectious agents like Human Infection of parvovirus B19 (HPV B19) and prions,^{16,17} and anaphylactic reaction¹⁸ Graft dehiscence is a recognized complication of using tissue glue ¹⁹as well as cost of fibrin glue.

In our study one eye of a male patient had recurrence (2.2%) that was having prolonged subconjunctival hemorrhage post operatively. It is believed that surgical trauma and subsequent postoperative inflammation activate proliferation of subconjunctival fibroblasts and vascular cells, and deposition of proteins in turn contributes to the pterygium recurrence.²⁰ study using similar procedure by Malik KPS et al (2012).²¹

Show recurrence rate of 2.5 % (1 eye out of 40) and no recurrence in one study by Wit et al (2010).²² Sharma and Moore reported 4 cases using autologous fibrin glue for pterygium surgery. In their study, they showed well-positioned grafts in all 4 cases after a 6-week follow-up.²³

It is suggested that lid apposing to bulbar conjunctiva act as natural dressing conferring perfect environment for wound healing.²²

We have one case of conjunctival granuloma which may be due to inadequate excision of tenon tissue on recipient bed since conjunctiva usually contracts more than the tenon's capsule resulting exposure of it (tenon capsule). Some authors advocate that friction of the exposed tenon tissue with the upper lid during blinking can lead to an overgrowth of the exposed tissue forming granuloma.^{24, 25}

Graft retraction occurred in five eyes (11.1%) which resolved without any intervention by the end of one month with no effect on the final outcome of operation. graft retraction could be minimized with meticulous dissection of subepithelial graft tissue.²⁶

In our study yellowish transplant edema was observed in 25 (55.55%) which disappeared by the end of one week. Mutla et al. (1999) reported that the most frequent complication in limbal conjunctival autograft transplantation was graft edema,²⁷ None of the patients developed graft rejection, graft dehiscence, perforation of the globe with suture needle, injury to medial rectus, dellen, symblepharon formation or scleral necrosis, glaucoma, cataract.

CONCLUSION: This simple technique may prevent potential adverse effect and complications encountered with the use of foreign materials while giving results without any increased chances of graft failure, graft loss, graft dislodgement, and recurrences as well and it is fast, safe, and effective and economical also.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7

Figure 8

Figure 9

Figure 10

Figure 11

Figure 12

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ORIGINAL ARTICLE

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