Dried Scleral Patch Graft: A Temporary Measure of Corneal Perforation Prior Keratoplasty-Two Case Reports

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Abstract.
Aim: To describe the temporary management of corneal perforation by using dried sclera patch graft prior keratoplasty when donor tissue not available.

Case report: Two cases of corneal perforation (>2 mm) of various causes presented with severely decreased vision and shallow anterior chamber and soft eye ball. Both needed immediate therapeutic keratoplasty to save the globe and restore the vision. Due to unavailability of donor cornea, both patients were surgically managed with dried scleral patch graft temporarily to save the globe. Both patients underwent therapeutic keratoplasty one moth and one and half months respectively. Both patients gained better vision (6/18 and 6/24 respectively), quiet anterior chamber and no secondary glaucoma after 6 month of keratoplasty.

Conclusion: Dried sclera patch graft is a good option for temporary management of corneal perforation of various causes until a donor cornea is available. These patch grafts prevent ocular hypotony, posterior synechiea and secondary glaucoma.

Keywords: Corneal perforation, patch graft, dried sclera, keratoplasty.

INTRODUCTION

Perforation of cornea from any cause is an ocular emergency. Cyanoacrylate glue frequently used for manage small perforation of less than 2 mm. but large corneal perforation should be managed by keratoplasty. Perforation of cornea along with tissue loss resulting from corneal ulcer and trauma should be given special attention. Therapeutic keratoplasty is the best option. In the absence of donor corneal tissue we can use dried preserved scleral tissue for temporary management of corneal perforation. We should replace the dried scleral tissue as soon as possible with fresh donor tissue. In our country donor corneal tissues are not easily available, so dried sclera tissue can be used as an emergency basis to seal the perforation and to prevent perforation related complications.

CASE REPORT AND SURGICAL METHOD

Surgical Methods

All necrotic tissues surrounding the corneal perforation were removed. Dried preserved scleral tissues were punched 2 mm larger than actual perforation and patch
grafts were sutured with 10/0 nylon monofilament. Bandage contact lenses were then applied. Therapeutic penetrating keratoplasty were done subsequently when donor corneas were available.

Case One

A 25 years old female patient presented at Cornea Clinic of Chittagong Eye Infirmary and Training Complex (CEITC) with complaints of pain, redness, watering and dimness of vision in her left eye for 4 days. Patient had a history of full thickness corneal injury and was sutured elsewhere. Patient was non-diabetic and normotensive. Slit lamp examination revealed suturing causes distortion of cornea [Figure 1]. As an emergency, patient was advised for dried scleral patch graft due to unavailability of donor cornea. On the same day patient was under gone surgical intervention – removal of sutures and dried scleral patch graft sutured with 10-0 nylon [Figures 2 and 3] under local anesthesia. Bandage contact lens applied and eye patch for 24 hours given. Post operatively she was treated with oral ciprofloxacin 500 mg twice daily for 7 days, atropine 1% eye drop 8 hourly, moxifloxacin 0.5% eye drop 4 hourly, betamethason 0.1% eye drop 4 hourly in her left eye and advised for review after 7 days. After a week anterior chamber was well formed with normal IOP. After one month therapeutic keratoplasty was done [Figure 4]. Patient was again treated with atropine 1% eye drop 8 hourly for a week more, moxifloxacin 0.5% eye drops continued for further 2 weeks, betamethason 0.1% eye drop 4 hourly in her left eye. After a month, corticosteroid drops tapered over next 2 months and continued as once daily dose. Digitally IOP was measured in each visit. Six months follow up showed clear graft with good (6/18) vision [Figure 5].

Case Two

Another female patient of 14 years old presented with complaints of pain, redness, watering and marked dimness of vision in her right eye for 10 days. Patient had a history of keratitis and treated elsewhere. On slit lamp
examination there was corneal perforation with iris prolapsed, shallow anterior chamber with leaking, soft eyeball [Figure 6]. She also underwent dried scleral patch graft under general anesthesia followed by bandage contact lens application. The patient was treated postoperatively with oral ciprofloxacin 250 mg twice daily for 7 days, atropine 1% eye drop 8 hourly, moxifloxacin 0.5% eye drop 4 hourly, betamethason 0.1% eye drop 4 hourly in her right eye. After a week anterior chamber was well formed with normal IOP [Figure 7]. After one and half month later therapeutic keratoplasty was done. Patient was again treated atropine 1% eye drop and 8 hourly for 2 weeks, moxifloxacin 0.5% eye drops continued for further a month, betamethason 0.1% eye drop 4 hourly in her left eye. After a month, corticosteroid drops tapered over next 2 months and continued as once daily dose. Digitally IOP was measured in each visit. Six months follow up showed clear graft with 6/24 vision [Figure 8].

DISCUSSION

Corneal perforation resulting from various causes is an ocular emergency and needs urgent management to prevent devastating complications. Most commonly corneal perforation caused by bacterial infection but fungal infection, immunological inflammation and trauma can also causes perforation. Infectious etiologies contribute about 24 to 55% of corneal perforations [1–7]. Sudden decrease visual acuity associated with pain is the most common symptom. Soft eye ball, flat anterior chamber, leaking from lesion (positive Seidel test) are the common signs. Even prolapsed uveal tissue in sealed a large perforation and reformed an irregular anterior chamber. Descemet’s folds radiating from base of lesion seen in impending perforation [8]. Management directed to seal the perforation as soon as possible to maintain the integrity of the eye ball preferably with 48 hours to prevent peripheral anterior synechiae and damage to the corneal endothelium. Systemic antibiotics most preferably oral ciprofloxacin should be used for prophylaxis as well as minimal manipulation of the eye ball should be maintained. Sealing of perforation can be performed with use of cyanoacrylate tissue adhesive which is very much effective in small perforation less than 2 mm in diameter. Cyanoacrylate glue quickly solidify in contact with water and seal the perforation [4, 8, 9]. A bandage contact lens should be used as solidify cyanoacrylate is hard in consistency and make foreign body sensation. After healing of perforation cyanoacrylate glue dislodge and should be removed along with bandage contact lens. Fibrin glue which is soft consistency and more comfortable recently using in even very small perforation and wound leak. Fibrin glue has lower tensile strength than cyanoacrylate glue. This glue originate from human and animal source and there is a chance of hypersensitive reaction and disease transmission [11, 12].

Multilayer amnionic membrane transplantation can be done in small perforation but in large perforation it gives a low tensile strength. After cleaning of base of perforation a small piece of membrane put over the perforation, then another layer of amniotic membrane with basement membrane side up and suture with 10-0 nylon and lastly third layer of amniotic membrane with basement membrane side down, placed and multiple interrupted suture with 10-0 nylon [13, 14]. Partial thickness corneal or sclera tissue can be used in large perforation with use of suture or tissue
adhesive [15]. Autologus Tennon’s or oral mucous membrane patch graft can be used as an alternative. In large perforation therapeutic penetrating keratoplasty (TPK) is the best option if corneal tissue is available. Here we used dried sclera tissue for temporary patch graft as an emergency basis because at that time donor cornea was not available. We prepared dried scleral tissue from remaining sclero-corneal rim of donor tissue after using the central corneal button for keratoplasty. Tissue rim is cleaned, heat dried, packaged and sterilized by ethylene oxide [EO] and preserved it in room temperature for a year. In these 2 cases we have done therapeutic penetrating keratoplasty after getting the donor cornea about one month later. Host corneas were trephined larger than the dried sclera patch graft and therapeutic penetrating keratoplasty were done. Post operatively we used topical corticosteroid for one month and tapered over next two months and continued as once daily dose. Intraocular pressure was normal in each follow up visit. After three to six month grafted eyes showed a stable condition and patients were advised to follow up 6 monthly.

CONCLUSION

Corneal perforation should be treated as an ocular emergency and sealing the wound as soon as possible to maintain the integrity of eye ball. Dried scleral patch graft is a good option for temporary management of large corneal perforation, until a donor corneal tissue is available. This graft will prevent ocular hypotony, peripheral anterior synechiae and secondary glaucoma. Visual rehabilitation can be achieved with corneal graft later on.

REFERENCES