

Reversed skin graft combining with lip mucosa transplantation in treating recurrent severe symblepharon

A case report

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Abstract

Rationale: Recurrent symblepharon is very difficult to cure. Techniques applied in symblepharon with no recurrence or low recurrent rate is rare and vital.

Patients concerns: A 12-year-old boy with severe symblepharon caused by firework underwent 2 surgeries for treating severe symblepharon. But both surgeries were failed and symblepharon recurred.

Diagnosis: He was diagnosed with conjunctival sac defect and recurrent symblepharon.

Intervention: The patient received reconstruction with mucosal grafts and a reversed split-thickness skin graft, and suture upper and lower eyelids for 10 days.

Outcome: Recurrent symblepharon was cured and the conjunctival sac was reconstructed.

Lessons: Reversed split-thickness skin graft is much less soft compared to other materials to treat symblepharon and can be used to reconstruct conjunctival sac with no or little recurrence.

Keywords: conjunctival sac reconstruction, lip mucosal transplantation, reversed split-thickness skin graft, symblepharon

1. Introduction

Symblepharon results from a variety of ocular trauma, keratitis, or conjunctival inflammation (bacterial, viral, chlamydial). Symblepharon is the partial or complete adhesion of the palpebral conjunctiva and the bulbar conjunctiva. The cornea may or may not be involved, and the conjunctival fornix may become shallow or obliterated. Signs and symptoms of symblepharon include fibrous adhesions between the palpebral conjunctiva and the bulbar conjunctiva, eye redness, burning and tearing, photophobia, diplopia, restricted extraocular motility, lagophthalmos, entropion, and cosmetic considerations. Various surgical interventions are used to treat symptomatic symblepharon.^[1] The conventional surgical approach is reconstruction of the ocular surface by symblepharon lysis and buccal mucosal (palate, lip) graft or amniotic membrane transplantation.^[2,3]

However, this approach is associated with recurrence. Here, we describe a novel technique for the treatment of recurrent symptomatic symblepharon resulting from trauma. We used mucosal transplantation to repair the bulbar conjunctiva and a reversed split-thickness skin graft to repair the palpebral conjunctiva and the conjunctival fornix.

2. Case report

A 12-year-old boy developed symblepharon with light perception after being injured by firework 5 years previously. The patient underwent 2 surgeries for reconstruction of the ocular surface. The first surgery used a free conjunctival graft from the contralateral eye, and the second surgery used buccal mucosal transplantation with a graft obtained from the lip; however, severe symblepharon recurred after the surgeries (Fig. 1A). The third surgery was approved by the Academic Ethics Committee of the First Hospital of Jilin University and the patient had written informed consent before the surgery. Informed written consent was obtained from the patient for publication of this case report and accompanying images. During a third surgery, buccal mucosal grafts were used to reconstruct the bulbar conjunctiva, and a skin graft harvested from the groin was used to reconstruct the palpebral conjunctiva and conjunctival fornix. Adhesions of the conjunctiva to the eye globe were separated. Granulation tissue was carefully removed from the palpebral conjunctiva such that only the skin and subcutaneous tissue of the eyelids was retained^[4] (Figs. 1B and 2A and B). Two pieces of buccal mucosa (3 × 2 cm) harvested from the lower lip were used to cover around the cornea. A split-thickness elliptic section of skin of a size consistent with the conjunctival sac was harvested from the right groin.^[5] The skin graft harvested from the groin, with the epithelial surface toward the eye globe, was sutured to the conjunctival margins with 6-0 absorbable thread. Sutures were

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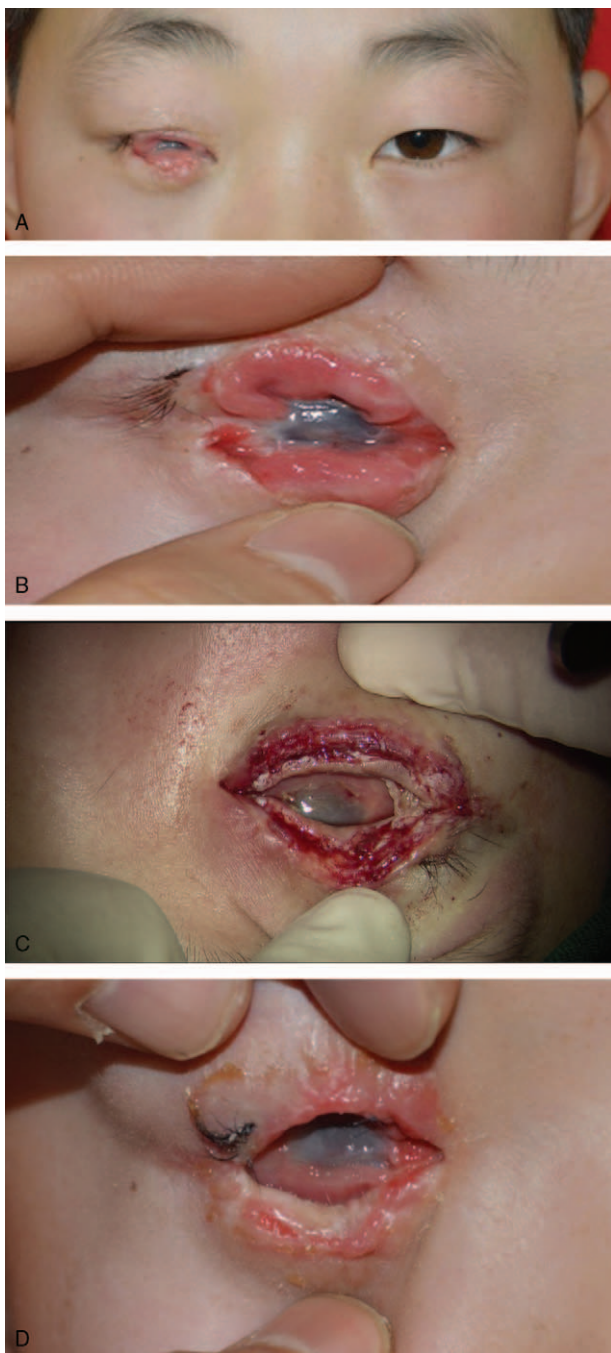


Figure 1. Photographs of the patient before and after surgery. (A) Preoperative ipsilateral view of the eye: The tarsus is absent, there is severe hypophthalmos, and the eye cannot be opened or closed. (B) Severe symblepharon with no obvious ocular anatomy: The tarsus has been replaced by granulation tissue. (C) Normal residual eyelid skin, the reversed split-thickness skin graft, and the silicone pad form a sandwich-like structure that covers the eyeball. At postoperative 10 days, the upper and lower eyelids were separated, and a palpebral fissure was created under local anesthesia. The reversed split-thickness skin graft survived well with no necrosis, and the epithelia surface had separated leaving a mucous membrane. (D) At the 6-month follow-up, there was no evidence of recurrent symblepharon. The conjunctiva was deep with well-formed fornices.

interrupted for 2 cm at the inner canthus, and a silicone pad was located between the buccal mucosal and reversed split-thickness skin grafts (Fig. 2C and D). The silicon pad was trimmed until it maintained the grafts at an appropriate tension. The upper and

lower eyelids were sutured with 6-0 unabsorbable thread (Fig. 2E). A pressure dressing was administered, and erythromycin was applied into the conjunctival sac. At postoperative 10 days, the upper and lower eyelids were separated, and a palpebral fissure was created under local anesthesia. Graft survival was evaluated, showing that the reversed split-thickness skin graft survived well with no necrosis, and the epithelia surface had separated leaving a mucous membrane. The inside and outside margins of the eyelids were stitched together, forming a complete upper and lower eyelid and conjunctival sac (Fig. 1C).

At the 6-month follow-up, there was no evidence of recurrent symblepharon. The conjunctiva was deep with well-formed fornices (Fig. 1D). At 1-year postoperation corneal transplantation was performed by an ophthalmologist, and vision was restored.

3. Discussion

This case report indicates that the combination of buccal mucosal grafts and a reversed split-thickness skin graft represents a novel technique for the treatment of recurrent symblepharon. The groin was chosen as the donor site because enough skin can be harvested, and contracture and adhesions are less likely to occur. After the reversed split-thickness skin graft was transplanted, the upper and lower eyelid margins were sutured together to stabilize the skin graft and prevent ectropion. A pressure dressing was applied and left in place for 10 days to aid in graft immobilization and ensure graft survival.

Conventional management of symptomatic symblepharon varies from frequent ocular lubrication using artificial tears and/or ointment, to occlusion of the tear drainage duct, therapeutic bandage contact or scleral lenses, symblepharon rings or dishes, or bio-tissue bandages.

Surgical intervention involves symblepharon lysis, buccal mucosal grafts, conjunctival autografts, or amniotic membrane transplantation. Buccal mucosal grafts are easily harvested without substantial scarring, and mucous membrane from the lip contains goblet cells that may stabilize the tear film by contributing mucin in the eye.^[6] Conjunctival autograft is a safe and quick procedure for ocular surface reconstruction that involves resecting conjunctiva and transplanting it to the affected area. Amniotic membrane transplantation supports epithelialization by promoting migration, adhesion, and differentiation of epithelia cells, and it suppresses the immune and inflammatory response.^[7-10]

In the current case, the patient underwent 2 surgeries for reconstruction of the ocular surface. The first surgery used a free conjunctival graft from the contralateral eye, and the second surgery used buccal mucosal transplantation with a graft obtained from the lip. As symblepharon recurred following these 2 approaches, the patient received ocular reconstruction with buccal mucosal and reverse split-thickness skin grafts. The skin graft was slightly smaller than the defect, so as to provide the necessary tension. External pressure, edge stitching, and fixture with percutaneous sutures were used to stabilize the graft. Reversed split-thickness skin grafts are widely applied in reconstructive surgery as they can be harvested in large amounts and have a good survival rate; however, they may lack moisture and contract during healing, and there may be substantial morbidity at the donor site.^[11] In this case, the groin was large enough to provide a graft that was supportive of the eyelid and nonadhesive. Reversal of the skin graft allowed integration of the mucous surface in the recipient bed. Our technique achieved good

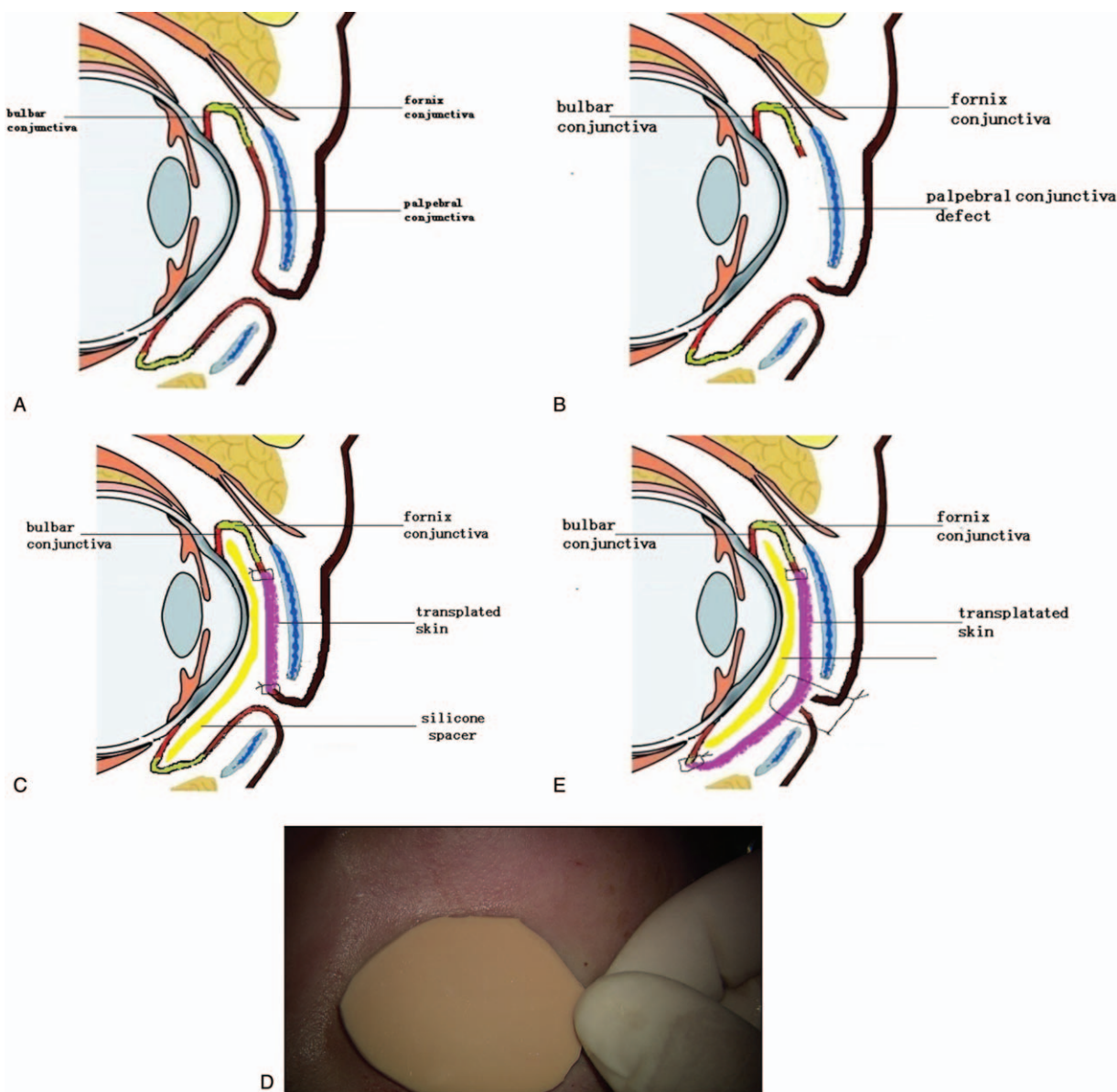


Figure 2. Schematic of the surgical procedure. (A) Normal anatomy of the conjunctival sac showing the bulbar conjunctiva, palpebral conjunctiva (reddish brown), and fornix conjunctiva (green); (B) the palpebral conjunctiva and bulbar conjunctiva (absence of reddish brown) are defective after separating the tarsus from the eyeball; (C) buccal mucosal grafts are used to reconstruct the bulbar conjunctiva, and a skin graft harvested from the groin is used to reconstruct the palpebral conjunctiva and conjunctival fornix (purple); (D) a silicone separator (yellow in C and E) is placed between the reconstructed bulbar conjunctiva and palpebral conjunctiva; (E) the upper and lower eyelids are sutured together to form a sandwich-like structure. A pressure dressing is applied for 10 days.

anatomical and functional reconstruction and provided the opportunity for corneal transplantation and restoration of vision.

Though we have achieved good results in the case, there were still some limitations and challenges. First, the skin was taken from the groin area and the structure was different from the palpebral conjunctiva. The final changes of the skin after transplantation still required longer-term follow-up. The residual hair follicle might lead to hair growth. Also, during the operation, oral mucosa was applied, which was soft and easy to curl. Therefore, the size of the silicone sheet and its tension on the conjunctival sac directly determined whether the symblepharon adhesion recurred.

Previous reports describing the use of skin grafts in symblepharon are scarce. Keswani et al and Romanes reported the use of a Thiersch graft as an alternative to conjunctival tissue

for the treatment of bilateral, total symblepharon, and established symblepharon, respectively. In all patients, surgery was performed with a fair degree of success.^[12–14]

4. Conclusion

Ocular reconstruction with buccal mucosal and reversed split-thickness skin grafts provided an effective approach to the treatment of recurrent symblepharon.

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Author contributions

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