

# Surgical Management of a Case of Symblepharon by Freshly Prepared Amniotic Membrane Transplantation

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**Abstract:** Amniotic membrane transplantation has been in common therapeutic use for a variety of ocular disorders. Author present a case of a 19-year-old man who was diagnosed to be a case of total symblepharon, following an episode of accidental spillage of molten iron, who was treated with freshly prepared Amniotic membrane transplantation with satisfactory cosmetic result.

**Keywords:** Amniotic membrane transplantation, Conjunctivitis, Symblepharon

## 1. Introduction

Amniotic membrane is the inner layer of fetal membrane that is composed of three distinct layers epithelium, basement membrane, and stroma, the inner most layer further consisting of an inner compact layer, middle fibroblast layer and an outermost spongy layer. The structure of the membrane, which presents a single layer of metabolically very active cuboidal to columnar epithelium very firmly attached to a basement membrane and a vascular and relatively sparsely populated stroma, makes it an easy and resilient tissue. (1, 2).

The first therapeutic use of amniotic membrane was successfully achieved by Davis. (3) Subsequently, the first ocular use of amniotic membrane was done by De Roth following successful treatment of a case of chemical burn of ocular surface. (4)

Amniotic membrane has been used in management of cicatricial pemphigoid and Stevens-Johnson syndrome, pterygium, persistent epithelial defects with ulceration, conjunctival surface reconstruction and ocular surface reconstruction in patients with chemical and thermal burns. (5-9).

Symblepharon is defined as a partial or complete adhesion of the palpebral conjunctiva of the eyelid to the bulbar conjunctiva of the eyeball. The adverse effects of symblepharon on the ocular surface include dry eye, inadequate blinking, eyelid malposition, mechanical extraocular movement restriction and additional abnormal appearance. Various modalities have been developed for the treatment of symblepharon. The use of systemic steroids, immunosuppression, or stronger agents can help mitigate ocular surface inflammation, which drives the cicatricial process. Tissue substitutes such as conjunctival graft, amniotic membrane, oral mucosa, and nasal mucosa have been used to cover the exposed surfaces after symblepharon lysis.

## 2. Case Report

A 19-year-old male from Uttar Pradesh, a construction worker by occupation presented to our Out Patient

Department with history of accidental spillage of molten iron 2 months back in right eye. It was followed by chief complaint of pain and inability to open right eye for last 20 days as seen in *Figure 1*. It was accompanied with pain which was gradually progressive in nature.



**Figure 1:** Right eye showing Corneal opacity with vascularization and inferior lid adherent to cornea

The pain was insidious in onset, gradually progressive, dull aching in nature, subsided by medication and not associated with fever or headache but was however associated with redness, watering and foreign body sensation. The patient also complained of profuse discharge from the right eye for 1 month and sticking together of the lid margins for 1 month. There is no history of any use of any long-term topical medication. There is no history of any throat or other respiratory illness. There is no history of any similar illness in the past. There is no history of any ocular disease or surgery. There is no history of diabetes mellitus, hypertension and tuberculosis.

In general examination patient was conscious, cooperative, alert and well oriented to time place and person, the patient was thin built, with normal nutritional status, afebrile with no pallor, generalized edema, clubbing, icterus, cyanosis or lymphadenopathy.

On ocular examination of right eye, Inferior lid was

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adherent to keratinized cornea. Visual acuity was Finger counting close to face with accurate projection of rays in all 4 quadrants in Right eye. Vision in LE was 6/6.

Vascularization of Cornea in inferior half was present with a central macular corneal opacity in right eye. Anterior and posterior segment was within normal limits of both eyes.

### 3.Surgical Management

The patient was initially managed conservatively with antibiotic eye drops and lubricants and planned for Right eye symblepharon release with lamellar keratoplasty with freshly prepared amniotic membrane transplantation.

Amniotic membrane was obtained under sterile conditions from a human placenta obtained shortly after elective caesarean delivery. Informed consent was obtained from the donor, and screening was done to exclude any risk of transmissible infections such as HIV, Hep. B and C, and syphilis. The placenta was first washed free of blood clots with balanced saline solution containing 50 µg/ml of penicillin, 50 µg/ml of streptomycin, 100 µg/ml of neomycin and 2.5 µg/ml of amphotericin B. Then the AM was separated from the rest of the chorion and rinsed with balanced saline solution containing antibiotics. Under a laminar flow, the AM was cut into required sizes and flattened into individually sterilized nitrocellulose paper without folds or tears with the epithelial surface up.

Surgery was performed under local anaesthesia. Adequate exposure was obtained with lid traction sutures. The conjunctival incision was made along the ends of the symblepharon and undermined from the Tenon's capsule to allow the conjunctiva to retract to its normal anatomical position. A traction suture was made near the exposed bulbar sclera allowing better exposure and subsequent excision of cicatrix. The subconjunctival fibrous tissue was excised to the maximum extent possible, and all adhesions around the muscle were released.

Ocular surface reconstruction was done by amniotic membrane transplant to cover the bare sclera, to reform the fornix and to cover the denuded palpebral conjunctiva up to the edge of the recessed symblepharon conjunctiva. Exposed Cornea was covered by donor corneal patch graft using 10-0 nylon interrupted sutures.

#### Follow-Up Course

It was observed that the patient had a smooth healing process with little pain and rapid corneal re-epithelization. The anterior chamber was well formed with clearly visible pupil margin. The ocular surface was stable, and no complications were detected during the follow-up visits. Graft-Host junction remains well apposed with intact 16 corneo-scleral interrupted 10-0 nylon sutures. Graft clarity was optically clear.

After surgery (1st post-op day photo as seen in *Figure 2*), patient received ointment containing topical antibiotic and steroid four times a day for 2 weeks and then was

subsequently tapered over the next few weeks. Healing was confirmed by fluorescein staining, and the fornix-forming sutures was removed after 2 weeks. (*Figure 3*)



**Figure 2:** Post operative Day 1



**Figure 3:** Post Operative picture after 2 weeks

### 4.Discussion

Amniotic membrane (AM) was first used as a biomaterial in ophthalmic surgery in 1938. It was applied as a conjunctival replacement following symblepharon release. The durability, pliability and versatility of AM makes it a useful adjunctive treatment in various ophthalmic procedures.

Kheirkhah et al, evaluated a combined approach of cicatrix lysis, MMC application, and suture less AMT in severe symblepharon in 32 eyes. (10) The anatomical outcome included complete success in 84.4%, partial success in 9.4%, and failure in 6.2%. Goyal et al, in retrospectively reviewed 5 eyes of children who underwent superficial keratectomy, symblepharon lysis, and forniceal reconstruction using amniotic membrane transplantation for symblepharon and massive pannus. The mean visual acuity pre-operatively was 1.1 log MAR and postoperatively was 0.7. (11) Visual acuity improved in 3 eyes. In another case report by P. Jain et al, showed management of a complicated case of recurrent symblepharon and ankyloblepharon after fire cracker injury with AMT with excellent cosmetic results. (12)

A lot of materials have been evaluated as a mechanical barrier to keep potentially adhesive surfaces apart after excision of the symblepharon, including conjunctival autograft, mucous membrane grafts and AM. The above-mentioned procedures may also be combined with

additional measures to prevent readhesion, such as insertion of a conformer, symblepharon ring or silicone sheet implant or MMC. Cheng J et al, in his study showed the therapeutic effects of allogeneic cultivated limbal epithelial transplantation (CLET) for symblepharon at different degrees caused by ocular burns. (13)

## 5. Conclusion

In summary, although a combination of excision, lamellar keratoplasty, and multilayer amniotic membrane and limbal stem cell transplantation is suggested in the treatment of symblepharon in previous studies, the surgical technique in this study offers an alternative time-saving surgical approach.

This patient was treated with symblepharon lysis along with freshly prepared Amniotic membrane Transplantation with satisfactory cosmetic results.

## Statement of Ethics

Study adhered to the tenets of the Declaration of Helsinki. Written Informed consent was obtained from patient for publication of this case report.

## Conflicts of Interest

Author has no conflict of interest in this study.

## Funding Sources

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