

## Case Report

# Management of a case of symblepharon by freshly prepared amniotic membrane transplantation: a clinical case report

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### ABSTRACT

Amniotic membrane transplantation has been in common therapeutic use for a variety of ocular disorders. Authors present a case of a 50-year-old man who was diagnosed to be a case of total symblepharon following an episode of membranous conjunctivitis who was treated with freshly prepared Amniotic membrane transplantation with satisfactory cosmetic result.

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

### 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.<sup>1,2</sup>

The first therapeutic use of amniotic membrane was successfully achieved by Davis.<sup>3</sup> 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.<sup>4</sup>

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.<sup>5-9</sup>

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.

### CASE REPORT

A 50-year-old male from Mahadevpur, Arunachal Pradesh, a construction worker by occupation presented to our Out Patient Department on 27th of January 2020

with chief complaint of inability to open both eyes for last 20 days as seen in Figure 1 which was gradually progressive in nature.



**Figure 1: Patient on the day of presentation.**

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 eyes for 2 months and sticking together of the lid margins especially in the morning for 1 month. There is no history of any physical or chemical injury or 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.



**Figure 2: Local examination.**

Local examination as seen in Figure 2

- Head posture : slightly tilted upwards
- Facial symmetry : Normal
- Alignment : Normal
- Forehead : Normal



**Figure 3: Examination of right eye.**

Examination of the right eye as seen in Figure 3

- Visual acuity : 6/9, N12
- Pupil: Normal
- Colour vision : Normal
- Eyelid: Margins thickened, oedematous, hyperaemic, rounded.



**Figure 4: Examination of left eye.**

Adhesion of the upper and lower lid at the medial and lateral fornices.

- Eyelashes : Matted
- Palpebral aperture: 3 mm vertical, 20 mm horizontal
- Conjunctiva: It was congested with adhesion of bulbar and palpebral conjunctiva along with superior, inferior, temporal fornices.
- Sclera : Normal
- Iris : Normal
- Anterior chamber : Normal
- Lens: Clear

Extra-ocular movements were restricted in all quadrants due to adhesions.

- Nasolacrimal duct : patent
- IOP : 17.3 mm Hg
- Fundus: Could not be visualized.

Examination of the left eye as seen in Figure 4

- Visual acuity : 6/9 , N12
- Pupil : Normal
- Colour vision : Normal
- Eyebrows : Normal
- Eyelid: Margins were thickened, oedematous, hyperaemic, rounded with adhesion of the upper and lower lid at the medial and lateral fornices.
- Eyelashes : Matted
- Palpebral aperture : 3mm vertical, 22 mm horizontal

Conjunctiva is congested with the adhesion of bulbar and palpebral conjunctiva along with all the superior, inferior, temporal fornices.

- Sclera : Normal
- Iris : Normal
- Anterior chamber : Normal
- Lens : Clear

Extraocular movements were restricted in all quadrants due to the adhesions.

- Nasolacrimal ducts : Patent
- IOP : 17.3 mm of Hg
- Fundus : Could not be visualized

#### Investigations

- Routine Blood examination : WNL
- USG B Scan : WNL
- Conjunctival swab : The Swab picture was suggestive of *S. Aureus*
- Liver function tests : WNL
- Renal function test : WNL
- HBs Ag : negative
- HIV : negative

Based upon the clinical and diagnostic workup, a provisional diagnosis of total symblepharon due to membranous conjunctivitis was made.

#### Management

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

Amniotic membrane was obtained under sterile conditions from a human placenta obtained shortly after elective caesarean delivery as seen in figure 5. 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.



Figure 5: Freshly prepared amniotic membrane.

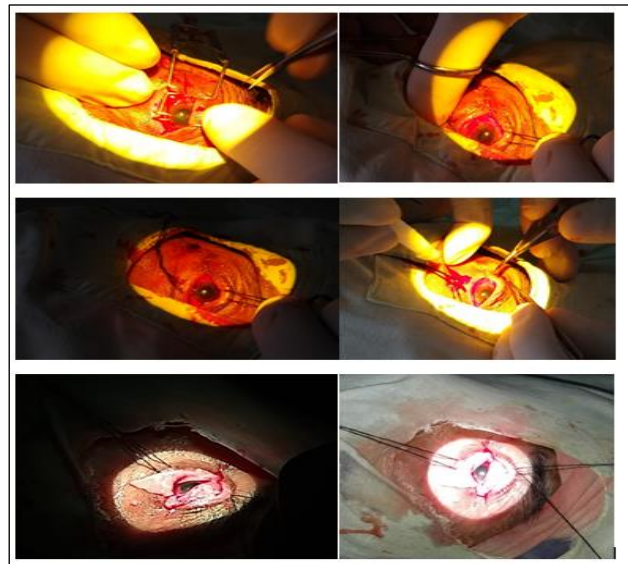


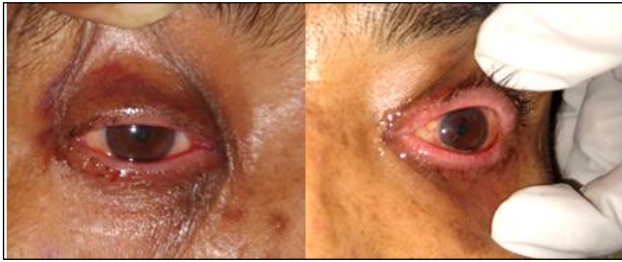
Figure 6: Some intra-operative photographs.

Surgery was performed under local anaesthesia as seen in Figure 6. 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.



**Figure 7: Day 1 post-operative photographs.**



**Figure 8: Patient at discharge.**

After surgery (1st post-op day photo as seen in Figure 7), 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 as seen in Figure 8.

## DISCUSSION

*Streptococcus pyogenes* and *Corynebacterium diphtheriae* are the most common causes of membranous conjunctivitis.<sup>10</sup> Membranous or pseudomembranous conjunctivitis can occur in any age group but are more predominant in adult population. There is evidence of its occurrence ranging from a 6 years old child to 80-year-old man. In our case it's a 50 years old male. In a study conducted by Reema et al, it was found that a 53 year male presenting with a history of chronic conjunctivitis revealed symblepharon and conjunctival granulomas on examination.<sup>11</sup> Hammer et al.<sup>12</sup> Presented two case reports in which patients with epidemic keratoconjunctivitis developed symblepharon during the

course of infection. Another report by Sezen et al, presented a case of symblepharon formation following EKC in an infant.<sup>13</sup>

In this case history, clinical features and further sequelae directs towards the development of membranous conjunctivitis of both eyes.

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.<sup>14</sup> 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.<sup>15</sup> 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.<sup>16</sup>

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.<sup>17</sup>

This patient was henceforth treated with symblepharon lysis along with freshly prepared Amniotic membrane Transplantation with satisfactory cosmetic results as seen in Figure 7 and 8.

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## REFERENCES

1. Akle CA, Adinolfi M, Welsh KI, Leibowitz S, McColl I. Immunogenicity of human amniotic epithelial cells after transplantation into volunteers. *Lancet* 1981;318:1003-5.

2. Dekaris I, Gabrić N. Preparation and preservation of amniotic membrane. *Dev Ophthalmol* 2009;43:97-104.
3. Dua HS, Azuara-Blanco A. Amniotic membrane transplantation. *Br J Ophthalmol.* 1999;83:748-52.
4. Fotopoulou C, Sehoul J, Gehrmann N, Schoenborn I, Lichtenegger W. Functional and anatomic results of amnion vaginoplasty in young women with Mayer–Rokitansky–Kuster–Hauser syndrome. *Fertil Steril.* 2010;94:317-23.
5. Grueterich M, Espana EM, Tseng SCG. Ex vivo expansion of limbal epithelial stem cells: amniotic membrane serving as a stem cell niche. *Surv Ophthalmol.* 2003;48:631-46.
6. Guo M, Grinnell F. Basement membrane and human epidermal differentiation in vitro. *J Investig Dermatol.* 1989;93:372-8.
7. Hao Y, Ma DH-K, Hwang DG, Kim W-S, Zhang F. Identification of antiangiogenic and antiinflammatory proteins in human amniotic membrane. *Cornea.* 2000;19:348-52.
8. Hasegawa M, Fujisawa H, Hayashi Y, Yamashita J. Autologous amnion graft for repair of myelomeningocele: technical note and clinical implication. *J Clin Neurosci.* 2004;11:408-11.
9. Hennerbichler S, Reichl B, Pleiner D, Gabriel C, Eibl J, Redl H. The influence of various storage conditions on cell viability in amniotic membrane. *Cell Tissue Bank.* 2007;8:1-8.
10. Hori J, Wang M, Kamiya K, Takahashi H, Sakuragawa N. Immunological characteristics of amniotic epithelium. *Cornea.* 2006;25:S53-8.
11. Kjaergaard N, Hein M, Hyttel L, Helmig RB, Schønheyder HC, Ulbjerg N, et al. Antibacterial properties of human amnion and chorion in vitro. *Eur J Obstet Gynecol Reprod Biol* 2001;94:224-9.
12. Kjaergaard N, Helmig RB, Schønheyder HC, Ulbjerg N, Hansen ES, Madsen H. Chorioamniotic membranes constitute a competent barrier to group B streptococcus in vitro. *Eur J Obstet Gynecol Reprod Biol.* 1999;83:165-9.
13. Kruse FE, Rohrschneider K, Völcker HE. Multilayer amniotic membrane transplantation for reconstruction of deep corneal ulcers. *Ophthalmology.* 1999;106:1504-11.
14. Kurpakus MA, Stock EL, Jones JCR. The role of the basement membrane in differential expression of keratin proteins in epithelial cells. *Dev Biol.* 1992;150:243-55.
15. Lee S-B, Li D-Q, Tan DTH, Meller D, Tseng SCG. Suppression of TGF- $\beta$  signaling in both normal conjunctival fibroblasts and pterygial body fibroblasts by amniotic membrane. *Curr Eye Res.* 2000;20:325-34.
16. Lee S-H, Tseng SCG. Amniotic membrane transplantation for persistent epithelial defects with ulceration. *Am J Ophthalmol.* 1997;123:303-12.
17. Madhavan HN, Priya K, Malathi J, Joseph PR. Preparation of amniotic membrane for ocular surface reconstruction. *Indian J ophthalmol.* 2002;50:227-31.

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