

Cryopreserved Amniotic Membrane in The Management of Persistent Epithelial Defect

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Abstract

Amniotic membrane has anti-inflammatory, anti-scarring and anti-angiogenic properties. Preclinical and clinical evidence support the successful use of cryopreserved amniotic membrane in treating corneal epithelial defects and ulcers caused by neurotrophic keratitis and the ulcers which are unresponsive to prior treatment. The case describes one such use of amniotic membrane in the treatment of a persistent epithelial defect.

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Photo Essay

The safety and effectiveness of cryopreserved amniotic membrane (AM) in expediting restoration of corneal epithelial health and eventually alleviating patient symptoms is known.¹ Amniotic membrane can successfully treat persistent epithelial defect (PED) in the cornea.² An unattended PED may result in Dellen's ulcer, corneal melting, descemetocoele, and corneal perforation that can be potentially devastating leading to blindness. Amniotic membrane transplantation (AMT) prevented these events in an 80-year-old gentleman suffering from coronary artery disease. He developed a non-healing epithelial defect in his right eye (OD) measuring 7.8 x 6 mm having ill-defined borders (Figure 1A). Corneal thinning upto one third of the corneal thickness was seen with stromal haze. Hypopyon was absent. The epithelial defect stained with fluorescein dye (Figure 1B). Moreover, the corneal sensations were diminished. The patient denied cataract surgery OD that was advised to him a year back as he had reasonably mobile vision of 6/9 in his left eye that had a posterior chamber pseudophakia. He had constant complaints of redness, watering, foreign body sensation and photophobia OD for last four months. There was no history suggestive of

autoimmune disorder, trauma, previous ocular surgery OD or similar complaints in the past. His presenting visual acuity OD was finger counting close to face. Fundus could not be visualized however a B-scan ultrasound demonstrated no posterior segment echoes. Although the basal schirmer value was 10 mm but the tear film break up time (TBUT) was decreased. He was managed on the lines of neurotrophic keratitis (NK) possibly due to herpetic keratitis. Over one month of treatment with topical preservative free antibiotics, cycloplegics, topical diluted steroids, antivirals and lubricants, resulted in non-resolution of clinical signs. He maintained normal intraocular pressures throughout. Eventually a cryopreserved AM was transplanted using an overlay technique and fixing with 10-0 nylon sutures (Figure 1C-D). The defect started to heal by two weeks (Figure 2A-B) and the healing (Figure 2C) was complete by 35 days with a vascularized corneal opacity (Figure 2D). His corneal sensitivity improved as so did the TBUT.

Traditional treatment for PED includes addressing the primary underlying pathology along-with suppression of inflammation. Lubricants, fibronectin, growth factors, serum



Figure 1(A-D): Patient on presentation with a large epithelial defect (1A) that stained deeply with fluorescein dye (1B). Amniotic membrane transplantation (AMT) was performed using overlay technique (1C) fixed with sutures (1D).

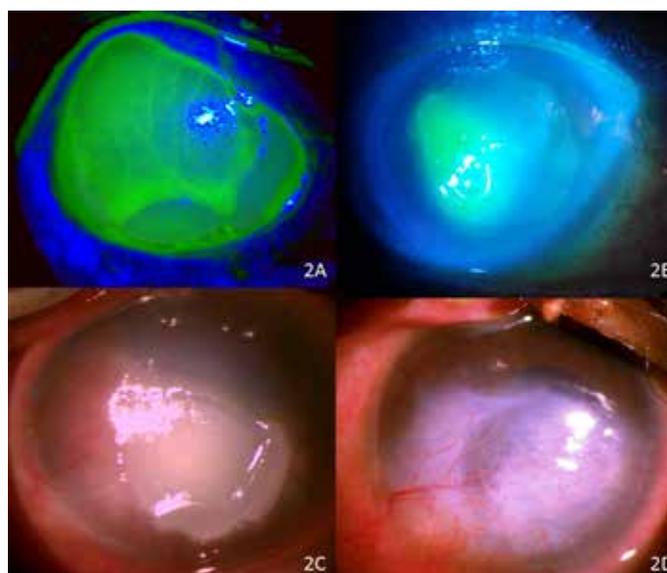


Figure 2(A-D): Two weeks after AMT the staining became faint (2A) and reduced as healing ensued (2B). Vascularization started and the ulcer reduced in size (2C) to heal completely with a vascularized corneal opacity (2D).

drops and substance P are alternatives.² A few of these agents may not be readily accessible and may not always suffice. Surgical options may then be tried which include tissue adhesive, contact lens, conjunctival flap, tarsorrhaphy or eventually a penetrating keratoplasty.^{2,3} Nevertheless, these options come with problems. A short surgical procedure of placing a cryopreserved AM fixed with sutures may prove beneficial in augmenting ulcer healing in difficult cases that require anesthetic monitoring as described. After its placement the membrane gradually becomes transparent and the healing area becomes clearer. Although AM limits corneal vascularization but it may not always be possible in such large PEDs.² Ocular surface inflammation is markedly reduced after AMT, which has been reported by several investigators.⁴ AMT has brought a paradigm shift in ocular surface reconstructive surgery. The growing popularity of AMTs in recent years has been modulated by the increasing knowledge about growth factors, cytokines and demographic changes that enhance AM usage.

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