FEATURED ARTICLE: Amniotic membrane transplantation for corneal indications
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The applications of amniotic membrane transplants (AMT) in ocular disease have continued to evolve over recent years. From their first ocular use in the 1940s to their more recent resurgence in ocular disease management, these biological membranes have proven to be effective as solitary and adjunctive therapies. AMT modalities have progressed quickly from small implanted sections and sutured patches to suture-less devices that allow in-office application with topical anesthetic. These advances have resulted in AMT becoming an increasingly available option in severe ocular surface disease management.

The innate properties of the amniotic membrane make it well suited for many ocular surface diseases. These characteristics include an ability to promote re-epithelialization while providing intrinsic anti-microbial, anti-inflammatory and anti-fibrotic properties. In addition, the AMT acts as a physical barrier much like a bandage contact lens. AMT lacks major immune markers associated with tissue rejection. Finally the membrane is transparent, allowing visualization of underlying ocular tissue.

Amniotic membranes are typically reserved for significant ocular surface disorders. The indications can be briefly summarized into four main categories:

- **Persistent epithelial defects (PED).** AMT had been shown to be effective in various etiologies of PEDs. This includes neurotrophic ulcers, dry eye syndrome, persistent superficial keratectomy defects, and refractory chemical burns. In addition, conditions such as vernal conjunctivitis with shield ulcer and peripheral ulcerative keratitis that have failed to respond to traditional therapies have been managed successfully with AMT.

- **Infectious keratitis.** In cases of severe infectious keratitis AMT has proven to be an effective option. AMT has been shown to decrease pain and allow for earlier administration of topical steroids in infectious bacterial ulcers. Similar results have been shown in cases of fungal keratitis, including severe cases with impending perforation.

- **Ocular surface protection/anti-cicatrization.** Due to its innate biomedical attributes and its action as a physical barrier, AMT is perfectly suited to function as a biological bandage in cases of surface protection and anti-cicatrization. In cases of chemical burn and Steven-Johnson syndrome, AMT can function to reduce pain, while providing a therapeutic function of reduced inflammation and
decreased scar formation\textsuperscript{10,11}. AMT has been used to stabilize the ocular surface, promote healing, and reduce pain in cases of bullous keratopathy\textsuperscript{12,13}.

- **Ocular surface reconstruction.** AMT has proven successful in ocular surface reconstruction for a number of etiologies. Early results demonstrated an increased rate of recurrence with AMT in pterygium removal and reconstruction\textsuperscript{14}. However, advances in technique now suggest an equal rate of recurrence when compared to traditional conjunctival autografts\textsuperscript{15,16}. AMT has been shown very effective in corneal reconstruction following removal of ocular surface neoplasms\textsuperscript{17}. AMT has been used to improve healing in cases of scleral melt with corneal involvement and necrotizing scleritis\textsuperscript{18,19}.

In many ocular surface conditions the clinician balances removal of antigen and suppression of the often deleterious effects of the ocular immune response. It appears AMT is well suited for this role. As evidence continues to accumulate and techniques continue to advance, we can expect AMT to become more routinely utilized in the management of corneal disorders.

References


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Dr. Cory Collier received his Doctor of Optometry degree from Nova Southeastern University (NSU) in Fort Lauderdale, Fla. Dr. Collier remained at NSU where he is currently a resident in primary care with emphasis in cornea and contact lenses.

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