AMNIOTIC MEMBRANES TO THE RESCUE

What these helpful little discs are, and how to use them.

BY REBECCA MILLER, OD

Amniotic tissue has been used to encourage wound healing for more than a century.[1] The first known use on the cornea was in 1940, when De Rotth suggested treating a corneal burn with amniotic tissue.[2] Amniotic membranes are created from the innermost layer of the placenta. The same biologic properties that protect the developing baby can promote new tissue formation, reduce scar tissue, modulate inflammation and pain, and may have antimicrobial effects when used on the cornea.[3]

These membranes are avascular, which means there's no concern for rejection while they provide fast corneal healing. The tissue is collected from consenting mothers with planned C-sections. Donors are screened for communicable diseases, and the tissue is treated with broad-spectrum antibiotics after collection.

TWO FORMS

Amniotic membranes are available in two forms, either cryopreserved or dehydrated tissue. I like to keep both on hand to provide options depending on the condition to be treated and the patient's tolerance for discomfort.

Cryopreserved Tissue

Cryopreserved tissue (Prokera, BioTissue) is slowly frozen to retain key antiinflammatory factors that promote healing. The tissue is attached to a PMMA ring measuring 21.6 mm in diameter. It is important to fully rinse the ring with balanced salt solution prior to placement to remove the preservative solution that can cause stinging. The tissue is inserted into the eye much like a contact lens and is reasonably comfortable when well centered.

If the patient experiences discomfort when blinking, a tape tarsorrhaphy can be performed to minimize lens and eyelid movement. Most patients comment that the PMMA ring feels large under their eyelid but is not painful.

It is best to leave the membrane in place for 5 to 7 days and then remove the PMMA ring that is left behind. Some patients cannot tolerate the

AT A GLANCE

- Amniotic membranes are available in two forms: cryopreserved or dehydrated. Which to use depends on the condition to be treated and the patient's tolerance for discomfort.
- Amniotic membranes are most commonly used as biologic bandages, to treat keratopathy, keratitis, corneal burns and abrasions, and more.
- Although some tissue products are expensive, most insurance carriers will reimburse with the correct documentation, diagnosis, and CPT code. Buying in bulk may reduce some costs.

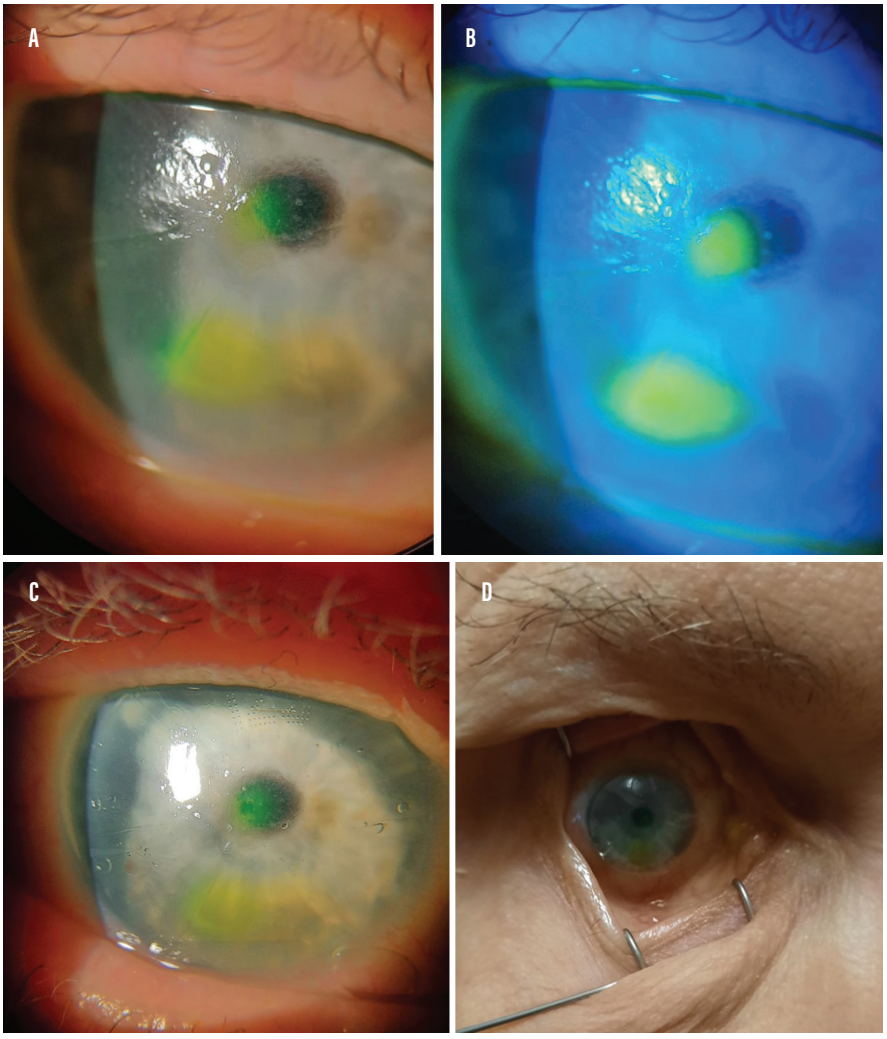

Figure 1. Patient's epithelial defects (A). The same defects viewed with fluorescein dye (B). The patient's eye after placement of the amniotic membrane and bandage contact lens. Notice the folds and bubbles, which resolve as the contact lens settles (C). Speculum positioning (D).

ring and need to have it removed before the membrane has absorbed. Discuss this possibility with patients before inserting the membrane. Let them know that they won't get the full healing benefits of the membrane if it is removed prematurely.

This device should not be used in patients with glaucoma who have a filtering bleb. Vision will be hazy until the membrane absorbs and the epithelium heals.

Dehydrated Tissue

Dehydrated membranes (BioDOptix, Integra LifeSciences; AmbioDisk, IOP Ophthalmics; Opticyte, Merakris; Aril, Seed Biotech; and Apollo, Atlas Ocular) are preserved in a variety of ways to retain cellular components: with low temperature heat, vacuum, air pressure, or chemicals. These membranes can be stored at room temperature, and shelf life is 2 to 5 years depending on the manufacturer.

Insertion typically involves reclining the patient's chair, instilling proparacaine, placing the eyelid speculum, and grasping the dry membrane with nontoothed forceps, taking care to notice which side of the membrane is facing the cornea. After placement, the membrane is smoothed with a Weck-Cel cellulose spear (BVI) and gently covered with a clear bandage contact lens. The speculum is then removed, the patient is returned to a sitting position, and the membrane placement is evaluated at the slit lamp.

The bandage contact lens is typically removed 5 to 7 days after insertion or when the membrane has absorbed. Patients usually don't feel any discomfort but do comment that their vision is hazy until the membrane absorbs, the epithelium heals, and the bandage contact lens is removed.

WHEN TO USE

Amniotic membranes are most commonly used as biologic bandages. The membrane creates a barrier that protects and supports the epithelium

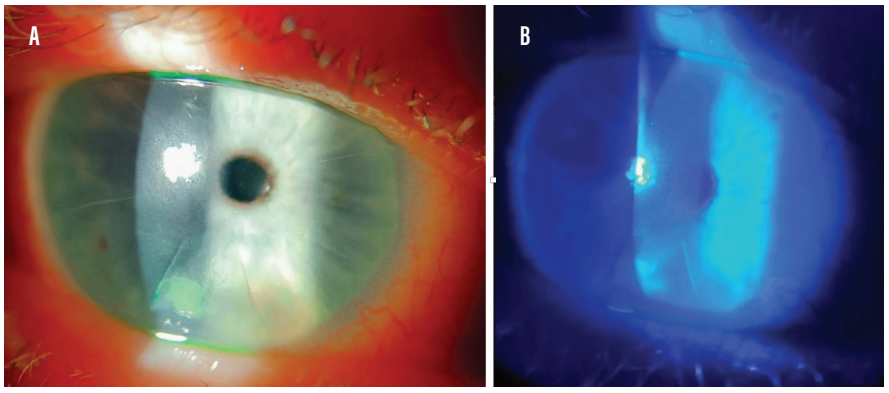

Figure 2. Patient's eye after amniotic membrane removal. Note that the central epithelial defects have resolved and the inferior epithelial defect is improving (A). Same eye shown with fluorescein staining (B).

as it heals. Membranes can be used to treat keratitis (due to dry eye, contact lens overwear, or mechanical injury), bullous or band keratopathy, chemical burns, epithelial basement membrane dystrophy, corneal erosions, Stevens-Johnson syndrome, corneal ulcers, and more. Because eye drop penetration is not an issue, topical medications can be used as indicated.

One of the most common uses for amniotic membrane in our clinic is for chronic epithelial defects related to dry eye that have not improved with other therapies. We place a dehydrated membrane for 5 days, remove it, and initiate long-term treatment with autologous serum eye drops. Improvement of dry eye symptoms for up to 4 months has been reported with use of amniotic membranes.[4]

Keep in mind, if the patient has chronic dry eye, membrane placement will not cure the disease, but it may create a healthier corneal surface for ongoing treatment.

Follow-up schedule depends on diagnosis and severity; for example, a patient with a chemical burn should likely be followed every 24 hours (I prefer to leave the membrane on until it absorbs), whereas a patient with chronic dry eye may not return to the clinic for 5 days.

COST ISSUES

The real question is, why don't more of us use these helpful membranes? Cost is usually the first response; purchase price for the physician can range from $125 to $900. The good news is that, with several companies now offering amniotic membrane products, you may be able to get more competitive pricing than was possible previously. Consider reaching out to multiple vendors and buying in bulk to obtain the best price. Keep in mind that cryopreserved slim membranes and large dehydrated membranes (5–15 mm) may be more expensive but may also give patients a better experience and/or healing response.

Most insurance carriers will reimburse with the correct documentation, diagnosis, and CPT code (65778). There is a 0-day global period for this procedure. This means, for example, that if the membrane absorbs before the defect has healed, you can place a new one 24 hours after the previous membrane.

As with all procedures, insurance prior authorization is recommended. Some clinics collect the insurance allowable and then reimburse the patient when the claim is paid. Be sure to keep an eye on what insurance will cover versus your own cost for the membrane.

INFORMED CONSENT

The risks, benefits, and alternatives of treatment should be discussed with patients, and a signed informed consent should be obtained. Most membrane companies provide a consent form that you can adapt for your clinic.

CASE REPORT

A 68-year-old man had complaints of ocular pain and vision changes after a recent hip surgery. BCVA OD was hand motions at 2 feet; BCVA OS was 20/40. Examination revealed a central corneal abrasion 1 mm x 1 mm and an inferior corneal abrasion 2 mm x 2 mm in the affected eye, with diffuse 4+ punctate epithelial erosion and eight corneal scars from a previous radial keratotomy (Figure 1).

A 12.0-mm dehydrated amniotic membrane (BioDOptix) was placed on the damaged cornea and covered with a bandage contact lens (Acuvue Oasys, Johnson & Johnson Vision Care). The patient was instructed to use moxifloxacin every 2 hours and preservative-free artificial tears every hour.

He returned 5 days later much happier, with pain resolved and with his BCVA improved to 20/100 (Figure 2). He was released to his primary care optometrist for further vision correction with a scleral lens and continued dry eye treatment.

GETTING STARTED

If you'd like to get started with amniotic membranes, reach out to some or all of the companies mentioned above and invite representatives to your office. They can answer your questions and show you how to properly use their products. You may be surprised by how often you find yourself reaching for a membrane and how happy your patients are with their recovery. ■

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4. Cheng AM, Zhao D, Chen R, et al. Accelerated restoration of ocular surface health in dry eye disease by self-retained cryopreserved amniotic membrane *Ocul Surf*. 2016;14(1):56-63.

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