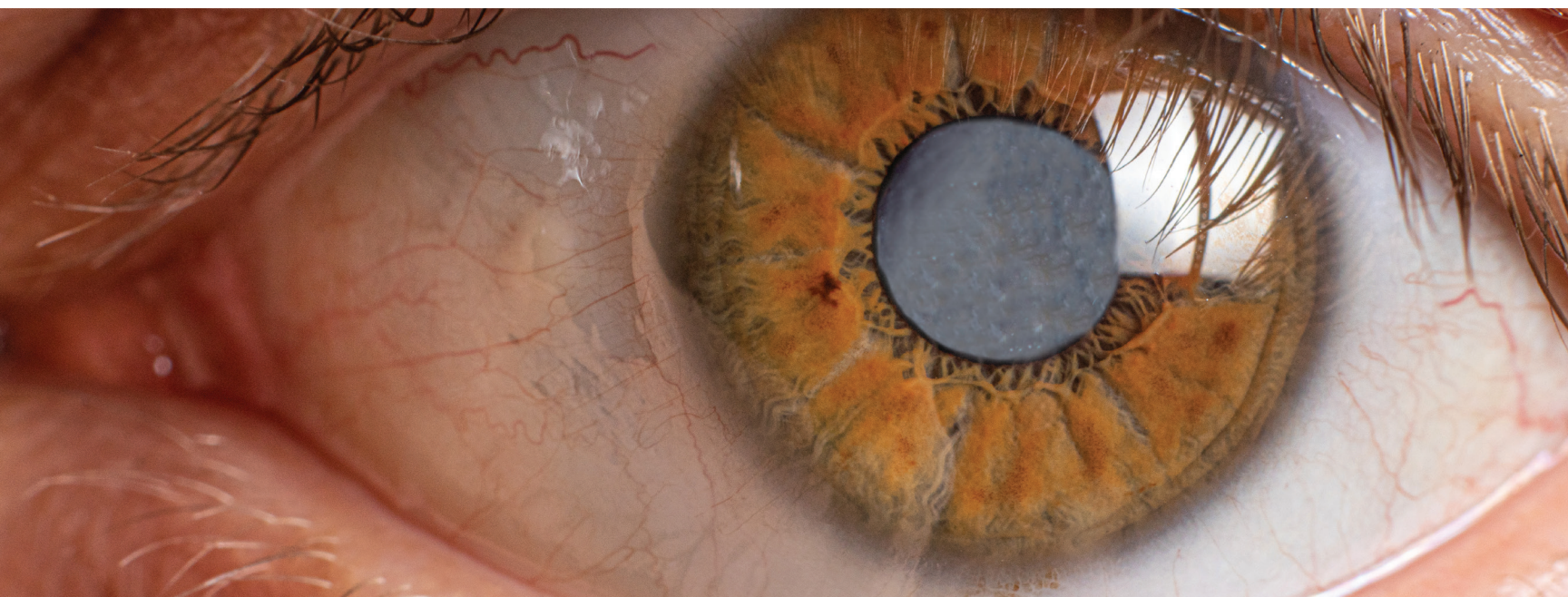




MANAGEMENT OF NK IN THE SURGICAL PATIENT



A case illustrating the benefits of amniotic membranes for patients with ocular surface disease undergoing cataract and refractive surgery.

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Neurotrophic keratopathy (NK) is characterized by the loss of corneal sensation and epithelial breakdown and is a common comorbidity with dry eye disease (DED), a multifactorial condition causing inflammation and dryness of the ocular surface, in patients undergoing refractive or cataract surgery. Studies have shown that 30% to 80% of patients who are evaluated for cataract surgery have objective signs of ocular surface disease (OSD).¹⁻³ Another recent study found the prevalence of NK to be 58% among patients with DED presenting for cataract surgery evaluation.⁴

Moreover, cataract surgery itself can exacerbate signs and symptoms of OSD postoperatively, as it can damage corneal nerves and disrupt the tear film.^{5,6}

DED and NK significantly compromise the health of the corneal surface, but they can also result in poor surgical outcomes, prolonged recovery, and patient discomfort. For example, DED can cause tear film instability, leading to unreliable topography and biometry measurements as well as inaccurate IOL calculations. Furthermore, preexisting NK or reduced corneal sensitivity can increase the risk of

postoperative complications such as epithelial defects and visual disturbances due to compromised healing of the epithelium. Thus, early assessment and treatment of OSD, including NK and DED, is crucial in patients presenting before and/or after cataract and refractive surgery.

MANAGING OSD IN SURGICAL PATIENTS

The American Society of Cataract and Refractive Surgery's Cornea Clinical Committee recently developed a consensus-based, practical diagnostic algorithm to aid surgeons in diagnosing

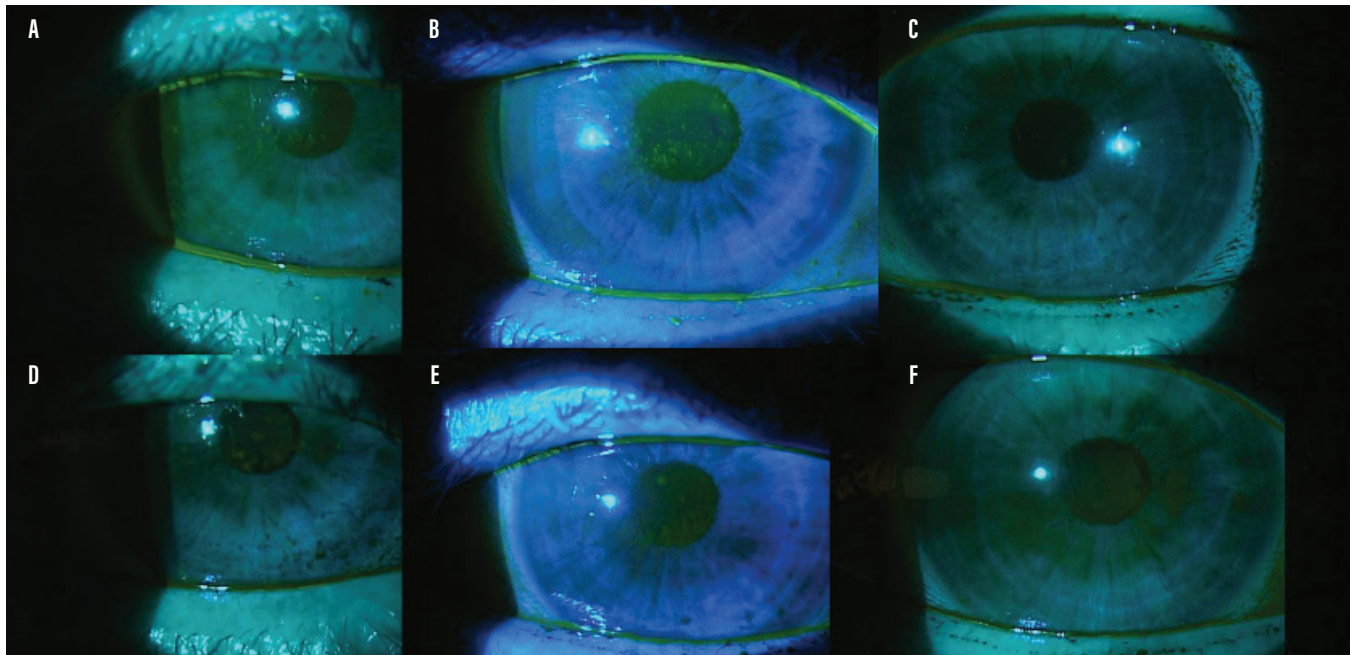


Figure 1. Slit-lamp examination revealed corneal staining OD (A) and OS (D) at initial presentation, which decreased after 1 day of treatment with cryopreserved amniotic membrane (B, E) and remained stable up to 1 month later (C, F).

and treating visually significant OSD in patients requiring cataract and refractive surgery.⁷ For patients with NK and DED, interventions such as punctal plugs, antiinflammatory medications, or lubricating ointments are often first-line therapies used to manage symptoms and promote corneal healing. Additionally, the use of cryopreserved amniotic membranes has been recommended for addressing severe punctate keratitis and helping

to restore a smooth ocular surface. Several studies have demonstrated that cryopreserved amniotic membrane expedites the recovery of a stable ocular surface in patients with NK and/or severe DED.⁸⁻¹¹

Below, I summarize a recent case in which treatment with a cryopreserved amniotic membrane (CAM360 AmnioGraft, BioTissue) improved signs and symptoms of NK before and after refractive lens exchange (RLE).

CASE EXAMPLE

A 55-year-old male patient presented for evaluation after undergoing RLE in his left eye 6 months earlier. He reported symptoms of grittiness, irritation, blurry vision, eye fatigue, and watery eyes despite using preservative-free artificial tears six times daily and gel/ointment at bedtime. My examination revealed corneal sensitivity loss, meibomian gland dysfunction, conjunctival staining, and 2-3+ corneal staining OU (Figure 1). The patient had a Standard Patient Evaluation of Eye Dryness questionnaire score of 17/28 (indicating severe dry eye), and his VA was 20/50 OS and 20/150 OD without correction.

To address the underlying NK and dry eye, I performed an irrigating eyelid retractor-facilitated ocular rinse (Rinsada) in-office and instructed the patient to use perfluorohexyloctane ophthalmic solution (Miebo, Bausch + Lomb) four times daily, lifitegrast ophthalmic solution 5% (Xiidra, Bausch + Lomb) twice daily, and to continue using the gel/ointment at bedtime.

AT A GLANCE

- Of patients who are evaluated for cataract surgery, 30% to 80% have objective signs of ocular surface disease, which can result in poor surgical outcomes, prolonged recovery, and patient discomfort.
- Treatment with a cryopreserved amniotic membrane can expedite the recovery of a stable ocular surface in patients with neurotrophic keratitis and/or severe dry eye.
- Consider treatment with a cryopreserved amniotic membrane for patients with signs and symptoms of NK and/or DED prior to cataract and refractive surgery and those who present with such findings postoperatively.

ADDITIONAL TREATMENT OPTIONS TO CONSIDER FOR NK

Autologous Serum Tears: A customized eye drop derived from the patient's own blood that contains essential proteins, immunoglobulins, nutrients, and growth factors. These components promote healing and homeostasis of the ocular surface in patients with neurotrophic keratitis (NK).¹

Cenegermin-bkbj ophthalmic solution 0.002% (Oxervate, Dompé): A recombinant human nerve growth factor, this drug helps corneal nerves to regenerate and restores corneal sensitivity. It is also the first FDA-approved treatment specifically for the treatment of NK.²

Lacrilfill Canalicular Gel (Nordic Pharma): This long-lasting intracanalicular insert is designed to enhance tear retention by blocking tear drainage, thus improving ocular surface moisture and promoting corneal healing.³

Punctal Plugs: These small devices are inserted into the tear ducts to slow tear drainage, increasing moisture on the ocular surface to support healing.⁴

Scleral Lenses: These large-diameter lenses vault over the cornea, creating a fluid-filled reservoir that can protect the ocular surface, maintain hydration, and support healing.⁵

Platelet-Rich Plasma Drops: Similar to autologous serum tears but with a higher concentration of growth factors, these drops can enhance corneal healing and nerve regeneration.⁶

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2. What is Oxervate? Accessed March 17, 2025. <https://oxervate.com/about-oxervate/>

3. Nordic Group B. V. through its subsidiary Nordic Pharma, Inc. (US), announces the launch of Lacrilfill Canalicular Gel, a novel therapy for dry eye [press release]. May 29, 2024. Accessed March 17, 2025. www.nordicpharma.com/nordic-group-b-v-through-its-subsidiary-nordic-pharma-inc-u-s-announces-the-launch-of-lacrilfill-canalicular-gel-a-novel-therapy-for-dry-eye/

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He returned 10 days after the initial evaluation with reduced irritation and redness OU. His visual acuity and corneal findings remained consistent with the prior visit. I instructed

him to continue topical drops and scheduled him to return in 1 week for treatment with a cryopreserved amniotic membrane to prepare his right eye for upcoming RLE.

One week later, corneal staining was still present despite compliance with topical drops; in light of these recalcitrant corneal findings, I applied an amniotic membrane to the right eye (Figure 2). It was briefly removed from the packaging and storage solution of saline and placed within a bandage contact lens with an 8.8-mm base curve (Acuvue Oasys, Johnson & Johnson Vision). The nonimplantable backing paper was then removed from the amniotic membrane with forceps and a sterile swab, and the bandage contact lens with the amniotic membrane was inserted into the patient's right eye. Prophylactic antibiotic drops and topical analgesic drops were instilled prior to insertion. The patient was instructed to return in 24 hours and to use only preservative-free artificial tears while the bandage contact lens and amniotic membrane were in his eye.

FOLLOW-UP CARE

The patient returned the following day, and I removed the bandage contact lens with the amniotic membrane. Examination revealed improvements in his corneal staining from 3+ to 1 and uncorrected VA from 20/150 to 20/100 OD, and he also reported improved clarity of vision and reduced irritation.

One week later, I placed an amniotic membrane in the patient's left eye using the same procedure as with the right. After 1 day, I removed the bandage contact lens and noted that the amniotic membrane was completely absorbed. Examination revealed improvements in corneal staining and uncorrected VA from 20/50 to 20/20 OS. The patient noted improved vision and ocular symptoms. I instructed him to continue topical drops thereafter for maintenance therapy.

The patient returned 1 month later and reported continued improvements in symptoms (ie, decreased irritation, watering, and blurry vision). He also noted that he could now feel the topical eye

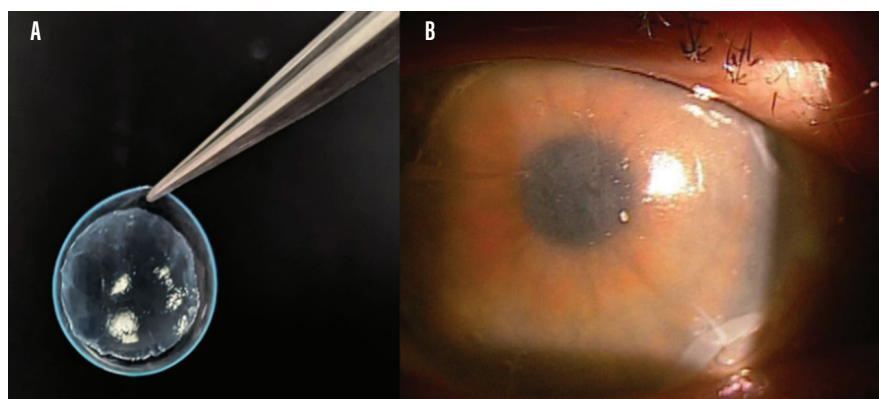


Figure 2. Depiction of the cryopreserved amniotic membrane within a bandage contact lens (A) and following insertion into the patient's right eye (B).

drops going into his eyes, suggesting improved corneal sensitivity. This was confirmed with corneal sensitivity testing and slit-lamp examination, which showed a healthy ocular surface with only trace central corneal staining. I noted his vision to be stable, and his corrected VA was 20/20 OU. At this point, I cleared the patient to schedule RLE for his right eye with possible plans to pre-treat the ocular surface with amniotic membrane prior to surgery, depending on scheduling and medical necessity.

POTENTIAL FOR RAPID RELIEF IN RECALCITRANT CASES

This case highlights how a single placement of an amniotic membrane for 1 day can significantly improve signs and symptoms of mild to moderate NK and DED. This treatment modality should be considered for patients who present with signs and symptoms of NK and/or DED prior to cataract and refractive surgery and even those who present with such findings postoperatively. ■

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