Family Outside the U.S. Sought Duke Specialist

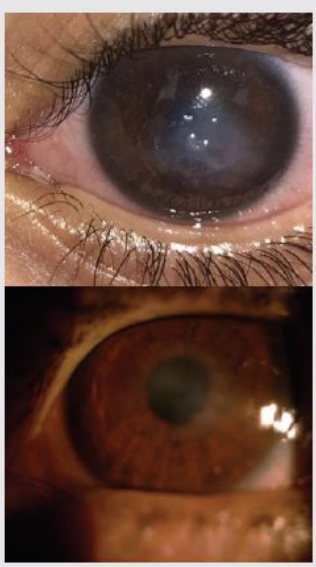
To Treat a Child with Severe Neurotrophic Keratopathy

A six-year-old boy from Dubai began to develop progressive vision loss. A local ophthalmologist found him to have severely diminished visual acuity, and corneal ulcers in both eyes associated with complete anesthesia (i.e., numbness) of the cornea. He was diagnosed with neurotrophic keratopathy (NK), a degenerative condition of the cornea which results from loss of corneal nerves. Despite consulting with multiple eye specialists in the region and ophthalmologists in other countries, the family could not find a doctor who could offer a definitive solution. The family was concerned that the untreated condition would result in permanent blindness.

While researching treatment options, the local physician identified **Ilya M. Leyngold, MD,** associate professor of ophthalmology and oculofacial plastic surgery specialist, who developed a novel corneal neurotization technique to treat NK.

Recognizing the child's long-term risks, Leyngold performed a minimally invasive procedure to harvest and reposition his adjacent sensory nerves to the surface of each eye. Less than six months after the procedure, the boy has recovered much of his corneal sensation and his vision has drastically improved.

During the minimally invasive procedure, Leyngold accessed the patient's supraorbital sensory nerves that extend up toward the hairline underneath the forehead muscle by making a small incision in the crease of the upper eyelid. "We did not have to do an interposition nerve graft in this case," Leyngold says. "I was able to directly harvest local sensory nerves situated above the eye and relocate them to the surface of each eye."



Images of the cornea before and at first post-operative appointment

After the supraorbital nerves were isolated, Leyngold secured enough of the tissue to rotate it, tunneling back down through the incision to access the conjunctival tissue lining the front surface of the eye. "Essentially we sutured the end of each nerve to the sclera underneath the conjunctiva adjacent to the cornea," he says.

The restoration of nerve function allows corneal nourishment to gradually begin again. The relocated nerves release trophic protein factors, neuropeptides that help the corneal surface regenerate properly. "We are able to restore the patient's natural ability to maintain corneal integrity," Leyngold says.

Because of the patient's young age, his recovery occurred faster than in an adult, Leyngold says. "Now he has been able to resume his normal visual activities without the difficulties he had prior to the surgery."

Leyngold continues to monitor the patient's condition by studying images and test results provided by the local ophthalmologist and by remaining in contact with the boy's father. The last follow up appointment was close to a year after surgery. During this examination his left cornea was completely clear and the right had only mild scarring with good clarity and integrity. He was able to fix and follow appropriately with both eyes.

Ilya M. Leyngold, MD
Associate Professor of Ophthalmology

Corneal neurotization has revolutionized the treatment of NK because it provides a definitive solution to the disease, Leyngold says. Although the concept of neurotization has been described before, Leyngold developed the minimally invasive technique to perform the procedure, reducing the morbidity and risks of the surgery.

"More patients will benefit from and have access to the procedure," he says.