

# CASE STUDY: WHEN THE HEART SKIPS A BEAT



Managing the oculocardiac reflex during corneal transplant surgery.

BY BEERAN MEGHPARA, MD

When a patient inquires preoperatively about the most serious potential complication of their impending surgery, I typically focus on the small risk of infection or retinal detachment. Occasionally, I broach the minute risk posed by a disastrous suprachoroidal hemorrhage. As an ophthalmologist, I rarely counsel patients on the possibility of cardiac arrest during routine ocular surgery.

## A CHILLING REAL-LIFE EXPERIENCE

Recently, I performed a penetrating keratoplasty (PKP) on a 32-year-old patient with keratoconus. She expected to experience anxiety about the process and therefore chose to receive general anesthesia rather than sedation. Anesthesia was successfully induced without complications, and the PKP began as expected. To trephinate the cornea, I applied a suction vacuum trephine and downward pressure. After successful removal of the corneal button, a sudden and alarming situation arose.

The anesthesiologist observed what seemed to be an absence of cardiac rhythm on the patient's monitor. Immediately, assuming it was a cardiac arrest event, the circulating nurse initiated emergency procedures and began chest compressions. The anesthesiologist, however, quickly identified it as severe bradycardia rather than cardiac arrest. He swiftly administered intravenous atropine, and the patient's pulse thankfully returned to normal levels. This unusually stressful

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situation presented a unique challenge: The patient's eye was open sky. I had no choice but to place my thumb on the cornea to tamponade the wound.

Once the patient's condition stabilized, the challenge lay in determining how to navigate the remainder of the surgery. Halting the procedure was not a viable option because the eye was open and the donor cornea had to be sutured securely in place.

I carefully lifted my finger from the corneal wound. To our collective relief, there was no prolapse of the patient's intraocular contents. I quickly sutured the donor cornea in place, after which the patient's general anesthesia was reversed. After awakening unscathed from the intraoperative event, the patient was kept overnight for observation and discharged the following morning in stable condition.

## UNDERSTANDING THE OCULOCARDIAC REFLEX

The episode I described was a textbook case of oculocardiac reflex—a physiologic phenomenon that can cause a patient's heart rate to decrease owing to pressure applied to the globe or extraocular muscles. The reflex is

mediated by a connection between the ophthalmic division of the trigeminal and vagus nerves. It is most frequently encountered during manipulation of the extraocular muscles in strabismus surgery but can also be triggered, though less commonly, when a suction trephine is applied during a PKP.

## OUTCOME

Witnessing a patient's heart rate plummet to a point where asystole—a state of no cardiac electrical activity—becomes a concern is daunting, especially when the eye is in an open-sky condition. Thanks to the rapid response of my anesthesiologist (and a little bit of luck), my patient's outcome was positive. The corneal transplant remains clear, and she continues to recover well. ■

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