Delayed-onset multifocal polymicrobial keratitis after laser in situ keratomileusis

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We report a case of mixed Aspergillus fumigatus and coagulase-negative Staphylococcus stromal keratitis in a 43-year-old man who developed discomfort and swelling in his right eye 20 days after uneventful bilateral laser in situ keratomileusis (LASIK). Clinical examination revealed 2 distinct corneal infiltrates beneath the LASIK flap. Corneal scrapings were taken for microscopic examination and culture. Both infiltrates initially improved on topical antibiotic therapy, but over the next 18 days, 1 infiltrate worsened and repeat cultures were performed, which demonstrated A fumigatus. Natamycin 5% and amphotericin 0.1% were started and continued for 8 weeks with resolution of the infiltrate and return of the best corrected visual acuity. Delayed-onset multifocal keratitis is a rare complication of LASIK. Fungal entities should be considered in the differential diagnosis.


Infectious keratitis after laser in situ keratomileusis (LASIK) is increasingly recognized, with over a dozen cases reported in the literature.1 Cases of delayed-onset keratitis after LASIK with bacteria, fungi, atypical mycobacteria, and nocardia have been reported.1–5 We recently treated a patient with delayed-onset, multifocal, polymicrobial keratitis that followed LASIK.

Case Report

A 43-year-old man had LASIK surgery in both eyes in July 2000. The surgery was uneventful, and postoperative therapy included ofloxacin 0.3% drops and loteprednol 0.2% 4 times daily for 1 week. At the 1-week examination, the corneal flaps and stroma were reportedly clear and the loteprednol and ofloxacin drops were discontinued.

Twenty days after the procedure, the patient returned complaining of increasing discomfort and swelling of the right eye for 3 to 4 days, with an uncorrected visual acuity (UCVA) of 20/40. The cornea revealed 2 distinct adjacent, but not contiguous, infiltrates below the superior flap hinge (Figure 1). The superior infiltrate was ulcerated, involved the flap and underlying stroma, and measured 1.5 mm in diameter. The inferior infiltrate was less dense, and the overlying epithelium was intact. Corneal scrapings and cultures were taken from the superior infiltrate. Vancomycin (25.0 mg/mL) and

Figure 1. (Ritterband) Slitlamp photograph of adjacent corneal infiltrates taken at the initial visit, 20 days after bilateral LASIK. A: The superior infiltrate (coagulase-negative Staphylococcus) has an overlying epithelial defect. B: The subtle inferior infiltrate (Aspergillus fumigatus) has intact epithelium.
tobramycin (13.6 mg/mL) drops were initiated hourly. A heavy growth of coagulase-negative staphylococci was identified within 24 hours. Loteprednol 0.2% drops 4 times daily were started 1 week later. On day 14, reepithelialization and consolidation of both infiltrates were noted.

On treatment day 19, the patient returned with increasing redness and discomfort and a breakdown of the epithelium overlying the inferior infiltrate. Corneal cultures were performed and demonstrated septate hyphal elements later identified as *Aspergillus fumigatus*.

Antifungal therapy was initiated with natamycin 5% and amphotericin 0.1% hourly. Loteprednol 0.2% was discontinued. Four weeks later, consolidation of the infiltrate, reepithelialization, and a reduction in the anterior segment inflammation were seen. Antifungal agents were discontinued 8 weeks after initiation. When the patient was last seen, 20 weeks after the initial treatment, the corneal examination revealed a peripheral scar and mild stromal loss. The UCVA was 20/40. The best corrected visual acuity at the time of the last examination was 20/20, with a manifest refraction of +1.00 –0.75 × 85.

**Discussion**

Infectious keratitis remains one of the most serious complications of LASIK, although the actual incidence is unknown. The first recorded case after LASIK was reported by Pérez-Santonja et al. in 1997 and was due to *Nocardia asteroides*. Post-LASIK infections usually present within the first week of infection, probably as a result of the direct inoculation of microbes under the flap at the time of surgery. Less commonly, delayed-onset keratitis has been reported weeks to months after surgery, sometimes as a result of trauma.

We report this case of polymicrobial multifocal keratitis to highlight the difficulties in managing delayed-onset and multifocal infections. We suspect latency between surgery and the clinical appearance may be due to the inherent biology of the organisms, which tend to be slow growing and innocuous at onset. *Aspergillus fumigatus*, an airborne mold, may have entered the stromal interface intraoperatively or from the eyelids. Coagulase-negative staphylococci, a common commensal organism of the lid, may cause keratitis and may have gained access to the flap interface intraoperatively. The possibility of a fungal keratitis was initially entertained because of the multifocality and delayed onset of the infiltrates. However, once the cultures were positive for heavy growth of staphylococci and the clinical response to antimicrobial therapy rapid, it appeared less likely. The superficial location of the infiltrates allowed adequate antiinfective access and most likely contributed to the excellent clinical response, making flap elevation unnecessary.

This report adds to the growing and varied list of organisms and presentations of infectious keratitis after LASIK.

**References**