

Late-Onset *Gemella morbillorum* Flap-Margin-Related Keratitis After Laser *In Situ* Keratomileusis

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Abstract

Purpose: Communicate a case of late onset *Gemella morbillorum* keratitis after laser *in situ* keratomileusis.

Infectious keratitis after laser *in situ* keratomileusis (LASIK) is a rare complication. The most common microorganisms in this infection are atypical Mycobacterium and gram-positive cocci. We treated a healthy 45-year-old man, who developed a spontaneous flap interface keratitis in the right eye 6 years after laser *in situ* keratomileusis (LASIK). Visual acuity represented in decimal fraction was 0.96 (19/20 feet) in the right eye and 1.0 (20/20) in the left eye. Cultures were positive for *Gemella morbillorum*. Topical treatment with fortified vancomycin and dexamethasone elicited a response. One month following initial treatment, the bacterial infiltrate had resolved. To our knowledge, this is the first reported case of post-LASIK infectious keratitis caused by *Gemella morbillorum* that occurred several years after the procedure.

Conclusions: This case emphasizes the importance of lifelong follow-up care after LASIK. When one of these patients exhibits symptoms of an infectious keratitis, it's important to suspect an atypical microorganism, and a culture should be taken to determine the best manner of treatment for each microorganism.

Keywords: Keratitis; LASIK; *Gemella morbillorum*

Introduction

Infectious keratitis after laser *in situ* keratomileusis (LASIK) is a rare complication, however it is still a devastating, vision-threatening complication. Its incidence is between 1/1000 and 1/5000 [1-3]. In the literature, there are several case reports of early onset postoperative LASIK microbial keratitis or late onset up to 6 months after surgery; it has been demonstrated that both atypical Mycobacterium and gram-positive microorganisms are the main causes of this infection [4-6]. We report what we think is the first case of infectious keratitis 6 years after LASIK caused by *Gemella morbillorum*, an uncommon gram-positive coccus.

Case Report

A 45-year-old man, with unremarkable medical history, was referred to our department because of his red and painful right eye. The patient remained symptomatic for 4 days with no signs of improvement despite treatment with topical ofloxacin prescribed by his general practitioner. His ophthalmic background mentioned bilateral Refractive Surgery (LASIK Technique) in 2008, without complications. There was no history of wearing contact lenses or any previous trauma. On examination, visual acuity without correction was 0.96 (19/20 feet) in the right eye and 1.0 (20/20 feet) in the left eye. Slit lamp examination of the right eye showed palpebral edema, normal eyelid (without blepharitis signs), short break up time (BUT), ciliary hyperemia between H-3 and H-6, inferior temporal ulcer with white 1.0 mm × 1.0 mm infiltrate and irregular borders in relation to the interface and perilesional edema (Figure 1). There was no Tyndall. Intraocular pressure and fundus were normal. The left eye exam was unremarkable. Corneal scraping samples for culture in thioglycolate, chocolate and blood agar were taken. The initial treatment regime was hourly, reinforced amikacin and ceftazidime to cover the most common organisms causing late-onset LASIK infectious keratitis [4]. After 48 hours, there was no clinical improvement and the culture was negative. We added vancomycin, ofloxacin and topical dexamethasone treatment and repeated the culture using blood, chocolate and Sabouraud agar. *Gemella morbillorum* (sensitive to vancomycin, ampicillin, cefotaxime, ciprofloxacin, clindamycin, linezolid, penicillin and rifampicin) was isolated. The same treatment was continued with Vancomycin

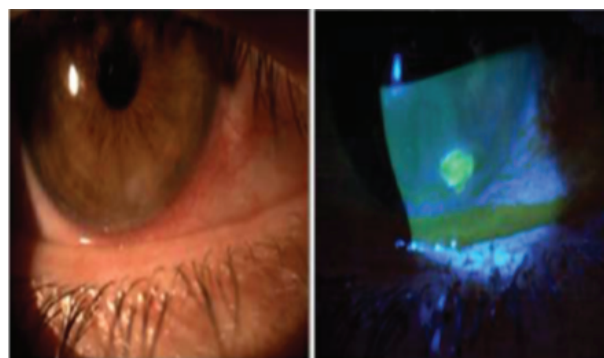


Figure 1: Patient with flap margin related bacterial keratitis. Anterior segment photographs of right eye showing a flap-margin related corneal ulcer, interface infiltrate and localized edema.

+ dexamethasone + artificial tears. After one month, visual acuity without correction was 1.0 (20/20 feet) in both eyes, there were no signs of infection, fluorescent assessment was negative, and only a small leukoma was observed in keratitis (Figure 2).

Discussion

LASIK is the most common, surgical refractive error correction procedure in the world. This procedure provides rapid recovery of visual acuity with a low incidence of complications. One of these rare complications is infectious keratitis. After LASIK surgery, patients are susceptible to infection due to a variety of reasons: "corneal tissue may

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Figure 2: Patient's cornea after 3 weeks treatment. Anterior segment of the right eye showing resolution of the infection, without infiltrate or edema.

present areas that are not completely sealed years after surgery and goblet cell populations that produce mucin are reduced" [7]. Other predisposing factors of very late-onset infection include the presence of recurrent epithelial defects, minor unrecognized trauma, dry eye, and a history of retreatment or diabetes [8]. Nevertheless, it may occur without any of the typical predisposing factors. In this case, we consider the presence of dry eye to be the main etiologic factor.

The incidence of microbial keratitis after refractive surgery is very low. However, cases may be underreported. There are several reports of late-onset flap-margin-related corneal ulcers in the literature, which include different kinds of microorganisms: *Staphylococcus aureus*, *Staphylococcus epidermidis*, Mycobacteria, *Fusarium solani*, *Pseudomonas mesophilica*, *Pseudomonas aeruginosa*, *Shewanella putrefaciens*, *Brevundimonas vesicularis*, *Klebsiella oxytoca*, *Acanthamoeba*, *Achromobacter xyloxidans*, Microsporidia [1-10]. In the case of this patient, *Gemella morbillorum* was isolated.

Gemella morbillorum is a gram-positive cocci with similar characteristics to Streptococci. It is a fermentative bacteria that is catalase and coagulase-negative, an optimum growth temperature of 35°C to 37°C, and a facultative anaerobe. It is present in the normal flora of the oral cavity and respiratory tract, but can also be found in the gastrointestinal tract of 0.1% of the population. It has been associated with various diseases such as endocarditis, septic arthritis, meningitis and brain abscess. Infectious dose, mode of transmission and incubation period [11] are unknown. It is sensitive to penicillin, tetracycline, ampicillin, cephalosporin, chloramphenicol, lincomycin, macrolides, vancomycin, bacitracin, and fusidic acid. However, it is resistant to aminoglycosides, sulfonamides and trimethoprim [12].

The American Society of Cataract and Refractive Surgery survey recommends lifting, scraping, and culturing in all cases of post-LASIK keratitis that appear to be infectious; while selecting the appropriate culture media which include chocolate agar, blood agar, Sabouraud

agar, thioglycolate broth and Löwenstein-Jensen. In Yamaguchi et al. [4], it was concluded that there is no standardized treatment for post-LASIK infectious keratitis.

In conclusion, this case report and literature review demonstrates the importance of lifelong postoperative vigilance of all patients having undergone LASIK surgery. In this case, keratitis was due to a microorganism that, to our knowledge, has never been isolated in relation to any eye complaint. When keratitis is observed and, like in this case, occurs a significant amount of time after LASIK; it is important to rule out any other condition that could be infectious cause, like previous trauma, blepharitis or eyelid infection. Early lifting and culturing of the flap are crucial due to the probability of isolating atypical microorganisms and the associated need for specific treatment.

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