Alcaligenes Xylosoxidans Keratitis following Photorefractive Keratectomy

Reza Zarei, MD1 • Mohammad Soleimani, MD2
Mohammad Yaser Kiarudi, MD2 • Hossein Zarei, BS3

Abstract

Purpose: Infectious corneal ulceration is a serious potential complication of PRK. Although gram positive organisms are the most common pathogens, in this study we present the first case of gram negative bacilli keratitis, Alcaligenes, after PRK.

Case report: A 22-year-old man was referred to our institution due to infection following corneal refractive surgery. Three days after surgery, the patient developed redness, very intense pain and blurred vision in the treated eye and he admitted with the clinical diagnosis of right eye post-PRK keratitis. Microscopic examination of the smear showed presence of gram negative bacilli and culture was positive for Alcaligenes. He was treated with fortified vancomycin, amikacin and ciprofloxacin and clinical symptoms subsided after 3 days and uncorrected visual acuity (UCVA) had improved to 6/10, but central haze remained.

Conclusion: Alcaligenes xylosoxidans has rarely been reported to cause postoperative endophthalmitis and infectious keratitis. Owing to a high degree of intrinsic antibiotic resistance, this organism presents a therapeutic challenge.

Keywords: Infectious Keratitis, Photorefractive Keratectomy, Alcaligenes Xylosoxidans

Introduction

Microbial keratitis following refractive surgery is a serious complication that can lead to visual loss and has been reported to occur after PRK, LASIK, and LASEK.1-6 We reported one case of infectious keratitis that occurred after PRK. We present the first case, to our knowledge, of gram negative bacilli keratitis, Alcaligenes xylosoxidans, after PRK in Iran.

Case report

A 22-year-old man was referred to our institution due to infection following corneal refractive surgery that was performed at another center. The patient initially presented for correction of mild to moderate myopia and astigmatism of -2.50-0.5×5º diopters (D) in the right eye and -2.5-0.5×180º D in the left eye.

1. Assistant Professor of Ophthalmology, Eye Research Center, Farabi Eye Hospital, Tehran University of Medical Sciences
2. Resident in Ophthalmology, Eye Research Center, Farabi Eye Hospital, Tehran University of Medical Sciences
3. Bachelor's Degree Insurance Management, School of Economic Sciences, Ministry of Science, Research & Technology

Received: December 4, 2008
Accepted: April 16, 2009

We state that our only interest is academic and we have no financial interest in this publication.

Correspondence to: Mohammad Soleimani, MD
Eye Research Center, Farabi Eye Hospital, Tehran, Iran, Tel:+98 21 55414941-6, Email: soleimani_md@yahoo.com

© 2009 by the Iranian Society of Ophthalmology
Published by Otagh-e-Chap Inc.
PRK had been performed by Allegretto IQ apparatus and after corneal surface ablation, 0.02% mitomycin had been instilled for 20 seconds. Three days after surgery, the patient developed redness, very intense pain and blurred vision in the treated eye. At the time of presentation at our corneal service, the visual acuity was hand motion in the right eye and 10/10 in the left eye. The right eyelids were edematous, and conjunctiva was congested. The cornea in the right eye showed a 3 mm × 2 mm epithelial defect with surrounding infiltration involving more than two thirds of the stromal bed (Figure 1). There was 2 mm hypopyon in the anterior chamber. The pupil was circular and mid-dilated and the crystalline lens appeared clear. Tactile measurement of intraocular pressure (IOP) was normal. A clinical diagnosis of right eye post-PRK keratitis was made. Corneal scrapings from the edge of the ulcer were taken. Smears were prepared and stained with gram stain, and a potassium hydroxide wet mount was also prepared. Microscopic examination of the smear showed presence of gram negative bacilli and the possibility of pseudomonal infection was kept in mind and patient underwent treatment with fortified ceftazidime (100 mg in 0.5 ml) and vancomycin (25 mg in 0.5 ml) eyedrops every 30 minutes, with atropine 1% eye drops three times a day.

On the third day after admission, cultures showed growth of Alcaligenes Xylosoxidans. The antibiogram showed sensitivity of the microorganism to gentamycin, tobramycin, amikacin, ciprofloxacin, vancomycin and tetracyclin. Fortified vancomycin and amikacin and ciprofloxacin were instituted every 60 minutes and patient observed daily. The corneal ulcers responded well to the treatment; three days later, hypopyon was resolved and size of the ulcer diminished (Figure 2). The frequency of the antibiotic eye drops was tapered slowly in the next week to every 6 hours and discontinued after 2 weeks. Fourth months later, BCVA had improved to 6/10 with +0.50×10°, but central haze remained (Figure 3).
Discussion
Infectious keratitis is an infrequent but severe complication following refractive surgery and has been reported in PRK and LASIK procedures. Risk factors for secondary infection after PRK include the presence of a large epithelial defect, the use of topical steroids, and the application of a bandage contact lens after surgery. Donnenfeld et al. reviewed a series of 13 cases of bacterial keratitis after PRK, proposing that gram positive infections pose the greatest risk. Wroblewski et al. with reviewing a total of 25,337 PRK procedures reported similar culture results to those in the case series of 13 patients reported by Donnenfeld et al. But in the present study we reported a case infected by gram negative bacilli. Alcaligenes (formerly Achromobacter) xylosoxidans has rarely been reported to cause postoperative endophthalmitis and infectious keratitis. Bacteria in the genus Alcaligenes are nonfermenting, gram negative bacilli found in soil and water. They grow well on standard blood and MacConkey agar culture media. These bacteria produce peritrichous flagella, a feature that distinguishes them from the genus Pseudomonas. Alcaligenes xylosoxidans, named for its ability to readily oxidize xylose (the most clinically important species in the genus), is a common contaminant of fluids and part of the indigenous flora of the ear and gastrointestinal tract. Because of these features, A. xylosoxidans is a causative agent of nosocomial outbreaks associated with contaminated solutions including intravenous fluids, irrigation fluids, hemodialysis fluid, incubators, humidifiers, and disinfectants. The other clinical infections of this organism are meningitis, biliary sepsis, pneumonia, urinary tract infection, and prosthetic knee infection. Alcaligenes xylosoxidans has been reported as one of the organisms causing keratitis in contact lens wearers.

There are reports of post refractive surgery infectious keratitis in Iran. Karimian et al reported a case of delayed-onset unilateral keratitis due to Actinomyses israelii after LASIK. Antibiotic treatment was initiated according to the sensitivity results and the infection was controlled.

Conclusion
In summary, we reported a case of post-PRK keratitis caused by the gram negative bacilli A. xylosoxidans. Owing to a high degree of intrinsic antibiotic resistance, this organism presents a therapeutic challenge. Antibiotic susceptibility testing of the individual isolate is required to optimize antibiotic therapy.

References