

Infectious Keratitis after Photorefractive Keratectomy

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Abstract

Infectious keratitis post-photorefractive keratectomy (PRK) is a rare but severe, vision-threatening complication, mostly caused by gram-positive bacteria. A 26-year-old female presented with diminution of vision two days post-PRK with corneal infiltrates in the right eye (RE). She was switched from topical moxifloxacin-loteprednol QID to moxifloxacin QID and one month later was prescribed topical gatifloxacin with prednisolone and cyclosporine. Prompt diagnosis and management with good antibiotic coverage helped restore her vision to 6/6 in the RE with paracentral scarring.

Keywords: Infectious keratitis, Photorefractive keratectomy, Gram positive bacteria, Refractive procedures.

INTRODUCTION

Surface ablation techniques, such as photorefractive keratectomy (PRK), remain among the most commonly performed laser keratorefractive procedures. They are associated with a lower risk of dry eye, corneal ectasia, and flap-related complications. However, these procedures involve a longer recovery period and carry a small risk of developing infectious keratitis—a rare but potentially vision-threatening complication.¹ Reported incidence rates range from 0.02 to 0.8% after PRK and 0 to 1.5% after LASIK. Identified risk factors for post-PRK infectious keratitis include intraoperative contamination, excessive surgical manipulation, disruption of the epithelial barrier, prior corneal surgery, delayed epithelial healing, use of topical steroids, and prolonged wear of bandage soft contact lenses.²

CASE REPORT

A 26-year-old female underwent an uneventful bilateral Photorefractive Keratectomy (PRK); her anterior and posterior segment examination was within normal limits. Post-operatively, she was started on topical moxifloxacin-loteprednol combination four times a day in both eyes.

Two days postoperative, she presented with diminution of vision in her right eye (RE), and her vision dropped to finger counting close to face with no refractive correction; her vision in the left eye was 6/6. On slit lamp examination, diffuse conjunctival congestion was present with a 1.5 x 2 mm

stromal infiltrate, 8 x 5 mm central stromal edema, and 2 x 2 mm of epithelial defect, rest of the anterior and posterior segment examination was normal. The other eye examination was normal. She was diagnosed with infectious keratitis post-PRK. Culture sensitivity of her bandage contact lens (BCL) was done, which showed the presence of gram-positive cocci, sensitive to Moxifloxacin (Figure 1).

She was shifted from topical Moxifloxacin- Loteprednol combination to only topical Moxifloxacin 1 hourly and later tapered to 2 hourly dosage on day 5 when there was incomplete epithelial healing with the presence of 1.5 x 2 mm stromal infiltrate superiorly and 8 x 5 mm stromal edema (Figure 2A and B).

One month later, her uncorrected visual acuity improved to 6/24 in the RE and best corrected vision of 6/9 with a refractive correction of +4.0 dioptre cylindrical power at 90-degree axis. On examination, the stain was negative, the infiltrate had resolved and mild stromal edema was present (Figure 3A and B).

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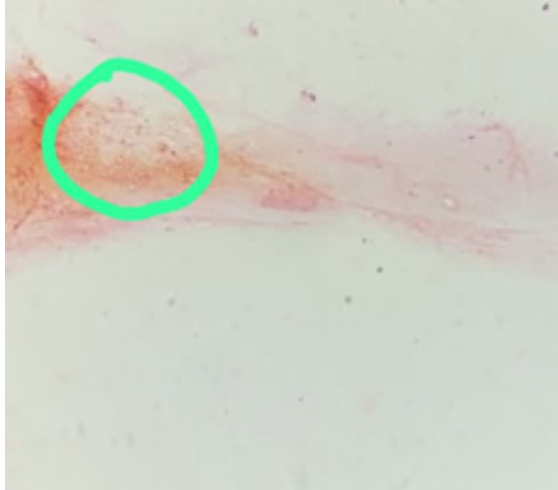


Figure 1: BCL showing the presence of gram-positive cocci, sensitive to moxifloxacin

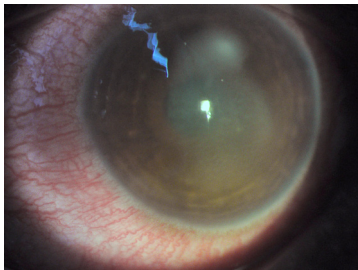


Figure 2A

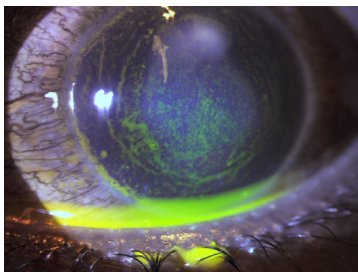


Figure 2B

Figure 2: Day 5 when there was incomplete epithelial healing with the presence of 1.5 x 2 mm stromal infiltrate superiorly and 8 x 5 mm stromal edema

Two months later, a paracentral scar was seen and she was prescribed topical Gatifloxacin with Prednisolone 0.5% combination tapered over 2 months and topical Cyclosporine 0.1% BD for 2 months to decrease the scarring and to relieve the dry eye symptoms post-PRK. Anterior segment – Optical Coherence Tomography (AS-OCT) was done which showed post – PRK corneal ectasia and scar formation (Figure 4). Three months later her best corrected visual acuity improved to 6/6 with best correction of +1.75 cylindrical power at 80-degree axis in the RE with a 4 x 2 mm nebular-macular paracentral scar (Figure 5).

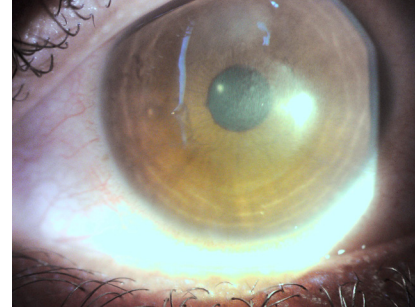


Figure 3A

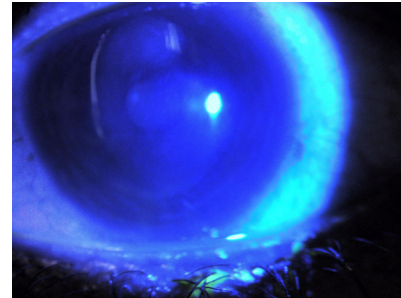


Figure 3B

Figure 3: Visual acuity improved to 6/24 in the RE and best corrected vision of 6/9

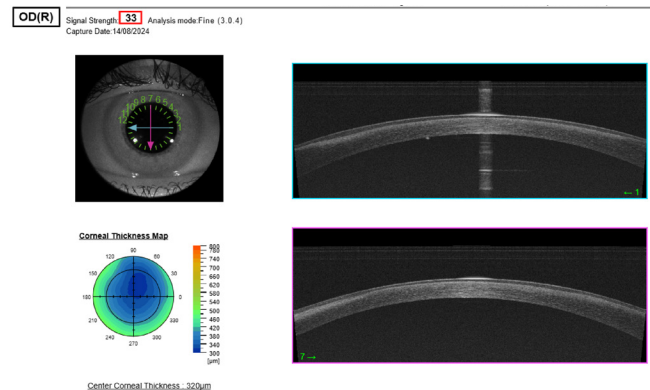


Figure 4: Anterior segment – Optical Coherence Tomography (AS-OCT) showed post – PRK corneal ectasia and scar formation

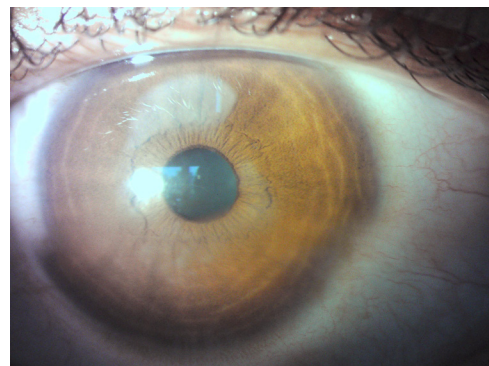


Figure 5: Three months later, visual acuity improved to 6/6 with the correction of +1.75 cylindrical power at 80-degree axis

DISCUSSION

Excimer laser-based corneal surgery is a cornerstone of kerato-refractive procedures, including PRK, LASIK, and LASEK. Among these, infectious keratitis following PRK is a rare but serious complication that can lead to substantial loss of visual acuity in eyes with good visual potential.ⁱⁱ

In contrast to LASIK, surface ablation techniques create a significant epithelial defect, facilitating microbial adhesion and proliferation. The use of topical corticosteroids and bandage contact lenses (BCLs) to promote healing may further suppress local immune defenses, increasing the risk of infection. Microbiological evaluation with culture and sensitivity testing is mandatory in all cases, either by scraping from the epithelial defect or the BCL.ⁱⁱ²

Early-onset infectious keratitis is most commonly caused by gram-positive bacteria such as streptococci and staphylococci, while gram-negative organisms are less frequently involved. Late-onset cases, on the other hand, are more often associated with opportunistic pathogens, including *Nocardia*, fungi, and atypical mycobacteria.²

Management of early-onset keratitis involves prompt and aggressive treatment with topical fluoroquinolones, such as moxifloxacin 0.5%, levofloxacin 0.5%, or ofloxacin 0.3%. In cases involving methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin is used. Adjunctive therapy with oral doxycycline (100 mg twice daily) can help inhibit collagenase activity, topical corticosteroids is discontinued. Early diagnosis and appropriate treatment are critical for achieving favorable visual outcomes.³⁻⁶

CONCLUSION

Infectious keratitis in a patient post-PRK should be treated early and aggressively with antibiotics and later steroids for

good prognosis. Potential risk factors for keratitis following surface ablation include blepharitis, exposure to healthcare environments, and contact lens handling. Prompt recognition, proper microbiological evaluation, and intensive antimicrobial treatment are essential for achieving good vision.¹

CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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