

The Danger of Overnight Contact Lenses – Orthokeratology-related Infectious Keratitis

Sadiq Said^{1, 2}, Martina M Bosch^{1, 3}, Sandrine Anne Zweifel², Daniel Barthelmes², Frank Blaser^{2, *}

¹ Eye Clinic Wettingen, Wettingen, Switzerland

² Department of Ophthalmology, University Hospital Zurich, University of Zurich, Zurich, Switzerland

³ University of Zurich, Zurich, Switzerland

Purpose

To present a case series of infectious keratitis associated with overnight orthokeratology lenses.

Methods

This investigator-initiated, single-center descriptive case series reviewed patients with orthokeratology-associated infectious keratitis between 2021 and 2024.

Results

We identified five cases of infectious keratitis in orthokeratology lens wearers (Figure 1). The first was an 18-year-old female who suffered from bilateral severe keratitis (Figure 2). The corneal scrapings revealed *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Staphylococcus caprae/capitis*, *Propionibacterium acnes* in the right eye, *Staphylococcus aureus* in the left, and *Acinetobacter baumannii* complex on both contact lenses. Despite intensive inpatient treatment with antibiotics and antifungals, the patient discontinued care prematurely. Second, an 18-year-old female presented with unilateral keratitis. We suspected *Acanthamoeba* infection on confocal microscopy, which was confirmed by PCR. We initiated anti-amoebic treatment, resulting in clinical improvement. Third, a 20-year-old female had unilateral infectious keratitis, whereby no pathogens were detected in the corneal scrapings. Confocal microscopy was unremarkable. Empirical antibiotic treatment resulted in clinical improvement. The fourth patient was a 20-year-old male who presented with unilateral peripheral corneal infiltrates, neovascularization, and corneal ulceration. Due to the improvement in the pre-treated patient, we did not perform corneal scrapings. Lastly, a 34-year-old male showed severe unilateral keratitis with corneal ulceration and hypopyon. Corneal scrapings revealed *Streptococcus dysgalacticae* by culture and HSV-1 by PCR. Intensive antiviral and antibiotic treatment resulted in gradual clinical improvement.

Discussion

Overnight orthokeratology lens use can be associated with severe, sight-threatening infectious keratitis of various microbial origins. Enhanced patient education and strict lens hygiene practices are critical to reducing such complications.

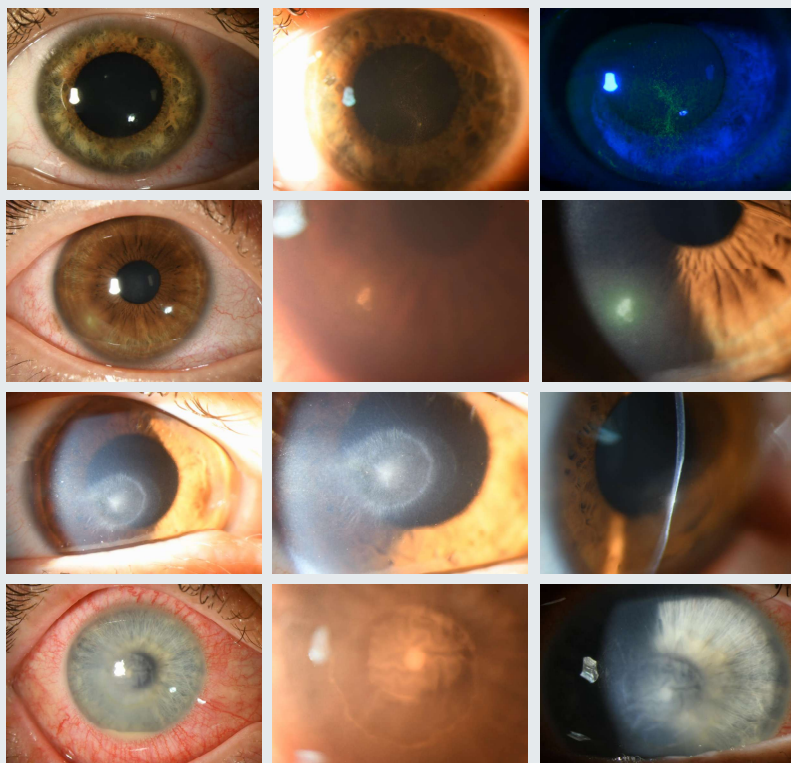


Figure 1: Slit-lamp montage of Ortho-K lens-associated infectious keratitis cases. The slit-lamp photographs are from four patients diagnosed with infectious keratitis linked to overnight orthokeratology (Ortho-K) lens wear. Each row corresponds to a different patient. The images highlight a range of clinical presentations, including conjunctival hyperemia, epithelial defects, stromal infiltrates, and hypopyon. The collage demonstrates the variability of disease severity and morphology across affected individuals.

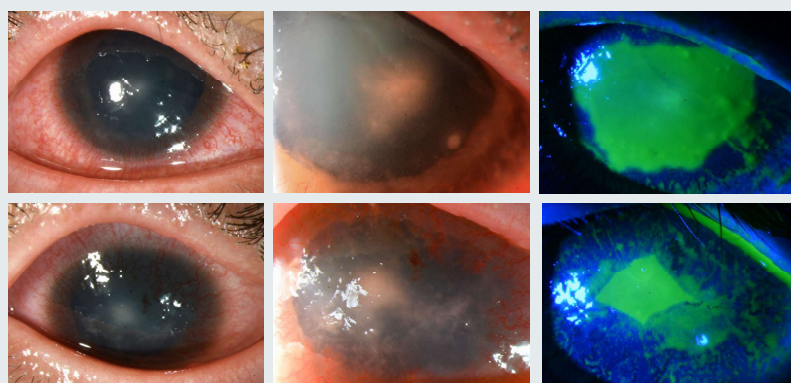


Figure 2: Slit-lamp photographs of a patient with bilateral infectious keratitis associated with overnight orthokeratology (Ortho-K) lens wear. The upper row displays the right eye, and the lower row shows the left one. Both eyes demonstrate marked conjunctival injection, dense central stromal infiltrates with surrounding edema, corneal neovascularization, and anterior chamber reaction. Fluorescein staining images under cobalt blue illumination reveals extensive epithelial defects consistent with active ulceration.