

# Contact Lens Induced Microbial Keratitis: A Case Report

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## Abstract

*Bacterial keratitis is a serious and potentially sight-threatening complication most commonly associated with overnight contact lens wear. This case report presents the management of a 22-year-old male patient who developed bacterial keratitis following non-compliance with recommended contact lens care practices, specifically sleeping in contact lenses. The report discusses the diagnosis, differential diagnosis, and treatment, along with the risk factors associated with contact-lens-related microbial keratitis (CLMK). Early intervention with fortified antibiotics and patient education led to a quick resolution of the condition. This case emphasizes the importance of proper contact lens hygiene and the timely treatment of bacterial keratitis to prevent visual impairment.*

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**Keywords:** keratitis, ulcer, fortified antibiotics, biofilm, contact-lens-related microbial keratitis, bacterial keratitis, prevention

**Abbreviations:** CLMK: contact-lens-related microbial keratitis

## Introduction

Bacterial keratitis (corneal ulcer) is a sight-threatening complication commonly seen in individuals who wear contact lenses, particularly when lenses are worn overnight. If untreated or inadequately managed, bacterial keratitis can lead to corneal perforation, endophthalmitis, and permanent vision loss. Bacterial infection accounts for approximately 90% of microbial keratitis cases, with *Staphylococcus aureus* and *Pseudomonas aeruginosa* being the most frequent pathogens. Sleeping in contact lenses is a significant risk factor for the development of bacterial keratitis, as it compromises the cornea's natural resistance to infection.

## Case Report

A 22-year-old male patient presented to our clinic on October 30th with a painful right eye, which was swollen shut. He had a history of wearing Biofinity 17 DS contact lenses and had been seen in our clinic a month prior for routine eye exams. The patient reported sleeping in his contact lenses the night before the visit but denied using water for cleaning or storing the lenses and stated that he replaced his lenses every two weeks. The patient had no history of swimming with contact lenses or any ocular trauma. His medical history was unremarkable, with no current medications or allergies.

Upon examination, his best-corrected visual acuity was 20/20 in both eyes. Slit-lamp examination revealed diffuse conjunctival injection, a small circular epithelial defect with underlying stromal infiltration in the center of the right eye, and a trace anterior chamber reaction with mucopurulent discharge.

## Differential Diagnosis

The differential diagnoses considered included:

- 1) Bacterial keratitis (corneal ulcer): Characterized by stromal loss with an overlying epithelial defect, associated with pain, photophobia, mucopurulent discharge, and anterior chamber reaction. The patient had classic signs of bacterial keratitis.
- 2) Fungal keratitis: More commonly associated with trauma involving vegetable matter, fungal lesions have feathery borders and may present with satellite infiltrates.
- 3) Acanthamoeba keratitis: Characterized by a painful ring-shaped infiltrate, often linked to poor contact lens hygiene (*e.g.*, using tap water or saline), with pain disproportionate to the clinical findings.
- 4) Herpes simplex keratitis (HSV-1): May present with dendritic lesions and decreased corneal sensitivity. The patient had no history of cold sores or immunocompromised conditions.
- 5) Herpes zoster keratitis (HZV): Involves pseudodendritic lesions and is typically accompanied by skin vesicles along a dermatomal distribution. The patient had no history of shingles or vesicular skin lesions.
- 6) Marginal keratitis: Caused by a staphylococcal exotoxin reaction, often occurring with blepharitis or ocular rosacea. This patient had no history of these conditions.

Given the clinical presentation, the diagnosis of bacterial keratitis was confirmed.

## Diagnosis

The patient was diagnosed with bacterial keratitis secondary to overnight contact lens wear.

## Treatment

The patient was treated with 1% atropine drops in the right eye to manage pain and prevent synechia formation. Additionally, Vigamox (moxifloxacin) was prescribed at a dosage of one drop every two hours for the right eye. A follow-up appointment was scheduled for the next day.

## Follow-up #1 (31/10/2024)

The patient returned for a follow-up the following day. His visual acuity remained 20/20 with spectacle correction. Slit-lamp examination showed a small corneal infiltrate with mild staining, indicating marked improvement. The dose of Vigamox was reduced to one drop four times daily, and the patient was advised not to wear contact lenses for one week.

### **Follow-up #2 (05/11/2024)**

At the subsequent follow-up, the patient's eye was clear, and no ulcer or symptoms (redness, pain, discharge) were present. The patient was educated on the risks of contact lens non-compliance, particularly sleeping in contact lenses.

### **Discussion**

Contact-lens-related microbial keratitis (CLMK) is a serious and potentially blinding condition. Overnight contact lens wear is a major risk factor, as it compromises the cornea's natural defense mechanisms. The use of contact lenses impairs corneal oxygenation, and sleeping in lenses increases the risk of bacterial contamination and infection.

In this case, the timely diagnosis and prompt initiation of treatment with fortified antibiotics helped prevent further complications. Early intervention with proper use of antimicrobial therapy is crucial in managing bacterial keratitis effectively and preventing vision loss [1–3].

### **Conclusion**

This case of bacterial keratitis highlights the importance of rapid diagnosis and treatment. It also emphasizes the need for patient education regarding the proper care of contact lenses and the risks associated with non-compliance, especially sleeping in lenses. Further research into the prevention and pathogenesis of bacterial keratitis, along with patient awareness campaigns, could help reduce the incidence of this potentially devastating condition.

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