

Bilateral Pseudomonas Keratitis Associated with Wear Same Soft Contact Lens in Both Eyes

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ABSTRACT

Purpose: To report a case of *Pseudomonas aeruginosa* microbial keratitis in a patient wearing the same soft contact lenses in both eyes.

Methods: 14-year-old girl with soft contact lenses she was diagnosed with a corneal ulcer in her right eye. Scrapings were positive for *P. aeruginosa*, started on fortified topical antibiotics, came one day after treatment then did not show up in her follow-ups. Two weeks later, she came after using the same contact lens in her left eye, diagnosed with a corneal ulcer, scraping of the corneal ulcer and contact lens were again positive for *P. aeruginosa*, she was admitted due to her poor compliance, treated with fortified topical antibiotics.

Results: The microbial keratitis healed with successful treatment.

Conclusions: Sight-threatening microbial keratitis can occur after using the same soft contact lenses in both eyes two week apart, showing how fertile is the contact lens for the growth of bacteria.

Keywords: Contact lens, poor hygiene, Microbial keratitis, Corneal ulcer, Pseudomonas

INTRODUCTION

Keratitis is a corneal disease in which the cornea is inflamed and it can lead to severe visual impairment. This disease can be due to infection i.e. bacteria, virus, fungi or protozoa or non-infection insults i.e. trauma, chemical exposure¹. Bacterial keratitis is the commonest among other forms of infectious keratitis, the most common causative agents are *Staphylococcus aureus*, *Pseudomonas aeruginosa*, coagulase-negative *Staphylococcus*, *Streptococcus* spp. and *Enterobacteriaceae*².

Particularly with contact-lens use *P. aeruginosa* is constantly the most commonly isolated microbe from corneal scrapings³⁻⁵. It is well known that the use of contact lenses has been a strong predisposing factor for microbial keratitis⁶. Yearly, contact-lens-associated microbial keratitis is expected to affect 1 in 2500 'daily use' patients and 1 in 500 'overnight use' patients⁷⁻¹⁰.

CASE REPORT

A 14-year-old white female student in good health presented with a 2-day history of right eye pain, redness, and photophobia. She had been wearing a soft contact lens of the same power as her refractive error was the same in both eyes, daily use and slept with her contact lens on for both eyes. On examination, Uncorrected Visual Acuity was Counting finger in both eyes. Intraocular pressure was 18 and 17 mmHg. The right eye had congested conjunctiva, a two early stromal infiltrates corneal

ulcer measuring 1 mm by 1 mm, with underlying stromal infiltrate and surrounding corneal oedema, located at the 1-o'clock position in the midperiphery (Figure 1). There was anterior chamber activity of 2 cells without a hypopyon. Examination of the left eye was unremarkable. Swabs from the corneal scrapings from the right eye were sent for gram staining, culture, and sensitivity, gram staining showed gram-negative bacilli. The possibility of pseudomonal infection was kept in mind because of the history of contact lens wear. Corneal cultures obtained by the scraping of the ulcer edge grew *Pseudomonas aeruginosa* on the blood and chocolate agar plates and thioglycolate broth. The scrapings were sensitive to ceftazidime, ciprofloxacin, gentamicin and piperacillin/tazobactam. She was asked to bring her contact lens, contact lens case and solution to obtain culture, but she did not. The patient was prescribed fortified intensive topical antibiotics: topical Ceftazidime 50 mg/mL, topical vancomycin 50 mg/mL hourly in the right eye and cyclopentolate every 8 hours. On the second day, visual acuity was counting finger and improving corneal edema and decreasing stromal infiltrates size to 0.5 mm. Hourly topical antibiotics were continued with the resolution of corneal edema and anterior chamber activity. She did not show up for her regular follow-ups. Two weeks later, presented with left eye pain, redness, photophobia, tearing and whitish discharge she was using the same contact lens in her left eye. On examination, Uncorrected Visual Acuity was Counting finger in both eyes. Intraocular pressure was 15 and 16 mmHg. The left eye had congested conjunctiva, an inferocentral corneal ulcer with

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stromal infiltrate measuring 1.5 mm vertical by 3.5 mm horizontal, with surrounding corneal edema, mucopurulent discharge and thinning (Figure 2). There was anterior chamber activity of 3 cells with a 0.3 mm hypopyon. Examination of the left eye was unremarkable apart from scarred previous infiltrates (Figure 3).



Figure 1: Anterior Segment photo of the right eye showing congested conjunctiva, a two early stromal infiltrates corneal ulcer measuring 1 mm by 1 mm, with underlying stromal infiltrate and surrounding corneal edema, located at the 1-o'clock position in the midperiphery

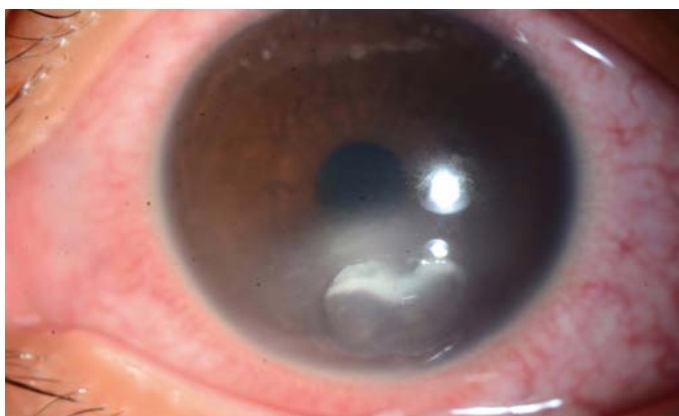


Figure 2: Anterior Segment photo of the right eye showing congested conjunctiva, an inferocentral corneal ulcer with stromal infiltrate measuring 1.5 mm vertical by 3.5 mm horizontal, with surrounding corneal edema, mucopurulent discharge and thinning

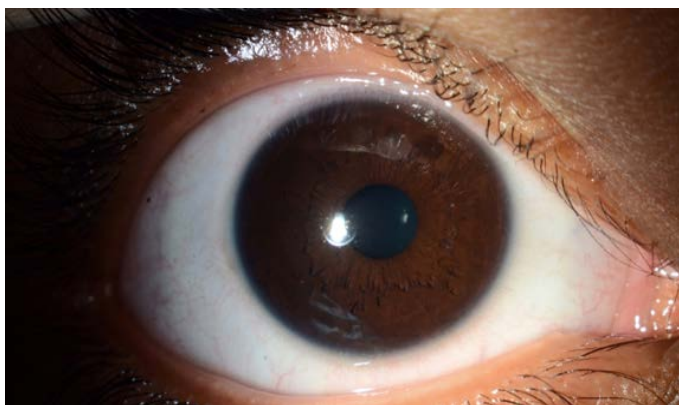


Figure 3: Anterior Segment photo of right eye after treatment showing two scarred previous infiltrates

The patient was admitted to the eye ward. Swabs from the conjunctival discharge, corneal scrapings from both eyes, and swabs from the contact

lenses and contact lens solution were sent for gram staining, culture, and sensitivity, again gram staining showed gram-negative bacilli. The possibility of pseudomonal infection was kept in mind because of the history of contact lens wear, Corneal cultures obtained by the scraping of the ulcer edge showed heavy growth of *Pseudomonas aeruginosa* on the blood and chocolate agar plates and thioglycolate broth. The scrapings were sensitive to ceftazidime, ciprofloxacin, gentamicin and piperacillin/tazobactam. The patient was started on fortified intensive topical antibiotics: topical Ceftazidime 50 mg/mL, topical vancomycin 25 mg/mL hourly in the left eye and cyclopentolate every 8 hours. On the second day, visual acuity was counting finger and improving corneal edema, decreasing stromal infiltrate density and clearing hypopyon Figure 4. Hourly topical antibiotics were continued with the resolution of corneal edema and anterior chamber activity. On the third day, the epithelial defect was healed and the infiltrate started to scar, she was shifted to topical ofloxacin for 2 weeks based on culture sensitivity and given follow up after 3 days in the Cornea clinic and refraction after one week but she did not show up again.



Figure 4: Anterior Segment photo of left eye after two days of fortified treatment improving of the corneal edema, decreasing stromal infiltrates density and clearing hypopyon

DISCUSSION

Contact lens-related Corneal Ulcers (CLCU) or Microbial keratitis (CLMK) is a devastating and potentially sight-threatening condition necessitating urgent management to encompass destruction and to improve prognosis¹¹⁻¹⁴. The use of contact lenses overnight is the solitary most common risk factor in the developed world¹¹. There are nearly 125 million contact lens wearers worldwide¹⁵. Corneal ulcers are the main cause of sight loss globally¹⁶. This number of contacts lens wearers increases the risk of complications of contact lens usage. Taking into consideration the age of our patient which is also playing a role factor for CLCU/CLMK in addition to this her poor hygiene/care of contact lenses, using the same contact lens in the other eye after developing CLCU/CLMK, as well as questioning her compliance and not showing up for her follow-ups. Whilst it is not the only causative agent of bacterial keratitis associated with contact-lens use, *P. aeruginosa* is responsible for the majority of corneal ulcers associated with lens wear.^{6,14} *Pseudomonas aeruginosa*, a versatile Gram-negative pathogen that can cause a wide range of infections, corneal infections with *P. aeruginosa* often have poor clinical outcomes and can result in long and costly treatments.

We are presenting this case to highlight how dirty contact lenses can carry a huge real risk to cause corneal sight-threatening disease, to show how the contact lens was a fertile reservoir for *P. aeruginosa*, and how virulence is pseudomonas as it was found in the second culture of the other eye using the same contact lens we advise to stress on the

importance of the contact lens hygiene/care, provide clear instructions to the patient in a simple clear way, involving the parents as well.

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Competing Interest: None

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