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Case Report/รายงานผู้ป่วย

Pseudomonas Keratitis Associated to Wearing Two Contact Lenses in One Eye
กระจกตาอักเสบติดเชื้อสูโดโมแนสจากการใส่เลนส์สัมผัสสองอันในตาข้างเดียว

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Abstract

This paper presented a patient who developed *Pseudomonas* keratitis followed by overnight wear and two contact use in the left eye in an elderly patient. Risk factors were identified including old age, overnight wear, and internet contact lens purchase. Gram negative bacilli were identified from patient's corneal specimen. Cultures of the corneal sample yielded growth of *Pseudomonas aeruginosa*. The clinical sign and symptom improved after topical fortified gentamicin and levofloxacin were prescribed.
Key words: *Pseudomonas aeruginosa*, keratitis, two contact lenses

บทคัดย่อ

บทความนี้นำเสนอผู้ป่วยสูงวัยที่มีภาวะกระจกตาติดเชื้อสูโดโมแนส จากการใส่เลนส์สัมผัสนอน และใส่สองอันในตาข้างซ้าย ปัจจัยเสี่ยงของโรค ได้แก่ อายุมาก การใส่เลนส์สัมผัส นอนขณะ การซื้อเลนส์สัมผัสจากอินเตอร์เนท ผลการย้อมกรัมพบแบคทีเรียกรัมลบชนิดแท่ง และผลการเพาะเชื้อพบสูโดโมแนส ออรูจิโนซา อาการและอาการแสดงของโรคดีขึ้น หลังจากได้รับการรักษาด้วยหยอดเยนตามายซินชนิดเข้มข้น และยาลีโวฟลอกซาซินชนิดหยอด

คำสำคัญ: สูโดโมแนสออรูจิโนซา, กระจกตาอักเสบ, เลนส์สัมผัสสองอัน

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Introduction

Contact lens related corneal infection is a crucial challenge to ophthalmologists. It includes bacterial keratitis, fungal keratitis, and *Acanthamoeba* keratitis. Among these causative pathogens, *Pseudomonas aeruginosa* is the most commonly recovered etiological organism, followed by Gram-positive bacteria, fungi, and *Acanthamoeba*[1]. The risk factors of infection were associated with age, gender, lens material, smoking habits, cleaning regimen, and wearing regimen [2]. We presented an elderly patient who had *Pseudomonas* keratitis associated to two contact lenses in the left eye.

Case Presentation

A 59-year-old Danish male who was a soft contact lens wearer presented at our clinic for two-day history of eye pain, redness, and decreased vision in the left eye. He had been using monthly disposable soft contact lens which obtained from the internet for at least 10 years. He also reported that he slept with contact lenses a few night during the past week and was not sure whether he took the contact lens out of his left eye before replacing a new contact lens. The patient regularly used multipurpose solutions for cleaning, disinfecting, and storing the contact lens.

His best-corrected visual acuity was 20/20, OD and hand movement, OS. Slit-lamp examination revealed both upper and lower eyelid swelling, profound mucopurulent discharge, and severe ciliary injection in the left eye but the right eye with contact lens was unremarkable. Two contact lenses were found in his left eye after trying to manipulate the contact lenses out (Fig. 1a). The cornea also showed superficial 1.0-mm white infiltrates paracentrally with surrounding marked mucopurulent discharge (Fig 1b). No hypopyon was found.

Specimens from conjunctival swabbing, corneal scraping, and the contact lens were all sent for microbiological analysis, including direct smear examination and culture and sensitivity testing. Numerous Gram-negative bacilli were found in both conjunctival samples and cornea specimens (Fig. 1c) but not in contact lens. The patient was initially treated with fortified gentamicin (14 mg/ml) eye drops hourly and 10% N-acetylcysteine eye drops 4 times daily in the left eye.

The patient denied to stay at the hospital. He was then instructed to stop using contact lens in the right eye and have daily follow-up examination at our clinic.

The ciliary injection was decreased and small infiltrates were barely seen at day 4 (Fig. 1d). His vision had improved from hand movement to 20/100, with pinhole to 20/40. Topical 1.5% levofloxacin eye drops were prescribed 4 times per day after fortified gentamicin (14 mg/ml) eye drops were tapered.

Follow-up cultures of the patient's conjunctival and corneal specimens, contact lens yielded growth of *Pseudomonas aeruginosa* and were susceptible to gentamicin, tobramycin, third- and fourth-generation fluoroquinolones.

He was instructed to continue topical 1.5% levofloxacin, however unfortunately he failed to return for 1 week follow-up appointment.

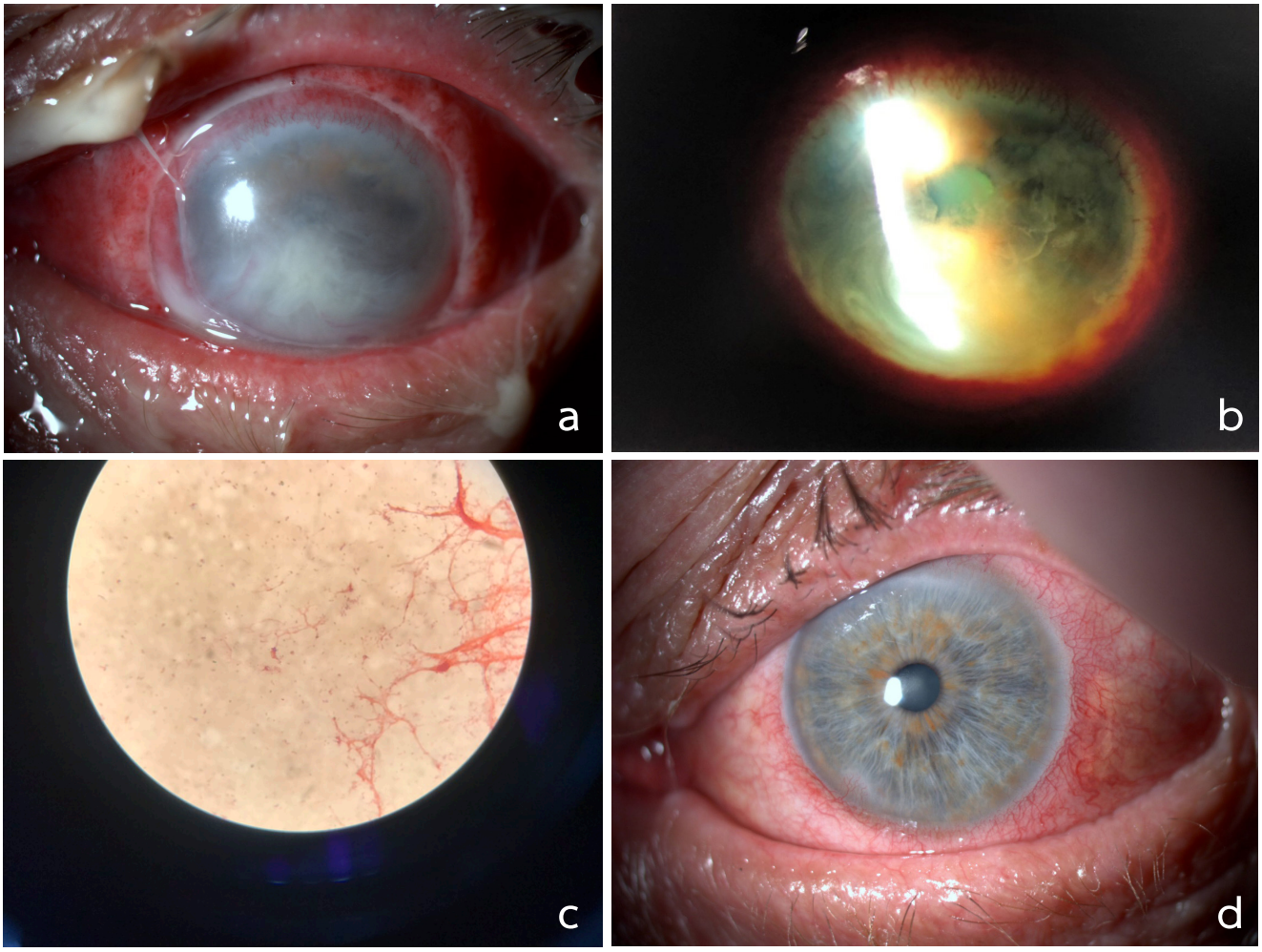

Figure 1 **a:** Left eye of the patient showed two contact lenses remained on the cornea. **b:** Marked mucupurulent discharge was located on top of the keratitis. **c:** Numerous Gram-negative microorganisms were showed in Gram staining. **d:** The ciliary injection was decreased and small infiltrate is barely seen after 4 days of treatment.

Discussion

Contact lens related corneal infection was a devastating ocular morbidity. Early recognition and rapid eradication of the pathogens were the key to the success of the treatment [3]. Bacterial infection should be presumed unless proven otherwise [4]. The gold standard of treatment for bacterial keratitis was the use of topical fortified antibiotics: either cefazolin and tobramycin combination or monotherapy with the second-generation fluoroquinolones [5].

The risk factors for bacterial keratitis of this patient were old age and overnight contact lens wear. In this elderly patient, forgetting to remove the contact lens might be a causative of having two contact lenses in his left eye. He also slept with the contact lens for a few days. Wearing two contact lenses promoted the lack of oxygenation providing for the corneal surface, consequently the cornea turned to a hypoxic state. Hypoxia was

a suitable environment for bacteria to replicate so it did increase the risk of infection [6] when two contact lenses were worn over the eye. The major risk factor for hypoxia was sleeping in contact lenses. Dart et al reported that sleeping in contact lens was one of the most frequently contact lens risk behaviors [7]. Although many brands of contact lenses had U.S. Food and Drug Administration-approved indications for overnight wear, sleeping in all kinds of contact lenses enhanced the risk for infectious keratitis. [8] One study by Stapleton F et al found that internet contact lenses purchase, possibly due to attitudes and behaviors association, was recently identified as a risk factor for infectious keratitis which was comparable to our patient [6]. The causative pathogen of this patient was *Pseudomonas aeruginosa* which is the most common microorganism related to contact lens wear [1,9]. Because contact lenses have appropriate surface for *Pseudomonas aeruginosa* and *Staphylococcus epidermidis* adhesion and biofilm formation [2], these are the major causes of contact lens related corneal infection. Our patient responded well to topical fortified gentamicin and levofloxacin in an early period of treatment, although he failed to return for the next appointment. Patient education and increased awareness of lens care would help to decrease the infection on cornea.

In conclusion, we presented a *Pseudomonas* keratitis followed by an overnight double contact lens wear in the left eye of an elderly patient. The clinical signs and symptoms improved after topical fortified gentamicin and levofloxacin were prescribed. Patient education should be advised to all contact lens wearers.

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