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Bacterial keratitis caused by *Kocuria varians*: a case report

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*The purpose of this paper is to report a rare case of bacterial keratitis caused by the non-pathogenic *Kocuria varians*. The case reported exemplifies the development of severe bacterial keratitis following a corneal microtrauma induced by of non-pathogenic or potentially pathogenic species. We report a rare cause of *Kocuria varians* keratitis in a review of national and foreign literature. Examination of the corneal microbiota and determination of its spectrum of sensitivity to antibiotics, if performed early, will facilitate the administration of adequate treatment and prevention of severe complications in corneal bacterial lesions.*

Introduction

Bacterial keratitis is a severe corneal disease that can result in significant vision loss, blindness, and even enucleation in severe cases. The disease can follow from a corneal microtrauma, an intraocular foreign body (IOFB), or from wearing contact lenses, etc. It is a matter of concern that about 55-60% of patients affected by keratitis are individuals of working age. Common infectious agents include, in particular, Gram-positive microflora, aggressive Gram-negative microflora and opportunistic bacterial species (*Streptococcus*, *Staphylococcus*, *Escherichia*, *Enterobacter*, *Proteus*, *Pseudomonas*, *Klebsiella*, etc).

Kocuria varians is a gram-positive, aerobic microorganism. Formerly it was classified into genus *Micrococcus*, but more recently was removed from *Micrococcus* based on phylogenetic and chemotaxonomic analysis.[1] Recently, Stackebrandt and colleagues [2, 3] made a taxonomic revision of *Micrococcus* spp. and reclassified it in the new genus *Kocuria* spp. (*Kocuria rosea*; *K. kristinae*; *K. varians*; *K. palustris*; and *K. rhizophila* sp. nov.). Although *Kocuria varians* is generally considered to be a non-pathogenic commensal that colonizes the skin, mucosa and oropharynx, it should be considered as a potential pathogen in immunocompromised patients. Isolated cases of ocular infections (like recurrent conjunctivitis [4] and endophthalmitis [5]) and brain abscess infection [6,7] caused by this microorganism have been reported. Herein we report a case of bacterial keratitis which was microbiologically diagnosed as keratitis caused by *Kocuria varians*. Cases of bacterial keratitis caused by *Kocuria* spp. variants have been reported in the foreign literature.[8] To the best of our knowledge, this is the first

case of *Kocuria* spp. keratitis reported in the Ukrainian literature. [9,10]

Case report

A 25 year-old male patient presented with complaints of decreased vision, redness, pain, and tearing in the right eye.

He reported that his symptoms started after something entered his right eye while he was doing agricultural works five days before presentation. The next morning after entrance his right eye became red and painful. On the second day after a foreign body event occurred, the patient presented to a local ophthalmologist and had some treatment prescribed for him, but this was followed by no improvement in the condition. Three days after this visit, he was referred to our eye hospital. He had no medical history of any chronic systemic disease or significant history of allergies. The patient had mild bilateral myopia and has been wearing spectacles or contact lenses since his childhood. He had no history of ocular inflammation.

He was treated and observed as in-patient at the hospital during 15 days. On admission, his general health condition was satisfactory. The skin and visible mucous membranes were pale pink and clear, and, on examination of the lungs, respiration was vesicular. Heart tones were clear, with a regular rhythm. His abdomen was soft and non-tender throughout. The liver and kidneys were not enlarged. His bowel and bladder functions were normal.

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In addition, blood pressure was 130/80 mmHg, heart rate 72 beats per minute (bpm) and body temperature 36.7 °C.

Unaided visual acuity (UCVA) was accurate projection of light OD and 0.3 OS, and the best-corrected visual acuity (BCVA) was 1.0 with -1.25 D Sph OS. His right visual acuity was uncorrectable.

In addition, intraocular pressure (IOP) measured by pneumotometry was 9 mmHg OD and 13 mmHg OS.

On objective examination, the right eye appeared irritated and showed mixed conjunctival injection, mucopurulent conjunctival discharge, a circular corneal infiltrate (5 mm to 6 mm in diameter) involving two-third of corneal thickness, and a purulent ulcer involving one-third of corneal thickness. The anterior chamber was moderately deep and showed a 2-mm hypopyon. The iris was swollen and iris surface appeared smooth. The pupil was round, miotic and slowly reactive to light, the lens clear, and fibrous strand floaters were seen in the vitreous.

The fundus was not seen (Figs. 1 and 2).

The left eye was quiet and clinically normal.

On admission, scrapings were taken from the edge of the right corneal ulcer and microbiologically processed using standard operating procedure. *Kocuria varians* was detected in an amount of 103 colony forming unit (CFU)/ml. Micro serial dilutions were carried out in vitro to

determine the chemotherapeutic sensitivity of isolated microorganisms. The bacterium was found to be sensitive to levofloxacin, moxifloxacin, clindamicin, meropenem, ceftriaxone, azithromycin and tobramycin.

The patient was prescribed topical and systemic therapy. The right eye was treated with miramistin, one drop every two hours for five days and then six times daily for ten days; levofloxacin, one drop every two hours for five days and then four times daily for 10 days; azithromycin, one drop twice daily for five days; liposomal ozone-based solution, one drop four times daily for 15 days; cyclopentolate, one drop twice daily for 10 days; and one 1.0 ml periocular amikacin injection daily, for 10 days. In addition, 1.0-ml ceftriaxone was injected intramuscularly twice daily for 10 days.

The patient's clinical findings and symptoms gradually improved with the treatment. There was a reduction in conjunctival discharge, and hypopyon completely released by day 5 of the treatment. Corneal epithelialization started on day 8 and was complete on day 12 of the treatment.

At discharge on day 15, the patient's general health condition was satisfactory. The skin and visible mucous membranes were pale pink and clear, and, on examination of the lungs, respiration was vesicular. Heart tones were clear, with a regular rhythm. His abdomen was soft and non-tender throughout. The liver and kidneys were not enlarged. His bowel and bladder functions were normal. Blood pressure was 120/75 mmHg, heart rate 68 beats per minute (bpm) and body temperature 36.5 °C.

On examination of the eye, UCVA was 0.05 OD and 0.3 OS, and BCVA was 0.2 with -1.5 D Sph OD and 1.0 with -1.25 D Sph OS. IOP measured by pneumotometry was 10 mmHg OD and 14 mmHg OS.

In addition, the right eye was almost quiet, and showed corneal opacity at the site of the previous ulcer and infiltration. The anterior chamber was moderately deep and the aqueous was transparent, the iris color and pattern were unchanged. The pupil was round and reactive to light, and the lens and vitreous were clear (Fig. 3). In addition, fundus examination revealed a pale pink optic disc with clear margins, an arteriovenous ratio of 2:3, normal macular response and normal foveal response, and unremarkable fundus periphery.

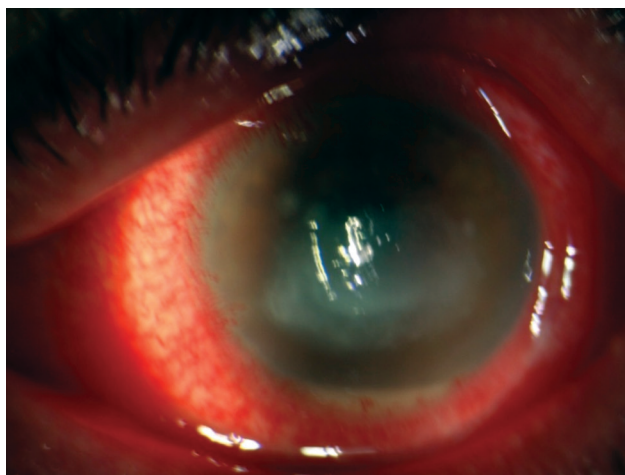


Fig. 1. Anterior segment of the right eye at admission .

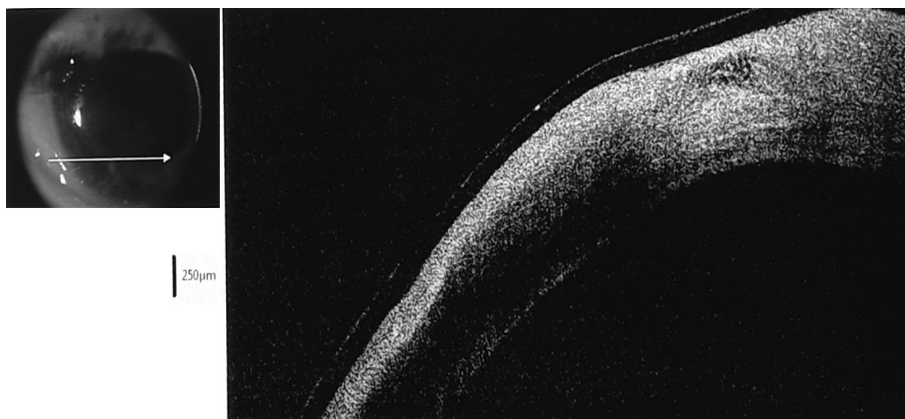


Fig. 2. Anterior segment optical coherence tomography of the right eye at admission.

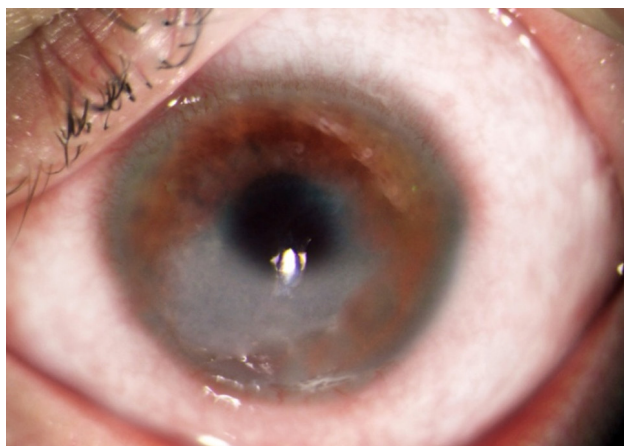


Fig. 3. Anterior segment of the right eye after treatment

After the therapeutic treatment, the patient had a negative culture from the same site as the initial positive baseline culture.

On discharge, the patient was instructed to take miramistin, one drop four times daily for 10 days; liposomal ozone-based solution, one drop four times daily for 10 days; and Neurorubine, one tablet daily for 30 days. In addition, the patient was recommended to avoid extreme cold.

Discussion

The case reported exemplifies the development of severe bacterial keratitis following a corneal microtrauma induced by species of non-pathogenic bacteria or potential pathogens. To the best of our knowledge, this is the first case of *Kocuria varians* keratitis reported in the national literature.

Pardo-Aguilar and colleagues [8] conducted a retrospective Mexican series of 8 cases of keratitis caused by *Kocuria* spp., with patient age ranging from 42 to 84 years. In all cases, ulcers were classified as severe. The infection resolved with medical treatment in one eye only. One case was treated with amniotic membrane graft. Two patients required keratoplasty (lamellar and penetrating), and one case needed sclerokeratoplasty. In three cases, the keratitis was severe enough to require evisceration. The final visual acuity ranged from light perception to 20/25. [8]

Examination of the corneal microbiota and determination of its spectrum of sensitivity to antibiotics, if performed early, will facilitate the administration of adequate treatment and prevention of severe complications in corneal bacterial lesions.

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Disclosures

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