

## Case Report

# Corneal Deposits: A Presentation of Arthrobacter Keratitis

Joanna S. Saade Baha' N. Nouredine Hanadi A. Ibrahim

Department of Ophthalmology, American University of Beirut Medical Center, Beirut, Lebanon

## Keywords

Arthrobacter · Bacterial keratitis · Corneal deposits · Keratitis · Infectious keratitis

## Abstract

**Introduction:** Infectious keratitis, an inflammatory condition of the cornea, poses a significant public health concern globally. Bacterial keratitis, the most common type, primarily involves *Staphylococcus aureus* and *Pseudomonas aeruginosa*. Timely diagnosis and treatment are crucial to prevent vision loss. **Case Presentation:** This case report presents a 78-year-old male patient with a burning sensation persisting for 1 week. The patient was diagnosed with keratitis caused by *Arthrobacter*, a Gram-positive coccobacillus commonly found in the environment. While the literature reports a few cases of *Arthrobacter* species keratitis, limited data exist regarding its clinical course and outcomes. Treatment with ciprofloxacin eye drops resulted in complete resolution of symptoms and a clear cornea upon final follow-up. **Conclusion:** *Arthrobacter*, a rare causative agent of keratitis, requires early suspicion for accurate diagnosis and treatment. Despite the limited literature on *Arthrobacter* keratitis, this case highlights the importance of considering uncommon pathogens in corneal infections. Further research is necessary to understand the prevalence and clinical course of *Arthrobacter* keratitis.

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## Introduction

Infectious keratitis is an inflammatory condition of the cornea caused by bacterial, fungal, viral, or parasitic infections. It is a serious condition that can lead to vision loss or blindness if left untreated. The prevalence of infectious keratitis varies depending on the causative agent and the population studied, but it is considered a significant public health issue worldwide [1].

Bacterial keratitis is the most common type of infectious keratitis, accounting for 60–90% of cases. The most common causative agents are *Staphylococcus aureus* and *Pseudomonas*

Correspondence to:  
Joanna S. Saade, js62@aub.edu.lb

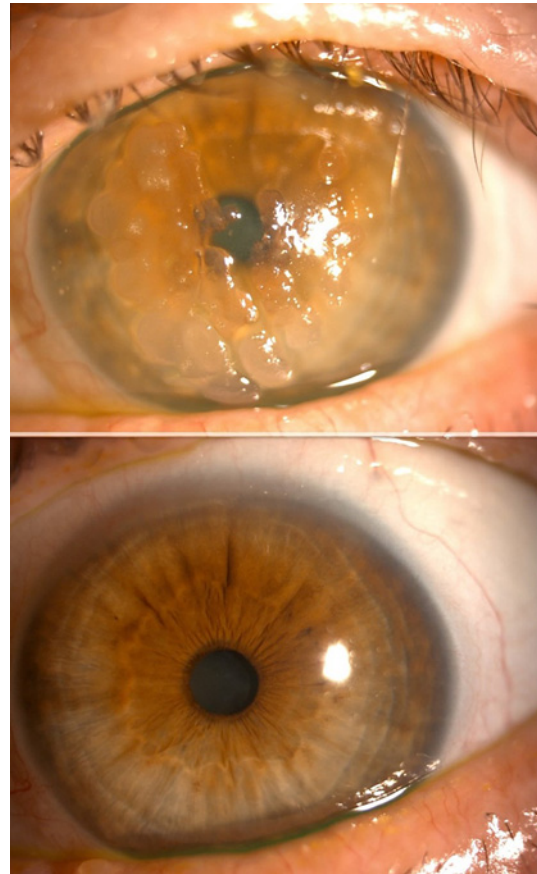
*aeruginosa* [1]. The clinical presentation of infectious keratitis can vary depending on the causative agent and the stage of the infection. Common symptoms include eye pain, redness, light sensitivity, and decreased vision [2]. A corneal ulcer or infiltrate may be visible on examination, and a corneal scraping for culture and microscopy can confirm the diagnosis. An early diagnosis and prompt treatment are essential to prevent vision loss and other complications.

### Case Presentation

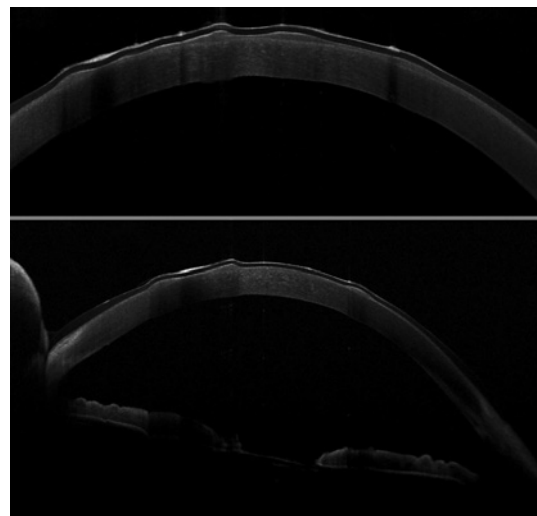
A 78-year-old male patient presented to the outpatient clinic with left eye pain, burning sensation, and decreased vision of 1-week duration. His ocular history was significant for bilateral ptosis repair done 1 month ago in an outside clinic. He was on prednisolone acetate 1% eye drops and NaCl 5% eye drops in his left eye (OS), 1 drop of each four times daily started 1 week prior to presentation, with no improvement. On examination, his vision was 6/24 in the right eye (OD) and 6/600 in the left eye (OS). Slit lamp examination revealed 3+ nuclear sclerosis in both eyes. The anterior chambers were deep and quiet, with limited view in the left eye (OS) but normal fundus exam (OU). The left eye cornea showed subepithelial translucent deposits causing elevations over the entire cornea, sparing the limbus. There were no epithelial defects. The conjunctiva was white with no significant papillae or follicles (Fig. 1). Anterior segment optical coherence tomography of the cornea MS-39 (CSO, Florence, Italy) showed hyper-reflective subepithelial deposits forming nodules in Bowman's layer and the anterior stroma (Fig. 2). Medication-induced keratitis was initially suspected. Epithelial keratectomy OS was performed, and tissue samples were sent for culturing and pathology. The pathology result did not reveal any abnormalities; corneal epithelium was that of normal thickness and had no evidence of dysplasia. However, within 1 day of incubation on chocolate (blood) agar at 37°C, corneal culture grew multi-sensitive *Arthrobacter* species (or *Glutamicibacter* sp.) identified through the MALDI-TOF. In order to confirm *Arthrobacter* as the causative agent, the microbiology laboratory underwent a thorough process of differentiation from other Gram-positive cocci. This process involved a series of tests, including Gram staining and biochemical assays including PCR and sequencing aimed at identifying unique characteristics specific to *Arthrobacter*. Furthermore, susceptibility testing revealed sensitivity to fluoroquinolones, hence guiding the selection of ciprofloxacin as the antibiotic of choice for topical treatment (Table 1). The patient received ciprofloxacin eye drops, administering 1 drop 4 times daily in the left eye for a duration of 2 weeks. After which he had complete resolution of his symptoms, and the cornea appeared clear (Fig. 1), with a vision of 6/24 in the right eye (OD) and 6/120 in the left eye (OS) at the final follow-up.

### Discussion

*Arthrobacter* is a genus of aerobic, Gram-positive, catalase-positive, spore-forming, nonmotile coccobacilli that grow on agar at a temperature of 37°C. It is widely present in the environment, primarily found in soil [3, 4]. Out of various human specimens, this bacterium has been isolated in 1996 from an eye with endophthalmitis post-intraocular lens implantation [5]. Also, *Arthrobacter* spp. were described as a causative organism of Whipple's syndrome uveitis [6]. Literature has reported a case of *Arthrobacter aurescens* from a corneal scraping [4] and another case of a bacterial perforated corneal ulcer caused by *Arthrobacter* spp. [7]. However, there are still limited data on the clinical course and outcomes of *Arthrobacter* species keratitis. Therefore, early suspicion of infectious keratitis is crucial to



**Fig. 1.** Top image: slit lamp photography of subepithelial translucent deposits causing elevations over the entire cornea, sparing the limbus. Bottom image: normal slit lamp photography of the cornea after treatment.



**Fig. 2.** AS-OCT MS-39 (CSO, Florence, Italy) showing hyper-reflective subepithelial deposits forming nodules in Bowman's layer and the anterior stroma.

prevent complications such as corneal scarring and perforation [8]. Although *Arthrobacter* keratitis is rare, it can present as subepithelial translucent deposits in an eye with no signs of inflammation, as seen in this case. Corneal samples from any corneal deposit should be considered for both pathology and culture, even if the presentation is not typically suspicious for an infectious keratitis. It is important to note that while this case report provides insight

**Table 1.** Susceptibility results for the identified *Arthrobacter* sp

Susceptibility	<i>Arthrobacter</i> sp
Amoxicillin/clavulanic acid	Susceptible
Clindamycin	Susceptible
Erythromycin	Susceptible
Gentamycin	Susceptible
Penicillin	Susceptible
Teicoplanin	Susceptible
Vancomycin	Susceptible

into the potential for *Arthrobacter* species to cause keratitis, more evidence is needed to fully understand the prevalence and severity of this condition. Furthermore, our patient's diabetic status may have rendered him immunocompromised, thereby increasing susceptibility to bacterial keratitis. Additionally, the patient's recent blepharoplasty may have predisposed him to an increased risk of infection, further complicating his condition [9]. The CARE Checklist has been completed by the authors for this case report, attached as a supplementary material (for all online suppl. material, see <https://doi.org/10.1159/000538474>).

#### *Patient's Perspective*

I started feeling a burning and foreign body sensation in my left eye, but I haven't had any unusual or new exposure to my eyes. I sought medical advice once I felt my vision was getting worse. At first, I was very worried, but after my doctor prescribed the antibiotics drops, my eye got much better, and I was immensely relieved and satisfied.

#### Statement of Ethics

Ethical approval is not required for this case report in accordance with local guidelines (Institutional Review Board at the American University of Beirut Medical Center). A written informed consent was obtained from the patient to publish the medical case and accompanying images.

#### Conflict of Interest Statement

The authors have no conflicts of interest to declare.

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#### Author Contributions

J.S. and B.N. were responsible for the evaluation, diagnosis, and follow-up of the patient. H.I. was responsible for the writing and gathering of the clinical information and images. All authors read, edited, and approved the final manuscript.

### Data Availability Statement

The data that support the findings of this study are not publicly available due to containing information that could compromise the privacy of research participants but are available from the corresponding author, Dr. Joanna Saade, upon reasonable request.

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