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J. Alvaro Toribio, Teresa Marrodán & Isabel Fernández-Natal

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CASE REPORT

Orbital implant infection by *Corynebacterium amycolatum*

J. Alvaro Toribio[a], Teresa Marrodán[b], and Isabel Fernández-Natal[b]

[a]Department of Ophthalmology, University Hospital of Leon, Leon, Spain; [b]Department of Clinical Microbiology, University Hospital of Leon, Leon, Spain

ABSTRACT

Corynebacterium amycolatum is a saprophyte gram-positive bacillus of the skin flora. It has been linked to diverse infections in immunocompromised patients and also of different types of prostheses. However, to our knowledge, there are no reports on its ability to produce ocular infections or to grow over alloplastic materials for orbital surgery. We present a case of orbital implant exposure including pure isolation of *C. amycolatum*. The patient was referred for discharge in his socket. After removal of the artificial eye, a large area of implant exposure and signs of chronic infection were observed. A microbiological sample was taken by rubbing the implant with a sterile swab. The sample was cultured and *C. amycolatum* was identified by phenotypical characterization. Other microbial species were not isolated. Besides being able to adhere to cardiac and joint devices, this case shows that *C. amycolatum* is a potential infectious agent of orbital prostheses. Pure isolation of *C. amycolatum* in an ocular sample is extremely rare and suggests an etiological role of this microorganism in an ocular or periocular infection.

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Bacterial adhesion; conjunctival flora; corynebacteria; ocular infection; prosthesis

Introduction

One of the major complications associated with the use of medical implants is microbial colonization of their surfaces. The microorganisms involved are generally flora adjacent to the input area of the device. An orbital implant may be colonized either at the time of its introduction or after an exposure, because it remains in contact with the conjunctival flora. Although non-diphtheritic *Corynebacterium* are common in conjunctival flora,[1] thus far, the species *Corynebacterium amycolatum* has not been described in orbital prosthetic material infections.

Corynebacterium amycolatum is considered a commensal flora organism of the skin.[2-5] Strains of *C. amycolatum* very typically produce dry colonies of about 1 to 1.5 mm in diameter after 24 hours of incubation at 37°C.[6] As other nonpathogenic corynebacteria resemble *C. amycolatum*, the microbiological diagnosis is frequently missed, if care is not taken to identify the isolate.[2] *Corynebacterium amycolatum* strains are predominantly misidentified as *C. xerosis*,[7] because both taxa have dry colonies and similar biochemical screening reactions.[6] In addition, some strains of *C. amycolatum* may be identified as *C. minutissimum* or *C. striatum*,[7] although *C. minutissimum* and *C. striatum* strains produce always moist colonies.[6] *Corynebacterium amycolatum* is an exception in the Corynebacteriaceae family because it does not contain mycolic acids in its cell envelope (in contrast to *C. xerosis* and most of the corynebacteria), and is the most frequently encountered nonlipophilic *Corynebacterium* species in clinical specimens.[6] Treatment of infections caused by *C. amycolatum* can be problematic as this organism is often multidrug resistant.[3,7]

Case report

A 42-year-old male was referred with profuse discharge in his anophthalmic socket. He had undergone left eye evisceration by another surgeon 14 years earlier, after several retinal detachment episodes. In that surgery, an 18-mm orbital implant of porous polyethylene was placed. Seven years ago, the patient suffered an exposure and the same surgeon replaced the orbital implant with another implant equivalent to the original. A year later, the patient again presented with an implant exposure, but he refused removal of the implant. When we examined the patient, a large exposure of 12 mm in diameter was observed.

A microbiological sample of the implant surface was taken by rubbing with a sterile swab. The sample was cultured and analyzed in the clinical microbiology

CONTACT J. Alvaro Toribio draltor@gmail.com Department of Ophthalmology, University Hospital of Leon, Altos de Nava s/n, Leon 24000, Spain

Table 1. Antimicrobial sensitivity of isolated *Corynebacterium amycolatum* strain.

Antibiotic	Sensitivity
Penicillin*	Resistant
Vancomycin*	Susceptible
Gentamicin*	Susceptible
Ciprofloxacin*	Resistant
Tetracycline*	Susceptible
Clindamycin*	Susceptible
Rifampicin*	Susceptible
Linezolid*	Susceptible
Erythromycin	Susceptible
Fosfomycin	Resistant
Chloramphenicol	Susceptible
Cotrimoxazole	Resistant

Antibiotic sensitivities were determined by disk diffusion technique according to the guidelines of the European Committee on Antimicrobial Susceptibility Testing (EUCAST) for *Corynebacterium* spp. (antibiotics marked with an asterisk) and the Clinical Laboratory Standards Institute (CLSI) M100-S24 (other antibiotics).

laboratory at our center. *Corynebacterium amycolatum* was identified using the API Coryne System with database 2.0 (BioMérieux, Marcy-l'Étoile, France) and by the phenotypic characteristics of the colonies. The API Coryne System is a specific commercial identification system for coryneform bacteria. It has been proved as a useful tool for identifying the coryneform bacteria encountered in the routine clinical laboratory.[8]

The API Coryne System was inoculated with a cell suspension of the isolated strain. The strain was classified as *Corynebacterium* group I: *C. amycolatum/C. striatum*. The final identification of the strain as *C. amycolatum* was achieved by observing formation of dry colonies after 24 hours of incubation. No other microorganism was isolated. The susceptibility pattern of the *C. amycolatum* strain obtained is shown in Table 1. As the orbital implant was markedly infected, conservative antibiotic treatment was avoided and surgical removal of the implant was proposed.

Written informed consent was obtained from the patient and surgery was performed to remove the orbital implant. The patient has not received a secondary implant insertion. After surgery, the purulent discharge disappeared and the patient refused surgery for a secondary implant. At present, the patient remains asymptomatic.

Discussion

The genus *Corynebacterium* is composed of aerobic and facultative anaerobic, non-acid-fast, pleomorphic, nonbranching, catalase-positive, gram-positive rods that do not form spores.[6,9] Currently it comprises more than 60 species.[9] *Corynebacterium* species other than *C. diphtheriae* are prominent members of the normal indigenous microflora of skin and mucous membranes.[3] Although isolation of these organisms may represent contamination with local flora, several species clearly cause systemic and ocular infections in humans.[10] *Corynebacterium macginleyi, Corynebacterium pseudodiphtericum*, and *Corynebacterium propinquum* are the species most frequently involved in the ocular pathology, causing conjunctivitis, keratitis, and endophthalmitis.[9,10] *Corynebacterium* spp. have also been observed in conjunctival microflora of anophthalmic sockets,[11] although *C. amycolatum* has not been determined until now in sockets. In fact, we have not found any report about the isolation of *C. amycolatum* in an ocular sample (either conjunctival or intraocular sample). Therefore, to our knowledge, there are no reports on the ability of *C. amycolatum* to produce ocular infections or to grow over alloplastic materials for oculoplastic surgery.

Corynebacterium amycolatum is regarded as a normal inhabitant of the skin.[2-5] Nevertheless, in the last two decades it is becoming widely recognized as an important pathogen.[2] *Corynebacterium amycolatum* has been linked to diverse infections in immunocompromised patients, such as septicemia, endocarditis, meningitis, septic arthritis, urinary-tract infections, and otitis media.[2] This microorganism has also been implicated in some infections in healthy subjects (i.e., vaginitis[3] and mastitis[5]), and as a colonizer of cardiac[7] and joint[4] prostheses. In addition, *C. amycolatum* is more resistant to many of the commonly used antimicrobials as compared to other *Corynebacteria*.[2]

Microorganisms isolated from the conjunctiva are thought to originate from the palpebral skin.[1] However, *C. amycolatum* has not been associated with ocular infections. In this case report, *C. amycolatum* was isolated as a pure and heavy growth that allows considering this bacterium as the responsible pathogen of the orbital implant infection. The antibiotic sensitivity of the isolated strain is consistent with that notified in previous reports (Table 1).[2] It is generally accepted that *C. amycolatum* is always susceptible to vancomycin, while it exhibits different degrees of resistance to penicillin, cephalosporin, aminoglycosides, and quinolones.

To the best of our knowledge, this is the first report that identifies *C. amycolatum* in an orbital infectious process. However, because of the prolonged exposure of the orbital implant in this patient, we cannot determine whether the colonization occurred at the time of the implant surgery or later when the implant was exposed.

Conclusion

Isolation of *C. amycolatum* in an ocular sample is extremely rare and suggests an etiological role of this microorganism in an ocular or periocular infection, especially if it is isolated in pure culture.

Disclosure statement

The authors do not have any financial interest in the information contained within this article.

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