are closely related, and a new phylogenetic clade, the "*sinensis* group", was proposed to include these three microorganisms.[2] The relationship between infections such as endocarditis and dental interventions has been proven, and prophylaxis is recommended in patients with risk factors, such as valve carriers. In addition, poor dental hygiene also seems to be associated with a higher risk of infections by *S. cristatus*.[3] In the case presented here, and in another of those previously reported, the patients had minor dental interventions or a history of poor dental hygiene prior to the infection.[4]

Only nine clinical cases of infections caused by this microorganism have been described: six cases of infective endocarditis, one of septic arthritis and two of bacteraemia.[4-9] At our institution, we have identified another case of endocarditis by sequencing the 16S rRNA gene from a prosthetic valve sample.

Current treatment guidelines recommend, in patients with *viridans* group streptococcal prosthetic valve endocarditis, six weeks of penicillin (24 million U/24 h IV in continuous infusion or 4-6 doses) or ceftriaxone (2 g/24 h IV or IM), which can be combined with a 2-6 week regimen of gentamicin (3 mg/kg every 24 h IV or IM). In highly sensitive strains (MIC of penicillin $\leq$0.12 mg/l), as in our case, the combination with gentamicin has not shown higher cure rates compared to monotherapy.[10]

This case adds more scientific evidence about the ability of *S. cristatus* to cause serious infections such as bacteraemia or endocarditis, although more studies are needed to explore its virulence.

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Annex. Additional material

Additional material for this article can be consulted in the electronic version available at doi:10.1016/j.eimc.2022.08.011

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Streptococcus canis as a causative agent of infection of osteosynthesis material and myositis

Streptococcus canis *como agente causal de infección de material de osteosíntesis y miositis*

A 51-year-old patient, a moderate alcohol consumer with a history of bimalleolar fracture of the right ankle nine years earlier, for which he required open reduction and osteosynthesis with a fibular plate and screw in the medial malleolus, was admitted due to ascitic decompensation in the context of Child C liver cirrhosis for control and study. At admission, the patient presented oedema and erythema in the right lower extremity, with a painful subcutaneous abscess on palpation. Surgical debridement was performed, with abundant purulent exudate discharge and osteosynthesis material was extracted, sending samples for cultures.

The osteosynthesis material sample was introduced into a container with thioglycolate enrichment medium, which was incubated at 37 °C in aerobic conditions for 24 h and subsequently Gram stained, and inoculated on chocolate and *Brucella* agars. Abscess samples were plated on chocolate, TSA with 5% sheep blood, McConkey, CNA and *Brucella* agars. In all the Gram

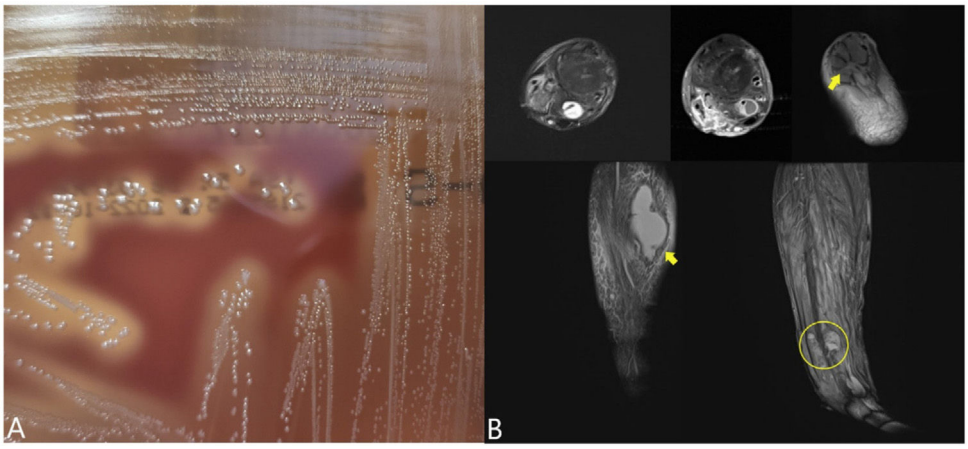

Figure 1. A) β-haemolytic colonies on TSA agar with 5% sheep blood (24 h incubation, 5% CO2). B) Collection in the posterior aspect of the leg (diameters of 8 × 5 × 2 cm) compatible with abscess (lower arrow), pretibial collection (1.7 cm) in the middle third and other collections at the distal level (circle). Collection in the region of the joint in relation to the tendon and flexor sheath of the big toe of 2 cm (upper arrow). Signs of renal alteration were also observed in relation to osteitis or incipient osteomyelitis in the external malleolus, in relation to the course of the screws removed along 10 cm and with diffusion coefficient restriction, in both cases abscessed.

stains, gram-positive cocci were identified in chains and pairs. At 24 hours, β-haemolytic colonies grew on the TSA agars (Fig. 1A), identified as *Streptococcus canis* (*S. canis*) using a MALDI-TOF mass spectrometer (Bruker, Massachusetts, United States) with a value of 2.15. Antibiotic susceptibility was studied using the SMIC-ID-11 panel on the BD Phoenix™ (Becton Dickinson, New Jersey, USA) AP system. The strain was sensitive to penicillin (MIC ≤0.03 mg/l), erythromycin (MIC = 0.125 mg/l), clindamycin (MIC = 0.06 mg/l), tetracyclines (MIC ≤0.5 mg/l), vancomycin (MIC ≤0.5 mg/l), teicoplanin (MIC ≤1 mg/l) and daptomycin (MIC ≤0.25 mg/l), while it showed increased dose sensitivity for levofloxacin (MIC = 1 mg/l) (EUCAST criteria; www.eucast.org).

The patient began receiving IV antibiotic treatment with ceftriaxone (2 g/24 h) and improved substantially, although after four days he developed oedema and erythema on the back of the right leg. Magnetic resonance imaging revealed collections along the leg (Fig. 1B) that were drained and six samples were cultured. In the Gram stain of two samples Gram-positive cocci were observed in pairs, although there was no growth. The patient denied having contact with animals in recent years.

After 21 days, he was reassessed and, given his good clinical progress and test results, he was discharged with outpatient follow-up. He received two more weeks of treatment with oral amoxicillin (500 mg/8 h), completing a total of six weeks, with good progress and no complications.

Discussion

S. canis is a β-haemolytic streptococcus belonging to Lancefield's group G, which is part of the microbiota of the skin and mucous membranes of many animal species (especially dogs and cats) and its main virulence factors are the arginine-deiminase system and the M protein.[1-3] While the arginine-deiminase system would favour bacterial growth, the M surface protein increases bacterial survival by recruiting plasminogen and binding IgG-Fc to the bacterial surface (preventing opsonisation by C1q).

Direct contact with domestic animals through bites, with their fluids (such as saliva or urine), or prolonged contact with their fur or skin would explain the origin of some human infections caused by *S. canis*. However, in many cases the cause is unknown.[4] In fact, in one series only one patient out of a total of 54 reported close contact with domestic animals.[5]

Most human infections are of the skin and soft tissue and proceed without complications, although in other cases, it can lead to serious infections such as sepsis or endocarditis.[5,6] This microorganism has also been reported as a cause of periprosthetic infection in a total of three patients to date, and in two of them a history of close contact with animals was described.[5,7,8] In prosthetic infections, the usual treatment consists of antibiotics for 4-6 weeks, open irrigation and debridement with possible surgery to explant the osteosynthesis material. Despite this, in some cases it seems that a conservative approach with minimal debridement, antibiotics and retention of the implant could be just as effective.[9] However, it also seems that in other series, there is a high failure rate despite adequate focus control and antibiotic treatment, which opens the way for investigation of other possible treatments such as the concomitant use of bacteriophages.[10] In our case, despite the first debridement with explant surgery, the patient required a second surgical intervention, demonstrating the importance of close follow-up and focus control in these infections.

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Conflicts of interest

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Acute paronychia: An atypical presentation of Monkeypox infection

Paroniquia aguda: una presentación atípica de la infección por Monkeypox

Monkeypox is a rare disease caused by monkeypox virus (MPX). MPX belongs to Orthopoxvirus genus in the Poxviridae family, commonly found in central and west Africa. It's a viral zoonotic disease, whom host it's unknown, but African rodents and non-human primates can harbor the virus. The incubation period ranges from 4 to 21 days. The transmission occurs from direct contact with infected skin lesions and/or with contagious materials, by droplet exposure via exhaled large droplets or through the placenta. Until May of 2022, few cases were reported in people from central/western African countries or with some link to that region.[1,2]

We describe a case of a 30-year-old, male, previously healthy, who came to our emergency room with painful tongue and left-hand lesions, odynophagia, and malaise for one week. The patient reported unprotected oral sexual contact with a man from Netherlands, asymptomatic to his knowledge, and the first lesion appeared four days after sexual contact. He denied other symptoms.

On observation, the patient had two painful superficial ulcers, 1 cm each, located on the dorsum and border of the tongue, with irregular whitish borders and violaceous center (Fig. 1a and b). He also presented tenderness, erythema, and edema of the distal phalanx of left middle finger, associated with two painful violaceous subungual ulcers, 2 mm each, in the distal portion of the nail bed, distal onycholysis and a subungual abscess (Fig. 1c). An umbilicated whitish papule on left palm was also noticed (Fig. 1d). Bilateral cervical lymphadenopathies were present. No other skin, oral, genital, or anal lesions were present at that time.

The patient was submitted to an incision of hyponychium nail fold, resulting in middle purulent drainage, whose cultural examination was negative. Serology for Human Immunodeficiency Virus 1/2, hepatitis B, and hepatitis C was negative, and for syphilis was compatible with previously treated infection. Screening for Neisseria gonorrhoeae, Chlamydia trachomatis, and Herpes Simplex Virus 1/2 were negative; PCR in real time for Orthopoxvirus genus gene rpo18 followed by Sanger sequentiation was positive for MPX in oropharyngeal and skin lesions.

Monkeypox was diagnosed associated with acute paronychia and cellulitis of left middle finger. The patient was treated with oral amoxicillin-clavulanate 875/125 mg and fusidic acid cream for finger lesions, combined with supportive care (oral analgesics, lidocaine gel, nystatin oral solution). He was reevaluated one month later, and total lesion regression was noticed with no associated scars.

The recent outbreak of monkeypox was declared a Public Health Emergency of International Concern. Until 28 July 2022, 16,016 laboratory confirmed cases have been reported from 75 territories, including 588 cases in Portugal.[3]

Monkeypox is often a self-limiting infection, with symptoms lasting between 2 and 4 weeks. In this outbreak, the most reported clinical features are skin lesions, mainly seen in the anogenital areas, which progress simultaneously through macular, papular, vesicular, pustular, and crusted stages, and are commonly accompanied by systemic symptoms such as fever, myalgias, headache, and lymphadenopathy.[1,4] Some complications such as pneumonitis, encephalitis, keratitis, and secondary bacterial infections have been reported,[4] but to our knowledge, no reports of subungual ulcers or acute paronychia have been published so far. We hypothesize that it occurred by autoinoculation (direct contact with self-oral ulcers) or direct contact with infected skin lesions from other individuals. In literature, viral paronychia is a well-defined entity, usually associated with Human papilloma virus or Herpes simplex virus. The most common complication is bacterial superinfection, most often caused by *Staphylococcus aureus* or *Streptococcus pyogenes*, which should be managed with local antiseptics, oral and/or topical antibiotics, and abscess drainage when present.[5]

In this case report, the monkeypox diagnosis was challenging due to the atypical clinical presentation.