

Spondylodiscitis due to *Clostridium ramosum* in an immunocompetent older adult: the second case described in the literature

Marco Rossato¹, Aurelio Guarnaccia², Lucio Conforto², Marina De Rui¹, Giuseppe Sergi¹

¹ Department of Medicine (DIMED) - Geriatric Unit, University of Padua, Padua, Italy, ² Geriatric Unit, Riuniti Hospitals of Padua South, Padua, Italy

The paper reports the second case described in the literature of spondylodiscitis caused by *Clostridium ramosum* in an elderly immunocompetent patient affected by cellulitis of the left lower limb treated with triple antibiotic therapy (vancomycin, metronidazole and meropenem). The patient has shown a clinical and bio-humoral improvement after the treatment, even if he died after 16 days of hospitalization for severe sepsis of unknown origin.

Key words: spondylodiscitis, *Clostridium ramosum*, older adult, treatment, immunocompetent

INTRODUCTION

Clostridium ramosum (*C. ramosum*), also known as *Erysipelatoclostridium ramosum*, is a Gram-positive, obligate anaerobic, terminally spore-forming bacterium. Normally this bacterium colonizes the gastrointestinal tract and the vagina. In the clinical field, it is the most frequently isolated specie after *Clostridium perfringens* and is responsible for various infections. In fact, especially in immunosuppressed subjects, it has been recognized as responsible for osteomyelitis, septic arthritis, mastoiditis, spondylodiscitis, otitis media, pyelonephritis, septic arterial embolism, endocarditis, gas gangrene, septic pseudoarthrosis, peritonitis related to peritoneal dialysis, liver abscess, brain abscess, cerebellar abscess, lung abscess, Fournier gangrene, pseudomembranous colitis, thoracic aortic aneurysm infection ¹. Risk factors for *Clostridium* infections are advanced age, cancer, need for hemodialysis, Crohn's disease, and cardiovascular disease ². So far, there are no evidence-based guidelines that indicate the adequate treatment of this microorganism, because in the literature individual case reports have been reported, suggesting in each case the best antibiotic based on *in vitro* susceptibility testing. Here we describe a case of spondylodiscitis due to *C. ramosum*.

CASE PRESENTATION

An 88-year old patient was hospitalized at the Geriatrics Unit of the United Padua South Hospitals (Monselice, Padua, Italy) in March 2023 for cellulitis of the left leg. The patient lived at home with his wife, was able to move

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Correspondence

Marco Rossato

E-mail: marco.rossato.6@studenti.unipd.it

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with a walker and was partially dependent on activities of daily living. In past medical history there were arterial hypertension, atrial fibrillation, benign prostatic hyperrophy, ischemic stroke, chronic renal failure.

The patient reported the onset of low-grade fever associated with low back pain and a skin's leg infection 3 weeks before admission; in addition, the week before hospitalization, the patient was treated by the general practitioner with cefditoren pivoxil, obtaining fever defervescence. The blood chemistry tests on admission revealed a C-reactive protein (CRP) of 150 mg/L (normal value < 5 mg/L), negative procalcitonin, and a blood count characterized by moderate anemia (Hb = 86 g/L) and neutrophilic leukocytosis (WBC 12.93×10^9 /L).

In light of the high inflammation indices, the following microbiological tests were performed: a urine culture, which resulted positive for *Enterococcus faecalis* (100,000 CFU), and 3 sets of blood cultures, which resulted positive in the two vials for anaerobes for *C. ramosum*. Afterwards, due to patient's allergy to penicillin, an empiric antibiotic therapy was started with meropenem in association with vancomycin and metronidazole. Meanwhile, a computed tomography scan of the lumbo-sacral spine was performed. This examination detected irregularities of the somatic surfaces of the L4-L5 bodies with a partially fragmented appearance, more evident in L5, whose surface was slightly depressed and presented inhomogeneity of the correspondent peri-vertebral soft tissue. As a consequence of the evidences given by the tomographic imaging, the patient underwent a lumbo-sacral magnetic resonance imaging (MRI) with contrast medium, confirming the diagnosis of spondylodiscitis of the L4-L5 vertebrae. However, a diagnostic biopsy was not possible due to poor patient compliance. Since the start of the antibiotic therapy, there was a significant improvement in the bio-humoral signs of inflammation (CRP decreased from 150 to 18 mg/L) and in the patient's clinical status, with a general reduction of signs and symptoms of leg's infection and the regression of back pain. After 7 days further blood cultures were performed, which resulted negative for *C. ramosum*. Nevertheless, although the success in treating *Clostridium ramosum*'s infection, the patient died two weeks later for a severe sepsis of unknown origin.

DISCUSSION

This is the second case described in literature of spondylodiscitis due to *C. ramosum*. The first case was described in Lavigne's paper in 2003³.

In our case the patient was older, nevertheless he had an excellent response to antibiotic therapy, which was set following literature's data in absence of an antibiogram.



Figure 1. MR imaging showed spondylodiscitis of the L4-L5 vertebrae.

Lavigne's et al. treated the infection empirically with amoxicillin plus ciprofloxacin, until antibiotic susceptibility tests were determined and revealed high ciprofloxacin MIC, so it was substituted with metronidazole. Current treatment recommendations are based only on *in vitro* sensitivity, according to which *C. ramosum* shows adequate sensitivity to metronidazole, chloramphenicol, vancomycin, erythromycin, carbapenems such as imipenem and meropenem, piperacillin/tazobactam. In a recent review, Milosavljevic et al.⁴ aimed at assessing the clinical outcomes of antibiotic therapy used to treat *C. ramosum*. The review confirmed good *in vitro* susceptibility of *C. ramosum* mainly to metronidazole and two broadspectrum beta-lactams plus beta-lactamase inhibitors, besides meropenem, which showed high efficacy, mostly without prior *in vitro* activity testing. Moreover, the authors found that other potentially effective treatment options, depending on the type and severity of the infection, are glycopeptides and chloramphenicol. Differently, there are conflicting data regarding the efficacy of penicillins as previous studies showed that *C. ramosum* strains producing beta-lactamases exhibited resistance to penicillin in 20% of cases⁵. Similarly, the use of clindamycin or cephalosporins should also be avoided, because *C. ramosum* often shows variable susceptibility to these antibiotics, as other clostridial species do⁵.

CONCLUSIONS

This case underlines that the *Clostridium ramosum*'s infection can involve atypical sites of infection like bone tissue and be treated successfully.

Conflict of interest statement

The authors declare no conflict of interest.

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Author contributions

All the authors contributed in the development of this manuscript.

Ethical consideration

Not applicable.

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