



Case report

A case of community-acquired spondylodiscitis caused by *Achromobacter xylosoxidans*

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ARTICLE INFO

Keywords:

Spondylodiscitis
Necrotizing dermohypodermatitis
Alcaligenes xylosoxidans
Achromobacter xylosoxidans

ABSTRACT

Achromobacter xylosoxidans is a Gram-negative, aerobic, non-fermenting bacillus mainly responsible for nosocomial infections. We report the first case of community-acquired spondylodiscitis caused by *Achromobacter xylosoxidans* in a 61-year-old woman, immunocompromised with necrotizing dermohypodermatitis of the right lower limb successfully treated with ertapenem and ciprofloxacin.

Introduction

Achromobacter xylosoxidans is a Gram-negative, aerobic, non-fermenting bacillus of aquatic reservoir, mainly found in nosocomial cases. Here we report the first case, to our knowledge, of community-acquired spondylodiscitis caused by *Achromobacter xylosoxidans*.

Case presentation

This is a case of a 61-year-old woman with type II diabetes and a history of right renal adenocarcinoma that was treated surgically by nephrectomy. Afterward, she developed a single-kidney chronic glomerular nephropathy that was treated by renal transplantation since 10 years. She presented with an acute red leg in the context of ulcers of the anterior tibia that had been evolving for a month. A diagnosis of non-necrotizing dermohypodermatitis of the right lower limb was made, for which antibiotic therapy with oral clindamycin was started.

Shortly after a rapid deterioration was observed with the appearance of purpuric and necrotic areas and bullous on the anterior aspect of the right leg and the posterior aspect of the right foot (Fig. 1), leading to the diagnosis of necrotizing dermohypodermatitis of the right leg. Antibiotic therapy was extended with intravenous piperacillin-tazobactam and oral clindamycin, combined with surgical debridement. Bacterial culture from the surgical debridement and peripheral blood cultures were positive for *Achromobacter xylosoxidans* subsp. *xylosoxidans*. Postoperative course was marked by the onset of inflammatory lumbar pain a week after, raising suspicions of infectious spondylodiscitis. This diagnosis

was confirmed by an MRI scan of the dorsolumbar spine, showing an edema of the L2-L3 vertebral endplates associated with inflammatory infiltration of the right and left anterior and lateral paravertebral soft tissues at L2-L3 and an anterior epiduritis of L3-L4 (Fig. 2).

No signs of infective endocarditis were found on two trans-thoracic cardiac ultrasounds performed seven days apart. After obtaining an antibiogram and establishing MICs, and in view of the osteoarticular involvement, antibiotic therapy was continued with intravenous piperacillin-tazobactam released on Midline and oral ciprofloxacin, and a vertebral brace was put in place in the context of epiduritis and spinal instability.

Midline thrombosis was subsequently diagnosed. Given the low venous capital and the presence of a contralateral arteriovenous fistula, IV antibiotic therapy was replaced by subcutaneous ertapenem in combination with ciprofloxacin for a total of 12 weeks. The course was subsequently satisfying, with disappearance of pain and no recurrence of signs of inflammation. When the antibiotic treatment was stopped, the PET-scanner showed erosive lesions on the L2 and L3 plateaus, which appeared to be sequelae of the spondylodiscitis, as did the follow-up MRI (Fig. 2). One year follow-up had showed no relapse.

Discussion/ literature review

Achromobacter xylosoxidans is a Gram-negative, aerobic, non-fermenting bacillus [1] mainly from aquatic reservoirs, as hospitals [2]. *A. xylosoxidans* was first isolated in 1971 by Yabuuchi and Oyama [3] from chronic otitis media in seven patients.

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<https://doi.org/10.1016/j.idcr.2024.e01980>

Received 16 December 2023; Received in revised form 25 April 2024; Accepted 29 April 2024

Available online 30 April 2024

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Fig. 1. Necrotizing dermohypodermatitis before medical and surgical management.

It is an opportunistic bacterium that is mainly implicated in nosocomial infections, most often in immunocompromised patients, those suffering from haematological or solid neoplasia, and patients who have received antibiotic therapy in the month prior to infection [4] but can also occur in the community more rarely.

The most frequent clinical presentation is bacteremia [5] linked to the use of catheters, most often [6] or pneumopathy [7] depending on the study. More rarely, other sites may be involved: meningitis [8], colonization in cystic fibrosis [9], osteomyelitis [10], chronic otitis media [3], endocarditis on prosthetic valves [11], skin and soft tissue infections [12].

In this case report, we present the first community-acquired case to our knowledge of spondylodiscitis following dermohypodermatitis complicated by *Achromobacter xylosoxidans* subsp. *xylosoxidans* bacteremia. The patient was immunocompromised following renal transplantation and taking immunosuppressants. She was also a type 2 diabetic, which corresponds to the population most commonly affected by this germ.

A case of L5-S1 discitis following treatment of a herniated disc with oxygen-ozone has been described [13], which therefore corresponds to a nosocomial case following an interventional radiology procedure.

Closer to our case, a case of discitis caused by community-acquired *Achromobacter xylosoxidans* subsp. *denitrificans* has been described, treated with an intravenous combination of ampicillin and sulbactam with oral sulfamethoxazole and trimethoprim for six weeks, followed by

six weeks of treatment with oral sulfamethoxazole and trimethoprim alone [14]. In addition, a case of spondylodiscitis caused by *A. xylosoxidans* has been reported, but it is not known whether this was a community-acquired or nosocomial case, or how it was managed [15].

The particularity of our case is the association of necrotizing dermohypodermatitis caused by *A. xylosoxidans*, a described but rare entity, with bacteremia caused by *A. xylosoxidans* subsp. *xylosoxidans* and spondylodiscitis caused by *A. xylosoxidans* subsp. *xylosoxidans*, an entity which has never been described in a community patient. Although the germ was not identified on bone biopsy because there was no indication for it, there was little doubt that *A. xylosoxidans* was involved after it was identified on intraoperative samples and on postoperative peripheral blood cultures taken at the same time as the onset of lumbar pain.

Treatment of *A. xylosoxidans* is not codified, as there are numerous natural and acquired resistance mechanisms. Around 40% of the germs isolated in the study by Pérez Barragan et al. [4] and 16% in the study by Marion-Sanchez et al. are multi-resistant germs [7]. It is generally sensitive to trimethoprim-sulfamethoxazole, anti-pseudomonal penicillins and carbapenems [4].

Conversely, it is naturally resistant to third-generation cephalosporins, aztreonam, aminoglycosides and ofloxacin. Moreover, recently, acquired resistance to ciprofloxacin has become common, and even to carbapenems, but very rarely to piperacillin-tazobactam [16].

The resistance mechanisms of *A. xylosoxidans* are based mainly on a constitutive oxacillinase, numerous beta-lactamases and, above all, on RND (resistant-nodulation-cell division) efflux pumps which are active against numerous molecules [17].

As regards the choice of antibiotic treatment, we were faced with the problem of the patient's chronic renal failure, which contraindicated the use of trimethoprim- sulfamethoxazole, which is classically active against this germ. Initially, piperacillin-tazobactam was introduced in dual therapy with ciprofloxacin, which showed in-vitro sensitivity in our case, which is unusual. However, given the difficulty of venous access, the in vitro activity of ertapenem, which is not classically used for this germ, was tested and showed that the germ was sensitive enough to be followed up subcutaneously with ertapenem. Progression at 3 months and then at one year was satisfying, with good tolerance of antibiotic therapy.

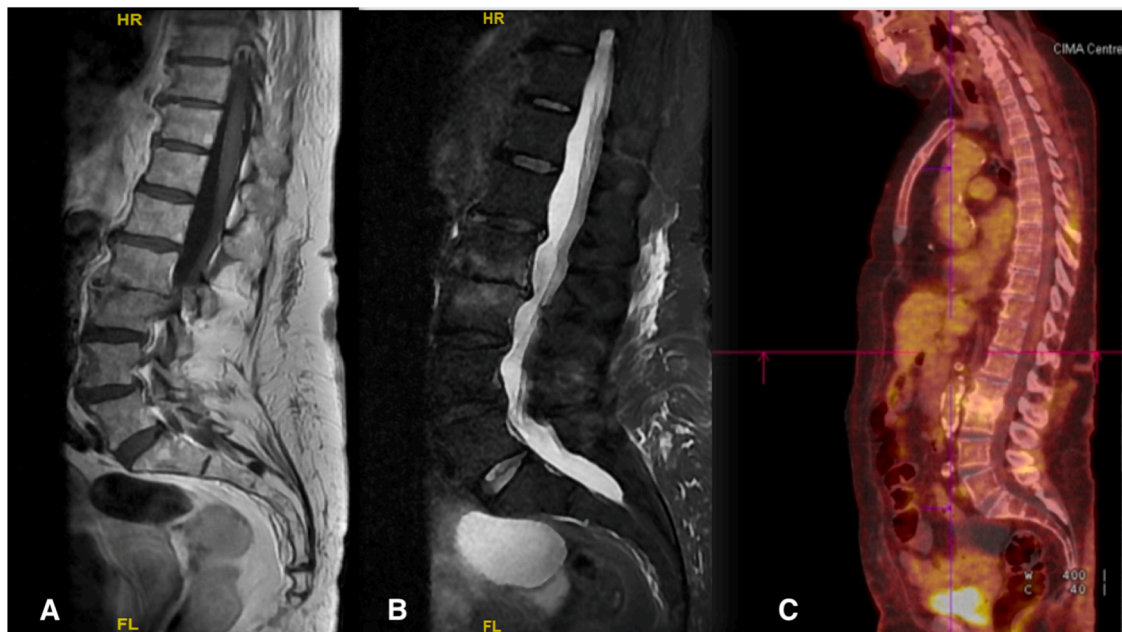


Fig. 2. A: sagittal section of initial MRI in T1 sequence injected with gadolinium; B: sagittal section of control MRI in T2 STIR sequence; C: sagittal section of control PET scan.

Conclusion

Achromobacter xylosoxidans is mainly responsible for nosocomial infections such as bacteremia and pneumonia in immunocompromised patients, although other rarer localizations have been described. Here we report the first case of *Achromobacter xylosoxidans* subsp. *xylosoxidans* community-acquired spondylodiscitis in a type II diabetic renal transplant patient.

Ethical approval statement

Not applicable.

Ethics statement

The patient described in this manuscript has given her informed consent for participation in the study and the use of her de-identified, anonymized, aggregated data and her case details (including photographs) for publication.

CRedit authorship contribution statement

T. Brochet: Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **M. Tonnelier:** Visualization, Validation, Conceptualization. **E. Justinien:** Visualization, Validation, Supervision. **A.-L. Lecapitaine:** Visualization, Validation, Supervision. **A. Bouras:** Supervision, Investigation, Conceptualization.

Conflict of interest statement

The authors declare no relevant conflict of interest.

Data availability statement

Data available on request from the authors.

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