



Case report

Osteomyelitis caused by *Veillonella* species: Case report and review of the literature

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ABSTRACT

Previously, *Veillonella* species had been considered as nonpathogenic and rarely caused serious infections. We report a case of 25-year-old man with osteomyelitis caused by *Veillonella* species. He was admitted to the hospital due to an open fracture to the left radial bone caused by industrial washing machine accident, and emergency surgery was performed. However, wound infections occurred one week after the operation. Although *Acinetobacter baumannii* and *Serratia marcescens* were cultured from the pus, obligate anaerobic bacteria were not detected at that point. Debridement was repeated and antibiotics were changed according to the result of bacterial culture and drug sensitivity. Despite this, the infection was poorly controlled. On the 5th debridement, granulated bone tissues on pseudarthrosis were found for the first time at the infection site. Although no bacteria was detected with aerobic culture, anaerobic incubation revealed Gram-negative cocci which was later identified as *Veillonella* species by 16S rRNA gene sequence analysis. His condition improved without any additional debridement after adding effective antibiotics against *Veillonella* species. It is well known that prolonged infection with aerobes consumes oxygen in the infection site and leads the environment to more favorable conditions for anaerobic bacteria, thus we speculated that prolonged infection with bacteria such as *S. marcescens* induced the favorable environment for *Veillonella* species. Physicians should realize the importance of anaerobic culture method in routine practice, especially in complicated cases such as the present case. In this article, we reviewed case reports of *Veillonella* infection and summarized the clinical features of this organism.

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1. Introduction

Veillonella species is an obligate anaerobe, non-sporulating Gram-negative coccus and exists ubiquitously in the oral cavity, upper respiratory, gastrointestinal tract, urethra, vagina and skin [1]. The genus *Veillonella* includes the following twelve species: *Veillonella atypical*, *Veillonella caviae*, *Veillonella criceti*, *Veillonella dispar*, *Veillonella denticariosi*, *Veillonella magna*, *Veillonella montpellierensis*, *Veillonella ratti*, *Veillonella rodentium*, *Veillonella*

rogosae, *Veillonella parvula*, and *Veillonella tobetsuensis*. Although *Veillonella* species was previously regarded as non-pathogenic anaerobes in human [2], it is now understood that these bacteria can occasionally cause serious infections. Indeed, there are several case reports showing bacteremia, endocarditis, and osteomyelitis due to *Veillonella* species [1–29]. Herein, we present a case of osteomyelitis caused by *Veillonella* species in a 25-year-old man. In addition, we review previous case reports and summarize the clinical features of this pathogen.

2. Case report

A 25-year-old Japanese man, with a congenital intellectual disability, was admitted to our hospital due to left arm injury caused

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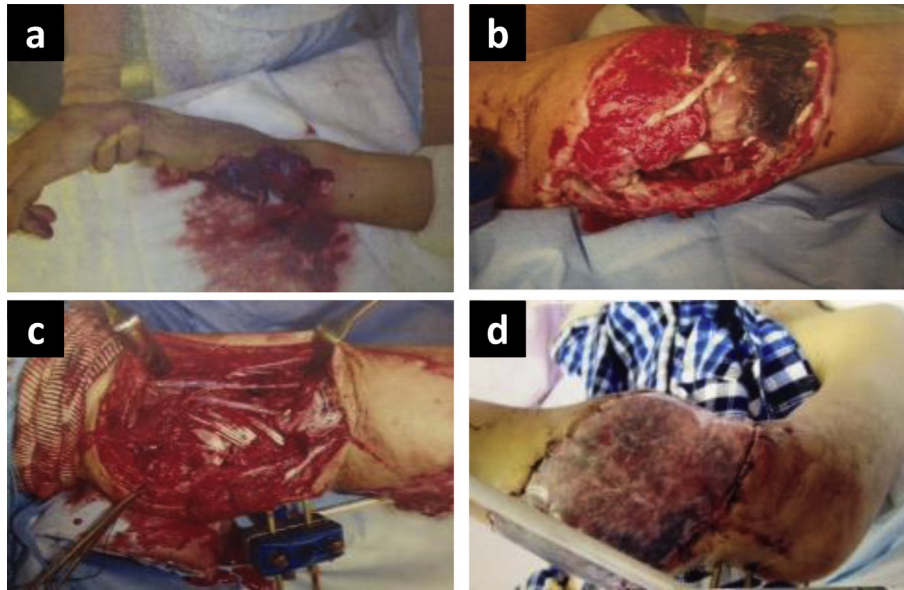
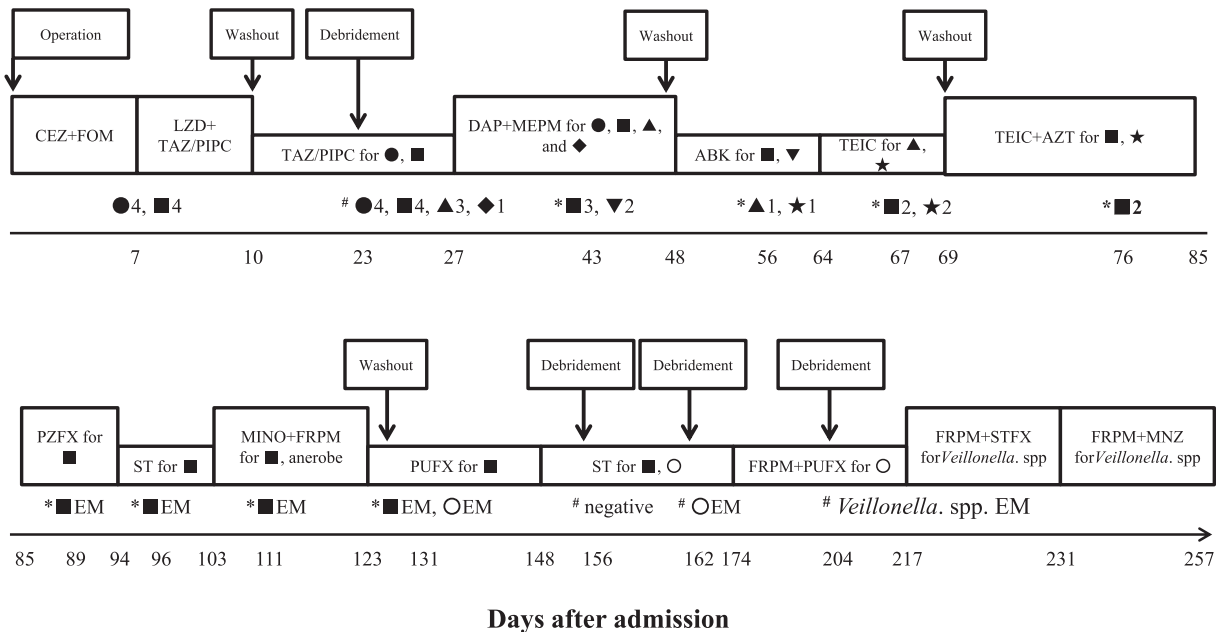


Fig. 1. Appearance of the left forearm.

by an industrial washing machine accident. At presentation, he had a large skin defect of the inner side of left forearm, open fracture of radial bone, dislocation fracture of cubital joint, rupture of brachial artery, and a crushed ulnar nerve (Fig. 1a, b). Emergency surgery included surgical debridement, external skeletal fixation of the elbow, intramedullary nailing of the radial bone, elbow arthrodesis, and artificial dermal protection of the skin defect (Fig. 1c, d).

Although cefazolin and fosfomycin were administered prophylactically, profuse pus discharge and skin color changes, suggesting wound infections, were observed one week after the operation. Therefore, the second surgical debridement was performed. *Acinetobacter baumannii* and *Serratia marcescens* (*S. marcescens*) were cultured from the pus and bone tissue specimens. However, despite prolonged incubation, no bacteria were detected with anaerobic



* purulent discharge, # intraoperative specimen

● *A. baumannii*, ■ *S. marcescens*, ▲ *E. fecalis*, ◆ *E. coli*, ▼ *E. avium*, ★ MRSA, ○ *E. coli* (ESBL)

Fig. 2. Clinical course of the present case. The numbers next to symbols indicate concentration of bacteria (1: 10⁵, 2: 10⁶, 3: 10⁷, 4: 10⁸) while EM indicates that bacteria grew only on enrichment medium. Abbreviations: CEZ; cefazolin, FOM; fosfomycin, LZD; linezolid, TAZ/PIPC; tazobactam/piperacillin, DAP; daptomycin, MEPM; meropenem, ABK; arbekacin, TEIC; teicoplanin, AZT; azactam, PZFX; pazufloxacin, ST; sulfametoxazol and trimetoprima, MINO; minocyclin, FRPM; faropenem, PUFX; prulifloxacin, STFX; sitafloxacin, MNZ; metronidazole, ESBL; extended-spectrum beta-lactamase.

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