Fournier gangrene caused by *Streptococcus agalactiae*, *Streptococcus anginosus*, and *Prevotella bivia* with *Alloscardovia omnicolens* bacteremia

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Abstract

A 44-year-old man with morbid obesity and undiagnosed diabetes presented with the signs and symptoms of diabetic ketoacidosis (DKA) and sepsis secondary to necrotizing soft tissue infection of the right side of the perineum and scrotum. He received treatment for DKA and broad spectrum IV antibiotic coverage including vancomycin, clindamycin, and piperacillin-tazobactam and underwent surgical debridement to the gangrenous wound. The wound cultures from the perineum grew Streptococcus agalactiae, Streptococcus anginosus*, and* Prevoltella bivia*; the blood culture grew* Alloscardovia omnicolens*. Antibiotics were changed to IV linezolid and IV piperacillin-tazobactam to cover these organisms. The patient received continued IV piperacillin-tazobactam for two weeks after the surgical debridement.* A. omnicolens *has been found to be a normal commensal of the oral cavity and the gastrointestinal tract; however, it has also been isolated from other tissue specimens, including pleural fluid in thoracic empyema, blood, urethra, and urine. There are limited data on the clinical significance of* A. ominicolens*; however, there have been multiple case reports on isolation of* A. ominicolens *in urine of patients with urinary tract infections (UTIs). It is noteworthy to find bacteremia due to* A. omnicolens *in the setting of Fournier gangrene.*

Keywords: *Alloscardovia omnicolens,* Fournier gangrene, necrotizing soft tissue infections

Introduction

Alloscardovia omnicolens is an anaerobic Gram-positive rod belonging to the *Bifidobacterium* genus first described in 2007.[1] It is a non-spore forming, catalase-negative bacterium that forms alpha hemolytic colonies on blood agar and grows best under CO_2 atmospheric conditions.[1,2] *A. omnicolens* is found to be normal commensals of the oral and gastrointestinal tract in humans, and its clinical significance is not well understood.[3–7] Although *A. omnicolens* has been isolated from urine,[8] blood,[9] the oral cavity,[3–7] a urethral specimen, a tonsil specimen, and a lung and aortic abscess,[1,10] its actual clinical significance in these cases is not clear.[1] Recent research has associated *A. omnicolens* with intrahepatic choangiocarcinoma,[11] human papilloma virus infection,[12] bacteremia,[9] post stroke cognitive impairment,[13] adenomyosis,[14,15] endometriosis,[14] *in vitro* fertilization,[16] Sjogren syndrome,[17] lacunar cerebral infarction,[18] bacterial vaginosis,[19] and smoking.[7]

Definitively identifying *A. omnicolens* using basic phenotypic methods can be challenging because *Gardenella vaginalis* and some species of actinomyces and lactobacillus share similar morphologies with *A. omnicolens.*[2,8] These similarities include being catalase-negative, growing better or equally well under anaerobic and CO_2 conditions, and forming similar small colonies on blood agar.[2,8] Diagnostic methods like 16S rRNA gene sequencing and MALDI-TOF-MS based identification are useful in correctly identifying *A. omnicolens*.[2,8]

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A. omnicolens can be isolated in pure growth from urine cultures in clinically significant quantities but not be clinically significant.[10] As such, clinicians need to interpret the isolation of *A. omnicolens* from urine specimens in light of the urinalysis and clinical presentation.[6] The same can be said for isolation of *A. omnicolens* from specimens other than urine, if associated with an ongoing infection. We report a case of *A. omnicolens* in a patient with Fournier gangrene.

Case

A 44-year-old man with morbid obesity and undiagnosed diabetes mellitus was admitted to our emergency department with complaints of fever, chills, nausea, and vomiting with progressively worsening shortness of breath and pain in his lower abdomen and perineum for four days. On examination, he appeared acutely ill with multiple vital sign abnormalities including tachycardia, tachypnea, high blood pressure, and blood sugar of 494 mg/dl with HbA1c of 14%. There was a necrotizing soft tissue infection involving the right scrotum and perineum and he developed an abscess in the right medial thigh during hospitalization. Treatment for DKA and sepsis was initiated, including blood cultures and broad-spectrum antibiotic coverage (900 mg of IV clindamycin stat, 2500 mg of IV vancomycin stat and 4.5 g of IV piperacillin-tazobactam stat). The computed tomography scan of the pelvis revealed diffuse inflammation, cellulitis, and subcutaneous air collections in the right groin area extending into the right side perineum and to the scrotum area with a focal abscess collection measuring 5.7 × 2.8 × 4.2 cm. He underwent surgical debridement of the gangrenous wound on the right perineum and scrotum and later, an abscess incision and drainage on the right medial thigh.

The microbiology investigations of wound cultures from the perineal abscess grew *Streptococcus agalactiae*, *Streptococcus anginosus,* and *Prevotella bivia*, and the wound cultures from the thigh abscess grew *Streptococcus agalactiae*, while the blood cultures grew *Alloscardovia omnicolens*. Blood cultures from the peripheral catheter were negative. The antibiotic treatment was changed to piperacillin-tazobactam 4.5 g q6h IV and linezolid 600 mg q12h PO on day 2 to cover for Streptococcus species. Linezolid was used for the necrotizing soft tissue infection for antitoxin effects and less for antimicrobial activity; it was stopped on day 7 with stable wound features and low suspicion for active necrosis, and no further surgeries were planned at that time. The patient improved subsequently and was discharged after 10 days of hospitalization. The patient was advised to continue piperacillin-tazobactam 4.5 g q6h IV for 14 days since the last surgical intervention to cover *Alloscardovia omnicolens* bacteremia. Antibiotic susceptibility testing was not performed on these isolates, although it has been seen that several strains of bifidobacteria are uniformly susceptible to several antimicrobial agents used to treat Gram-positive organisms, such as vancomycin and the beta-lactams.[20]

Discussion

Alloscardovia omnicolens and *Bifidobacterium* isolates may be underreported or not recovered, as clinical laboratories may consider them normal flora or not recover these organisms since they grow slowly and are difficult to identify;[8] however, they should not be ignored when isolated from clinical specimens on the background of an active infection. Although the actual clinical significance of *A. omnicolens* remains unclear, it may be contributing to the ongoing infection. Therefore, it becomes imperative to report every case of *A. omnicolens* isolated from clinical specimens in an active infection.

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