

CASE REPORT

A case report of necrotizing fasciitis with growth of *Actinomyces europaeus* and *Actinotignum schaalii*

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Abstract

Actinomyces europaeus and *Actinotignum schaalii* are two facultative anaerobes that are common contaminants of human flora; namely the urinary tract, the female genital tract and the gastrointestinal tract. *A. europaeus* has been linked with abscesses, decubitus ulcers and purulent urethritis, while *A. schaalii* has been associated with urinary tract infections, bacteremia and Fournier's gangrene. Here we present a case report of an 84-year-old female patient found to have a necrotizing soft tissue infection caused by *A. europaeus* and *A. schaalii*. To our knowledge, this is the first case report that documents *A. europaeus* as a causal agent of a necrotizing infection.

INTRODUCTION

Actinomyces is a common genus of bacteria that are typically found in the oral cavity, gastrointestinal tract, genitourinary tract and skin [1]. *Actinomyces europaeus* is a facultative anaerobic Gram-positive rod that has been well associated with abscesses of the groin, axilla and breast, as well as decubitus ulcers, cystitis and purulent urethritis [1,2]. The *Actinomyces* species are known to cause slowly progressive granulomatous infections [3].

Actinotignum schaalii is a facultative anaerobic Gram-positive coccoid that is part of the urinary tract. *A. schaalii* has been associated with urinary tract infections, bacteremia, cellulitis and Fournier's gangrene [4–6]. *A. schaalii* is typically found in elderly patients and associated with many urologic-related predisposing conditions [7].

Here we present a case of a patient found to have a necrotizing soft tissue infection (NSTI) caused by *Actinomyces* and *Actinotignum*.

CASE REPORT

An 84-year-old African-American female with a medical history significant for type 2 diabetes mellitus, hypertension, anemia and coronary artery disease presented to the emergency room with severe right thigh pain. She reported that prior to presentation she had a bump on her right groin that ruptured within the past week and started to cause her pain.

On examination, the patient was febrile to 38.3 C, blood pressure 114/90, pulse 70 with an SpO₂ of 96%. Her physical exam showed right inner thigh induration with associated erythema. The skin was tense, edematous and discolored. No bullae or crepitus was present on exam. She was obese with a body mass index of 34.66 kg/m², and laboratory tests were notable for a WBC of 15.7 × 10⁹/L, lactate of 2.4, glucose of 533 and creatinine of 2.29. The patient was started on intravenous fluids, insulin and dosed with broad-spectrum antibiotics, including clindamycin, vancomycin and piperacillin-tazobactam. The patient was immediately taken for a computed tomography (CT)

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scan of the abdomen and pelvis for concerns of NSTI and general surgery was consulted.

CT scan showed extensive cellulitis of the medial aspect of the right proximal lower extremity with diffuse soft tissue gas in the underlying gracilis muscle and extension into the perineum, right labia majora, right inguinal region and right ischio-rectal fossa consistent with necrotizing fasciitis. The patient was immediately taken to the operating room for radical debridement of the groin.

Upon arrival to the OR, a 3-mm opening was found adjacent to the right groin fold draining serosanguinous material. A cutting current incision revealed a foul-smelling cavity filled with necrotic material. The incision was opened across the labia and mons pubis and inferiorly toward and onto the thigh. The skin, subcutaneous tissue and involved muscles were all radically excised. Portions were sent as specimen and blood cultures were also sent. Once debridement was complete, all tissues were noted to be viable. There was no perianal or anal involvement. The wound was packed with gauze and the patient was sent to the Surgical Intensive Care Unit (SICU) due to persistently low blood pressure of 76/37.

In the SICU, the patient was extubated and continued broad-spectrum antibiotic treatment. Her blood glucose remained elevated, ranging between 298 and 438. Her blood pressures remained low and norepinephrine on continuous infusion was begun. Her wound was evaluated for viability, recurrent infection and repacked with wet to dry dressing changes daily.

The patient's blood pressure was stabilized, and she was transferred to the floor on hospital day 4. She continued to improve clinically, her blood pressure remained stable, glucose controlled and she was discharged to a skilled nursing facility on hospital day 8. Negative pressure therapy was applied to improve wound healing on day 7. The patient was recommended to continue oral therapy with amoxicillin-clavulanate and metronidazole. Throughout her hospitalization, the wound remained viable and she did not require further debridement in the operating room.

Cultures from the operating room were sent for microbiology analysis. Growth was evaluated for anaerobic bacteria, aerobic bacteria, acid-fast bacilli and fungal species. Cultures were grown on blood agar with 5% sheep blood, MacConkey agar, chocolate agar, CNA agar and thioglycolate. Although the extensive disease burden of her perineal wound, no growth was noted of the specimen until hospital day 6. Of note, two interesting species of bacteria were isolated as the cause of her subcutaneous NSTI: *A. europaeus* and *A. schaalii*. Both of these bacteria were isolated on blood agar with 5% sheep blood in aerobic conditions.

DISCUSSION

To our knowledge, this is the first report of *A. europaeus* and *A. schaalii* NSTI. Abscesses from *A. europaeus* are well documented, but never known to cause NSTIs [2]. The patient did not have a

history of recurrent skin infections or other abscesses, but had known urinary incontinence and urinary tract infections.

As evidenced by Pederson et al. [8], the urinary tract was the primary focus of bacteremia in patients infected with *A. schaalii*, along with *Escherichia coli* and *Enterococcus faecalis*. They concluded that *A. schaalii* was a cause of significant mortality in elderly patients, specifically in those with predisposing urinary tract conditions. In the case of this 84-year-old female who presented with an NSTI, she had a previous history of urinary incontinence and urinary tract infections. Taken together, it is possible that her infection was a cause of her urinary flora.

In necrotizing infections, bacterial growth is rampant and the species of bacteria can be rapidly identified. In the case of our patient, it was unusual that her wound cultures grew on day 6. This slow growth is typical of the bacteria, which have been identified from the wound, and lead us to believe that the results of the growth were true growth rather than contaminants. However, it is important to note that quantitative studies and polymerase chain reaction analysis was not performed. It is unclear whether *A. europaeus* or *A. schaalii* was the major causing agent, but this is the first report linking *A. europaeus* to an NSTI.

This report shows the potential of *A. europaeus* and *A. schaalii* to cause NSTIs. More studies must be conducted to confirm the clinical significance of these bacteria and to determine the best course and length of treatment.

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