

***Aeromonas veronii* septicemia in an immunocompetent patient**

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ABSTRACT

We present a 29-year-old healthy man who fell into an industrial auger, sustaining a crushed, open pelvic injury, multiple comminuted fractures of the right leg, and traumatic amputation of his left foot. Blood and wound cultures were positive for *Aeromonas* spp and vancomycin resistant *Enterococcus*. Treatment included cefepime, levofloxacin, daptomycin, and metronidazole. *Aeromonas veronii* is a Gram negative bacillus usually found in fresh and brackish water in warm climates. It can cause severe skin and soft tissue infections, typically after injured tissue is exposed to contaminated water. *Aeromonas* septicemia is uncommon and is usually associated with underlying diseases, such as malignancy, cirrhosis, diabetes, or immunosuppression. It rarely occurs in a healthy host.

Key words: *Aeromonas*, septicemia, immunocompromised, immunocompetent, trauma

INTRODUCTION

Aeromonas veronii is an opportunistic pathogen that can cause a variety of infections, most commonly severe skin and soft tissue infections. Infection is often rapidly progressive, affecting deeper tissues, leading to necrotizing fasciitis or myonecrosis.¹ Most infections are due to exposure to contaminated water and are rarely associated with bacteremia in immunocompetent patients. If bacteremia is present, it usually occurs in the presence of malignancy, hepatobiliary disease, or diabetes.¹

CASE PRESENTATION

Our patient is a 29-year-old man who was transferred from an outside facility in acute respiratory failure and septic shock. On arrival he was intubated and sedated with a temperature of 101 °F, a heart rate of 141 beats per minute, and a blood pressure of 111/55 mmHg. Physical examination included a crushed, open pelvic injury, multiple comminuted fractures of the right leg, and transmetatarsal traumatic amputation of the left foot, all sustained after falling into an industrial auger. The remainder of the physical exam was within normal limits. Laboratory findings revealed a white blood cell count of 8000 with 82 % neutrophils, an Hb of 12.8 g/dl, normal renal function, a CK of 13,447 IU/L, and a normal PT and PTT. The patient underwent a right above knee amputation, external pelvic fixation, and an exploratory laparotomy with a diverting sigmoid colostomy.

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He was started on meropenem and vancomycin. Subsequently, Infectious Diseases was consulted due to two positive blood cultures for *Aeromonas veronii*. Wound cultures were also positive for *Aeromonas veronii*, *Aeromonas hydrophila*, and later a vancomycin resistant *Enterococcus faecalis* (VRE). The patient had also been on metronidazole and levofloxacin; metronidazole was later discontinued and vancomycin was replaced with daptomycin because of the presence of VRE. He was treated with fluconazole when wound cultures also grew *Candida spp* and received 14 days of oral vancomycin for *Clostridium difficile* infection. His condition improved. He had multiple negative blood cultures and was transferred to a skilled nursing facility after 38 days of hospitalization.

DISCUSSION

We report a patient with no history of malignancy, hepatobiliary disease, or diabetes. He sustained severe wounds after falling into a drilling device, which was his only possible exposure to *Aeromonas veronii*.

Bacteriology: *Aeromonas veronii* is a Gram-negative, facultative anaerobic, oxidase positive, lactose fermenting, motile bacillus with flagella.¹ Its natural habitat is fresh and brackish water, but it can also be recovered from lakes, rivers, fish tanks, swimming pools, soil, tap water (hospital water supplies), and food.² *Aeromonas* septicemia is rare, but when it does occur it is usually associated with *A. hydrophila*, *A. veronii* biovar *sobria*, or *A. caviae*.⁴ Hickman and Brenner originally classified this bacterium as a new species in the genus *Aeromonas*, previously referred to as Enteric Group 77 by the Centers for Disease Control and Prevention.³ It is divided into two biovars, *A. veronii* biovar *sobria* and *A. veronii* biovar *veronii*.⁴

Epidemiology: *Aeromonas veronii* biovar *veronii* is an uncommon cause of human infections and not much information is available about its infectiv-

ity.⁵ In 1994 the first case of *Aeromonas veronii* biovar *veronii* bacteremia was reported in a cancer patient, and in 1994 another case in a diabetic patient with necrotizing fasciitis was reported.² There has been one reported case of *A. veronii* biovar *sobria* causing septic arthritis and bacteremia in an 81-year-old man in 2005.⁵ Fifty-nine episodes of *Aeromonas* bacteremia were identified in one medical center in southern Taiwan between 1989 and 1994.⁴ These patients had cirrhosis (36 %) and cancer (24 %). The overall mortality rate was 36 %; risk factors for death in cirrhotic patients included spontaneous bacterial peritonitis, hypotension on presentation, diabetes, and a high Pugh score. A case of acute suppurative cholangitis in a patient with Hepatitis B was reported in 2003.⁶

Clinical presentation and diagnosis: *A. veronii* can cause severe skin and soft tissue infections, which can lead to sepsis in the immunocompromised host, usually after exposure of wounds to contaminated water.¹ *A. veronii* can also cause osteomyelitis and septic arthritis and less commonly meningitis and endocarditis.¹ The severity of the illness depends on risk factors such as diabetes, cirrhosis, and immune status. Our patient was immunocompetent and presented with bacteremia and subsequently septicemia. Based on his exposure, his wounds were most likely contaminated from the industrial auger. He required several operations with extensive debridement and an amputation. His initial presentation was that of necrotizing fasciitis. The infection was rapidly progressive, and the patient became septic with temperatures from 102-104 ° F, blood pressures of 86/52 to 96/48 mmHg, and WBC counts of 11,000 to 31,000.

Diagnosis requires tissue, wound, and/or blood cultures. Our patient had positive blood cultures and multiple positive wound cultures for *A. veronii*.

Treatment: Early fasciotomy may be required for complicated soft tissue infections; diarrheal diseases are self-limited.¹ Aminoglycosides, fluoroquinolones, carbapenems, aztreonam, and third generation cephalosporins are usually active against *A. veronii*.⁴ Penicillin, ampicillin, cefazolin, ticarcillin, and

streptomycin are not recommended, since *Aeromonas* species are frequent beta lactamase producers.⁶ Our patient was treated with cefepime (later switched to meropenem for broader anaerobic coverage) and levofloxacin specifically for the *A. veronii*. Despite a resistance to carbapenems and sensitivity to quinolones, the severity of his disease at presentation and the extent of the injury warranted broader antibiotic coverage while cultures were pending. His blood cultures became negative within 48 hours, and his wound cultures were negative within 72 hours. A cephalosporin or fluoroquinolone for 3-5 days is recommended for uncomplicated skin and soft tissue infections, but there are limited recommendations for the length of treatment for bacteremia or septicemia. Our patient was treated for twenty-one days.

In summary, we report an unusual and uncommon presentation of *A. veronii* septicemia, secondary to a drilling injury in a young immunocompetent host without any significant past medical history. The circumstances of the infection were unusual, and the rarity of *Aeromonas* bacteremia and subsequent septicemia was of particular interest, especially in a previously healthy host. Our patient's survival was most likely due to aggressive surgical and medical management.

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