

# *Necrotizing Fasciitis and Myonecrosis of Both Legs due to Aeromonas: Two-Case Report*

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## **Abstract**

**Introduction:** *Aeromonas* is a facultative, anaerobic Gram-negative bacillus. It has been reported that this bacterium is responsible for opportunistic infections in patients with compromised immune function due to an underlying disease. The infection usually occurs in one leg and following direct wound contact with water. These two reported cases had necrotizing fasciitis and myonecrosis of both legs without history of trauma but they presented with septicemia.

### **Case report:**

**Case 1:** A 63-year-old man presented with severe right leg pain, fever and septic shock for 1 day. His underlying diseases included diabetes mellitus, hypertension and aplastic anemia. Right leg was markedly swollen with ecchymosis. X-ray demonstrated air in the muscle and subcutaneous fat. The diagnosis was gas gangrene and right AK amputation was performed. At post-operative day 1 his left leg became red, swollen and painful similar to the right leg. The patient did not want to have his left leg amputated. Wide debridement and fasciotomy were performed. Tissue culture revealed *Aeromonas hydrophilla*. With fever and progressive myonecrosis of the left leg, left AK amputation was then performed on post-operative day 11 with an uneventful recovery.

**Case 2:** A 47-year-old man presented with pain of both legs for 2 days, more on the left leg, and septic shock. Underlying diseases included diabetes mellitus, hepatitis C and cirrhosis. Ultrasound and X-ray of both legs showed no evidence of deep vein thrombosis or air in both legs. Debridement and fasciotomy were performed in both legs. Hemoculture and tissue culture revealed *Aeromonas sobria*. With daily open dressing, he had an uneventful recovery.

**Conclusions:** Necrotizing fasciitis and myonecrosis of both legs due to *Aeromonas* are not common and they result in high morbidity and mortality. Early and aggressive surgical intervention should be implemented.

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## **INTRODUCTION**

Members of the genus *Aeromonas* are gram-negative rods that belong to the family Vibrionaceae. They are oxidase-positive, facultative anaerobes with large zones of hemolysis around colonies on blood agar that ferment carbohydrates.<sup>1</sup> *Aeromonas*

bacterium is found in all freshwater environments as well as in brackish, chlorinated, and unchlorinated water.<sup>2</sup> The bacterium is transmitted in humans through oral contact with contaminated water, food, soil, feces, and/or ingestion of contaminated fish or reptiles.<sup>2</sup>

In Thailand, among survivors from Tsunami on 26 December 2004, the most common organisms

isolated were *Aeromonas* species (22.6% of 641 isolates from 305 patients) including *Aeromonas hydrophila* (16.2%) and *Aeromonas sobria* (6.4%).<sup>3</sup> It has been suggested that patients with immunosuppression or malignant diseases are more easily infected with aeromonads, although normal, healthy individuals may become infected as well.<sup>1</sup> Skin and soft-tissue infections (SSTI) by this bacterium in immunocompromised hosts tend to follow severe and rapid courses, often leading to death.<sup>4-7</sup> This report is presented to remind that both legs may be infected with *Aeromonas* infections at the same time.

### CASE REPORT

#### Case 1

A 63-year-old man with history of diabetes mellitus, hypertension and aplastic anemia (on prednisolone)

came to the hospital on 19 October 2007 with pain of his right leg for 1 day and with no history of trauma. He was febrile with temperature of 38.8 °C. Physical findings revealed tenderness, swelling and warmth with erythematous ecchymosis of his distal right leg. The initial impression was cellulites of the right leg.

The laboratory results revealed WBC 5250, Hct 30.0%, N 55%, L 18%, M 25% band 1%, Platelet 59,000. Duplex Ultrasonogram of the right leg revealed limited visualization of right calve veins due to artifact from leg swelling. X-ray of the right leg revealed abnormal air in the muscle of right leg and posterior right knee, possibly from infectious process. During this time his blood pressure dropped from 120/80 mmHg to 80/50 mmHg.

The diagnosis of gas gangrene of the right leg was made and emergency above-knee (AK) amputation of the right leg was performed on the same day. After



**Figure 1** Case #1 Right leg on 19 October 2007



**Figure 3** Case #1 Left leg on 29 October 2007



**Figure 2** Case #1 Left leg on 20 October 2007, right leg had been amputated.



**Figure 4** Case #1 Both stumps on 10 January 2008



surgery he was moved to ICU. Tissue gram stain revealed numerous gram negative bacilli.

On 20 October 2007, his body temperature came down. Erythematous ecchymosis of the left leg was noted and the lesion progressed with pain of the left leg. X-ray of the left leg revealed no abnormal gas. His blood pressure was stable while on dopamine. The patient was advised to have left AK amputation but he refused, so wide debridement and fasciotomy of the left leg were performed. After operation, his blood pressure could be maintained normally and dopamine was tailed off. Tissue culture revealed numerous *Aeromonas hydrophila*. Pathological diagnosis was myonecrosis, acute and chronic inflammation of subcutaneous tissue consistent with gangrene.

On 30 October 2007, he became febrile and the wound was worse. Left AK amputation was advised to save his life. This time he accepted and left AK

amputation was performed on 31 October 2007. Stumps were left open with secondary sutures done later. He then had an uneventful recovery.

### Case 2

A 47-year-old man with history of diabetes mellitus, hepatitis C, and cirrhosis, came to the hospital on 28 December 2007 with pain of both legs (more on the left), fever and septic shock. He was admitted to ICU. The laboratory results revealed WBC 7860, Hct 34.3%, N 45%, L 5%, Band 42% metamyelocyte 1%, Plt 23000, Cr 2.4, alb 2.3, total bilirubin 7.0, SGPT 63, ALP 96. On 30 December 2007, he developed erythematous ecchymosis with progressive pain of both legs. Hemoculture revealed *Aeromonas sobria*. X-ray of both legs revealed no abnormal air. Debridement and fasciotomy were performed. Tissue culture revealed *Aeromonas sobria*. Pathological diagnosis was



Figure 5 Case #2 Left leg on 30 December 2007



Figure 7 Case #2 Left leg on 20 January 2008



Figure 6 Case #2 Right leg on 30 December 2007



Figure 8 Case #2 Right leg on 20 January 2008



necrotizing fasciitis and myonecrosis both legs. Post-operatively, his vital signs gradually improved and he was then moved from ICU to ward. Wound dressing was carried out daily for secondary healing. He had an uneventful recovery.

## DISCUSSION

*Aeromonas* is a facultative, anaerobic Gram-negative bacillus of the Vibrionaceae family. It is widely distributed in the environment such as fresh water, sea water, and soil.<sup>4,5</sup>

These *Aeromonas* have been recognized as pathogens of fish, reptiles, and amphibians for many decades, but it is only recently that they have been recognized as significant human pathogens.<sup>8</sup>

In a comparative study of the occurrence of *A. hydrophila* and *A. sobria* in the environment, *A. hydrophila* accounted for 90% of the *Aeromonas* population, with *A. sobria* accounting for the remainder. Curiously, the data reported by Daily OP, et al.<sup>9</sup> showed that *A. sobria* seems to predominate among clinical specimens.

Type of infection most frequently found in human by this bacterium is gastrointestinal infection, followed by skin and soft-tissue infections (SSTI). Two mechanisms have been proposed to explain the onset of *Aeromonas* SSTI. One mechanism, the bacterium invades through trauma area and causes primary SSTI, which is followed by secondary sepsis. Another mechanism, sepsis is first induced by this bacterium, followed by secondary metastatic lesion of skin and soft tissue. It has been estimated that this bacterium causes sepsis via the intestinal-portal route.<sup>4</sup>

The most common underlying conditions associated with *Aeromonas* septicemia include malignancy, hepatobiliary disease, and diabetes.<sup>7,10</sup>

In healthy individuals, injury within water was seen relatively frequently, but sepsis seldom occurs. *Aeromonas* SSTI in these individuals is often confined to narrow areas and responds relatively well to surgical treatment or antibiotic therapy. It is seldom fatal. In immunocompromised hosts, on the other hand, *Aeromonas* SSTI and sepsis have occurred even in cases where no marked injury within water was seen or there was no lesion on the body surface which might allow bacterial invasion. SSTI and sepsis in these individuals often resist surgical treatment or antibiotic therapy and follow a serious course.<sup>4,7</sup>

The spectrums of *Aeromonas* infection include cellulitis, gas gangrene, myonecrosis, fulminant necrotizing infection, ecthyma gangrenosum and osteomyelitis.<sup>1,2</sup>

Fatality of *Aeromonas* SSTI in immunocompromised hosts was as high as 50%, and that the fatality was even higher (75%) for cases where SSTI was complicated by sepsis.<sup>4</sup>

Early surgical intervention is therefore essential in immunocompromised hosts with this infection. Some investigators reported that amputation saved lives of these patients, while others reported patients who died probably because of delay in removal of necrotic lesion by surgery (including amputation).<sup>2,4,8</sup>

In Thailand, among 777 patients from the Tsunami on 26 December 2004, there were 515 cases with SSTI. The most common organisms isolated were *Aeromonas* species (145 or 22.6% of 641 isolates from 305 patients) including *Aeromonas hydrophila* 16.2% and *Aeromonas sobria* 6.4%.<sup>3</sup> These bacterium were susceptible to aminoglycosides, third- and fourth-generation cephalosporins, quinolones and imipenem but were resisted to amoxicillin-clavulanate and first-generation cephalosporins.<sup>3,8</sup> The sensitivity test was also similar to these two reported cases.

In many reports, *Aeromonas* SSTI occurred in only one extremity.<sup>2,4,6</sup> These two cases would remind that there may be SSTI in more than one extremity at the same time and it may not be associated with trauma. *Aeromonas* SSTI may be found more often than in the past.

It is suspected that these two cases developed septicemia from intestinal-portal route because there was no history of trauma and no external wound was found. Metastatic lesion of SSTI in case #1 began in the right leg then to the left leg, in case #2 it began first in the left leg then to the right leg.

## CONCLUSIONS

In patient with septicemia, severe SSTI or leg pain, with or without history of trauma, *Aeromonas* should be considered as a causative pathogen. *Aeromonas* SSTI may be involved in more than one extremity as reported here. Surgical treatment and appropriate antibiotic should be given early and aggressively to save life. Routine gram stain and culture could help to identify these pathogens.

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