



Case Report

Septic arthritis caused by *Aeromonas hydrophila*Chi-Chou Tseng^a, Chung-Da Wu^b, Shun-Chien Cheng^b, Wei-Ting Lin^{b,*}, Huan-Tee Chan^a, Po-Yih Chen^a^a Department of Orthopedics, Chi Mei Medical Center, Liouying, Tainan, Taiwan^b Department of Orthopedics, Chi-Mei Medical Center, Tainan, Taiwan

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ABSTRACT

Septic arthritis caused by *Aeromonas hydrophila* is a rare clinical entity in common practice. Herein, we describe one case of *A. hydrophila*-associated septic knee after a traumatic injury. The clinical condition gradually improved after appropriate antibiotic and surgical debridement.

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1. Introduction

Septic arthritis is defined as bacterial, fungal, viral, or mycobacterial infection in a joint; however, most acute forms of this clinical entity are caused by bacteria. *Staphylococcus aureus* is the most common pathogen causing an acute form of septic arthritis.^{1–3}

By contrast, Gram-negative bacteria-related septic arthritis is only reported in some special settings, including trauma, intravenous drug abuser, neonates, the elderly, and immunocompromised patients. *Aeromonas* species are Gram-negative, rod-shaped bacteria that are ubiquitous in aquatic environments. These organisms are frequently isolated from fresh or brackish water, sewage, soil, and tap water in temperate or subtropical countries, such as Taiwan.^{4–8}

However, the research focusing on septic arthritis caused by *Aeromonas* species is rare and only limited in the form of case reports.^{9–15}

Herein, we describe one case of *Aeromonas hydrophila*-associated septic arthritis.

2. Case report

A 26-year-old man presented with severe right knee pain after falling to the ground from a bridge about 10 m in height because of a motor vehicle accident. Initial loss of consciousness and right thigh deformity were found. He was brought to our emergency

department by ambulance 30 minutes later. On arrival, his consciousness was drowsy and vital signs were: body temperature of 36°C pulse rate of 80/min, respiratory rate of 15/min, and blood pressure of 130/70 mm Hg. Physical examinations showed a laceration wound over the right knee with painful swelling and deformity of the right thigh. Laboratory examination results were as follows: white blood cell count (WBC) 11,100/mm³ (78.2% neutrophils) and C-reactive protein (CRP) 150.0 mg/L (normal reference, 6 mg/L). Radiography of the right knee showed right patella fracture and right femoral shaft fracture (Fig. 1). Under the impression of right patella open comminuted fracture (Collins and Temple Grade IIIb)¹⁶ and right femur shaft closed fracture with displacement, the patient received vigorous joint toilet with massive irrigation and debridement, and open reduction and internal fixation with interlocking nail and tension band wire. Hemovac drainage was implemented and empirical antibiotic with cefazolin 1 g every 8 hours was administered. However, progressive swelling with erythematous change developed over the right knee 3 days later. Therefore, arthrotomy with débridement of the right knee was performed for the septic knee; antibiotic was shifted to ciprofloxacin 400 mg every 12 hours. After removal of previous stitches, a large amount of pus was noted and drained. Next, irrigation and debridement were done followed by wound closure. Two days after debridement, aerobic bacterial culture of the turbid joint fluid yielded *A. hydrophila*. Susceptibility tests revealed that *A. hydrophila* was sensitive to amikacin, ceftazidime, ciprofloxacin, cefuroxime, gentamicin, lomefloxacin, ertapenem, piperacillin, and piperacillin/tazobactam, but resistant to cefazolin and ampicillin. Therefore, we kept parenteral ciprofloxacin in use for 21 days and

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Fig. 1. Radiography of the right knee showed right patella fracture and right femoral shaft fracture.

follow-up CRP levels declined to 5.5 mg/L. Finally, the patient was discharged without incident under oral ciprofloxacin treatment. He received oral ciprofloxacin for 8 weeks and aggressive debridement three times. Follow-up CRP level and erythrocyte sedimentation rate (ESR) gradually declined (Fig. 2). One year later, the general condition of the knee was good, with an acceptable range of motion.

3. Discussion

During the study period from 1995 to 2012, we had 130 patients with microbiology-confirmed septic arthritis, and only one case was confirmed as *Aeromonas* infections. Therefore, the overall prevalence of this clinical entity is 0.77%. Although it is not uncommon for *A. hydrophila* to be present in the setting of septic arthritis, we documented that *A. hydrophila* should be considered in the differential diagnosis of septic arthritis in Taiwan, which was the endemic area for aeromonad.

Open fractures, which can cause traumatic disruption of the intervening soft tissue and skin, carries a higher risk for infection than closed fractures. Its associated infections usually result from the contaminated open fracture wound. Because the pathogenesis of posttraumatic open fracture wound infections is that micro-organisms intrude bone directly in the setting of trauma or contiguous spread from injury to overlying soft tissue, the possible pathogens are skin flora, soil organisms, or nosocomial pathogens acquired through surgical intervention. In our patient, he may obtain *Aeromonas* species infection through the traumatic wound after exposure to an environmental source.

In our case, initial antibiotic with cephalosporin was inappropriate for *A. hydrophila* isolate based on an *in vitro* study, and the clinical condition deteriorated in the beginning. In this study, the antibiotic susceptibility pattern of the clinical isolates in this report was similar to previous reviews.^{17,18} Although most of the isolates were not susceptible to ampicillin, most were susceptible to third- or fourth-generation cephalosporins, aminoglycosides, ciprofloxacin, and imipenem. Therefore, third- or fourth-generation cephalosporins as well as fluoroquinolones should be considered the antibiotic treatments of choice for patients in this clinical condition. Such as our case, the clinical condition gradually improved after appropriate antibiotic (ciprofloxacin) treatment, with surgical débridement.

In conclusion, *A. hydrophila* septic arthritis is an uncommon clinical entity, but it deserves clinicians' attention especially in the setting of posttraumatic infection.

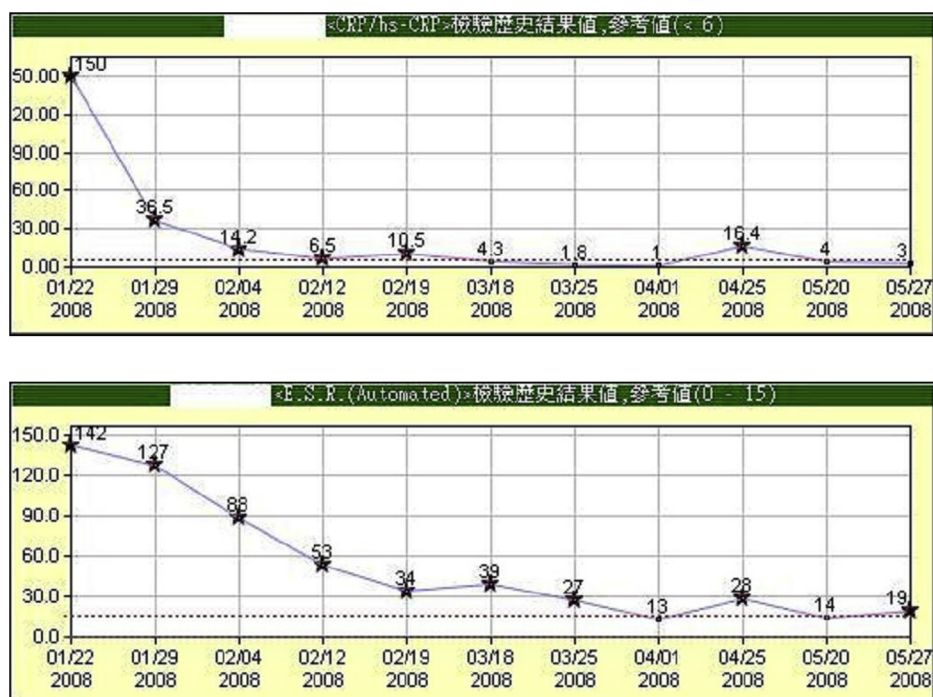


Fig. 2. Trends in C-reactive protein and erythrocyte sedimentation rate during the course of treatment.

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