

SALMONELLA SEPTIC BURSITIS OF THE ANKLE IN A HUMAN IMMUNODEFICIENCY VIRUS-INFECTED PATIENT: A CASE REPORT AND LITERATURE REVIEW

Akarin Hiransuthikul and Narin Hiransuthikul

Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand

Abstract. Salmonella is an unusual cause of septic bursitis of the ankle. A 48-year-old male fish-merchant with a history of HIV infection with a CD4 cell count of 79 cells/ml presented with pain of the left ankle for 2 weeks and fever for 1 day. The bursal fluid was aspirated and culture of the fluid revealed *Salmonella* group D. He was treated initially with intravenous ceftriaxone 2g once daily for 5 days, followed by oral ciprofloxacin 500mg twice daily for 4 weeks to give a treatment course of 5 weeks. Follow-up visit revealed complete recovery without any residual defects. Salmonella should be considered in the differential of the etiology of immunosuppressed patient with septic bursitis.

Keywords: acquired immunodeficiency syndrome (AIDS), human immunodeficiency virus (HIV), Salmonella, septic bursitis

INTRODUCTION

Septic bursitis accounts for 1/3 of all bursitis cases and commonly involves the olecranon and prepatellar bursae, with *Staphylococcus aureus* and other gram-positive organisms accounted for over 80% of cases (Zimmermann *et al*, 1995; Cea-Pereiro *et al*, 2001; Baumbach *et al*, 2014). Repetitive occupational trauma is a known risk factor for septic bursitis (Cea-Pereiro *et al*, 2001). Descriptions of septic bursitis among HIV-infected patients are rare, and mostly due to *Staphylococcus aureus* and occurred at olecranon and knee bursae (Buskila and Tenenbaum,

1989; Hughes *et al*, 1992; Vassilopoulos *et al*, 1997; Burke *et al*, 2013). We present a case of septic bursitis in HIV-infected patient with an uncommon causative pathogen at uncommon site.

CASE REPORT

A 48-year-old male fish-merchant with a history of HIV infection presented with a history of left ankle pain for 2 weeks which was initially intermittent and then became constant and was accompanied by fever for 1 day. The patient did not seek medical care prior to admission. He walked throughout the day and was constantly exposed to swamp water at a fish market at his work. The patient had been diagnosed 10 years previously with HIV infection. His antiretroviral therapy since 2012 was tenofovir, lamivudine, and ritonavir-boosted lopinavir. He had

Correspondence: Narin Hiransuthikul, Department of Preventive and Social Medicine, Faculty of Medicine, Chulalongkorn University, Bangkok 10330, Thailand.
E-mail: nhiransu@gmail.com



Fig 1—Photograph of swollen left ankle of study subject. There is a small abrasion of the skin overlying the affected site.

poor compliance to this regimen and infrequently followed up. His most recent CD4 count was 79 (5%) cells/ml.

On physical examination at admission he had a temperature of 38.5°C and his other vital signs were normal. The patient was able to walk into the office but he had obvious fatigue. His skin had generalized hyperpigmentation. His left ankle was swollen, tender and had fluctuation over the lateral aspect (Fig 1). The rest of his physical examination was unremarkable.

The subcutaneous bursa over the left lateral malleolus was then aspirated with a needle and syringe of 20 ml of odorless pus was removed. A gram stain of the pus revealed gram-negative bacilli. A complete blood count revealed a white blood cell count of 10,070 cells/ml with 57% neutrophils. A culture of the bursa aspirate and blood culture both revealed *Salmonella* group D.

The patient was treated with intravenous ceftriaxone 2 g once daily for 5 days, followed by oral ciprofloxacin 500 mg twice daily for 4 weeks. He had

gradual improvement in his symptoms and at follow-up after finishing treatment he had recovered completely without any residual defects.

DISCUSSION

Bursitis is a common cause for orthopedic pain. Septic bursitis, accounts for approximately 1/3 of bursitis cases, commonly involves the olecranon and prepatellar bursae, and septic olecranon bursitis occurs four times

more often than septic prepatellar bursitis (Baumbach *et al*, 2014). Septic bursitis most commonly results from direct inoculation of microorganism; *Staphylococcus aureus* and other gram-positive organisms are responsible for more than 80% of cases (Zimmermann *et al*, 1995). The majority of bursitis cases in adults occur in patients with occupations involving repetitive trauma and pressure on the underlying bursa (Cea-Pereiro *et al*, 2001). Our case had occupational risk factors for developing septic bursitis.

Septic bursitis in HIV-infected patients has not been commonly reported (Table 1). Using the PubMed database, a total of 8 published cases were found in the literature between 1989 and April 2016 (Jacobson *et al*, 1988; Buskila and Tenenbaum, 1989; Hughes *et al*, 1992; Vassilopoulos *et al*, 1997; Leth and Jensen-Fangel, 2012; Burke *et al*, 2013). All the cases were males. The median age at presentation was 37.5 (range 28-57) years old. Olecranon or knee bursae were involved in 6 of the 8 reported cases (Burke *et al*, 2013; Buskila and Tenenbaum, 1989; Hughes *et al*,

Table 1
Eight reported cases of septic bursitis among HIV-infected patients.

| Year | Age, Sex | CD4 cell count (cells/mm ³) | Plasma HIV-RNA level (copies/mm ³) | Site | Pathogen | | Prescribed antibiotic(s) | Outcome |
|-----------------------------------|----------|---|--|--------------------|----------------------|------------------|---|-----------------------------|
| | | | | | Bursa | Blood | | |
| Jacobson <i>et al</i> (1988) | 1988 | 31, M | NA | NA | <i>S. aureus</i> | <i>S. aureus</i> | NA | Complicated by endocarditis |
| Buskila and Tenenbaum (1989) | 1989 | 36, NA | NA | Olecranon | <i>S. aureus</i> | Negative | NA | Recurrent |
| | 1989 | 34, NA | NA | Olecranon | <i>S. aureus</i> | NA | NA | Recovery |
| Hughes <i>et al</i> (1992) | 1992 | 40, M | NA | Prepatellar | <i>S. aureus</i> | Negative | Ampicillin + flucloxacillin | Recovery |
| Vassilopoulos <i>et al</i> (1997) | 1997 | 28, M | 2 | Prepatellar | <i>S. aureus</i> | NA | Vancomycin | Recovery |
| | 1997 | 43, M | 247 | Greater trochanter | Unknown | NA | Imipenem | Recovery |
| Leth and Jensen-Fangel (2012) | 2012 | 39, M | 2,600 | Infrapatellar | <i>M. malmoeense</i> | NA | None | Recovery |
| Burke <i>et al</i> (2013) | 2013 | 57, M | Undetectable | Suprapatellar | <i>S. aureus</i> | NA | Amoxicillin-clavulanic acid + discharged with dicloxacillin | Recovery |

M, Male; NA, Not available.

1992; Vassilopoulos *et al*, 1997; Leth and Jensen-Fangel, 2012). All the case but two were due to *Staphylococcus aureus* and one had *Staphylococcus aureus* bacteremia (Jacobson *et al*, 1988). One case was due to immune reconstitution inflammatory syndrome (IRIS) caused by *Mycobacterium malmoense* in the infrapatellar bursae (Leth and Jensen-Fangel, 2012). The causative pathogen for the other case, which involved the hip, was not identified; in this case, septic bursitis was diagnosed since the patient recovered fully after being treated with broad spectrum antibiotics (imipenem) (Vassilopoulos *et al*, 1997). All the cases but two recovered fully; one was complicated by endocarditis and another case reported recurrent infection (Jacobson *et al*, 1988; Buskila and Tenenbaum, 1989). Six of the 8 cases occurred during the pre-highly active anti-retroviral therapy era (Jacobson *et al*, 1988; Buskila and Tenenbaum, 1989; Hughes *et al*, 1992; Vassilopoulos *et al*, 1997). Our case had septic bursitis at an uncommon site (subcutaneous bursa of the lateral malleolus) due to an uncommon pathogen (*Salmonella* group D). We also found a case of aseptic bursitis of the acromial bursae reported in the literature among HIV-infected patients (Ejnisman *et al*, 2010).

Septic bursitis caused by gram-negative organisms, such as *Haemophilus influenzae* and *Pseudomonas aeruginosa*, have been reported on rare occasions, but only in non-HIV infected patients (Cea-Pereiro *et al*, 2001). Because our patient worked as a fish merchant, he had a history of prolonged walking and exposure to swamp water and seafood in the market, which increased his risk for contacting the detected bacteria. To our knowledge, this patient is the first reported case of septic bursitis caused by *Salmonella* group D.

Clinical syndromes caused by *Salmonella* infection in humans are classically categorized as: typhoid fever, caused by *Salmonella typhi* and *Salmonella paratyphi*, and a wide range of clinical diseases caused by non-typhoidal salmonellae (NTS). NTS infections usually have a more severe presentation in immunocompromised patients than typhoidal serotypes (Subramoney, 2015). Unlike *S typhi* and *S.paratyphi*, whose only reservoir is humans, NTS can be acquired from several animals, including fish and other seafood; a prevalence survey reported *Salmonella* contamination in 21% of uncooked seafood markets from Thailand (Heinitz *et al*, 2000). Human transmission can occur by ingestion of contaminated food or by direct inoculation, which appeared to be the case in our patient.

Only 0-8% of septic bursitis cases have associated bacteremia (Zimmermann *et al*, 1995). Trebicka *et al* (2014) reported HIV-infected individuals with detectable viral loads are at increased risk for NST infection due to a significant reduction in lipopolysaccharide (LPS)-specific IgG, the antibody responsible for bactericidal activity against NTS. This may have contributed to our patient's case.

Gram stain and culture of aspirated bursal fluid are the diagnostic tests of choice for septic bursitis. Bursal fluid-to-serum glucose ratios of <50% can be used to distinguish septic from aseptic bursitis (Ho and Tice, 1979). In our patient, bursal fluid culture results yielded *Salmonella* group D confirming the diagnosis of septic bursitis.

Although there are similarities in the causative organisms and clinical features of septic bursitis between immunocompromised and immunocompetent patients, the infected bursa of immunocom-

promised patients take three times longer to recover (Roschmann and Bell, 1987). A previous report found the usual time for bursal sterilization is 4 days, provided that the patient presents within 1 week of infection (Ho and Tice, 1979). Complete cure occurs when the antibiotic is continued for 5 days after bursal sterilization, making a total of approximately a 9-day course of antibiotics required to treat septic bursitis. Antibiotic duration may require an extension of up to 11 days in immunocompromised patients before the eradication of organisms in bursal fluid (Zimmermann *et al*, 1995). In the presence of *Salmonella* bacteremia, provided there is no suspicion of endovascular focus, antibiotics should be administered for 10-14 days for successful treatment (Hohmann, 2001). However, it is recommended prolonged therapy of 4 -6 weeks be given to patients with underlying HIV infection (Hohmann, 2001). The antibiotic was given for a total duration of nearly 5 weeks in this case.

Although septic bursitis is believed to be a rare cause of orthopedic pain in HIV-infected patients, it should be considered in the differential diagnosis. When it occurs, olecranon and knee bursae are the most commonly infected sites and *Staphylococcus aureus* is the most common pathogen (Buskila and Tenenbaum, 1989; Hughes *et al*, 1992; Vassilopoulos *et al*, 1997; Burke *et al*, 2013). Although rare, *Salmonella* bursitis should be considered among patients with suppressed immunity who have occupational risk factors.

ACKNOWLEDGEMENTS

We thank the patient for providing written informed consent to publish this case report and include the accompanying image.

REFERENCES

- Baumbach SF, Lobo CM, Badyine I, Mutschler W, Kanz KG. Prepatellar and olecranon bursitis: literature review and development of a treatment algorithm. *Arch Orthop Trauma Surg* 2014; 134: 359-70.
- Burke CC, Martel-Laferrriere V, Dieterich DT. Septic bursitis, a potential complication of protease inhibitor use in hepatitis C virus. *Clin Infect Dis* 2013; 56: 1507-8.
- Buskila D, Tenenbaum J. Septic bursitis in human immunodeficiency virus infection. *J Rheumatol* 1989; 16: 1374-6.
- Cea-Pereiro JC, Garcia-Meijide J, Mera-Varela A, Gomez-Reino JJ. A comparison between septic bursitis caused by *Staphylococcus aureus* and those caused by other organisms. *Clin Rheumatol* 2001; 20: 10-4.
- Ejnisman B, Figueiredo EA, Terra BB, Lima AL, Uip DE. Subacromial bursitis related to HIV infection: case report. *Braz J Infect Dis* 2010; 14: 645-6.
- Heinitz ML, Ruble RD, Wagner DE, Tatini SR. Incidence of Salmonella in fish and seafood. *J Food Prot* 2000; 63: 579-92.
- Ho G Jr, Tice AD. Comparison of nonseptic and septic bursitis. Further observations on the treatment of septic bursitis. *Arch Intern Med* 1979; 139: 1269-73.
- Hohmann EL. Nontyphoidal salmonellosis. *Clin Infect Dis* 2001; 32: 263-9.
- Hughes RA, Rowe IF, Shanson D, Keat AC. Septic bone, joint and muscle lesions associated with human immunodeficiency virus infection. *Br J Rheumatol* 1992; 31: 381-8.
- Jacobson MA, Gellermann H, Chambers H. *Staphylococcus aureus* bacteremia and recurrent staphylococcal infection in patients with acquired immunodeficiency syndrome and AIDS-related complex. *Am J Med* 1988; 85: 172-6.
- Leth S, Jensen-Fangel S. Infrapatellar bursitis with *Mycobacterium malmoense* related to immune reconstitution inflammatory syndrome in an HIV-positive patient. *BMJ Case Rep* 2012; 2012.

- Roschmann RA, Bell CL. Septic bursitis in immunocompromised patients. *Am J Med* 1987; 83: 661-5.
- Subramoney EL. Non-typhoidal Salmonella infections in HIV-positive adults. *S Afr Med J* 2015; 105: 805-7.
- Trebicka E, Shanmugam NK, Mikhailova A, Alter G, Cherayil BJ. Effect of human immunodeficiency virus infection on plasma bactericidal activity against *Salmonella enterica* serovar Typhimurium. *Clin Vaccine Immunol* 2014; 21: 1437-42.
- Vassilopoulos D, Chalasani P, Jurado RL, Workowski K, Agudelo CA. Musculoskeletal infections in patients with human immunodeficiency virus infection. *Medicine (Baltimore)* 1997; 76: 284-94.
- Zimmermann B 3rd, Mikolich DJ, Ho G Jr. Septic bursitis. *Semin Arthritis Rheum* 1995; 24: 391-410.