Acute Oligoarthritis with Streptococcus Suis Infection with Septicemia: A Case Report

Sarawut Suksupthew**, RakSina Chaimarnongsiriporn¹ and Phob Ganokjoji

¹School of Medicine, Department of Medicine, Suranaree University of Technology, Nakhon Ratcsima, Thailand
²Department of Orthopaedic Surgery, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok, Thailand

Received Date: May 01, 2018, Accepted Date: May 15, 2018, Published Date: May 21, 2018.

*Corresponding author: Sarawut Suksupthew, School of Medicine, Institute of Medicine, Suranaree University of Technology, Nakhon Ratcsima 30000, Thailand, Tel: 66-442-239-63; E-mail: ssarawut@sut.ac.th

Abstract

An unusual clinical presentation of Streptococcus suis infection in a 45-year-old Thai male presenting with oligoarthritis involving the shoulder and knees with septicemia is reported herein. The causative organism was isolated from the blood and the synovial fluid of the knee joint and was susceptible to ceftriaxone and vancomycin. The patient underwent open arthrotomy of the affected shoulder and knee, joint lavage, debridement and two weeks of intravenous antibiotic therapy and made a full recovery.

Keywords: Streptococcus suis infection; Septic arthritis; Septicemia; Oligoarthritis

Introduction

Human Streptococcus suis (S. suis) infections are zoonotic infections in swine and are an emerging public health concern in Asia that can lead to severe systemic infection in humans [1]. In recent years, the number of human S. suis cases reported in the literature has increased significantly. Over 409 cases were reported in a review article published in 2007 [1], with most cases originating in Southeast Asia, including Thailand.

S. suis causes a systemic infection in humans that affects several organ systems; meningitis is the most common clinical manifestation [2–4]. Other organ systems manifestations of S. suis include subjective hearing loss, abnormal skin findings such as petechiae or purpura, acute or subacute endocarditis, endophthalmitis and uveitis, spondylodiscitis and acute pyogenic arthritis [5]. A review of the literature indicates that acute pyogenic arthritis with associated septicemia is an uncommon presentation. Here we report what we believe to be the first case of S. suis infection presenting as a pyogenic arthritis involving two distinct joints with septicemia [3, 6–13].

Case Report

A 45-year-old Thai male presented with an acute high grade fever, as well as left shoulder and right knee pain. Three days prior to admission, he complained of a low-grade fever and a mild headache without neck or back pain. He subsequently developed left shoulder pain and restricted range of motion of the joint. One day prior to admission, he noted the onset of severe right knee pain that prevented him from walking or moving his right leg with increased body temperature. He then presented to a local hospital for treatment. His history was remarkable for contact with pigs and the eating of raw pork several days prior to admission. He denied having any open wounds.

Upon examination, the patient appeared ill and in distress with a temperature of 38.5 degrees Celsius. There were no lesions or abrasions of the skin or mucous membranes. He exhibited no meningismus or deafness. There was swelling, warmth and tenderness at the anterior aspect of the left shoulder. Range of motion of the left shoulder was limited due to pain. There was no evidence of distal neurovascular impairment. The right knee was swollen, warm and tender with decreased range of motion due to pain. Pain was also present on passive motion of the right knee. Distal neurovascular assessment of the right knee was unremarkable. Other joints appeared normal. The neurological examination was grossly intact, and the neck stiffness test was unremarkable. There were swelling and erythema of the scrotal skin and tenderness of the scrotum on palpation. The rectal examination appeared unremarkable.

Arthrocentesis of the right knee revealed a white blood cell count of 53,000 cell/mm³ (neutrophil 94% and lymphocyte 6%) and a red blood cell count of 51,000 cell/mm³, and no crystals were observed. The gram stain from the right knee revealed gram-positive cocci in chains.

Medical treatment was started with intravenous ceftriaxone 2 grams q 12 hours at the local hospital. The patient was then transferred to Suranaree University of Technology Hospital. He continued to experience pain in his left shoulder and right knee with a high-grade fever.

On admission, the laboratory data showed a hematocrit of 34.8%, a white blood cell count of 9.5 x 10⁹/L (neutrophil 71%, lymphocyte 22%, monocyte 6%), a platelet count of 236 x 10⁹/L, an erythrocyte sedimentation rate (ESR) of 84 mm/hr, sodium 139 mmol/L, potassium 3.6 mmol/L, chloride 104 mmol/L, carbon dioxide 23 mmol/L, aspartate aminotransferase 29 U/L, and alanine aminotransferase 59 U/L. Hepatitis B and hepatitis C profiles were negative. Urine analysis was unremarkable. Radiographic images of the chest, left shoulder and the right knee were unremarkable. CT scan of the brain with contrast revealed no detectable intracranial abnormality. A lumbar puncture was unremarkable. EKG was normal. Echo-cardiography showed normal LV systolic function with LVEF of 75% with no evidence of vegetation. An audiogram was also performed, and normal hearing was found.

The patient was sent to an operating theater. Arthrocentesis of the left shoulder and right knee revealed 3 ml and 10 ml of purulent fluid, respectively (Figure 1). Open arthrotomy, joint lavage and debridement were subsequently performed on both the left shoulder and the right knee. Intravenous ceftriaxone and cloxacillin were started postoperatively as an empirical treatment.

After two days of treatment, the patient’s temperature returned to normal. There was less pain, swelling and tenderness in both the left shoulder and the right knee. He was able to ambulate and move his left shoulder normally (Figure 2). Two samples of the blood culture from the initial hospitalization grew S. suis, which was sensitive to ceftraxone and vancomycin. Although joint fluid isolated in the operating theater failed to yield bacterial growth on...
culture, the culture of the fluid from the initial arthrocentesis of the right knee grew *S. suis*.

On postoperative day five, the patient’s clinical status was markedly improved. He could walk without aids and had a full range of active and passive motion of the left shoulder. After 14 days of intravenous antibiotic treatment and seven days of oral doxycycline, he appeared well and symptom-free. The laboratory data showed a hematocrit of 38.2%, a white blood cell count of 7.0 x 10⁹/L (neutrophil 65%, lymphocyte 27%, monocyte 5%), a platelet count of 575 x 10⁹/L, an ESR of 73 mm/hr and C-reactive protein (CRP) of 19.0 mg/L. He was discharged on amoxicillin (500 mg) three times a day for 4 weeks. Recurrence did not take place during the three months of the follow-up period. Additionally, the laboratory data (complete blood count, ESR and CRP) were normal at the three-month follow-up.

The patient was diagnosed as having an atypical presentation of *S. suis* infection manifested by septic oligoarthritis of both the left shoulder and the right knee with septicemia and acute orchitis.

**Discussion**

Septic arthritis is a serious medical problem. The case-fatality rate of septic arthritis is estimated to be 1–25%, and 25–50% of surviving patients suffer a permanent loss of joint function as a consequence of the infection [14–16]. There are many etiologies such as bacterial infection, fungal infection, viral infection and also mycobacterial infection. The risk factors for acquiring joint infections include crystalline arthopathies, rheumatoid arthritis, previous trauma and the presence of joint prostheses. The incidence of bacterial joint infection in the United States is about 10 per 100,000 patients [17] with a greater risk in patients with a history of rheumatoid arthritis and those having had previous joint replacement surgery [18]. Moreover, more than 50% of cases of bacterial joint infections occur most commonly and exclusively in the knee joint [19].

*S. suis* is a pathogen in swine that can cause severe systemic infections in humans. The first occurrence of a human *S. suis* case was reported in Denmark. More recently, increasing numbers of human cases have been reported. Although most reports involve sporadic cases of infection, an outbreak of *S. suis* infection occurred in Sichuan Province, China, during July and August 2005, that involved 215 cases and 38 deaths, emphasizing the significance of *S. suis* as an emerging zoonosis [4]. More recently, over 409 cases were reported in a review article published in 2007 [1] with most cases originating in Southeast Asia, including Thailand.

In a matched case-control study of risk factors for human *S. suis* infection in Sichuan Province, slaughtering (OR, 11.9; 95% CI, 3.4–42.8) and cutting carcasses and processing sick or dead pigs (OR, 3.0; 95% CI, 1.0–8.8) were major risk factors for human infection [4]. Because *S. suis* was isolated from 6.1% of raw pork meat from three out of the six wet markets in Hong Kong, it is likely that, apart from occupational exposure, processing or consuming uncooked or partially cooked pork products are also risk factors for infection. Many Thai people prefer to buy fresh pork from the market. In this case report, the patient also bought fresh pork from a local wet market and consumed uncooked pork before developing the symptoms of infection.

The clinical manifestations of *S. suis* infection affect several organ systems. The presenting features of *S. suis* meningitis are generally similar to those of other bacterial meningitides, including headache, fever, vomiting and meningeal signs. *S. suis* has strong predilection to plexus choroiditis of the brain [28–29] and this probably caused inflammation of this brain anatomic structure associated with overproduction of proinflammatory cytokines [30] and increased cerebrospinal fluid production finally leading to intracranial hypertension and headache. Similar pathomechanism of headache and intracranial hypertension has been reported for the intracellular parasite *T. gondii*, which also has predilection to this brain structures. One significant feature is subjective hearing loss, which has been reported in up to one-half of the patients at presentation or a few days afterwards [20]. Less common manifestations include acute and subacute endocarditis [21–22], endophthalmitis and uveitis [20,23], spondylodiscitis [24], brain stem ophthalmoplegia [25], epidural abscess [26] and acute pyogenic arthritis. The headache, ocular abnormalities and hearing loss characteristic for *S. suis* infection had also been reported in patients with cerebral toxoplasmosis [31–32], therefore concomitant infection with this microbe should eventually be excluded during differential diagnosis.

Review of the literature indicates that acute pyogenic arthritis...
with associated septicemia is an uncommon clinical manifestation for *S. suis* infection. Cheng, et al. [6] studied *S. suis* serotype 2 infections with associated septic arthritis in Hong Kong, China in 1986. They reported the first case that presented with septicemia and septic arthritis in both knee joints. The latter appears to be the first report in which the causative organism was cultured from the joint fluid (both knees) and from the blood. Ma, et al. [7] conducted a 31-month retrospective review of confirmed *S. suis* infections admitted to a public hospital in Hong Kong from January 2003 to July 2005. Twenty-one sporadic cases were identified. The primary clinical manifestations were meningitis (48%), septicemia (38%) and endocarditis (14%). Included in this series were two cases (9.5%) of septicemia and septic arthritis (site unknown).

In Thailand, where *S. suis* infection is considered a rare disease, the first two cases were reported by Ramathibodi Hospital in 1987 [27], and there have been eight subsequent reports. Teekakirikul P and Wiwanitkit V [8] reviewed case reports of *S. suis* infection published between 1987–2001 and found that there were nine reports with a total of 27 patients with a confirmed diagnosis of *S. suis* infection. The demographic and clinical data show 15 (55.6%) of all samples had a history of contact with pigs or raw pork products, or a history of raw pork or uncooked pig blood consumption. The ages of the patients ranged from 23 to 72 years (mean 47 ± 8.91). Most patients presented with fever (N = 27, 100%), headache (N = 11, 40.74%) and neck stiffness (N = 13, 48.15%). Twelve cases (44.44%) developed septic shock, and only one survived with loss of hearing. Two cases were the first reports of human *S. suis* endocarditis in Thailand. One case was probably the first case report of *S. suis* peritonitis. Additionally, there were two cases (7.4%) of septic arthritis (site unspecified).

There are few case reports of septic arthritis associated with *S. suis* infection. Kim, et al. [9] reported the first case of *S. suis* infection in an 81-year-old Korean woman who presented with fever, arthralgia, and headache. She was diagnosed as having septic arthritis in both knees and bacteremia caused by *S. suis*. Gustavsson and Rasmussen [10] reported a 65-year-old Swedish pig farmer with septic arthritis of the hip joint caused by *Streptococcus suis* serotype 5. Ceia, et al. [11] reported a case of a 22-year-old previously healthy Portuguese man who presented to the hospital with fever, myalgia, swelling and pain of the right wrist. He was diagnosed with septic arthritis of the wrist joint and septicemia caused by *S. suis* infection.

**Conclusion**

*S. suis* infection is now not uncommon in Thailand and is an emerging human pathogen. Currently, a human vaccine is not available. Therefore, simple preventative measures are important, including wearing gloves during pork processing, washing hands after handling raw fresh pork, and providing education on the possible consequences of eating raw or partially cooked pork. Further studies are necessary to identify the serotypes of the most common organisms causing human infections, atypical presentations, the reservoirs of *S. suis* in the environment, factors that are associated with higher virulence and poorer clinical outcomes, and case control studies to identify risk factors for *S. suis* infection.

**What is already known about this Topic?**

*S. suis* can cause a systemic infection in humans and can affect one or more organ systems. Meningitis is its most common clinical manifestation. According to the literature, acute pyogenic arthritis with associated septicemia is reported in less than 10% of patients with *S. suis* infection. The majority of *S. suis* infection cases involve one joint (i.e. mono-arthritis) or multiple joints of the same type, such as both knee joints.

**What does this Study Add?**

We believe that this report is the first recorded case of a patient presenting with an oligoarthropathy involving two distinct joints (i.e. left shoulder and right knee). Thus, one should consider *S. suis* infection in the differential of individuals with a new onset of a septic oligoarthropathy, particularly in those working with swine and/or who have a history of handling or eating raw or partially-cooked pork.

**Conflicts of Interest**

No conflicts of interest.

**References**


31. Prandota J. Recurrent headache as the main symptom of acquired cerebral toxoplasmosis in nonhuman immunodeficiency virus-infected subjects with no lymphadenopathy: the parasite may be responsible for the neurogenic inflammation postulated as a cause of different types of headaches. Am J Ther. 2007;14:63-105.