Meningitis and Spondylodiscitis Due to *Streptococcus suis*

Lakkana Boonyagars, M.D.*, Piriyaporn Chongtrakool, Ph.D.**, Siriorn P. Watcharananan, M.D.***

**ABSTRACT**

Invasive infection caused by *Streptococcus suis*, is an emerging zoonotic disease resulting in significant morbidity and mortality among general population in Thailand. We reported a case of an elderly Thai man who presented with two-week onset of subacute fever and neck pain. The patient developed alteration of consciousness one day prior to admission. He was subsequently diagnosed with meningitis and spondylodiscitis, a less common presentation of *S. suis* infection. The organism was fully sensitive to penicillin. He recovered completely without hearing loss or focal neurological deficit following six-week treatment with intravenous ceftriaxone. (*J Infect Dis Antimicrob Agents* 2010;27:129-33.)

Note: This case had been presented and discussed in the Interhospital Case Conference on Infectious Diseases (ICCID), 6 May 2010, Bangkok, Thailand.

**INTRODUCTION**

*Streptococcus suis* infection is an emerging zoonotic Disease in South East Asia. The number of cases has significantly increased over the past few years.¹ According to recent literatures, acute meningitis is a major presentation of systemic infection from *S. suis*.¹² In the present report, we illustrated a case of 82 years old Thai male from Ang Thong province who presented with subacute onset of fever and neck pain from meningitis and spondylodiscitis caused by *S. suis* infection.

**CASE REPORT**

An 82 years old Thai man, a farmer from Ang Thong province with underlying diseases of hypertension and dyslipidemia, presented with a two-week onset of fever and progressive neck pain. The pain radiated to both scapula areas and was temporarily relieved by non-steroidal anti-inflammatory drugs (NSAIDS) and acetaminophen.

*Department of Medicine, BMA Medical College and Vajira Hospital, Bangkok, Thailand.
**Department of Pathology, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok 10400, Thailand.
***Department of Medicine, Faculty of Medicine Ramathibodi Hospital, Mahidol University, Bangkok 10400, Thailand.

Received for publication: August 27, 2010.
Reprint request: Lakkana Boonyagars, M.D., Department of Medicine, BMA Medical College and Vajira Hospital, Bangkok, Thailand.

**Keywords:** *Streptococcus suis*, meningitis, spondylodiscitis
One day prior to admission, he developed weakness of right leg and was subsequently brought to the hospital by his relatives. Physical examination on the date of admission revealed a maximum temperature of 38°C, respiratory rate of 18/min, pulse rate of 100/min, and blood pressure of 140/70 mmHg. The patient was stuporous and did not follow verbal command. Examination of the neck revealed tenderness over C5-C7 area upon manual compression. There was no focal neurological deficit. However, there was stiffness of the neck. Examination of other organs was otherwise unremarkable. According to initial Laboratory investigations, complete blood count revealed a hematocrit of 44.1 percent, WBC of 16,800/mm³ (N 68%, L 14%, M 16%, E 1%, B 1%), and platelet of 374,000/mm³. Blood urea nitrogen and creatinine were 29 and 1.2 mg/dL respectively. Liver function test reveal AST/ALT of 57/151 U/L, ALP of 391 U/L, and albumin/globulin of 3.5/4.5 g/dL. Chest and cervical spine radiography were normal.

On the first day of admission, the patient was intubated due to the depressed mental status. Septic work up including hemoculture was obtained. Lumbar puncture was performed. The open and close pressure was 26 and 24 cmH₂O, respectively. Cerebrospinal fluid (CSF) was clear and colorless. CSF white blood cell count was 260 cell/mm³ (polymorphonuclear cell 89%, and mononuclear cell 11%). CSF total protein was 92 mg/dL; CSF glucose and blood glucose was 52 and 153 mg/dL, respectively. CSF Gram stain revealed no organisms. Empiric treatment for bacterial meningitis with intravenous ceftriaxone, ampicillin, and vancomycin was given.

On the second day of admission, result of hemoculture was reported growing of Gram-positive cocci in chain. Both ampicillin and vancomycin were discontinued. On the next day, magnetic resonance imaging (MRI) brain and cervical spine was performed and revealed diffuse leptomeningeal enhancement. Cervical spine MRI suggestive of marrow infiltrative process involving C4-C7 vertebrae associated with enhancing anterior epidural soft tissue at C4-C5 level. Adjacent spinal cord compression was suspected. Prevertebral and paravertebral soft tissues enhancement along C3-C6 level and hypersignal T2 changes of the narrowing disc at C4/5 and C6/7 level was observed. Figure 1 and 2 demonstrate the MRI findings of C-spine.

On the fourth day of admission, the patient gained consciousness and could follow command. He was subsequently extubated. Transthoracic echocardiogram revealed no vegetation. Hemoculture and CSF culture initially reported viridans Streptococci. However, the organism was subsequently identified as *S. suis* biotype II using commercial biochemical identification (API 20 STREP®). The minimum inhibitory concentration (MIC) of penicillin and ceftriaxone to *S. suis* was 0.25 and 0.125, respectively. The final diagnosis of *S. suis* meningitis complicated with spondylodiscitis was made. He was discharged on the twelfth day of admission with low grade of fever and he was continued on intravenous ceftriaxone for 6 weeks. He had complete recovery without hearing impairment.

**DISCUSSION**

In the present report, we demonstrate a case of an elderly man who suffered from subacute meningitis and spondylodiscitis, an uncommon, yet complicated form of systemic infection from *S. suis*. Invasive infection with *S. suis* was originally reported after outbreaks of meningitis, septicemia, and purulent arthritis among piglets in 1954.³ The first case of *S. suis* infection in human was recognized in 1968.⁴ Few decades later, numbers of cases has been increasingly reported, particularly in South East Asia. In Thailand,
S. suis infection has recently become an important re-emerging infectious disease that results in a significant morbidity and mortality among general population. According to available literatures, common manifestations among Thai patients included meningitis, sepsis, and infective endocarditis. The majority of human S. suis infections were associated with contact with symptomless carrier pigs, sick pigs, or raw pork contaminated with S. suis, and the entrance is wounds on skin or mucosa of the mouth and nasal cavity. Recently, a retrospective cohort study conducted at a tertiary care center in Northern part of Thailand found that approximately two-third on patients in their cohort had a history of eating undercooked pork or internal organs or had occupational contact with raw pork, such as butcher or abattoir worker. However, our patient did not have any risk factors. The lesson we learnt highlights an awareness of the atypical presentation from an emerging pathogen that resulted in significant morbidity in an elderly patient who was otherwise healthy.

Using conventional biochemical identification, S. suis might easily be misidentified as viridans Streptococcal species, as it resembles S. gordonii, S. sanguinis, and S. parasanguinis. The misidentification of the organism could potentially misdirect the appropriate investigation and managing strategy, as viridans Streptococcal species could
sometimes present in hemoculture without true clinical significance.

In summary, a very severe clinical case, including bacteremia, meningitis, and spondylodiscitis, can caused by *S. suis*. This disease need prompt diagnosis and treatment which included effective antibiotic treatment and adequate supportive care.

References


