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Brodie's Abscess Caused by *Salmonella enteritica* serovar Senftenberg in a Healthy Child

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Salmonella enteritica serovar Senftenberg is a rare pathogen in osteomyelitis, and is not usually encountered in healthy individuals. Here we report radiological and microbiological findings of a case of Brodie's abscess caused by *S. enteritica* serovar Senftenberg in the left tibia of an otherwise healthy child. **(Korean J Clin Microbiol 2010;13:132-134)**

Key Words: *Salmonella enteritica*, Osteomyelitis, Brodie's abscess

INTRODUCTION

Infections caused by *Salmonella enteritica* serovar Senftenberg is a rare condition without any underlying disorders[1,2]. A case of Brodie's abscess caused by *S. enteritica* serovar Senftenberg in an otherwise healthy child who complained of left ankle panin for 3 months without any historic events. The authors reviewed the rarity of this causative pathogen with clinical and radiological findings.

CASE REPORT

A 13-year-old girl presented in a local clinic with intermittent left ankle pain for 3 months without any history of trauma. She often had discomfort in walking but with no altered sensation or swelling. The patient was transferred to our hospital for the persistent pain in her left ankle. Fever and other constitutional symptoms were absent at presentation. There was no family history of specific illness and no evidence of any underlying diseases. A physical examination revealed swelling and mild tenderness of her left ankle. She had no systolic murmur or other specific findings. She undertook simple radiography and magnetic resonance imaging (MRI).

Preoperatively, blood examination revealed a leukocyte count of 6.0×10^9/L (reference range, $4.0\sim10.0\times10^9$/L) with neutrophils in 54%, a hemoglobin level of 12.5 g/dL (reference range, 12～14 g/dL) and a platelet count of 398×10^9/L (reference range, $140\sim450\times10^9$/L). C-reactive protein level was at 0.08 mg/dL (reference range, 0～0.5 mg/dL), and an erythrocyte sedimentation rate at 6 mm/hr (reference range, <25 mm/hr). A preoperative simple radiography of lower extremity showed well-defined lytic lesion in the metadiaphyseal region of the left distal tibia (Fig. 1). MRI of the left ankle using T1-weighted and T2-weighted MRI showed a well-defined and bilobed intramedullary cystic lesion in metadiaphysis of left distal tibia about 18 mm in diameter and 40 mm in length. This lesion revealed uniform rim enhancement, marrow edema and thin periosteal reaction, and no definite cortical disruption nor soft tissue mass was noted (Fig. 2). A percutaneous needle biopsy of the lesion showed an intracortical lytic lesion with a tiny, hyperdense focus at its center and revealed chronic inflammatory tissue reaction.

She underwent a surgery for the debridement of Brodie's abscess. Aspirates of abscess during the operation were cultured sequentially and yielded *Salmonealla* spp., group E by performing Gram stain, Salmonella/Shigella and triple sugar iron agar findings, and antisera grouping with no other pathogenic colonies. *S. enterica* serovar Senftenberg was finally identified by conventional and molecular identification methods at the Institute of Health and Environment in Daegu. Antimicrobial susceptibility test was done by VITEK system (bioMérieux VITEK, Hazelwood, MO, USA) and revealed susceptible to ampicillin, cefotaxime and ciprofloxacin except trimethoprim-sulfamethoxazole. The infection was successfully treated with operational curettage and intravenous cefotaxime. After 2 weeks of the treatment, cefotaxime was changed to per oral and she returned to outpatient clinic.

DISCUSSION

Bone and joint infections caused by *Salmonella* spp. are infrequent with less than 1% of occurrence[2-6]. *Salmonella* osteomyelitis is usually associated with hemoglobinopathies and other diseases with immunosuppression[3-5]. However, it occasionally has been occurred in healthy or immunocompromised patients

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Fig. 1. Plain radiographs of the left ankle showing lytic lesion in metadiaphysis of left distal tibia (anteroposterior (A) and lateral (B) views).

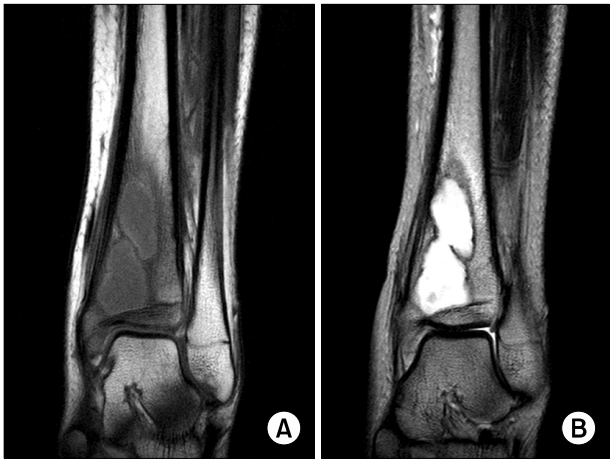

Fig. 2. Coronal T1 (A) and T2-weighted (B) magnetic resonance images of the left ankle showing a well-defined and bilobed intramedullary cystic lesion in metadiaphysis of left distal tibia about 18 mm in diameter and 40 mm in length.

with no history of underlying above diseases[5-7]. *Salmonella* Typhi is the most frequent isolate in these infections[3,4]. Infections by rare nonenterical salmonella spp. in developing countries are common due to overcrowding, frequent breakdown of antiseptic practices and overuse and misuse of antimicrobials[1].

Brodie's abscess is defined as a form of osteomyelitis with clinical, radiological and pathological findings[8-10]. It is a form of osteomyelitits and first reported by Brodie in the tibia in 1836. Brodie's abscess usually involve the medulla accounting about 85% and 14% in the cortex[10]. It has gradual onset mostly with pain only for several weeks to months. Laboratory findings are usually nonspecific and not referring to any inflammatory events[11]. The etiologic pathogen of Brodie's abscess is mostly *Staphylococcus aureus* but sterile cultures were found in about 25%[2,9,10]. Our patient was previously an otherwise healthy child, but we did not have a chance to screen for the *Salmonella* carriage in stool culture. In the review of present illness, she did not complaint for any gastrointestinal events suggesting prior infection of *Salmonella*. During the time of the culture of this case in the laboratory, there wasn't any isolation of *S. enterica* serovar Senftenberg. Also we never had any isolation of *S. enterica* serovar Senftenberg in the laboratory at all confirming that our laboratory including the technicians was not the source of this organism. The treatment of Brodie's abscess is usually combined with surgical removal of the abscess with antimicrobial therapy[7,8,11]. As in our case, Brodie's abscess in left tibia was successfully treated with surgical debridement and appropriate antibiotics.

There wasn't any report of Brodie's abscess caused by *S. enterica* serovar Senftenberg in Korea yet. An outbreak of food poisoning in 104 patients by this organism has been reported in 1998[12]. Therefore, we report the first case of Brodie's abscess by *S. enterica* serovar Senftenberg in Korea.

An infection caused by *Salmonella enterica* serovar Senftenberg is a rare condition in healthy person, and *S. enterica* serovar Senftenberg is also a rare pathogen in osteomyelitis. A case of Brodie's abscess caused by *S. enterica* serovar Senftenberg in a healthy child is reported. This patient initially presented with an intermittent left ankle pain for 3 months without any history of trauma. Plain radiograph and mangnetic resonance image of left ankle revealed an abscess formation with chronic osteomyelitis around left distal tibia and diagnosed as Brodie's abscess. *S. enterica* serovar Senftenberg was found out to be the causative organism with the culture of abscess aspirates. The infection was successfully treated with operational curettage and intravenous cefotaxime.

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=국문초록=

건강한 소아에서 발생한 *Salmonella enteritica* serovar Senftenberg에 의한 Brodie's Abscess 1예

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류남희[1], 하정숙[1], 송광순[2]

건강한 사람에 있어 *Salmonella enteritica* serovar Senftenberg에 의한 감염은 드물며 특히 골수염의 원인균으로도 드물게 보고되고 있다. 저자들은 평소 건강하던 소아에서 발생한 *Salmonella enteritica* serovar Senftenberg에 의한 Brodie 농양을 경험하였기에 방사선학적 그리고 미생물학적 소견과 함께 보고하는 바이다. **[대한임상미생물학회지** 2010;13:132-134]

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