대한임상미생물학회지 : 제9권 제2호 2006
Korean J Clin Microbiol 2006;9(2):146-148

Salmonella Osteomyelitis of the Sternoclavicular Joint Mimicking Tuberculosis in an Otherwise Healthy Person

Young Dae Kim[1], Sun Min Lee[2], Bong Soo Son[1], Eun Yup Lee[2], and Chulhun L. Chang[2]

Departments of Thoracic and Cardiovascular Surgery[1], and Laboratory Medicine[2], School of Medicine, Pusan National University, Busan, Korea

건강인에서 장티프스균에 의해 골수염이 생기는 경우는 드물다. 저자들은 초기 진찰시에 결핵 혹은 악성 종양으로 의심되었던 흉쇄관절의 장티프스균에 의한 골수염을 보고한다. 골수염의 원인균으로 특히 이전 설사 경력이 있는 경우에는 장티프스균도 가능한 원인균의 하나로 고려해야 할 것으로 생각한다.

INTRODUCTION

Osteomyelitis caused by *Salmonella* Typhi, which constitutes only 0.5% of all osteomyelitis cases[1], is rare in healthy patients; cases of *Salmonella* osteomyelitis have been reported in association with sickle cell disease, immunosuppression, or trauma [2-5]. Here, we describe our experience with a case of *Salmonella* osteomyelitis in a sternoclavicular joint in an immunocompetent patient.

CASE REPORT

A 53-year-old man presented to the Thoracic and Cardiovascular Surgery Department at Pusan National University Hospital with a painful mass in the left sternoclavicular joint. He had neither a history of an antecedent trauma in the affected area nor medical illness. Two months before admission, the patient felt a tolerable pain in the left sternoclavicular region, and 40 days later, a palpable reddish mass developed with sustained pain. He underwent acupuncture on the mass at a local oriental clinic but this failed to relieve his symptom. For five days before admission, the mass became markedly swollen with tenderness and a sensation of heat. Physical examination performed on admission revealed intact skin and a palpable tender mass but no neurovascular abnormalities or movement limitations. A detailed case history revealed that the patient experienced frequent diarrhea for a few days prior to the development of the mass, but other symptoms, such as, a fever, night sweats, and weight loss were denied. A laboratory examination on admission revealed an erythrocyte sedimentation rate of 55 mm/h (reference value 0-0.5 mm/h) but normal blood cell counts. Moreover, with the exception of an increased level of C-reactive protein (CRP) (5.49 mg/dL, reference value 0-0.5 mg/dL) and positivity for HBs Ag, no distinct abnormal results were obtained by chemical and serologic tests, including serum anti-HIV antibody, and no evidence of sickle cell anemia was found. Radiographs of the sternum showed widening of the joint space between the left clavicle and manubrium. A computed tomographic (CT) scan of the chest showed a soft tissue mass with bony destruction and erosion of the sternum, left 1st rib and clavicle, and consolidation and fibrotic change at the apex of the left lung. A technetium-99 bone scan demonstrated focal increased uptake in the sternum, left 1st rib and clavicle. The initial impression based on clinicoradiologic grounds was of a malignancy or *Mycobacterium tuberculosis* infection. Thus, fine needle aspiration and biopsy of the lesion were undertaken. Histopathologic findings of tissues from five

This work was supported by Pusan National University Research Grant.
접 수 일 : 06 / 8 / 17 게재승인일 : 06 / 9 / 18
교 신 저 자 : 이은엽
(602-739) 부산광역시 서구 아미동 1-10번지
부산대학교병원 진단검사의학과
TEL : 051)240-7415 FAX : 051)247-6560
E-mail : eylee@pusan.ac.kr

different sites were all consistent with chronic active inflammation, and the microbiologic results of the aspirated fluid and biopsy tissues showed gram negative rods under the microscope and *Salmonella* Typhi by culture and identification using Vitek 2 (bioMerieux Vitek, Hazelwood, MO, USA) and serologic tests. Blood and stool cultures for *Salmonella* were unsuccessful, and auramine stainings for acid-fast bacilli and mycobacterial cultures were all negative. Antibiotic therapy with intravenous ciprofloxacin 400mg and ceftezole 2g (twice daily) was started. The biopsy wound was ruptured ten days later, where only a few of coagulase-negative staphylococci (CNS) were grown. The CNS was considered contamination, so no specific treatment for this organism was administered. Soft tissue debridement of the periclavicular area and saucerization of the infected bony structure were performed on 15th day of admission, and the soft tissue and bone defects were filled with pectoralis major muscle and the sternal head of the sternocleidomastoid muscle by local flap interposition. Post-operative antibiotics included a 5-week course of oral ciprofloxacin 500mg and intravenous ceftazidime 1g administered twice daily. Five weeks after the operation, wound culture was negative and CRP values had normalized; the patient had completely recovered and was discharged. A follow-up CT scan taken 3 months after discharge revealed much reduced soft tissue mass extent and left upper lobe consolidation.

DISCUSSION

Salmonella infections are characterized by various clinical manifestations, such as, gastroenteritis, enteric fever, bacteremia, vascular infection, localized infections, and a chronic carrier state [6]. Bone infection, which is a rare extraintestinal complication of salmonellosis, frequently involves the diaphysis of long bones or vertebral bodies [7]. In addition to sickle-cell anemia, several predisposing conditions are associated with the development of *Salmonella* osteomyelitis including a young age, diabetes mellitus, systemic lupus erythematosus, lymphoma, and previous musculoskeletal damage [2-7]. However, several reports in the literature have described cases of *Salmonella* osteomyelitis with no underlying disease history or precipitating cause [8,9]. Because *Salmonella* osteomyelitis is rare and often present months to years after initial exposure, its diagnosis may be difficult. In the present case, the patient's course was somewhat different in that he was an otherwise healthy adult. Initially, our impression was of a malignancy or *M. tuberculosis* infection, the latter on account of the relatively high incidence of tuberculosis in Korea.

Here, the authors report a case of *Salmonella* Typhi osteomyelitis presenting as a palpable mass in the left sternoclavicular joint and mimicking malignancy or tuberculosis in an otherwise healthy adult male. We believe that this is the first report of sternoclavicular joint *Salmonella* osteomyelitis in an immunocompetent adult with no history of an underlying disease. This case demonstrates that *Salmonella* infection should be included in the differential diagnosis of osteomyelitis, especially in patients with a previous history of diarrhea, because this rare infection can be successfully treated with antibiotics alone or sometimes by antibiotics in combination with surgical debridement. Moreover, the diagnosis is easily made by routine microbiologic examinations [6].

REFERENCES

1. Ortiz-Neu C, Marr JS, Cherubin CE, Neu HC. Bone and joint infections due to *Salmonella*. J Infect Dis 1978; 138:820-8.
2. Bettin D, Schaphorn G, Blasius S, Becker K, Niemeyer T. A rare case of *Salmonella* osteomyelitis in the humerus as a differential diagnosis to a malignant bone tumor. Arch Orthop Trauma Surg 2002;122:544-6.
3. Carlson DA and Dobozi WR. Hematogenous *Salmonella* typhi osteomyelitis of the radius. A case report. Clin Orthop Relat Res 1994;(308):187-91.
4. Sanchez AA, Mazurek MT, Clapper MF. *Salmonella* osteomyelitis presenting as fibrous dysplasia. A case report. Clin Orthop Relat Res 1996;(330):185-9.
5. Bennett OM and Namnyak SS. Bone and joint manifestations of sickle cell anaemia. J Bone Joint Surg Br 1990;72:494-9.
6. Pegues DA, Ohl ME, Miller SI. *Salmonella* Including Salmonella Typhi. In: Mandell GL, Bennett JE, et al., editors. Douglas and Bennett's priniciples and practice of infectious disease. 6th ed. Philadelphia: Churchill Livingstone, 2005:2636-54.
7. Declercq J, Verhaegen J, Verbist L, Lammens J, Stuyck J, Fabry G. *Salmonella* typhi osteomyelitis. Arch Orthop Trauma Surg 1994;113:232-4.
8. Song KJ and Lee KR. *Salmonella* spondylitis on thoracic spine: A case report. J Korean Orthop Assoc 1997; 32:1424-30.
9. Lee YK, Jun DW, Lee KC, Chu JW. A case of *Salmonella* osteomyelitis in lumbar spine. J Korean Neurosurg Soc 1997;6:247-52.

Salmonella Osteomyelitis of the Sternoclavicular Joint Mimicking Tuberculosis in an Otherwise Healthy Person

Young Dae Kim[1], Sun Min Lee[2], Bong Soo Son[1], Eun Yup Lee[2], and Chulhun L. Chang[2]

Departments of Thoracic and Cardiovascular Surgery[1], and Laboratory Medicine[2], School of Medicine, Pusan National University, Busan, Korea

Osteomyelitis caused by *Salmonella* Typhi is rare in an otherwise healthy person. Here, we describe a case of *Salmonella* osteomyelitis in a sternoclavicular joint mimicking malignancy or tuberculosis, in an immunocompetent patient. *Salmonella* infection should be included in the differential diagnosis of osteomyelitis, especially in patients with a previous history of diarrhea.

(Korean J Clin Microbiol 2006;9(2):146-148)

Keywords: *Salmonella*, Osteomyelitis, Sternoclavicular joint

Address reprint requests to : Eun Yup Lee, M.D., Department of Laboratory Medicine, School of Medicine, Pusan National University, Busan 602-739, Korea.
TEL. +82-51-240-7415 FAX. +82-51-247-6560 E-mail: eylee@pusan.ac.kr