Salmonella osteomyelitis in an otherwise healthy adult male—successful management with conservative treatment: A case report

A Arora, S Singh, A Aggarwal, PK Aggarwal
University College of Medical Sciences and Guru Teg Bahadur Hospital, Delhi, India

ABSTRACT

A 21-year-old male presented with pain in the right thigh of insidious onset and 3 months’ duration. He had a history of febrile illness lasting for 15 days, 2 months prior to the onset of pain. Examination revealed swelling over the lower lateral aspect of the right thigh with some induration and tenderness. Initial X-rays of the right femur and the computed tomography scan at 10 weeks after the onset of disease were normal. Magnetic resonance imaging scan showed signal alteration with minimal destruction of the anterior cortex in the mid-diaphyseal region of the right femur. A repeated X-ray taken at 15 weeks after the onset of illness showed erosive changes, along with periosteal reaction in the diaphyseal area. The Widal test was positive. Open biopsy of the lesion revealed inflammatory non-caseating tissue. Culture of the specimen grew Salmonella typhi. The patient was given antibiotic treatment. Both X-rays and the Widal titres were normal on subsequent follow-up at 3 months.

Key words: osteomyelitis; salmonella osteomyelitis; typhoid osteomyelitis

INTRODUCTION

Salmonella osteomyelitis is a rare entity, constituting 0.8% of all salmonella infections and only 0.45% of all types of osteomyelitis.1 The 3 most common strains of salmonella causing osteomyelitis are Salmonella typhimurium, Salmonella typhi, and Salmonella enteritidis, with Salmonella typhi being the only strain to be transmitted from human to human. Osteomyelitis caused by Salmonella panama has also been reported in the literature.2 Salmonella infections may present in 5 different clinical forms namely, gastroenteritis, enteric fever, bactaeremia (without localised infection),
focal disease (including soft tissue infection), and the chronic carrier state. There is a striking association between salmonella osteomyelitis and sickle cell anaemia. Typhoid osteomyelitis has a predilection for patients with diabetes, systemic lupus erythematosus, lymphoma, liver disease, previous surgery or trauma, those at extremes of age, and patients using steroids. The incidence of typhoid osteomyelitis in otherwise healthy individuals is much lower. There are very few cases reported in the literature in which salmonella osteomyelitis is seen in an otherwise healthy individual.

CASE REPORT

A 21-year-old male presented with significant pain in the right thigh of insidious onset and 3 months’ duration. There was no history of trauma. The patient did not have fever concurrent with the symptom of pain, but gave a history of febrile illness of 15 days’ duration, 2 months prior to the onset of pain in the thigh for which he was treated with oral antibiotics for 3 weeks. Examination revealed swelling over the lower lateral aspect of the right thigh with some induration and tenderness. The overlying skin was normal. Local temperature was not raised and there was no fluctuation evident. Regional lymph nodes were not enlarged. Hip movements were free, and knee flexion was only restricted in the terminal phase. Initial X-rays of the right femur and the computed tomography scan taken at 10 weeks after the onset of disease were unremarkable. The patient was advised to have a magnetic resonance imaging scan, which showed
signal alteration with minimal destruction of the anterior cortex in the mid-diaphyseal region of right femur on T2 and fluid-attenuated inversion recovery images (Figs. 1 and 2). There was an associated collection evident immediately anterior to the bone in this region. Vastus intermedius and lateralis showed hyperintense signals on T2 images. A repeated X-ray at 15 weeks after the onset of illness showed erosive changes, along with periosteal reaction in the diaphyseal area of the right femur (Fig. 3). The Widal test was positive. Other routine haematological investigations and an abdominal ultrasound were within normal limits. A differential diagnosis of typhoid osteomyelitis, tubercular osteomyelitis, or Ewing’s sarcoma was considered. Open biopsy of the lesion revealed inflammatory non-caseating tissue. Culture of the specimen grew *Salmonella typhi*. The patient was given intravenous ceftazidime 1 g twice daily for 3 weeks, followed by 9 weeks of oral ofloxacin 400 mg twice daily. X-rays and the Widal titres were normal on subsequent follow-up at 3 months (Fig. 4). Urine and stool cultures were also negative at 3 months’ follow-up.

**DISCUSSION**

Salmonella osteomyelitis is typically an infection of the diaphysis of the long bones. The most common bones involved are the femur and the humerus.7 Other bones commonly involved are the tibia, radius, lumbar vertebrae, and ulna. Most patients have involvement of only one bone, though multiple bone involvement has also been reported.3 The duration of symptoms can range from a few months to several years,1,7 and the symptom-free interval between the initial illness and the osteomyelitis can be as long as 25 years.8 Lang et al.9 have reported a case in which 2 separate events of osteomyelitis occurred at 2 different anatomical sites (left distal tibia and right proximal tibia), 17 years apart, both caused by *Salmonella paratyphi* C.

Salmonella osteomyelitis is clinically and radiographically indistinguishable from osteomyelitis caused by other organisms, with most patients presenting with pain and variable swelling of the affected limb. High temperatures are rarely noted. The lesions may be non-tender, further confusing the clinical picture.1,9 The erythrocyte sedimentation rate is usually raised and the blood culture is reported as positive in 71% of patients.3 X-rays typically show diaphyseal erosion with destruction of the bone, with or without sequestrum formation. Periosteal reaction may or may not be present. The lesion may be calcified.1 The clinico-radiological picture has been confused with lymphoma, giant cell tumour and fibrous dysplasia.1 Though the Widal test was positive in our case, it is not a definitive diagnostic test, as titres can be raised due to prior exposure.10 The test may also be negative in some cases of Salmonella osteomyelitis.9 The only confirmatory evidence is the growth of the Salmonella organism on culture.

Chronic Salmonella osteomyelitis has been treated conventionally by surgical debridement combined with antibiotics.1,2 Carlson and Dobozí8 consider that surgical debridement is not adequate, and advocate radical debridement of the lesion. In the current case, since there was no evidence of sequestrum formation the patient was managed with antibiotics alone. A biopsy was taken in order to confirm the diagnosis and to exclude the possibility of a tumour. Given this latter possibility, debridement was not completed at the time of biopsy. The patient had complete resolution of the lesion with antibiotic therapy alone, within 3 months.

Though this condition is quite rare in western countries, it is an important entity due to increased international travel, and its occurrence in patients with acquired immunodeficiency syndrome.3 Typhoid

![Figure 4](image-url)  
*Figure 4* X-ray of the right femur at 3 months’ follow-up from (a) lateral, and (b) anteroposterior view, showing complete healing of the lesion.
osteomyelitis should always be considered in the differential diagnosis of a patient with diaphyseal osteomyelitis who gives a prior history of prolonged continuous fever of a few weeks’ duration, or diarrhoea.

REFERENCES