

Case Report

Salmonella Osteomyelitis

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ABSTRACT

Salmonella infection can cause four predominant clinical syndromes: enteric fever, acute gastroenteritis, bacteraemia with or without metastatic infection, and the asymptomatic carrier state. Salmonella as an aetiological agent in osteomyelitis is essentially rare and salmonella osteomyelitis in itself is predominantly seen in patients with haemoglobinopathies such as sickle cell disease or thalassemia. There are very few cases reported in the literature in which salmonella osteomyelitis is seen in otherwise healthy individuals. We describe here a case of salmonella osteomyelitis in a young gentleman with no significant comorbidities who presented with fever and severe back pain, having returned from recent foreign travel. It is therefore important to consider uncommon pathogens in the differential diagnosis of travellers with prolonged fever and insidious symptoms.

INTRODUCTION

Salmonella infection can cause four predominant clinical syndromes: enteric fever, acute gastroenteritis, bacteraemia with or without metastatic infection and the asymptomatic carrier state.

Salmonella as an aetiological agent in osteomyelitis is essentially rare. It is the causative organism in 0.45% of osteomyelitis and salmonella osteomyelitis itself accounts for as few as 0.8% of all Salmonella infections.¹

Salmonella osteomyelitis is predominantly seen in patients with haemoglobinopathies such as sickle cell disease or thalassemia and it remains a significant cause of morbidity and mortality in this population.² Salmonella osteomyelitis, in particular when due to Salmonella typhi, has a predilection for patients with diabetes mellitus, systemic lupus erythematosus, lymphoma, liver and cardiovascular diseases, previous surgery or trauma and patient on steroids.³ There are very few cases reported in the literature in which salmonella osteomyelitis is seen in otherwise healthy individuals and in the majority of cases there is commonly a pre-existing history of intestinal infection.

CASE REPORT

A 37 year old gentleman presented with severe back pain, pyrexia and a four week history of diarrhoea alternating with constipation, following recent travel to Dubai and the

Maldives. Right upper abdominal pain, weight loss, anorexia and left leg swelling were also present. There was no history of trauma and no significant past medical history of note.

Examination revealed marked paravertebral spasm and diminution of lumbar and thoracic spine movement but no focal neurological deficit was localised. Hepatomegaly was noted and the left leg was found to be swollen, tender and erythematous.

At presentation, haemoglobin was 123 g/L, white blood cell count $13.7 \times 10^9/l$, neutrophils 71.2%, lymphocytes 16.4%, ESR 21 mm/hr and C reactive protein 215mg/L. Liver function tests were noted to be deranged (GGT 552 U/L, ALT 78 U/L, Alk Phos 235 U/L) and D-dimer 5.38 mg/L.

CT Abdomen demonstrated hepatomegaly and splenomegaly but no focal abnormality. The colon was dilated to the level of the splenic flexure with calibre change at this level. Flexible sigmoidoscopy demonstrated a left inflamed colon and histopathology confirmed mild inflammation.

USS Doppler demonstrated a deep vein thrombosis in the left popliteal vein which was treated with a six month course of Warfarin.

All blood cultures for the patient were negative. The antibody for human immunodeficiency virus was negative. Cytomegalovirus, Hepatitis B and C, and Q Fever serology were all negative. Stool culture was positive for Salmonella typhi. A urinalysis was normal.

Radiographs showed reduction in intervertebral disc space at T12-L1. MRI demonstrated osteomyelitis of the T12 and L1 vertebral bodies with relative sparing of the intervertebral disc. There was decreased intervertebral disc space at T12-L1, with increased signal intensity on T2 and decreased signal intensity on T1 weighted images (Figure 1). Salmonella infection characteristically traverses the posterior longitudinal ligament and is associated with inflammatory masses extending along several segments, which was in keeping with this patient's MRI findings.

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Fig 1. Magnetic resonance imaging demonstrating osteomyelitis of T12 and L1 vertebral bodies (white arrow).

The patient received a six week course of intravenous ciprofloxacin and meropenem and subsequently a six week oral course of ciprofloxacin. At the latest follow-up, the patient had no back pain, was afebrile with significant clinical improvement in range of spine movements. In addition, radiographs confirmed the healing bone lesion.

DISCUSSION

While *Salmonella* osteomyelitis is rare, it is typically an infection of the diaphysis of long bones, predominantly the femur and humerus. Other bones commonly involved are the lumbar vertebrae, tibia, radius and ulna.^{3,4,5} *Salmonella* enterica serovar Typhi and Paratyphi and diverse nontyphoidal salmonella are recognised as causes of vertebral osteomyelitis.⁶ Santos and Sapicco concluded that fever and back pain were the main symptoms on presentation in 44 cases of vertebral osteomyelitis that they reviewed.⁶ Thus one should suspect vertebral osteomyelitis in a patient with fever and back pain, and in particular salmonella infection should be considered where there has been a recent gastro-intestinal disturbance preceding the episode.

The treatment of salmonella is difficult and there are no randomised or case control studies in the currently available literature. Essentially there are no standardised antibacterial therapy regimes or surgical procedures. The most commonly used antimicrobials are chloramphenicol, third generation cephalosporins and fluoroquinolones.⁷ In particular

Ciprofloxacin has the ability to penetrate macrophages which is imperative in killing intracellular salmonellae and oral ciprofloxacin demonstrates good efficacy in treating bone infections.^{8,9} Santos and Sapicco have recommended a duration of 2 months antimicrobial therapy in uncomplicated osteomyelitis, the duration used in this case.⁶ However long term antibiotic therapy and radical surgical debridement should be performed in cases unresponsive to antimicrobial therapy.

Although this condition is relatively rare in Western countries, it remains an important entity due to increased international travel and its ability to cause significant morbidity and mortality in immunocompromised patients. *Salmonella* osteomyelitis should always be considered as a differential diagnosis in a patient with diaphyseal or vertebral osteomyelitis who gives a prior history of prolonged continuous fever or diarrhoea.

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