CASE REPORT

Salmonella osteomyelitis of the thoracic spine: an unusual presentation

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A case of thoracic vertebral osteomyelitis due to *Salmonella enteritidis* phage type 2 in an immunocompetent patient is reported. The patient initially presented with abdominal, urinary and chest symptoms, which were followed by a large pleural effusion. The infection was successfully treated with ciprofloxacin. This is the only case of salmonella thoracic vertebral osteomyelitis in an immunocompetent patient reported in the English literature.

Summary points

- This case demonstrates that thoracic vertebral *Salmonella* osteomyelitis can present as a pleural effusion giving rise to chest symptoms.
- Osteomyelitis of the thoracic vertebrae should be among the factors considered to contribute to pleurisy and/or pleural effusion.

A 17 year old white girl presented with acute left loin pain and dysuria. She had a history of contact with her mother's parrot, which had died two months previously. On examination, she had slight tenderness in her left iliac fossa. Her white cell count was raised to $13.6 \times 10^9/l$. A provisional diagnosis of urinary tract infection was made, and she was prescribed oral ciprofloxacin.

Three days later she developed right pleuritic chest pain and a productive cough with green sputum. She had pyrexia of 38°C , and chest auscultation revealed crepitation at both lung bases. A chest radiograph was normal. On blood analysis, alkaline phosphatase was 386 U/l (normal range 50–136 U/l), C-reactive protein was 256 mg/l (normal range less than 10 mg/l), and erythrocyte sedimentation rate was 76 mm in the first hour. An ultrasound of her abdomen revealed a minor splenic enlargement and bilateral small pleural effusions. A working diagnosis of atypical pneumonia was made.

Ciprofloxacin was discontinued, and she was prescribed intravenous cefuroxime and oral clarithromycin. Her signs and symptoms improved on this treatment, and two weeks after admission she was discharged home.

Four weeks later she was readmitted with pain in her lower thoracic and lumbosacral area and lateral chest walls, a history of night sweats, and a weight loss of over 6 kg in one month. On chest examination, there was no air entry at the right lung base. She was extremely tender over the sacrum and lower back. Her white cell count was raised to $19.1 \times 10^9/l$, her erythrocyte sedimentation rate was 78 mm in the first hour, and her C-reactive protein was 114 mg/l. Chest radiography revealed a large right pleural effusion (fig 1). A bone scan showed a hotspot at the ninth and tenth thoracic vertebrae (T9–T10). The pleural effusion was aspirated and found to be negative for culture and acid fast bacillus. She was treated with intravenous cefuroxime and clarithromycin for one week, but her temperature did not settle, and hence she was given intravascular injections of imipenem after which her condition settled. A chest drain was inserted, and she was given 250 000 units of streptokinase intrapleurally twice a day for three days.

Computed tomography of the thoracic spine with contrast showed a loss of height of the T10 vertebra with evidence of widespread oedema of the bone marrow

spreading up into the anterior portion of T9 and affecting the superior portion of T11. This finding is consistent with vertebral osteomyelitis. There was a paraspinal mass of soft tissue around these vertebrae (fig 2). A needle aspiration of the abscess grew *Salmonella enteritidis* phage type 2. The vertebral osteomyelitis was treated successfully with ciprofloxacin 500 mg twice a day for eight weeks, after which she was asymptomatic and her erythrocyte sedimentation rate and C-reactive protein were within the physiological range.

DISCUSSION

Salmonella causes a broad spectrum of human illnesses from gastroenteritis, typhoid fever, and bacteraemia to the asymptomatic carrier state.^{1 2} *Salmonella* has been recognised as a causative organism of osteomyelitis for more than a century; however, it is a rare cause of osteomyelitis, accounting for approximately 0.5% of all cases.³ Only 67 cases of salmonella bone and soft tissue infections were reported to the Communicable Disease Surveillance Centre in England and Wales between 1992 and 2000.

Salmonella osteomyelitis is usually seen when the patient is immunologically compromised. In addition to sickle cell

Figure 1 Chest radiograph showing right sided pleural effusion.

Figure 2 Magnetic resonance imaging scan showing osteomyelitis of T9, T10, and T11 with paraspinal mass of soft tissue.

disease,⁴ conditions that may compromise the immune system include chronic alcoholism,⁵ chronic lymphocytic leukaemia, systemic lupus erythematosus, neoplastic disease, long term steroid intake,⁶ and possibly AIDS. Our patient did not have any of these predisposing factors.

Santos *et al* reviewed 44 cases of salmonella vertebral osteomyelitis published in the English literature between 1966 and June 1997.⁷ They found that fever and back pain were the main symptoms on presentation. However, Shimada *et al* did report a case of vertebral osteomyelitis due to *Salmonella newport* associated with a bilateral pleural effusion in a leprosy patient in 1996.⁸ The infection was considered to have been precipitated by haemolytic anaemia resulting from the use of dapsone. Carr and Crow⁹ and Sullivan *et al*¹⁰ each reported a case of vertebral osteomyelitis presenting with pleural effusion, but the pathogen was staphylococcus in each case.

This case demonstrates that thoracic vertebral salmonella osteomyelitis can present as a pleural effusion giving rise to chest symptoms, which may be due to a reactive pleuritis as the pleura is in close contact with the thoracic vertebrae.

Osteomyelitis of the thoracic vertebrae should be among the factors considered to contribute to pleurisy and/or pleural effusion.

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