

it has a less than benign repertoire in immunocompromised patients, including severe pneumonitis and haemorrhagic cystitis in bone marrow and renal transplant patients, hepatitis in liver transplant patients, and colitis, hepatitis, and meningoencephalitis in patients with HIV infection. The mortality from adenoviral pneumonitis in immunocompromised patients is approximately 60%.⁴ Sabroe *et al* on pages 1219–20 describe a 67 year old woman with mixed essential cryoglobulinaemia, treated with prednisolone and cyclophosphamide, who developed adenovirus pneumonitis. Initially the chest radiograph was normal but later developed extensive alveolar shadowing. Tissue culture of material obtained by bronchoalveolar lavage revealed adenovirus. Treatment was

commenced with intravenous immunoglobulin and ribavirin and she required mechanical ventilation. She recovered, but whether this was spontaneous or attributable to the treatment given is uncertain. The speed and timing of her recovery, related to the commencement of treatment, suggest that it did, however, play a part.

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Tuberculosis of the sternum presenting as metastatic disease

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Abstract

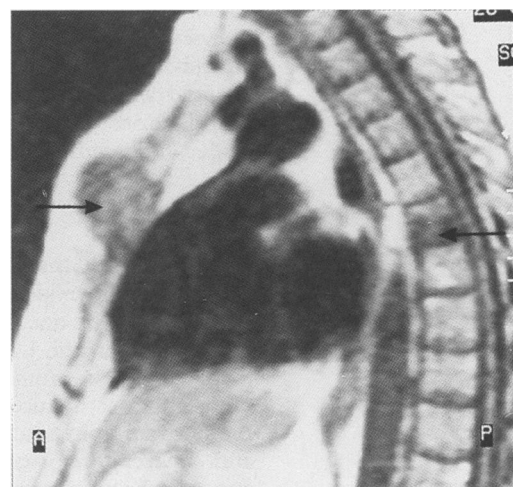
The case is presented of a 59 year old Saudi Arabian woman with sternal and vertebral tuberculous osteomyelitis and a benign breast mass simulating metastatic disease. This case illustrates the diagnostic difficulties that may be encountered in the diagnosis of tuberculous osteomyelitis.

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Keywords: tuberculous osteomyelitis, sternum, metastatic disease.

A 59 year old Saudi Arabian woman presented for investigation of a paroxysmal cough of one year's duration. She had no other complaints apart from slight tiredness; in particular, she denied fever, back pain, weight loss, or history of tuberculosis. On examination a 6 cm × 4 cm mass was palpable over the upper sternum which she stated had been gradually enlarging for three months. The mass was firm and slightly tender with a lobulated surface, but it did not transilluminate. It appeared to be fixed to the sternum, but was not attached to the overlying skin which was of normal colour and temperature. Apart from bilateral expiratory rhonchi, there were no other abnormalities on physical examination. Malignancy of the sternum was suspected.

Radiographic examination showed increased bone density at the junction of the first and second sternal segments on oblique views. The chest radiograph was normal apart from cardiomegaly. Laboratory investigations were unremarkable apart from an erythrocyte sedimentation rate of 50 mm in the first hour. Serum alkaline phosphatase levels were normal. A needle biopsy specimen of the chest wall mass showed a non-specific fibroblastic proliferative reaction with a dense round cell inflammatory infiltrate at one end of the core of tissue. An MRI scan of the thorax (figure) showed an irregular mass in the upper sternum, expanding the sternal bone, invading the subcutaneous tissues anteriorly and the mediastinum fat posteriorly, and in close contact with the great vessels of the heart. This mass was of low signal intensity on T1 and high signal intensity on



Sagittal MRI scan of the thorax showing the upper sternal mass (anterior arrow) invading the subcutaneous tissue anteriorly and the mediastinum fat posteriorly. A low intensity lesion is also visible in the body of the sixth dorsal vertebra (posterior arrow). The breast mass was visible only on the transverse scan.

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T2 weighted images. There was an abnormal area of low signal intensity in the body of the fifth or sixth dorsal vertebra and also an irregular low intensity mass in the right breast. The impression was of metastatic breast carcinoma or, possibly, multiple myeloma. Mammography showed an irregular area of increased density in the right breast with clusters of microcalcifications suggestive of malignancy. Radiography of the dorsal spine showed increased density of the body of the sixth dorsal vertebra with normal disc spaces. A whole body isotopic bone scan showed areas of increased radiouclide activity in the upper sternum, in a mid thoracic vertebra, and in a left upper rib, the appearances being consistent with metastatic disease. Serum protein electrophoresis was normal.

The breast lump was not palpable clinically so an excision biopsy was performed with the aid of mammography-guided wires inserted into the area of microcalcification. Histological examination revealed benign mammary dysplasia and "radial scar" with no evidence of malignancy.

One week after the needle biopsy the sternal mass enlarged further and became erythematous and pointing, but the overlying skin remained cool suggesting a cold abscess. On exploration under general anaesthesia a solid subcutaneous mass extending to the sternum was found with an abscess cavity anterior to the sternum. The cavity was drained, part of the mass was excised for histological examination and culture, and the incision was closed in layers. Bone debridement was not carried out. Histological examination of the resected tissue showed that the subcuticular tissue contained a collection of suppurative and caseating giant cell granulomas surrounded by an exuberant fibroblastic proliferation. Direct staining was negative for tuberculosis. The culture grew *Mycobacterium tuberculosis* which was fully sensitive to antituberculous drugs. Sputum cultures were negative for tuberculosis.

A diagnosis of tuberculosis of the sternum and presumptive tuberculosis of the dorsal spine was made and the patient was commenced on a nine month course of quadruple antituberculous chemotherapy with pyrazinamide, ethambutol, rifampicin, and isoniazid. Both the sternal and spinal lesions healed fully without any complications.

Discussion

Osteomyelitis of the sternum is rare, and tuberculous osteomyelitis of the sternum is particularly so.¹ In one series of bone and joint tuberculosis in the UK only two of 198 cases involved the sternum.² There have been two reported cases of tuberculous osteomyelitis of the sternum from Saudi Arabia.³ Both pyogenic and tuberculous osteomyelitis of the sternum appear to be more common in intravenous drug abusers or in individuals with HIV infection.^{4,5} It is thus likely that worldwide the number of

cases will increase, and it is important that the possibility of tuberculosis is not overlooked in immunosuppressed patients or in patients from tuberculosis endemic areas presenting with sternal masses.

This case illustrates the difficulties involved in the diagnosis of tuberculous osteomyelitis unless tuberculosis is considered in the differential diagnosis of malignant bone lesions. Our patient did not have any systemic symptoms such as pyrexia or weight loss, and the combination of a spinal lesion, a breast mass, and a sternal mass were very suggestive of metastatic disease. The MRI scan showed that the lesion was causing bone expansion and invasion of adjacent tissues, again increasing the suspicion of a malignant tumour. The presence of the firm sternal mass in this case is in contrast to previously reported cases of tuberculosis of the sternum which usually presented with a cold abscess in association with pyrexia and systemic symptoms.⁶ In one of the previously reported cases malignancy was also suspected, as the patient presented with a fractured sternum, a firm mass, and no pyrexia.³

The radiographic appearances of this case were not the classical ones of radiolucency and disc space narrowing, which compounded the diagnostic difficulties. The radiodense sternal and spinal lesions and preserved disc space raised the possibility of multiple myeloma or metastatic breast carcinoma, both of which can occasionally cause sclerotic bone lesions.⁷ However, in spinal tuberculosis, non-Caucasians appear to have new bone formation and sclerotic appearances on radiography more frequently than do Caucasians, and they are also more likely to have preservation of the disc space.⁸

Initial investigations were directed at obtaining a tissue diagnosis of malignancy with the aim of giving the patient appropriate chemotherapy or radiotherapy. It was only the negative needle biopsy specimen of the sternal mass, followed by the later change in its physical appearance, that alerted us to the possibility of tuberculosis and allowed the correct diagnosis to be made. This case emphasises the importance of considering tuberculosis in the differential diagnosis of unusual bony lesions.

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