Osteosarcoma of the talus misdiagnosed as ankle arthritis: a case report

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ABSTRACT

We present a 65-year-old man with osteosarcoma of the talus that was misdiagnosed as osteoarthritis. The patient eventually underwent below-knee amputation and adjuvant chemotherapy.

Key words: amputation; ankle joint; arthritis; osteosarcoma; talus

INTRODUCTION

Bone tumours around the foot and ankle joint are rare, accounting for <1% of malignant tumours,1,2 and <0.2% to 2% of all osteosarcoma at this site.3–11 They usually involve the metatarsals and calcaneum, followed by the phalanges and talus.2 Osteosarcoma usually arises from the long bones during the second and third decades of life, and after the fifth decade of life. We present a 65-year-old man with osteosarcoma of the talus that was misdiagnosed as osteoarthritis.

The patient eventually underwent below-knee amputation and adjuvant chemotherapy.

CASE REPORT

In March 2011, a 65-year-old man presented with a one-year history of left ankle pain that was mechanical, aggravated by walking, and partially relieved with rest. He had chronic kidney disease, hyperuricaemia, and hypertension, but had no systemic symptoms or traumatic events. He had consulted local clinicians and had been treated with anti-inflammatory medicine for presumptive osteoarthritis of the ankle joint. The symptoms had worsened despite medication, and the patient had consulted an orthopaedic surgeon and had been prescribed colchicines and allopurinol for gouty arthritis. The symptoms continued to worsen and the patient developed swelling around the ankle joint. Open debridement of the ankle joint was performed for suspected septic arthritis and haematoma of the ankle joint. Microbiological study was negative for gram staining and acid fast staining.
After 3 to 4 weeks, the pain worsened and the patient was referred to our centre. Physical examination showed a palpable mass at the anterior aspect of the left ankle. The swelling was tender on palpation and slightly warm. The ankle and subtalar movements were painful and restricted. There was no popliteal or inguinal adenopathy and the distal neurovascular status was not affected. Blood tests were normal and the white cell count was not elevated. Radiographs revealed a sclerotic and lytic lesion causing collapse of the talus with associated periosteal reaction. There was diffuse soft tissue swelling around the talus (Fig. 1). Magnetic resonance imaging revealed a soft tissue mass originating from the talus with extensive local invasion in the anterior tibial plafond, lateral malleolus, and calcaneum (Fig. 2). There were areas

![Figure 1](image1.png)

**Figure 1**  (a) Radiography showing a sclerotic and lytic lesion causing collapse of the talus with associated periosteal reaction and a diffuse soft-tissue swelling around the talus. (b) Magnetic resonance imaging showing a soft-tissue mass originating from the talus with extensive local invasion in the anterior tibial plafond, lateral malleolus, and calcaneum. There are areas of low T2-weighted signals with non-enhancement suggestive of osteoid formation. (c) Computed tomography showing extensive bone destruction of the talus with a large soft-tissue mass, osteoid matrix, and adjacent bone erosion.

![Figure 2](image2.png)

**Figure 2**  Bone scan showing increased uptake in the talar bone and around the ankle.
of low T2-weighted signals with non-enhancement suggestive of osteoid formation. Computed tomography showed extensive bone destruction of the talus with a large soft tissue mass, osteoid matrix, and adjacent bone erosion (Fig. 3) Bone scan showed increased uptake in the talar bone and around the ankle (Fig. 4). Open biopsy confirmed a conventional high-grade osteosarcoma. Staging studies did not reveal any metastasis.

It was decided that limb salvage surgery was not feasible and below-knee amputation was suggested. The tumour was widely expansive, measuring 8.5x4.5x4.0 cm. The posterior cortex of the talus was breached and the tumour extended into the overlying soft tissue and skeletal muscles on the medial and lateral aspect of the foot. It had a tan gray appearance with irregular borders. Microscopically, the tumor was ill-defined with destructive infiltration into cancellous bone. There was dense proliferation of spindle cells with osteoblastic and fibroblastic components. Osteoid formation with focal giant cell rich areas was noted. A precursor lesion i.e. Paget’s disease, chronic osteomyelitis, fibrous dysplasia was not identified.

Postoperatively, the patient was given adjuvant chemotherapy with intravenous methotrexate,

<table>
<thead>
<tr>
<th>Study</th>
<th>Sex/age (years)</th>
<th>Radiographic feature</th>
<th>Magnetic resonance imaging features</th>
<th>Treatment</th>
<th>Survival (months)</th>
<th>Outcome</th>
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</thead>
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<tr>
<td>Amini and Colacecchi, 1979</td>
<td>M/21</td>
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<td>Below-knee amputation</td>
<td>19</td>
<td>Died of disease</td>
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<tr>
<td>Kerjes et al., 1995</td>
<td>M/19</td>
<td>Parosteal osteosarcoma with dense lobular juxtacortical mass of new bone</td>
<td>A mass over the ventral aspect of talus without intramedullary involvement</td>
<td>Below-knee amputation</td>
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<td>Sclerotic lesion</td>
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<td></td>
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<td>Lytic lesion with thinning of cortex</td>
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<td>Below-knee amputation</td>
<td>24</td>
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<tr>
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<td>M/37</td>
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<td></td>
<td>Below-knee amputation</td>
<td>120</td>
<td>No evidence of disease</td>
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<td>M/8</td>
<td>Mixed lytic and sclerotic lesion</td>
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<td>Choong et al., 1999</td>
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<td>Osteochondritis</td>
<td>Several cystic lesions and extraosseous invasion</td>
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<td></td>
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<td>Lytic lesion with extraosseous calcifications</td>
<td>Soft-signal changes in body of talus in sagittal T2-weighted image</td>
<td>Below-knee amputation</td>
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<td>Elision et al., 2008</td>
<td>F/81</td>
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<td>No evidence of disease</td>
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<td>Elision et al., 2008</td>
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<td>Limb salvage</td>
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<td>F/15</td>
<td>Ill-defined lucent lesion with cloudy mineralisation</td>
<td>A lesion with low signal intensity in sagittal T1-weighted image; high signal intensity of the whole talus in STIR image</td>
<td>Limb salvage</td>
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<td>Geographic osteolytic lesion with a sclerotic margin</td>
<td>Intermediate to high signal on the T1-weighted (fast-spin-echo) images and high signal on the T1-weighted (fat-suppressed) images</td>
<td>Limb salvage</td>
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</tr>
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<td>Current Study</td>
<td>M/65</td>
<td>Sclerotic &amp; lytic lesion with collapse and destruction of the talus with associated periosteal reaction</td>
<td>Soft tissue mass originating from the talus with extensive local invasion in anterior tibial plafond, lateral malleolus and calcaneum; low T2-weighted signals with non-enhancement suggestive of osteoid formation</td>
<td>Below-knee amputation</td>
<td>24</td>
<td>No evidence of disease</td>
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cisplatin, doxorubicin, and ifosfamide. The patient made an uneventful recovery and was followed up every 3 months. At the 2-year follow-up, the patient could walk comfortably with prosthetic support and had no evidence of local or distal recurrence.

**DISCUSSION**

Radiological findings and oncological outcome of patients with osteosarcoma of the talus were reviewed (Table). Most patients with osteosarcoma of the ankle and foot present with painful, rapidly doubling (20–30 days) swellings. Radiological features of osteosarcoma range from lytic to sclerotic to mixed lesions. When osteosarcoma occurs in the talus, there are no typical periosteal reactions such as Codman’s triangle and spicules that are present in osteosarcoma of the long bones. For osteosarcoma of the foot, there is cortical destruction and soft tissue involvement, and osteoid matrix mineralisation with wide zone of transition and cortical destruction. Osteosarcoma is of low-to-intermediate signal intensity and high T2-weighted signal intensity, with features of perilesional oedema and diffuse enhancement body. For giant cell tumour of the talus, radiography shows an osteolytic expansile lesion with or without cortical breech. Magnetic resonance imaging shows multiple fluid levels, septae formation, and peripheral enhancement on contrast-enhanced images. For osteomyelitis, radiology shows a mixed osteolytic-sclerotic lesion with periosteal reaction, involucrum, sequestrum, and cloacae formation. For tuberculosis of the foot, radiology shows cystic, rheumatoid, kissing, and spina ventosa appearance, with areas of well- or ill-defined radiolucency with loss of trabeculae and absence of sequestrum. Tubercular arthritis of the ankle and foot can lead to complete disorganisation of the affected joint. For osteonecrosis of the talus, radiology shows increased opacity or sclerosis in the talar dome with extension into the talar body. Advanced-stage osteonecrosis results in collapse of the articular surface and fragmentation of the talar dome.

Although limb salvage surgery is one of the treatment options, below-knee amputation is usually performed in patients with osteosarcoma of the talus.

**DISCLOSURE**

No conflicts of interest were declared by the authors.

**REFERENCES**