



Ankle osteomyelitis: an unusual presentation

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Traumatic ankle injury should not distract clinicians from considering osteomyelitis as a cause of persistent joint pain.

Introduction

Pain around the ankle occurs and is one of the most common complaints seen by medical practitioners treating patients with sporting injuries. Although there are many possible causes of ankle pain, common causes include injuries to the bony, ligamentous and tendinous structures around the joint. Injury to the cartilage leading to early arthritis can present as acute pain, swelling and instability. Acute osteomyelitis in this healthy, active population without any open injury is rare. We present a case of a traumatic cause of osteomyelitis affecting the hindfoot bones and resulting in significant bone injury and disability from a closed footballing injury.

Case report

A 52-year-old gentleman suffered an inversion injury to his left ankle following a tackle sustained during a football match. Over the next 48 h there was gradually increasing pain and swelling, resulting in difficulty in weight-bearing. Initial assessment in his local Emergency Department, including ankle radiographs, showed no evidence of bony injury. Ligamentous injury was suspected and he was managed conservatively.

Over the next week his symptoms progressed and within that period he was unable to mobilize without crutches. He was admitted to hospital at

this stage. A magnetic resonance imaging (MRI) scan was carried out of his ankle which showed a grade 1 injury to his medial collateral ligament, lateral ligament complex, tenosynovitis of the posterior tibial tendon, subtalar osteoarthritis, as well as some overlying soft tissue oedema. There was no evidence of bony injury, destruction or any infective processes. The patient was subsequently discharged with analgesics and referred for a course of physiotherapy.

A bone scan was later performed which showed a florid increase in activity of the left ankle, highly abnormal and suspicious of infection (Figure 1). A white cell scan was also strongly positive for infection in the hindfoot. A subsequent computed tomography (CT) scan confirmed X-ray appearances of cortical destruction and lytic lesions in the calcaneus, talus, navicular and cuboid bones (Figure 2). These appearances were suggestive of osteomyelitis.

Surgical debridement of his left hindfoot was performed and he was commenced on broad-spectrum antibiotics (cefuroxime). As his pain was progressive, one week later he underwent a triple fusion of the ankle with exploration and washout. A below knee plaster of paris was fitted and was managed non-weight bearing. The inserted screws were planned to be removed after four months depending on whether union had been achieved. No culture was grown from the bone directly. Synovial soft tissue samples grew *Staphylococcus aureus* and he was subsequently placed on oral antibiotics according to hospital's microbiology protocol (trimethoprim and rifampicin due to his penicillin allergy).

Figure 1
Bone scan image postcontrast showing increased activity within the left ankle

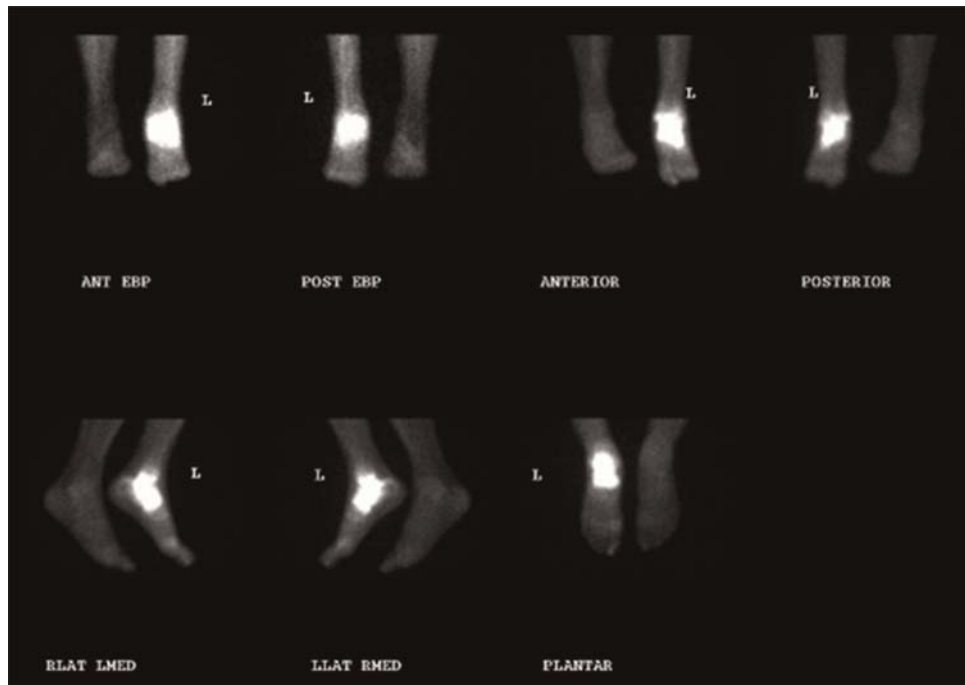


Figure 2
Oblique radiographs of the left foot showing cortical destruction of the calcaneus, talus, navicular and cuboid bones



A follow-up CT three months postoperatively confirmed fusion in the subtalar and calcaneocuboid joint, with some incomplete fusion in the inferior aspect of the talonavicular joint.

The patient experienced no systemic symptoms in keeping with his infection right up until his discharge six months from the onset of his symptoms.

Discussion

Pain around the ankle is one of the most common complaints seen by medical practitioners, occurring in up to 30% of the sporting population.¹ Osteomyelitis (OM) is an infection of the bone which has a number of recognized causes and can be categorized into a number of categories, e.g. traumatic or atraumatic, haematogenous or non- and subacute or acute.² The most common causes are via the bloodstream, chronically infected wounds or ulcers and exposure of an open wound fracture. Bacterial infections are the most common causative organisms of which *S. aureus* is the most prevalent. Signs and symptoms of OM in the ankle include a warm, swollen, tender and painful joint which is worsened on weight-bearing. The usual treatment

of OM is with antibiotics for a minimum of six weeks.

X-rays are generally regarded as a good choice for first-line imaging, although its sensitivity has been shown to be as low as 43%.³ They are not good at picking up early OM as the features of sequestra and sclerosis are not evident for many weeks. The gold standard for diagnosis of acute OM is MRI with a sensitivity and specificity of 91% and 82% respectively.³ It has been shown to detect OM as early as up to five days from the start of an infection.⁴ Many centres also advocate the use of bone scans and white cell scans, although this view is not shared by all.⁵ These have been shown to have a similar sensitivity to MRI, but a lower specificity.

The exact pathophysiology of the cause of this patient's OM is unknown. Although there was no visible breach of the skin in this patient at presentation, it is most likely that there would have been a defect too small to visualize, hence allowing a bacterial skin commensal to enter the ankle joint. There are no cases in the literature suggesting a closed ankle injury giving rise to OM. However, there are reports of OM of the sternum secondary to chest trauma, but these patients were generally either immunocompromised or intravenous drug users.⁶

In a case series of 52 children with calcaneal osteomyelitis,⁷ the authors noted that the presenting symptoms were pain on weight-bearing and local clinical symptoms. Most had no definitive preceding history of trauma, with many cases reported as rationalizing a trauma situation retrospectively. Only a few patients were systemically unwell with laboratory tests (e.g. bloods such as FBC, ESR and blood cultures) unreliable. Only a third of patients demonstrated X-ray changes within the first two weeks from the onset of symptoms. Early positive results, however, were

seen in direct tissue or pus culture and bone scanning.

In a series of 13 child cases of calcaneal osteomyelitis and seven of the talus, the main causative organism was found to be *S. aureus*.⁸ The authors also noted there not to be a predilection for age or sex and limited systemic or physical signs. The most common diagnosis was a ligamentous injury with normal radiographs. OM of the talus was found to be rarer than of the calcaneus.

This case highlights to clinicians that for patients who have had traumatic joint injury with progressive symptoms and normal radiographs, further urgent imaging should be undertaken so as to exclude serious pathology. The diagnosis of OM is rare, but nevertheless should be part of the differential diagnoses of the clinician when encountered by sporting individuals with a similar presentation.

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