

## Young man with left foot pain

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### Case history

A 23-year-old man was referred for pain in his left foot of 2 weeks duration following a sprain. Examination revealed vague tenderness over the medial aspect of the left mid-foot. An anteroposterior radiograph of both feet was obtained.

### Q1 What are the radiological findings?

In the left foot, an additional bone is seen dorsomedial to the navicular bone. This accessory bone is well-corticated (**Fig. 1**). The margins of the navicular bone adjacent to this accessory bone are also well-corticated. No fracture, joint or soft tissue abnormality is detected. The radiograph of the right foot is normal.



**Figure 1** Anterior-posterior radiograph shows a left accessory navicular bone depicted as a well-corticated rounded bone (black arrow) located dorsomedially to the normal left navicular bone (broad open arrow). Right foot is normal

### Q2 What is the diagnosis?

The diagnosis is a left accessory navicular bone. There are three main types of accessory bones associated with the navicular bone. These are: the os tibiale externum, located dorsomedially to the navicular tuberosity; os supranaviculare, located at the dorsal aspect of the talonavicular articulation; and os infranaviculare, located at the dorsal aspect of the articulation between the navicular and second cuneiform bones. In this case, the accessory skeletal element in the left foot is an os tibiale externum.

### Q3 What is the significance of this condition?

The os tibiale externum has a prevalence of 10–16% and is one of the most frequently observed accessory bones. It appears in the tendon of the posterior tibialis muscle and does not articulate with the navicular. Instead, it coalesces with the navicular through connective tissue that fills the intervening space. It is often found bilaterally and can be expressed in several members of the same family. Pain may develop in the region of the os tibiale externum following a sprain, in flat feet, or in rapid growth during puberty. In most cases, management for this developmental variant is conservative.

### Q4 Could an avulsion fracture give this radiological appearance?

The most frequent fracture of the navicular bone is an avulsion fracture from its dorsal surface. It is often observed in soccer players and is caused by sudden forced plantar flexion. The created cortical defect at the dorsal contour of the navicular and the absence of cortication along the opposing margins of both bones distinguish an avulsed fracture fragment from an accessory bone. If the radiographical findings are indeterminate, the clinical presentation can be helpful. Typically, there is severe tenderness over the talonavicular articulation. For such patients, a below-knee plaster is applied for 4 weeks, followed by intensive physiotherapy. The clinical and radiographical features of navicular avulsion fracture were not present in this patient.

### Q5 Could a March fracture give this radiological appearance?

March fractures typically occur in young adults who normally lead a semi-sedentary lifestyle and who suddenly

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become more active. Classic examples are army recruits and so-called 'weekend warriors'. Affected patients complain of their forefoot becoming quite suddenly painful from overuse. A tender lump may be palpable just distal to the mid-shaft of a metatarsal bone, usually the second, and less commonly, the third. The radiographs may at first be normal but radioisotope bone scan will show an area of intense activity in the bone. Later on, a hairline crack may be visible radiographically and later still, a mass of callus or periosteal new bone is seen. Treatment consists of a plaster cast worn until the main discomfort has subsided, followed by a metatarsal support worn in the shoes and physiotherapy. If no displacement has occurred, neither reduction nor prolonged splintage is necessary. This patient did not have clinical or radiographic findings of a March fracture.

## References

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- 2 Apley AG, Solomon L. *Concise System of Orthopaedics and Fractures*, 2nd edn. Oxford: Butterworth-Heinemann; 1994: 222, 343.