

# Diagnosis of the Acute OS Peroneum Fracture

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## ABSTRACT

**Acute fracture of the os peroneum is a relatively uncommon injury. However physicians must be cognizant of its occurrence and include it in their differential diagnosis of acute ankle trauma. A careful clinical evaluation as well as awareness of its radiographic appearance and of the possibility for injury to other surrounding structures is important in the appropriate diagnosis and management of this fracture. We present the case of a patient who sustained an os peroneum fracture and review the relevant literature.**

**Keywords:** ankle, fracture, injury, os peroneum

## INTRODUCTION

The os peroneum (OP) is one of the most common accessory ossicles of the foot<sup>(1)</sup>. Other terms that have been used in the past to designate it include the sesamum peroneum and the cuboidum secundarium or accessorium because of its relation to the cuboid<sup>(1,2)</sup>. Its incidence varies between 5% and 26% and it is present unilaterally in about 40% of cases. In approximately 30% of cases, the bone is divided in two or more fragments which originate from ununited ossification centres, resulting in an OP bipartitum or multipartitum<sup>(3-5)</sup>. Although relatively infrequent, the os peroneum can sustain a fracture which can either be isolated or associated with injury to surrounding bony and soft tissue elements. The challenge of this injury lies not only in the detection of the fracture but also in ruling out traumatic involvement of adjacent structures and distinguishing it from other entities that may resemble it clinically or radiographically.

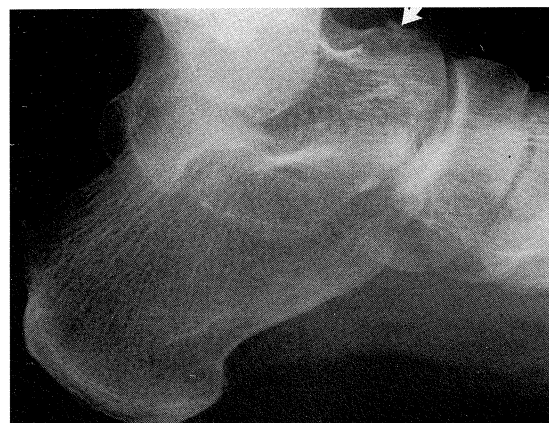
## CASE REPORT

A 40-year-old woman presented to the emergency department complaining of pain and inability to weight-bear on her left foot after she had fallen down some stairs. Her past medical history was unremarkable. Physical examination revealed a bruised, mildly swollen left ankle on the lateral aspect of the foot. There was point tenderness at the dorsum of the foot as well as at the region of the cuboid bone. Postero-anterior, lateral and oblique radiographs of her foot were performed. The patient was diagnosed with a small chip fracture of the talus (Fig 1). A closer review of the oblique

views however, also demonstrated a fracture of the os peroneum (Fig 2). She was treated conservatively with strapping and non-weightbearing.

## DISCUSSION

The OP is an accessory ossicle situated within the peroneus longus tendon (PLT) where it curves beneath the cuboid bone. The position of the OP in relation to the cuboid can vary but is usually at its plantar aspect or more proximally at the calcaneocuboid articulation<sup>(2)</sup>. Although its size and shape are variable, it most commonly presents as an oval or rounded structure and on average has a longitudinal diameter of 7 mm<sup>(5)</sup>.



**Fig 1** – Lateral radiograph of the left foot shows an avulsion fracture (arrow) along the dorsum of the talus.



**Fig 2** – Oblique radiograph demonstrates a longitudinal radiolucency within the os peroneum, at the site of point tenderness, which represents a fracture (arrows).

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When injury occurs to the OP, the two main mechanisms of fracture that have commonly been reported are direct trauma and supination of the ankle where failure of the bone occurs as tension is exerted while a counteracting eversion is attempted<sup>(1,6)</sup>. Excessive dorsiflexion of the ankle caused by the pull of the PLT has also been suggested as a possible mechanism<sup>(1)</sup>. The clinical findings usually include pain and swelling of the ankle as well as point tenderness of the lateral aspect of the foot, proximal to the fifth metatarsal or distal to the lateral malleolus<sup>(3,6)</sup>. Eversion of the ankle may also be limited and sometimes severely, especially if there is accompanying disruption of the PLT<sup>(7)</sup>. The diagnosis of an injury specifically to the OP/PLT complex can be assisted on physical examination by demonstrating exacerbation of pain in the heel rise phase of gait and by the varus inversion test where pain is elicited as the foot is placed into an inverted, supinated and adducted position. Applying resistance to plantar flexion of the first metatarsal would also localise tenderness of the PLT along its distal course at the cuboid tunnel. However, other entities may mimic an acute fracture of the OP clinically and therefore a differential diagnosis must include the following: lateral ligamentous sprains of the ankle; ruptures of the PLT proximal or distal to the OP; diastases of a multipartite OP; peroneus longus tenosynovitis, and avulsions of the bony insertion of the peroneus brevis tendon<sup>(8,9)</sup>.

Radiologically, the fractured OP may pose a few diagnostic challenges. Many of these fractures are not easily detected on plain radiographs at the time of injury and only become more apparent on later images when the fragments have separated. Therefore Bianchi et al have emphasised that imaging of acute ankle sprains should provide adequate views to clearly show the os peroneum separate from the adjacent cuboid and calcaneus bones and thereby allow visualisation of even thin fracture lines<sup>(8)</sup>. Oblique views of the foot are probably the best suited for optimal radiographic evaluation of the OP<sup>(9)</sup>. Furthermore, a bipartite or multipartite OP subjected to trauma can often appear to be a fractured OP both clinically and radiographically. The latter case can be distinguished on plain films however, by its jagged, sharply defined borders compared to the smooth, rounded edges of the bipartite and multipartite ossicle. Obtaining previous radiographs or performing a bone scan when the former are not available could also help in differentiating these entities. Avulsion fractures of the cuboid or calcaneus and calcific tendinitis of the PLT can also resemble the OP fracture on plain X-ray films. Although rare, concomitant rupture of the PLT can

occur and may warrant further evaluation. Peterson et al have used ultrasound to assess PLT integrity but MRI and peroneal tenography have also been suggested as a method of evaluation in suspected fractures of the OP<sup>(1,8,10)</sup>. As is seen in the case presented, fractures of the surrounding tarsal bones may also be present and should be ruled out.

Review of the literature shows that various approaches have been used to treat the OP fracture. In acute injuries to the OP, conservative management has consisted of casting, strapping, soft dressing and steroid injection. These methods of treatment when utilised within one month of the injury have yielded results that range from satisfactory to excellent<sup>(9)</sup>. However, in one report on five patients who had sustained this fracture, four were initially treated with immobilisation but all required surgical excision of the fractured ossicle 8 months to 8 years after the initial injury because of ongoing pain<sup>(10)</sup>. Surgical treatment in the acute setting however was found in only two cases. One case yielded a satisfactory outcome whereas the other resulted poorly<sup>(6,7)</sup>. Sobel et al therefore concluded that one month of cast immobilisation may be of benefit in the patient who presents within one month of the onset of symptoms. In the chronic setting the same authors have suggested a trial with cast immobilisation but recommended surgical intervention in the event that this fails<sup>(9)</sup>.

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