

CONTINUING MEDICAL EDUCATION ΣΥΝΕΧΙΖΟΜΕΝΗ ΙΑΤΡΙΚΗ ΕΚΠΑΙΔΕΥΣΗ

Medical Imaging Quiz – Case 85

A previously healthy 36-years-old woman was admitted to the emergency department following an acute ankle injury sustained during a tennis game. The injury occurred during a sudden rotational movement of the foot, after which the patient experienced immediate and severe ankle pain, leading to inability to bear weight. The patient's medical history was unremarkable, with no reported comorbidities or predisposing factors. Given the clinical presentation and suspicion of intra-articular injury, imaging evaluation with computed tomography (CT) of the ankle was performed. The CT scan revealed pathological findings (fig. 1).

Comment

Osteochondral fractures (OCFs) concern a specialized type of injury involving damage to both the articular cartilage and the underlying subchondral bone, most commonly affecting the lower extremities (knee, ankle, hip). They are frequently associated with joint instability and trauma, and their incidence is rising due to increased sports participation and improved diagnostic imaging.

OCFs of the talus typically result from acute traumatic mechanisms involving axial loading combined with rotational forces at the ankle joint, most commonly during inversion or eversion injuries. These

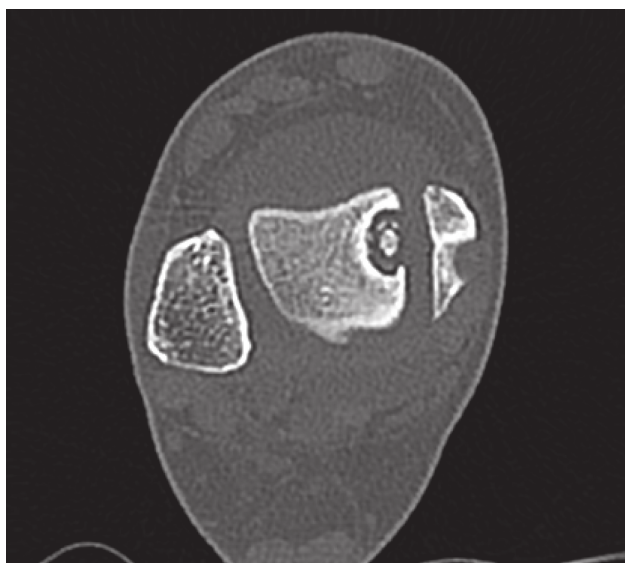


Figure 1. Axial computed tomography (CT) image demonstrating an osteochondral fracture, with disruption of the subchondral bone and involvement of the overlying articular cartilage.

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forces lead to shearing of the articular cartilage with concomitant separation of a fragment of the underlying subchondral bone from the talar dome. The talus is particularly vulnerable to such injuries due to its high proportion of articular cartilage coverage and limited vascular supply, which may compromise fragment healing if not promptly recognized. On CT, osteochondral fractures are characterized by a well-defined osseous fragment adjacent to the articular surface, often without extensive reactive sclerosis, distinguishing them from chronic osteochondral lesions. Accurate early diagnosis is essential, as untreated OCFs of the talus may progress to chronic ankle pain, instability, or early degenerative changes.

Most common locations are the knees particularly the lateral femoral condyle following patellar dislocation, and the ankle (talar dome). These injuries are most common in young, active individuals and adolescents (typically 10–17 years old). Males are more commonly affected, often due to higher-impact sports activities. Acute patellar dislocation refers to 37% to 94% of cases, 45% to 69% of patients with acute ankle fractures have accompanying osteochondral lesions (OCLs), with the talus being the most common site. In the knee, specifically, the annual incidence of osteochondritis dissecans (a related condition) in the general population is approximately 6.09 per 100,000 person-years. In a retrospective review of over 31,000 knee arthroscopies, 63% showed some form of chondral damage.

High-level athletics (soccer, football, basketball, gymnastics) are strongly associated with OCF development, especially in the knee (55–60% of cases) and elbow (84% of cases). Mechanism may be direct trauma, rotation, or shearing forces during joint dislocation. Males represent 71% of patients with OCFs in some studies, particularly with right-sided, high-energy injuries. Extreme obesity is a risk factor for talar and elbow OCFs, while moderate obesity increases risk. The lateral femoral condyle is the most frequent location, followed by the medial patellar facet. 95.4% of ankle (osteochondral lesions are located on the talar dome.

OCFs are a significant concern in the pediatric population (un-

der 16) due to high activity levels. In children, OCFs are commonly associated with patellar dislocation, with incidence rates for that injury being 43 per 100,000 per year. Skeletally immature patients are more prone to these fractures.

Magnetic resonance imaging (MRI) is considered the gold standard, as many OCFs are missed on plain radiographs (up to 60% missed).

If not treated early, they often lead to persistent pain, loose bodies, and the development of early-onset osteoarthritis. Treatment consists of surgical fixation (especially for large fragments >1 cm²) is the standard approach to restore joint surface congruity.

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