

## Case Report

## Closed medial subtalar dislocation: A case report and literature review

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## ABSTRACT

Subtalar dislocation is characterized by simultaneous dislocation of the subtalar (talocalcaneal) and talonavicular joints, hence the name talocalcaneonavicular. These lesions can be grouped into four distinct categories: anterior and posterior, which are exceptional, lateral and medial. Medial subtalar dislocations are more frequent, are due to low-energy trauma and generally have good functional results. Anatomical reduction and stabilization of the subtalar joint and optimal management of all associated foot injuries are the key to good results.

## Introduction

Medial subtalar dislocations account for around 75 % of all cases, and are characterized by medial dislocation of the foot and heel in relation to the talus.

They result from forced inversion of the foot in plantar flexion. In this position, the neck of the talus articulates and rotates around the sustentaculum tali, leading to rupture of the capsule and ligaments of the lateral talonavicular joint, and then of the subtalar ligaments [1]

Biomechanically, forced plantar flexion leads to dislocation of the foot from the ankle joint. Next, the forces of adduction and internal rotation cause the foot to rotate 90° along its vertical and longitudinal axis, dislocating the talocalcaneal and talonavicular joints. Finally, the displaced foot returns to its position, leaving the talus laterally dislocated [2].

## Case report

We report the case of a 28-year-old patient, with no notable pathological history, who suffered a trauma to the left ankle following a road accident with an inverted landing and equinus of the foot.

The patient was admitted after 30 min of trauma, and clinical examination revealed a deformity of the mid-tarsal region, ankle edema, pain and total functional impotence of the limb, with no cutaneous or vascular-nerve lesions (Fig. 1).

Standard radiographs revealed a medial subtalar dislocation (Fig. 2).

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**Fig. 1.** Clinical images of the patient on admission showing deformity of the medio-tarsal region without skin opening.



**Fig. 2.** Standard X-ray of the patient showing: a) front view: medial dislocation of the foot below the talus, b) profile view: dislocation of the talonavicular joint.

Reduction was performed under sedation, with the knee flexed to 90°, longitudinal traction applied to the heel and counter traction applied to the leg, the foot placed in dorsiflexion and eversion, and light pressure applied to the palpable head of the talus. The ankle was stable on testing, and a control X-ray had shown good joint congruence (Fig. 3). We completed the procedure with a CT scan showing good talocalcaneonavicular joint congruence and the presence of an astragalar head fracture (Fig. 4). The ankle was then immobilized in a cast for 6 weeks without support (Fig. 5), followed by functional rehabilitation. The functional result was excellent after 3 months (Fig. 6), and the return to sport was authorized after 6 months (Fig. 7).



**Fig. 3.** Standard radiographs, front (a) and profile (b) after reduction of the dislocation.

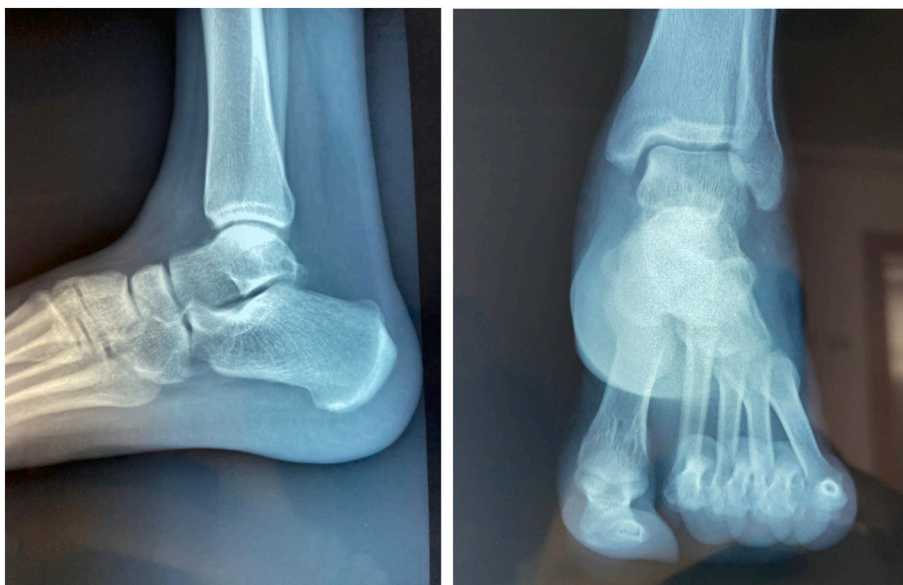


**Fig. 4.** CT scan showing good talocalcaneonavicular joint congruence and the presence of an astragalar head fracture: a) sagittal section: good congruence of the subtalar joint, b) axial section: good congruence of the talonavicular joint, c) 3D reconstruction: fracture of talus head.

### Discussion

Medial subtalar dislocations result in an obvious deformity of the foot, comparable to an acquired clubfoot. Ecchymosis and swelling may be observed around the midfoot and hindfoot. Profound pain and limited passive range of movement of the joints are also observed. Wounds and distal neurovascular lesions may also be present [3].

In most cases, the diagnosis of subtalar dislocation can be made on plain radiographs of the ankle and foot, with the frontal view showing medial dislocation of the foot below the talus, and the profile view revealing dislocation of the talonavicular joint, which can be noted as a disruption of the head-cup relationship, similar to that seen on the lateral view [4].



**Fig. 5.** Standard radiograph of patient after 6-week immobilization: consolidation of talar head and good congruence of subtalar and talonavicular joints.

A CT scan should be performed for all subtalar dislocations, as associated lesions may be present in up to 60 % of cases [5]. After reduction, it allows assessment of the congruence of the subtalar and talonavicular joints, and any associated lesions that may require surgical intervention. In the case of irreducible lesions, the scan may reveal bony obstacles to reduction, such as an interposed osteochondral fragment or impaction of the navicular against the head of the talus [1].

Subtalar dislocations require urgent reduction to reduce the risk of damage to soft tissue and neurovascular structures, as well as to the cartilage of the subtalar and talonavicular joints. In contrast to lateral dislocations, medial subtalar dislocations are generally reduced in a closed fashion after adequate muscle relaxation and sedation, or under general or regional anesthesia if the patient presents after a few hours. The closed reduction maneuver for a medial subtalar dislocation is performed as follows: the gastrocnemius-soleus complex must be relaxed in order to reduce its traction on the calcaneus by flexing the knee to 90°; the calcaneus is usually blocked under the talus, and it is necessary to unblock it by exaggerating the deformity. Next, longitudinal traction is applied to the heel and counter traction to the leg. The foot is placed in dorsiflexion and eversion, and gentle pressure is applied to the palpable head of the talus. The result is a reduction, accompanied by an audible or palpable click [6].

The reduction is usually stable and does not justify, in principle, any osteosynthesis (boot cast for 3 to 6 weeks without support) [7]. Most authors consider the prognosis of these injuries to be relatively good, except in cases of skin opening or associated fracture [8,9]. The risk of talar necrosis is estimated at 4 %, and subtalar osteoarthritis at 31 % [9].

#### **CRedit authorship contribution statement**

**Amine El Farhaoui:** Writing – review & editing, Writing – original draft, Data curation, Conceptualization. **Mohamed Maroc:** Conceptualization. **Zakaria Khatab:** Conceptualization. **Anass Sefti:** Conceptualization. **Mbainaidara Debonheur:** Writing – original draft, Conceptualization. **Adnane Lachkar:** Visualization. **Najib Abdeljaouad:** Visualization, Validation. **Hicham Yacoubi:** Visualization, Validation, Supervision.

#### **Declaration of competing interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.





**Fig. 6.** Clinical images showing ankle mobility after 3 months.



**Fig. 7.** Standard radiograph of the patient after a 12-month follow-up.

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