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# Diagnosis and treatment of talar dislocation fractures illustrated by 3 case reports and review of literature



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## ABSTRACT

**INTRODUCTION:** Talar fractures are a rare type of fractures (less than 1%). They are difficult to treat and outcome is often complicated by arthritis and avascular necrosis.

In this article three cases are presented with different types of dislocated talar neck fractures. Anatomy of the talus, treatment, outcome and follow up of these fractures are discussed. Further, review of literature and guidelines for treatment and follow up for dislocated talar neck fractures are discussed.

**DISCUSSION:** The risk of developing arthritis or avascular necrosis of the talus after dislocated talar neck fractures depends on the initial trauma with vascular compromise due to dislocation of the talus. The modified Hawkins classification gives an insight in the risk of developing avascular necrosis. During follow up the Hawkins sign can be an indication of a vital talus. To diagnose avascular necrosis MRI is the only suitable diagnostic tool.

**CONCLUSION:** Reduction of a dislocated talar fracture is a medical emergency in an effort to reduce the vascular compromise of the talus. Definitive fixation can be delayed but should be performed by an experienced surgeon to achieve an optimal reconstruction of the talar surface. Long-term follow up is important to evaluate signs of arthritis and avascular necrosis.

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## 1. Introduction

Less than 1% of fractures occur in the talar neck [1]. Due to the complex vascularisation and the large weight bearing surface of the talus the correct treatment of fractures is very important. Talar neck fractures are known to have a high morbidity, being subject to avascular necrosis (AVN), arthritis and non-union of the talar fragments. Given the uncommon nature of talar fractures most studies included few patients, and there is room for discussion as to the correct treatment and risks following the talar neck fracture. Further, different classifications have been used, making a comparison between studies unreliable. In this article we discuss the treatment and outcome of three patients with dislocated talar neck fractures. Further, literature is reviewed and guidelines for treatment and follow up on this rare type of fractures are discussed.

## 2. Case reports

### 2.1. First case

The first patient discussed is a 19-year old motorcyclist, without medical history, who fell off his bike during acceleration. He sustained a medial subtalar luxation with a talar neck fracture type Hawkins II (Fig. 1). The skin was intact and there was no neurovascular compromise. Treatment consisted of closed reduction under general anaesthesia followed by cast immobilisation for six weeks. Radiological follow-up at six and twelve weeks showed subchondral lucency of the talar dome. This is called a Hawkins sign and occurs secondary to subchondral atrophy 6–8 weeks after a talar neck fracture. It indicates that there is sufficient vascularity in the talus and it is less likely to develop an avascular necrosis. Fracture healing was uneventful and the patient reported no complaints of pain or limitation in activities during the 19 months follow up.

### 2.2. Second case

A 51-year old male, without relevant medical history, who fell off a ladder, landing on his left ankle. He had a severe medial dislocation of the ankle with a lateroventral open luxation of the talus. Sensibility and vascularisation of the foot were normal. Radiography showed a tibiotalar and subtalar dislocation, classified as a Hawkins III fracture (Fig. 2). Attempts at closed reposition failed.

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Fig. 1. Top left and right: X-ray of a right ankle in splint. A dislocated fracture of the talus can be seen. Bottom left and right: situation 3 weeks after closed reduction.

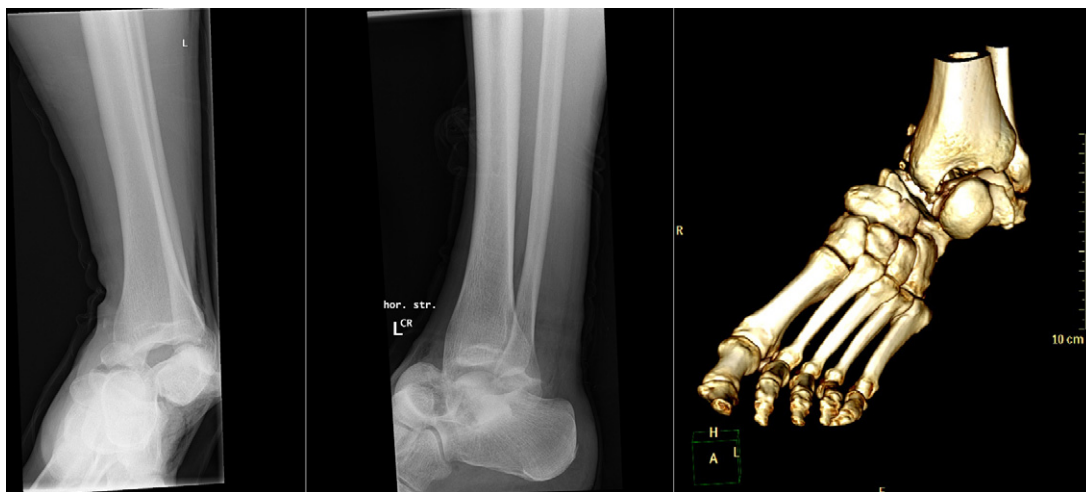


Fig. 2. X-ray of a left ankle with 3D CT reconstructions: complete dislocation of the tibiocalcaneal joint and subtotal dislocation of the tibiotalar joint combined with comminuted talar fracture.

Patient was taken to theatre where open reduction was successful and fixation of the comminuted fracture was performed with two k-wires and two screws. An external fixator was placed to assure stability. Antibiotics were prescribed because of the open nature of the fracture. No complications occurred and ten weeks after surgery there were no signs of avascular necrosis on radiologic imaging. Two years after the initial treatment the patient

suffered from local pain. CT radiography showed mild subtalar and talonavicular arthritis, moderate collapse of the talar dome and a bony impingement exactly at the location of the complaints. Considering the location of the pain and the radiographic findings an arthroscopic nettoyage of the involved region and a k-wire removal was performed with good results. Three years after the incident the patient has resumed sporting activities and only reports minor pain,

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