



Case Report

Minimally invasive technique for medial subtalar dislocation associated with navicular and entire posterior talar process fracture: A case report



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ABSTRACT

This is a case report of 31-year-old woman who sustained medial subtalar dislocation with navicular and entire posterior talar process fracture. After closed reduction of the subtalar dislocation, compute tomography (CT) demonstrated that the talus fracture involved the entire posterior process and navicular. The fracture of the talus was fixed with a cannulated screw and the navicular was held with two K-wires to the main body using with a minimally invasive approach. Follow-up revealed that the functional and radiographic results were graded as good.

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Introduction

Subtalar dislocation is a rare injury involving the talocalcaneal and talonavicular joints and caused by high energy trauma, such as a fall from a height or traffic accident [1]. There is simultaneous disruption of both the talocalcaneal and talonavicular joints, whereas the tibiotalar and calcaneocuboid joints remain undisturbed. Subtalar dislocation accounts for 1–2% of all dislocations [2]. Among the subtalar dislocation, medial subtalar dislocation is the most common injury pattern (up to 85%), with lateral type making up the majority of the rest [3,4]. These injuries may be associated with fractures of the foot and ankle. Sometimes they may be easily overlooked which leads to arthritis or avascular necrosis of the talus.

We present a case of medial subtalar dislocation with navicular and entire posterior talar process fracture after a fall. The purpose of this report is to describe a case of closed subtalar dislocation with ipsilateral talus and navicular fractures, including operative reduction and fixation of the fracture.

Case report

A 31-year-old man sustained what he described was an inversion and plantarflexion injury of his right ankle while playing

basketball, and was presented to our emergency department approximately 4 h after the injury with complaints of right foot pain and swelling and an inability to bear weight. In clinical examination the ankle was substantially swollen and ecchymotic, while the talonavicular and medial subtalar joints were very tender and painful to palpation. Both oblique and anteroposterior radiographs showed medial displacement of the midfoot without any evidence of bone fracture (Fig. 1A and B).

In the operation room, the patient in the prone position was taken to for closed reduction under general anaesthesia. The subtalar dislocation was successfully reduced with manual pressure on the head of the talus under traction, plantar flexion and pronation of the forefoot. The knee was kept flexed throughout the relocation process for eliminating the tension of the soleus muscle. Afterwards, the quality of the reduction and the stability were evaluated under fluoroscopy. As no signs of anteroposterior or mediolateral instability were recognized, the patient was immobilized in a short boot cast and prescribed low molecular weight heparin and nonsteroidal anti-inflammatory drugs.

A subsequent compute tomography (CT) scan was also performed to confirm the anatomic reduction of the subtalar joint dislocation and to reveal any potential fractures. The CT scan showed fracture of the entire posterior talar process and a non-displaced navicular fracture (Fig. 2A and B). The patient was re-examined at a surgical orthopedic inpatient department. During this examination, a significant hematoma in the foot and blisters on the inner side of the hindfoot were observed. Ten days later,

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Fig. 1. Anteroposterior (A) and oblique (B) foot radiographs illustrate medial subtalar dislocation of the right foot.

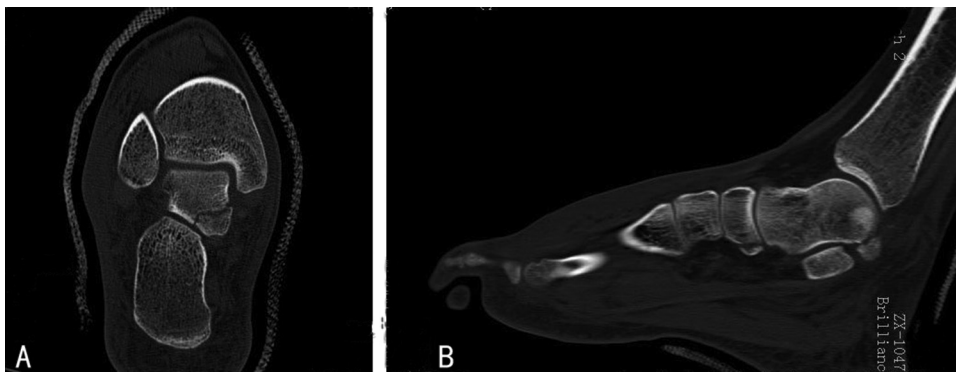


Fig. 2. CT scan of coronary and sagittal view for the right foot showing two fractures of the entire posterior talar process and navicular fracture.

once the blisters were healed, the patient underwent surgery for fracture. Before surgery, the Di-com data from CT scan were put into MIMICS (Materiaise's interactive medical image control system) software and then the image for simulation of the operation was shown in Fig. 3. Based on the image for simulation of pre-operation, a closed reduction and internal fixation of the posterior process of the talus using a minimally invasive approach was performed (Fig. 4). The fracture was reduced temporarily stabilized with two guide pins and the reduction was confirmed

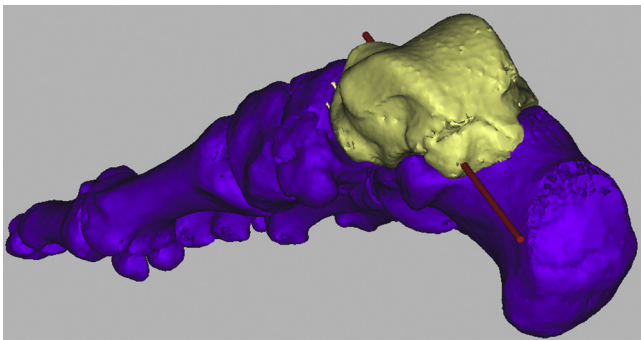


Fig. 3. The image for simulation of pre-operation with MIMICS software.

with fluoroscopy (Fig. 5). The fragment was then definitively fixed with a self-tapping, self-drilling 4.5 mm cannulated screw (Synthes Inc, Shanghai) directed from the posterior to the anterior through the fracture fragment into the body of the talus (Fig. 6). The non-displaced navicular fracture was held with two Kirschner



Fig. 4. A minimally invasive approach was performed during operation.

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