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Subtalar and talonavicular joint dislocation with fracture calcaneum: A difficult case to manage

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Abstract
Subtalar joint dislocations are a relatively rare injury accounting for not more than 1% of traumatic dislocations. A 40-year-old male presented with pain and swelling of the left ankle and foot after 6 hours of a road traffic accident. Clinical examination and radiography revealed subtalar, talonavicular joint dislocation and fracture calcaneum. Open reduction and k-wire fixation was done. After 6 months of follow-up, foot was painless and stable with normal range of motion.

Keywords: subtalar, talonavicular, joint dislocation

Introduction
Talocalcaneal navicular joint dislocations are a relatively rare injury accounting for less than 1% of traumatic dislocations which may be caused both by high energy and low energy trauma, most commonly medial joint dislocation. This injury is associated with numerous serious complications like neurovascular injury, injury to tendons of the extensor retinaculum, avascular necrosis of the talus, joint instability and subtalar arthritis in the long run. Closed reduction is challenging because of massive swelling and obstruction by fracture fragments; and it often requires open reduction and internal fixation. We are hereby reporting this case because of its rarity.

Case Report
A 40-year-old male, clerk by occupation, presented to emergency with history of injury to the left foot 24 hours back, after a fall while riding a motor cycle. He had pain, swelling, and inability to bear weight on the left foot. Clinical examination revealed diffuse swelling and tenderness in midfoot region with midfoot deviated medially as compared to hindfoot. There was no neurovascular compromise in the left foot.

Anteroposterior and oblique radiographs of left foot revealed subtalar and talonavicular joint dislocation (Figure 1). CT scan with 3D reconstruction was performed to rule out any other associated bony injury which showed fracture calcaneum (undisplaced) in association with subtalar and talonavicular joint dislocation (Figure 2).

Closed reduction to reduce the joint dislocation was attempted, but was unsuccessful because of gross swelling. So, open reduction was done using the anterior approach to ankle. The interval was developed between tibialis anterior and extensor hallucis longus tendon. In this case, neurovascular bundle was retracted laterally with the long extensor tendons of toes, and the anterior tibial tendon was retracted medially. The joint was reduced and fixed with 2 k – wires (Figure 3). Closure was done in layers and below knee splint was applied. Fracture calcaneum was managed conservatively with below knee slab and later converted to cast.

Post operatively, the limb was kept elevated and wound check was done on the fifth day. The wound was healthy and the patient was discharged on the same day. Sutures were removed on the 14th day and the below knee slab was converted to cast. The k-wires were removed after 8 weeks and the patient was allowed full weight bearing. After 6 months of follow-up, foot was painless and stable with normal range of motion (Figure 4).

Discussion
Subtalar joint dislocation was first described in 1811 by Judey and Dufaurets and had also been referred to as peritalar or subastragalar dislocation [1]. A more accurate term for subtalar joint dislocation would be talocalcaneal navicular (TCN) dislocation because not only is the normal architecture of the subtalar joint affected, but the talonavicular joint is also disrupted. Subtalar joint dislocations are a relatively rare injury accounting for not more than 1% of traumatic dislocations and only 15% of all talar injuries [2]. The mechanism of subtalar dislocation is trauma to a plantar-flexed foot either in inversion, resulting in medial subtalar joint dislocation (80%) [3], or eversion, resulting in lateral dislocation (17%). Anterior and posterior dislocations have also been described but are rare. Subtalar dislocation is seen with both high- and low-energy trauma. Sporting activities, commonly basketball, are often the

cause of low-energy injuries. Lateral subtalar dislocation are often associated with fractures and can result in serious complications, such as avascular necrosis of the talus; and navicular and subtalar instability. In addition, severe post traumatic subtalar arthritis can occur and may require triple arthrodesis. Immediate reduction of subtalar dislocation is necessary to avoid neurovascular compromise and prevent avascular necrosis of talus. Entrapment of the posterior tibial tendon, flexor hallucis longus, joint capsule, or obstructing fracture fragments may hinder closed reduction and often requires open reduction [4].

It is well known that Dufaurest and Judcy were the first to describe TCN joint dislocations in 1811. A classification system was not really developed until proposed by Broca in 1852, which focused on the direction of the dislocation. He described them as medial, lateral, and posterior, starting with most frequent to least common [5]. Malgaigne added the anterior direction to the classification system in 1856. According to this there are four types of talocalcaneal and talonavicular joint dislocation i.e medial (65-80%), lateral (15-35%), posterior (0.8-2.5%), anterior (1%).

Patients with a subtalar dislocation obviously presents with lot of pain and swelling and there is no possibility to bear weight on the affected foot. The deformity of the extremity is clearly noticeable. The talar head can stick out prominently and the talonavicular and medial subtalar joints are very tender and painful to palpate. Initially a plain x-ray is done to look for injuries but later, a CT-scan is always needed to be completely sure of the diagnosis, see the type of dislocation and any other associated fracture. These injuries usually require operative treatment and if immediately managed, the prognosis is excellent.

Fig 1: pre-operative radiographs of left foot showing subtalar and talonavicular joint dislocation

Fig 2: pre-operative CT scan of left foot showing subtalar and talonavicular joint dislocation with fracture calcaneum (undisplaced)

Fig 3: post-operative radiographs of left foot showing reduced joint with 2 K- wires in situ

Fig 4: follow up radiograph of left foot showing reduced and stable joint

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