

Occult Talar Fractures in Young Athletes: Case Report and Literature Review

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Abstract

Talar fractures are uncommon injuries that are often misdiagnosed as usual ankle sprains. The diagnosis could be challenging only with a SODLQ UDGLRJUDSK\ DQG WKH FRPSXWHULJHG WRPRJUDSK\ VFDQ FRXOG EH WKH ¿UVW H[DPSO increase risk of persistent pain, non-union and degenerative changes.

We present a case of a non-displaced talar neck fracture in an athlete diagnosed only after 7 days, and a case of a snowboarder fracture in

Keywords

Talar fractures; Snowboarder fracture; Occult talar fractures; Avascular talar necrosis; Hawkins

Abbreviations

Computerized Tomography scan (CT scan); Weight Bearing (WB); Range of Motion (ROM); Avascular Necrosis (AVN)

Introduction

Talar fractures are uncommon injuries, accounting for <1%-4% of all foot fractures [1,2]. They are often misdiagnosed because its symptoms resemble those of an ankle sprain. The diagnosis could be challenging with a simple plain radiography, turning the computerized tomography (CT) scan the most indicated exam in case of high index of suspicion. Missed diagnosis and subsequent delayed or inadequate treatment increases the risk of persistent pain, disability, non-union and degenerative changes [1-4].

Cases Report

Case 1: Non displaced talar neck fracture in a young volleyball player

23 year old male volleyball player with history of acute inversion ankle sprain after a jump during a training session. The player immediately presented severe ankle pain and absolute disability to continue playing. He was transported to urgent department and at admission was unable to tolerate weight bearing (WB) and present a mild swelling without ecchymosis. The ankle radiographic series was negative and the athlete was discharged to home with instruction to follow RICE protocol (Figure 1). After 7 days, he was reassessed for sustained pain and repeated imaging study, including ankle CT scan (Figures 2 and 3). In CT scan was evident a Hawkins II talar neck fracture. An open reduction and internal fixation with 3 screws was performed, followed by 10 weeks of no weight bearing and active mobilization (Figure 4). At 10 weeks he had complete ankle range of motion (ROM) and started partial WB.

Case 2: Occult snowboarder fracture in a young football player

17 years old male football player with a lateral process of talus fracture. After injury, the player referred severe pain and was unable to tolerate WB. In the emergency department he was clinically assessed and made an ankle radiographic series. On the radiography it was not evident any fracture or other articular abnormality (Figure 5). The diagnosis of ankle sprain was assumed. After 10 days, the player returned with sustained pain

and made an ankle CT scan (Figure 6). The CT scan revealed a Hawkins type I fracture of the lateral process of the talus. We performed an open reduction and internal fixation with one lag screw of the talar lateral process (Figure 7). Postoperatively, a non WB short leg boot was applied for 6 weeks followed by a partial WB short leg boot for an additional period of 4 weeks. At 10 weeks the player was able to walk without any pain and with complete ROM.



Figure 1: X-ray at admission

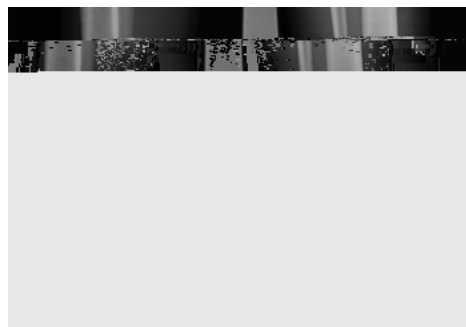


Figure 2: X-ray with 7 days of injury

should be left for assessment of talar vitality during follow up [1,8].

In the case of late or missed diagnosis, and subsequent improper treatment, the morbidity and the number of complications increase greatly [1]. The most prevalent complication is subtalar arthrosis which occurs in almost 50% of the cases. The prevalence of tibiotalar and talonavicular arthrosis also rounds one third of talar neck fractures. Malunion could happen in 25%-30% of the patients, but non-union is rare, accounting to less than 5%. One of the most feared is AVN which is very associated to this type of fracture occurring in nearly 30% of all talar neck fractures [5,7,10].

The vascularization pattern of the talus is peculiar. It has no muscular or tendinous attachments and thus relies on the integrity of its capsule for its blood supply which runs retrogradely by branches of the anterior tibial artery, posterior tibial artery and a perforating peroneal artery [1,7,8,10,12]. Therefore, an impairment of the blood supply of the head by a neck talar fracture have an increased risk of AVN. Injuries associated to medial malleolar fractures are less likely to develop AVN due to preservation of the deltoid ligament and the deltoid branch of the posterior tibial artery [8,9].

The rates of AVN correlate with the degree of initial dislocation [1,5,8,10,13]. Hawkins described a classification system of the talar neck and body fractures, later modified by Canale and Kelly, which provides descriptive and prognostic information [11,14]. Type I fractures are vertical, minimally displaced, with the subtalar joint reduced, and a reported rate of AVN of 0%-10%. Type II injuries include vertical, displaced fractures with the subtalar joint subluxated or dislocated, and are associated to AVN in 15%-20% of the cases. Type III fractures are similar to type II with the addition of dislocation of the ankle joint; a 30%-50% rate of AVN has been reported. Type IV fractures are neck talar fracture associated with dislocation of the ankle joint and dislocation or subluxation of the head of the talus from the talonavicular joint. The rate of AVN ranges from 10%-60% [7,10,13]. This variability could be partly explained by recent demonstration of a significant anterograde blood supply of the head and body whereby not all talar neck fracture evolve to osteonecrosis [7,15,16].

The treatment of a neck talar fracture is defined by the degree of dislocation. Most of the literature recommends short leg casting for type I fractures plus 6 to 12 weeks of non WB or until consolidation. It has also been described percutaneous fixation as a method for treatment of type I fractures with the possibility of early range of motion. Displaced type II-IV fractures almost all will require open reduction and internal fixation focusing on anatomic reduction and restoration of the peritalar joints, not depreciating the emergency character of reduction of open and/or dislocated fractures [1,5,7,8,17].

Snowboarder fractures

The fracture of the lateral process of the talus is thought to be an uncommon injury clinically resembling ankle sprains whereby they are frequently overlooked initially with between 30 and 60% of missed diagnosis [3,4,6].

In the physical exam, tenderness anterior and inferior to the tip of the lateral malleolus or a posterior subtalar effusion could be signs strongly suggestive and more specific of an occult lateral process fracture [3,6]. A Mortise or Broden's view are also more sensitive than a standard radiograph, but the CT scan is the image technique of choice if fracture of the lateral process of the talus is suspected but plain radiographs are negative or inconclusive, especially in a patient with long term pain following an ankle injury [3,4,6].

This injury was rarely seen before snowboard became a popular sport in recent decades. In the general population, its incidence rounds less

than 1% of talar fractures, but recent evidence shows a remarkably higher incidence in the snowboarders (some authors have pointed rates around 15%-30%) often associated with falls after high jumps associated to aerial

of severe acute ankle sprains or persistent ankle pain after previous ankle injury. CT scan could be the key in suspected cases. Early recognition and adequate treatment based on fracture type may reduce the associated morbidity and long term sequelae.

Conflict of Interest

We have no conflict of interests to disclose and the manuscript has been read and approved by all named authors.

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