An Unusual Case of Medial Dislocation of the Subtalar Joint with Fracture of the Talar Body

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ABSTRACT

Talus dislocation with a fracture of the body of talus is a relatively rare clinical entity. Medial subtalar dislocation accompanying this type of fracture was reported only once in Germany in 1968. For the past 50 years, there have been no other cases in the literature. In this article, we report the results of surgical treatment and 2-year follow-up of a patient who presented to the emergency department with such an injury. Radiographs of the ankle revealed a subtalar medial dislocation; however, a talus fracture was not detected. An Xray in the lateral projection of the right ankle obtained after closed reduction under sedative anesthesia showed a fracture of the talar body with displacement. Under spinal anesthesia with anteromedial and anterolateral exposure to the ankle joint, fracture was openly reduced and fixed two cannulated screws(4.5 mm) on the day of presentation to support subtalar joint stability, and one 2-mm Kirshner wire was placed toward the calcaneus to the talus. At 2-year follow-up excellent functional outcome of ankle joint was noted without any avascular necrosis of talus or tibiotalar and subtalar arthrosis.

Key Words: Avascular necrosis, subtalar dislocation, talus body fracture, talus.

This article may be cited as: Kekec AF. An Unusual Case of Medial Dislocation of the Subtalar Joint with Fracture of the Talar Body.J Pak Orthop Assoc 2019;31(3):

INTRODUCTION

Talus fractures are relatively rare and constitute approximately 0.1% of all fractures. Similarly, subtalar dislocations are uncommon and comprises of 1%–2% of all dislocations.[1]These injuries usually occur as a result of high-energy trauma (motor vehicle collisions, falls from a significant height). Our case presented after a fall from height that occurred while he was working on a construction site and was found to have medial subtalar dislocation in combination with a talus body fracture. We describe herein the rare presentation of this clinical entity, the mechanism of injury, the surgical treatment approach, and 2-year follow up outcome.

CASE REPORT

On July 2016 a 33-year-old construction worker presented to the emergency room with severe ankle pain after falling from construction scaffolding approximately 5 m in height. The initial physical examination revealed a severe deformity and pain in the right ankle, which was cold and pale, with no posterior tibial pulse. After initial symptomatic management radiographs in two planes were advised for diagnostic work-up. A subtalar medial dislocation was noted; however, the talus fracture was not clearly seen on the X-rays (Fig. I). The patient's past medical history and laboratory findings did not reveal any relevant information. In operation room talus was reduced closely under general anaesthesia but without image intensifier. The reduction was easy and uneventful. Post reduction distal pulses were intact. The control lateral radiograph taken after closed reduction showed a fracture of the talar body with displacement (Fig. II). Elevation and immobilization were started in a short-leg splint. Six hours after the injury, the patient was operated with combined anteromedial and anterolateral exposure to the ankle joint, fracture was openly reduced and stabilized with two 4.5-mm cannulated screws under spinal anesthesia. To maintain subtalar joint stability, one 2-mm Kirshner wire was placed toward the calcaneus to

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Fig. I: AP(a) and Oblique (b) Xrays of the right ankle showing medial subtalar dislocation.

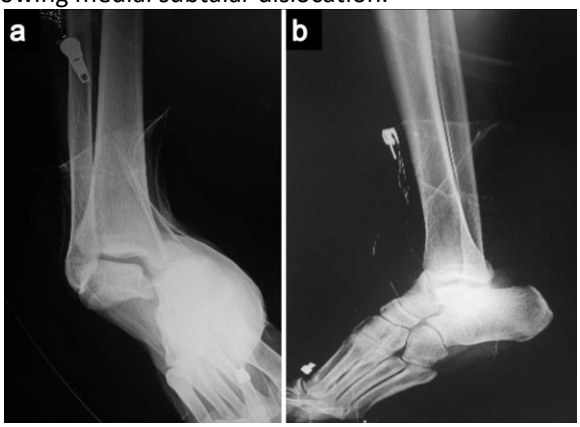


Fig. II. Lateral X-ray of the right ankle after closed reduction

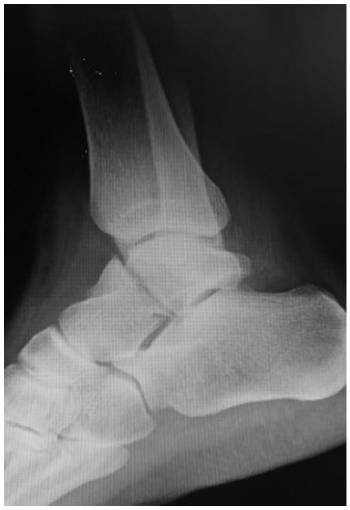


Fig. 3III. Anteroposterior (a) and lateral (b) radiographs on the first day of surgery demonstrating osteosynthesis of the talus and Kirschner wire for stabilization of subtalar joint reduction

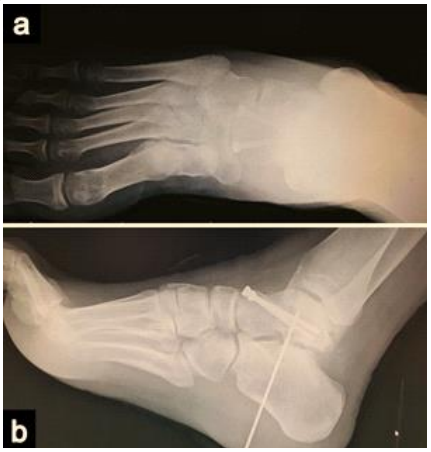
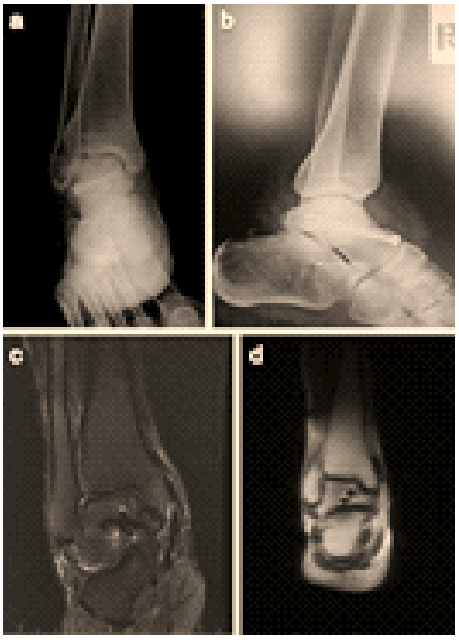


Fig. IV. AP (a) and lateral (b) X-Rays of the right ankle at 2-year follow-up showing no malunion or nonunion, T2 (c) and T1 (d) weighted coronal magnetic resonance images revealed no avascular necrosis and posttraumatic osteoarthritis



talus with fluoroscopic guidance (Fig. III). After 6weeks of splinting, the Kirshner wire was removed, and ankle joint movements and partial weight bearing were allowed. Full range of motion and weight bearing was observed at 3rd months post surgery. He returned to construction work at the sixth month successfully. At 2-year follow-up, the patient had excellent radiological and functional outcome without any evidence of avascular necrosis(AVN) of talus or arthrosis of tibiotalar and subtalar joints. (Fig. IV)

DISCUSSION

Talus fractures are rare and constitute only approximately 0.1% of all fractures while subtalar dislocations comprises of 1%–2% of all dislocations.[1] The talus is a hard bone and it is fractured in high energy trauma like motor accidents.[2] The talus has unique anatomic and functional features, and talar injuries may potentially cause complications leading to disability.[3] There are various classifications of talar body fractures. Sneppen[4] classified this fractures into five subtypes whereas Fortin[5] classifies them into three subtypes. These two classification systems do not include dislocations. However, Boyd and Knight's [6,7] classification is more suitable for our case because

associated ankle or subtalar dislocations have also been considered in this classification. According to this classification, our case can be considered as type Ic (coronal shear of the talus with medial subtalar joint dislocation). Fall from height resulting in axial compression of talus between tibia and calcanuim is the usual mechanisim of talus fracture.[4] When the forefoot is blocked in equinus and it is inverted it causes talus dislocation. This dislocation can be in any direction but medial dislocation is the most common variety and found in 80% of such dislocations.[8] The most unstable position for the subtalar joint is known to be inversion. All important stabilizing ligaments of the foot(talonavicular, Interosseous and calcaneofibular) are stretched. In our case, the fracture of the talus body was likely due to the first impact to the heel in the equinus position. Subsequently, the foot was locked in inversion between construction materials, causing subtalar medial dislocation. The treatment goal of talar body fractures is to restore articular congruity of ankle joints. Because of the high-energy trauma, majority of fractures of the talar body are displaced and need surgical intervention. Despite surgical treatment, malunion, nonunion, avascular necrosis and osteoarthritis are frequently seen after this type of injury.[9] A study by Vallier [9] reported that 65%(n=17) of his patients had tibiotalar joint osteoarthritis while 35%(n=9)had subtalar arthritis. Blood supply disruption is commonly seen resulting in osteonecrosis of 25% had been reported in literature.[10] At the end of the 2-year follow up, our case had not yet developed avascular necrosis or posttraumatic osteoarthritis. Sneppen [4] after treating 51 talus fractures concluded that good post op outcome depends upon the energy of initial trauma causing the fracture with high energy trauma associated with bad post op outcome. They emphasized that the long-term prognosis is poor if accompanied by subluxation, dislocation, and initial articular damage.

Management of such complicated cases is also very challenging. The first intervention should be performed as early as possible in these patients, who usually arrive with a high-energy trauma and additional injuries. Occasionally, the operation may be delayed due to additional injuries or excessive edema of the ankle. In the literature, the timing of osteosynthesis has not been shown to affect the occurrence of complicating avascular necrosis or functional outcomes if urgent reduction is performed.[9,11-13] In our case, closed reduction was performed under general anesthesia immediately after the first X-ray in the emergency room, and osteosynthesis was carried out within 6 hours. Probably because of the initial urgent intervention, at the 2-year follow-up, our case did not show any clinical or radiologic findings of a vascular necrosis or posttraumatic osteoarthritis. However, posttraumatic osteoarthritis may develop in later years and will require clinical surveillance. A review of the literature revealed no other cases for the past 50 years, except one in German.[14]

CONCLUSION

Talus body fractures and dislocations are rare but potentially complicated. Sometimes, excellent results can be achieved in talar injuries with prompt and appropriate treatment modality. This rare case, which is unique in terms of the mechanism and type of injury, was managed successfully with a staged joint reduction and internal fixation.

Conflict of Interests: None
Grants/Funding: None

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Authorship and contribution Declaration

Ahmet Fevzi Kekec,Conception, acquisition of patient data, Drafted the manuscript ,Revised the manuscript critically for important intellectual content, Final approval of the version for publication