

## Closed posterior total (pan-talar) dislocation of the talus: an unusual injury pattern

Erdal Uzun<sup>1</sup>, Ali Eray Gunay<sup>2</sup>, Turan Bilge Kizkapan<sup>3</sup>, Mahmut Mutlu<sup>2</sup>, Abdulhamit Misir<sup>3</sup>

<sup>1</sup>Kayseri Research and Training Hospital, Orthopedic and Traumatology Clinic, Kayseri, Turkey

<sup>2</sup>Erciyes University Faculty of Medicine Department of Orthopedics and Traumatology, Kayseri, Turkey

<sup>3</sup>Metin Sabancı Baltalimanı Bone Diseases Training Department of Orthopedics and Traumatology, and Research Hospital, Istanbul, Turkey

### Abstract

Major displaced fractures and dislocations of the talus are uncommon. Total talar dislocations are caused by high-energy traumas occurring as dislocations from all its surrounding articulations. Pathophysiologic mechanisms are still a subject of controversy. Most reported cases are open talus dislocations; closed dislocations are rarely seen. Here, we present a 25 year old male with an injury of closed posterior total talus dislocation with concomitant medial malleolus fracture. After closed reduction of talus, internal fixation of medial malleolus was performed. At the last visit, the ankle was painless, stable with mobility, and without any radiologic signs of avascular necrosis of talus.

**Keywords:** Dislocation; Talus; Pantalar; Posterior.

## INTRODUCTION

Total dislocation of the talus from all of its three joints (tibiotalar, subtalar, and talonavicular) is a very rare. It is caused by a high energy trauma and indicates a severe injury with disruption of almost all ligaments and capsular attachments of the talus. Total dislocation of the talus is associated with either malleolar fracture or talus fracture (1,2). The blood supply of the talus is delicate. Surrounding soft tissue attachments have critical role in the stability and blood supply. Closed reduction and careful surgical dissection in cases of open reduction respect more soft tissue attachments. This careful approach reduces the potential risk of avascular necrosis (3). In this case report, we present a patient who sustained a traffic accident with total posterior dislocation of the talus with concomitant medial malleolar fracture.

## CASE REPORT

A 25-year-old male presented in our emergency department with pain, swelling and deformity of his left ankle after a traffic accident. He was sustained a twisting and crush injury to his left foot while driving his car.

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### Corresponding Author

Erdal Uzun, Kayseri Research and Training Hospital, Orthopedic and Traumatology Clinic, Kayseri, Turkey

E-mail: [nuzuladre@gmail.com](mailto:nuzuladre@gmail.com)

In admission, he was hemodynamically stable. His Glasgow Coma Scale was 15. In the initial evaluation he had no hypoesthesia over the foot or ankle. No pulses of both tibialis posterior and dorsalis pedis arteries of the left lower extremity were detected. The skin was intact but very tense. There were no other injuries. On radiographic examination of the foot and ankle, talus was found completely dislocated posteriorly from the tibiotalar, subtalar and talonavicular joints with concomitant medial malleolar fracture (Figure 1).

Closed reduction was performed under sedoanalgesia at emergency room. While reducing the ankle joint the knee flexed to relax the posterior muscles, traction was applied to the foot and counter-traction to the tibia. Then the talus reduced with pushing maneuver of anterior and medial direction. The reduction was seen stable with physical examination and radiographs (Figure 2).

After closed reduction, tibialis posterior and dorsalis pedis pulses were both palpable. Then, open reduction and internal fixation of medial malleolus with a 6.5 mm compression screw was performed. A non-weight-bearing below-knee cast applied. Six weeks later, the cast removed. Gradual mobilization started but without weight bearing. Two months later Hawkins sign was positive which was indicating an adequate blood supply (Figure 3).

Six months after the injury, patient was examined and found to have nearly 15° of ankle dorsiflexion and 40° of ankle plantar flexion without any pain. At the last visit, the ankle was painless, stable with mobility, and without any radiologic signs of avascular necrosis of talus (Figure 4).



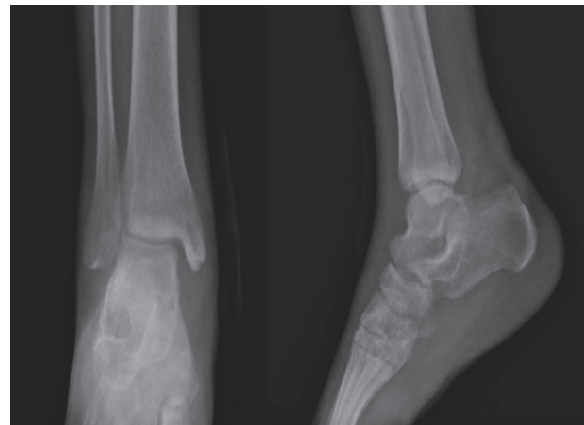
**Figure 1** a,b. Illustrating the AP and lateral view of the ankle on XR imaging - complete dislocation of talotibial, subtalar and talonavicular joints, concomitant medial malleolar fracture; c,d: Three-dimensional CT images are illustrating complete posterior dislocation of the talus; e: Lateral CT view of total talar dislocation



**Figure 2.** The reduction was confirmed radiologically with XR imaging.



**Figure 3.** On XR imaging two months after the injury Hawkins sign was positive.



**Figure 4.** There was no radiologic signs of avascular necrosis of talus at the last follow up.

## DISCUSSION

Pantalar (tibiotalar, subtalar, talonavicular) dislocation of the talus bone is an unusual injury that results after a high-energy trauma. Dislocation of subtalar joint is the first stage then if the force progresses, talonavicular joint dislocates and finally tibiotalar joint dislocation occurs. In closed reduction, trying to reduce tibiotalar joint is the key for successful treatment. With reduction of tibiotalar joint, other joints (subtalar and talonavicular) spontaneously reduce (4). Pathophysiologic mechanisms are still a subject of controversy. Some authors reported (5) that the mechanism of this injury was that the forces make ankle joint go plantar flexion and inversion, however others advocate the opinion that the force makes ankle joint going supination (6). In this case the mechanism of injury is thought to be axial loading with or without supination or pronation injury. Because the high energy nature of the trauma, combined mechanisms are responsible and an exact isolated mechanism can not be clarified. There are no standard published treatment guidelines. Closed or open reduction of the talus is the mainstay initial treatment method. Tibiocalcaneal joint arthrodesis (7); talectomy and triple arthrodesis by using talus as a graft (8) are different secondary treatment choices. Actually, most authors underline the importance of a prompt conservative treatment (6).

They defend that arthrodesis may be a choice after septic or arthritic complications. In this case we performed closed reduction promptly for pantalar dislocations of the ankle joint to prevent skin and vascular complications. If closed reduction is not successful due to the lockness of the subtalar joint in dislocated position or talar neck entrapment between flexor tendons open reduction must be performed. Avascular necrosis is mostly predictable, because almost all capsular and ligamentous attachments rupture in this injury. Although some investigators believe that avascular necrosis is inevitable consequence of the injury, there are some reported cases of total talar dislocations without osteonecrosis. Reduced range of motion and osteoarthritis in any three joint are also predictable complications (4-10).

## CONCLUSION

Initial treatment method in closed pantalar dislocations must be closed reduction. Pantalar dislocation frequently leads to degenerative changes in related joints, decreased range of motion of the ankle and avascular necrosis of the talar body. Actually in this report we wanted to consider the importance of prompt treatment of a very rare case of posterior pantalar dislocation.

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