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Case Report

Simultaneous fracture of the tibia shaft and talar body — A case report[☆]

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ABSTRACT

Combined fractures of the talus and adjacent bones are rare. We present a case with a fracture of the talus body concurrently with a tibial shaft fracture. Open reduction and internal fixation were applied in the treatment of talus fracture. The tibial shaft fracture was treated with closed reduction and intramedullary nails. At 1-year follow-up, no complication occurred and the patient returned to work before the injury.

Introduction

Talus fractures are constituting a mere 0.1% to 0.85% of all fractures. However, 7%–38% of all talus fractures belong to the talar body. Combined fractures of the talar body and adjacent bones are much rarer. The mechanism of a talus body fracture is axial compression of the talus trapped between the calcaneus and tibia plafond due to injury [1]. The current case is significant because although the fracture occurred in the tibia shaft, the energy was transferred to the talar body, creating a comminuted fracture in this area, and there is no similar report found in the literature. The local ethics committee approved the study.

Case report

An 18-year-old male patient presented to the emergency service of the hospital with the complaints of pain in his right ankle and leg after falling from a second-floor balcony. The physical examination performed in our hospital revealed a 1-cm wound in the distal 1/3 anterior of the right cruris. The skin over his ankle was stretched, but the capillary refill time was normal and there was no suspicion of compartment syndrome. The upper extremity was atraumatic and the neurovascular examination of all extremities was uneventful. Radiographic evaluation revealed a spiral oblique fracture (Fig. 1) and comminuted fracture of the talus (Fig. 2). Computed tomography (CT) imaging (Fig. 3) was performed to evaluate the talar joint surface and displacement of the fracture. Open fracture prophylaxis and tetanus prophylaxis were undertaken. In the emergency service, a long leg splint was applied following proper irrigation and debridement. Due to high velocity injury, other departments were also consulted. The patient was hospitalized and scheduled for closed reduction of the tibial body fracture using intramedullary nailing and open reduction of fracture of the talus with internal fixation. Before the open reduction of the talar body fracture using internal fixation, the patient was followed up for

[☆] All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version. Additionally, there are no conflicts of interest in connection with this paper.

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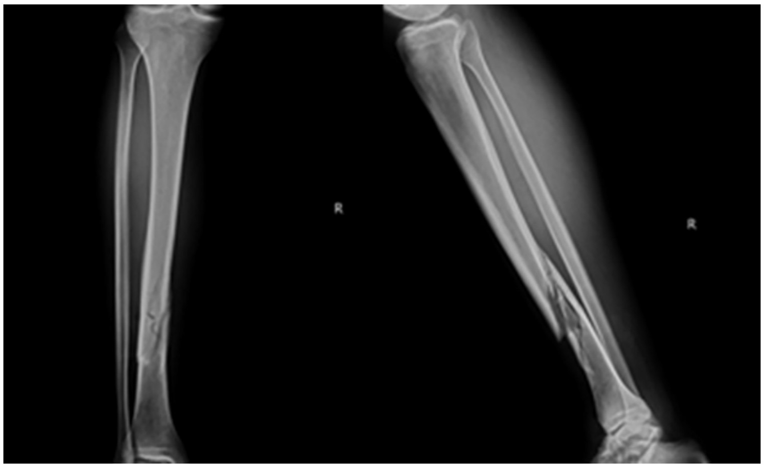

Fig. 1. Preoperative tibia radiograph. The radiograph shows spiral oblique fracture of tibia shaft.

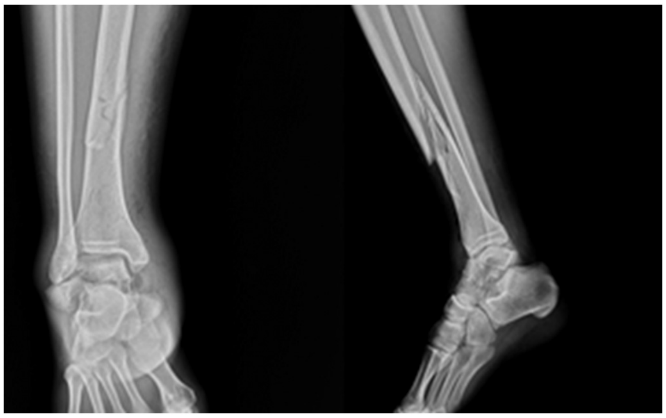

Fig. 2. Preoperative X-ray of the left ankle (anterior-posterior and lateral view).

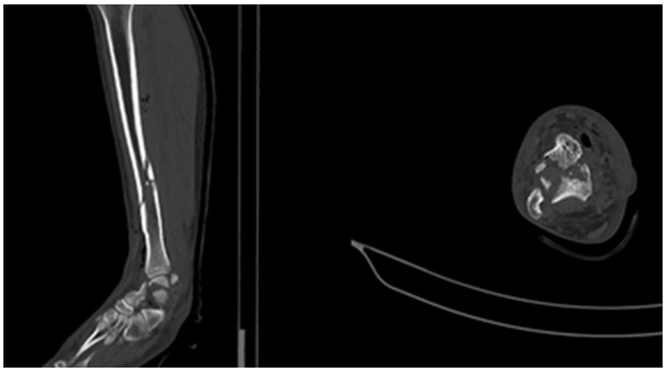

Fig. 3. CT images of the right ankle demonstrating a comminuted fracture of the talus.

13 days to monitor soft tissue healing.

The patient was placed in the supine position on the operating table under general anesthesia. The operation was started with the fixation of the tibial fracture. After achieving sufficient closed reduction, fixation was performed using a 320×10 mm intramedullary nail (Tasarımmed, Eyup, Turkey). The nail was locked with two distal and three proximal screws. Then, the fixation of the talar fracture was undertaken. In this procedure, anteromedial and anterolateral combined incisions were used. The bone debris and fracture hematoma were cleared. Then, the fixation of talus was performed with four 4-mm headless cannulated screws (TST Orthopedics, Pendik, Turkey). The positions of the screws were confirmed to be appropriate based on the fluoroscopic image in the

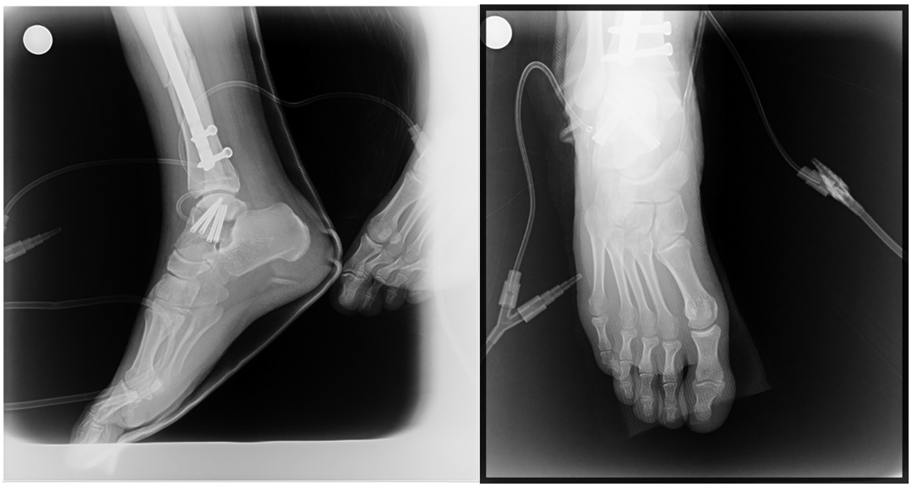

Fig. 4. Immediate post-operative X-ray of the right foot (anterior-posterior and lateral view).

operating room and the postoperative direct X-ray (Figs. 4–6). After the surgery, short leg plaster was applied for one week for soft tissue healing. Prior to hospital discharge, the plaster was removed and the ankle and knee movements were started. The patient was allowed to bear partial weight after eight weeks and full weight at week 12. The clinical and radiographic results of the patient were evaluated at the follow-up sessions undertaken at postoperative months 1, 3, 6, 9 and 12. At the end of the first year, magnetic resonance imaging was performed to assess the blood supply to the talus to ensure that avascular necrosis (AVN) did not develop (Fig. 7).

Discussion

One possible mechanism of injury leading to the fracture of the body of the talus is a fall from a height, producing an axial compression of the talus between the tibial plafond and the calcaneus [2–5]. Sneppen et al. explained that only certain nonphysical forces; for example, pronounced caudal compression, force during pronation, and especially supination trauma will injure the body of the talus. The authors found that medial side talar body fractures are typical of supination trauma (compression or shear type), whereas a lateral side fracture is due to pronation or pronation-external rotation trauma (compression fracture) [6,7].

It is important to differentiate talar body fractures from talus neck fractures due to the differences in management and prognosis. Talar body fractures are identified by the fracture line, extending within or posterior to the lateral process of the talus [8]. Inokuchi et al. distinguished talar neck and body fractures by inspecting the fracture line on the inferior surface. The authors described talar body fractures as those in which the fracture line on the inferior surface extends into the subtalar joint [9]. Talar body fractures have various classifications. The commonly used Sneppen's classification divided these fractures into five types, but they do not help in making treatment choices or predicting outcomes [5–9].

Avascular necrosis is a common complication following talus fractures. The aim of treatment of talus fractures; achieve

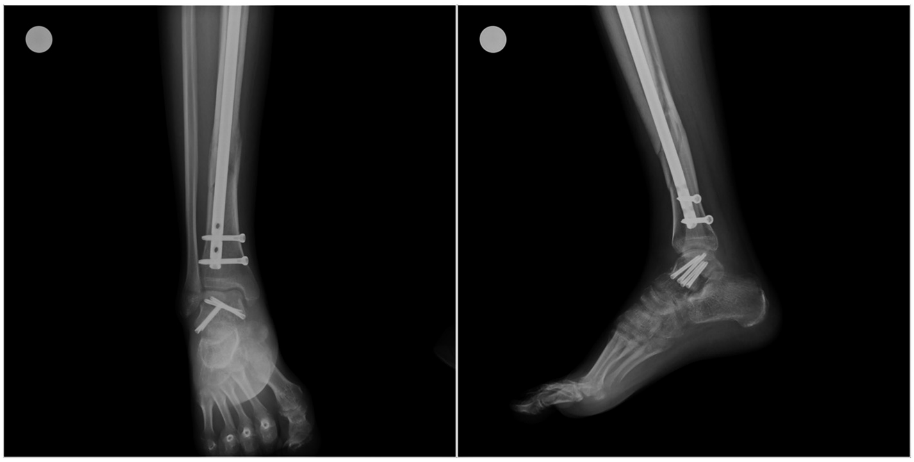

Fig. 5. At 3 months post-operative X-ray of the right ankle (anterior-posterior and lateral view).

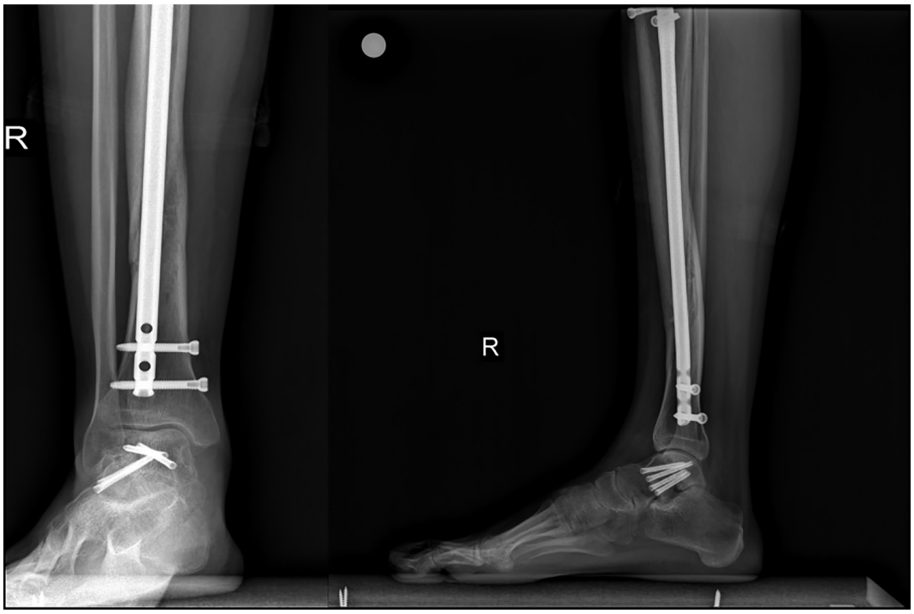

Fig. 6. At 1 year post-operative X-ray of the right ankle (anterior-posterior and lateral view).

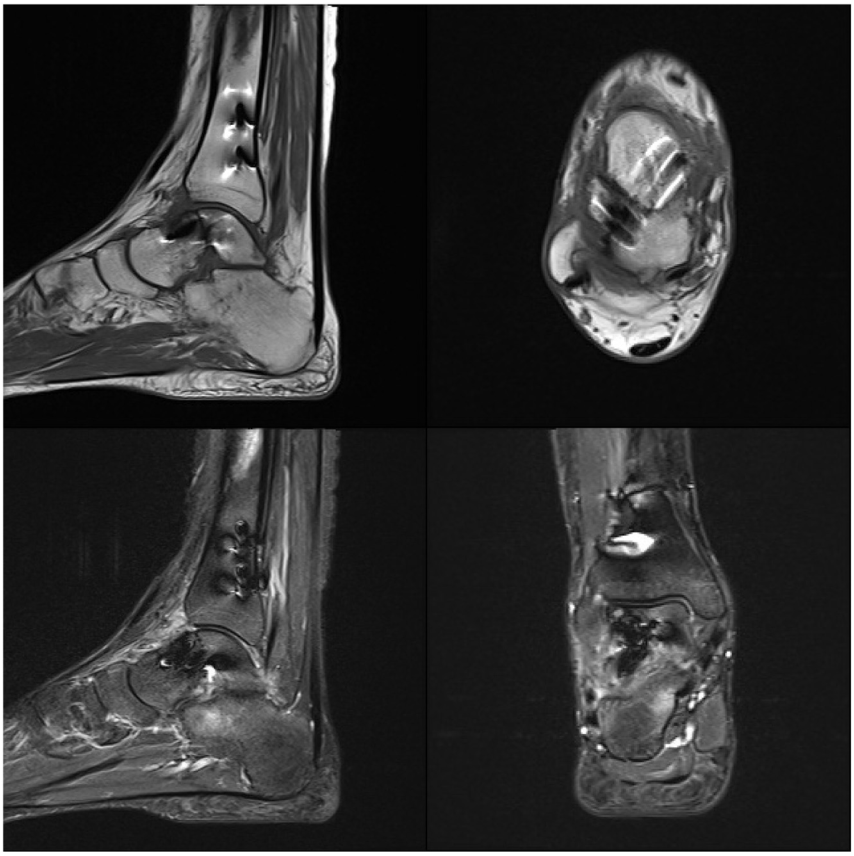

Fig. 7. At 1 year post-operative magnetic resonance imaging of the right ankle showing the vitality of talus in T1 and T2 weighted image.

anatomical reduction and stable fixation to ensure compliance of foot and ankle and reduce the risk of avascular necrosis (AVN). AVN rates depend on the type of fracture, degree of displacement, and type of surgical approach. Osteonecrosis was reported in 50–75% of cases in talar body fractures [10]. Vallier et al. found the rate of AVN to be 38%. In a study by Lindvall et al. conducted with 26 cases, AVN developed in approximately half of the patients. Many authors agree that the initial degree of fracture displacement is an important risk factor for osteonecrosis [11–13]. Although AVN is a very common complication of talus fractures, it was not seen in the current case. The radiography and magnetic resonance images obtained at the end of the first postoperative year did not show any evidence of talar osteonecrosis.

Conclusion

This study shows that the tibia shaft fracture caused by high velocity injury may be accompanied by talus fracture. These fractures require attention to soft tissues. However, soft tissue damage which may prevent early surgery should not change our treatment. In the current case with a one-year follow-up, providing an opportunity for preoperative soft tissue healing, preservation of the soft tissue and anatomical reduction during surgery, and stable internal fixation provided excellent results. The patient was able to resume work without any problems. This case demonstrates that rigorous joint reconstruction is worth the effort, especially in a young and active patient.

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