

C A S E R E P O R T

Percutaneous treatment of traumatic talus extrusion: a case report

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Summary. *Background and aim of work:* Total traumatic extrusion of talus with interruption of all ligaments (missing talus) is a very rare injury. We represent the case of a 44-years-old male who reported total extrusion of talus and Lisfranc dislocation after a motorbike accident. This rare injury has a wide choice of treatment but usually there is not a successful functional restore. *Methods:* We decided to treat the patient with an immediate reimplantation of extruded talus using 3 Kirschner wires and antibiotic therapy. We performed a temporary fixation of talus with calcaneus, tibia and scaphoid. *Results:* Usually, this kind of injuries are treated with a tibiocalcaneal arthrodesis and show common complications such as avascular necrosis and infection. Against our expectations we managed to treat successfully our patient. *Conclusions:* After 5 years of follow up the patient reported good clinical outcomes without performing arthrodesis and recording major complications. (www.actabiomedica.it)

Key words: K-wires, missing talus, total extrusion, Lisfranc fracture

Introduction

Total traumatic extrusion of Talus, as consequence of a high energy injury, is a very rare occurrence (1). This event always causes an impairment of surrounding bones and soft tissue and an impairment of slight talar vascularity (2-6). Common effects of total talus extrusion could be avascular necrosis and serious contamination of talus. There are no clear guidelines and consensus about treatment (4, 7-11). There are few reports in literature about successful reimplantation of total extruded talus (12). We herein describe our experience with 5-years follow-up of one patient, who suffered from total traumatic extrusion of talus, successfully treated with immediate replacement of talus using just Kirschner wires (K-wire). This is in contrast with similar cases, where talus reimplantation was per-

formed using: pins, screws and external fixation and were complicated by avascular necrosis and infection.

Case report

Our patient was a 44-years-old male, who had an accident while driving his motorcycle. He received a high energy trauma that caused midfoot abduction and hindfoot eversion and pronation. Talus was totally extruded and was found seriously contaminated on ground. He was rescued and urgently moved by helicopter to the Hospital of Reggio Calabria to receive medical examination and treatment.

Physical examination showed a significant injury of left foot and ankle; we observed a wide open wound (around 6 cm) with loss of substance and a

great amount of blood on the medial side of ankle. We found an extrusion of talus bone which was intact anyway. Furthermore Patient showed a left ankle and tarsus-metatarsus dislocation (fig. 1). The functionality of left foot and ankle was impaired.

Once the patient reached the hospital, we performed oblique and lateral X-rays of left foot and ankle. These examinations revealed: the extrusion of talus bone and Lisfranc dislocation.

The patient after clinical, radiological and vascular examinations (which showed absence of posterior tibial artery pulse) was carried in the surgical room. We made antibiotic prophylaxis using Vancomycin (according to the hospital protocol of open fractures) and anti-thrombosis prophylaxis, toilette and serial



Figure 1. Total extrusion of talus after motorbike accident at the arriving at “Bianchi-Melacrino-Morelli” Hospital

lavages by saline solution of wound and extruded talus. We proceeded with immediate reimplantation of talus, restoring normal anatomic ankle and hindfoot architecture. To fix subtalar joint we used 2 K-wires placed on caudo-cranial way and one more K-wire on distal-proximal way to stabilize talo-navicular joint. Under fluoroscopic guidance, we reduced Lisfranc dislocation using 2 percutaneous K-wires (fig. 2). We verified the anterior tibial artery flow and after accurate hemostasis we sutured the wound respecting all anatomical layers. To protect the injured ankle, we made a plaster cast. We prescribed 3 weeks of antibiotic therapy (Teicoplanin 400 mg/12 h, Levofloxacin 500 mg/die and Ceftazidime 2 g/die i.v.), 90 days of anti-thrombosis therapy and no weight bearing for 90 days. The post surgery antibiotic therapy choice was made considering pre-surgery tampon outcome. After 6 weeks we removed K-wires and plaster cast. Patient underwent a rehabilitative protocol to recover left ankle R.O.M. and muscles strenght. After 90 days from the injury,

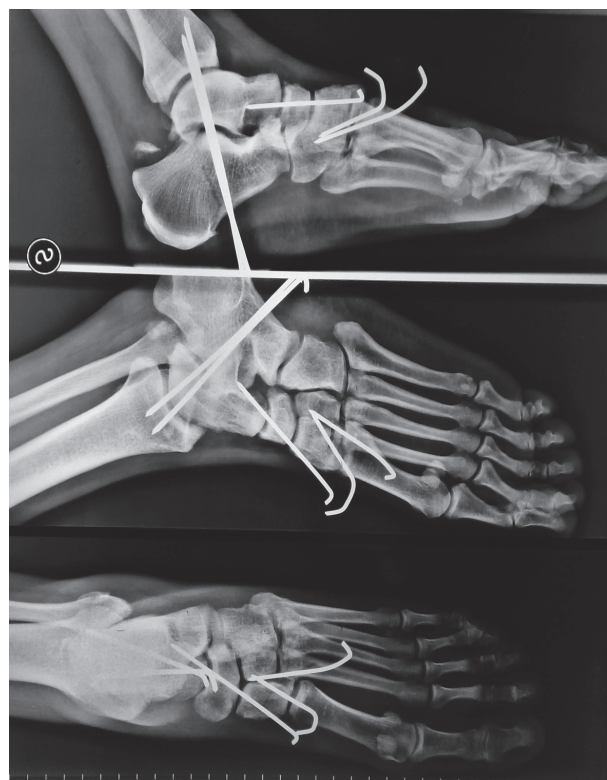


Figure 2. Post-operative X-rays (lateral, dorso-plantar and oblique projection) of talus reimplantation, fixation and reduction of Lisfranc dislocation using K-wires

we allowed protected weight bearing using crutches. During post-operative care we did not record any complication.

The patient underwent outpatient control each month. After 1 month of follow up, the patient referred some pain and functional limitation. At clinical examination there were no signs of infection. X-rays of left foot and ankle highlighted total reduction of talus-metatarsal dislocation and successful reduction of talus fixed by K-wires to calcaneal and tibia bone. After 3 months radiological assessment (MRI, X-rays) showed spongiosa edema of hindfoot bones, scar signs of calcaneofibular, anterior talofibular ligaments and joint capsule, post-traumatic tarsal-metatarsal arthrosis and reduced calcific density (fig. 3). At clinical examination, the patient showed limitation of left ankle dorsal flexion, hindfoot eversion and inversion due to subtalar joint ankyloses. We also found hypotrophy of left leg muscles associated to edema of ankle region and post-traumatic CPRS (complex pain regional syndrome). After 24 months from injury, the patient achieved a fair clinical outcome (AOFAS Ankle Hindfoot Scale: 75). Radiological examinations

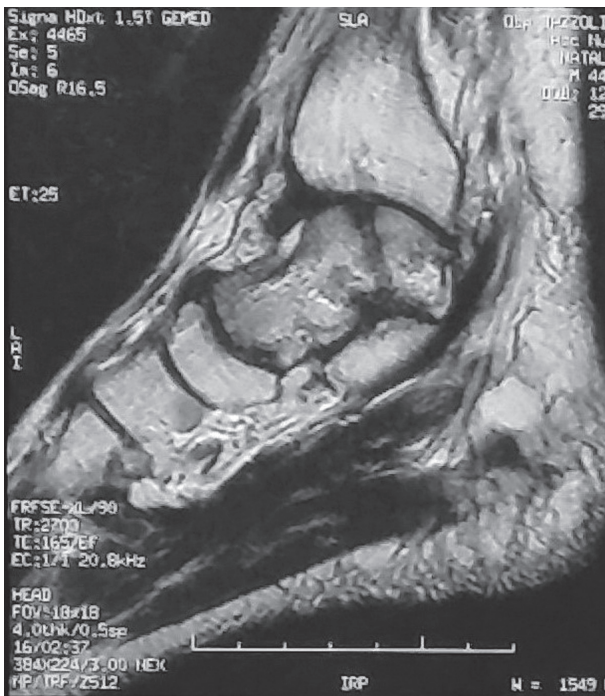


Figure 3. MRI and X-ray of left ankle and foot after 3 months of follow up. No signs of avascular necrosis were recorded

(X-rays, MRI and CT) revealed normal bone structure with radiological signs of post-traumatic arthrosis (fig. 4). They also showed absence of avascular necrosis of talus and total resolution of foot CPRS. Clinically patient revealed acceptable ankle pain (VAS 2) and good range of motion with limitation of ankle dorsiflexion and severe limitation of sub-talar R.O.M.

Discussion

In literature, traumatic total extrusion of talus with interruption of all ligaments (missing talus) is a rare injury (7). It is often caused by excessive ankle plantar flexion or dorsiflexion associated with subtalar supination or pronation in high-energy trauma (13). Considering the exceptionality of this event, treatment choice is still controversial. Surgical management offers several options: immediate replacement of talus, pseudo-arthrodesis (7), amputation, primary tibio-calcaneal arthrodesis (4, 8), talar body prosthesis (9) or total ankle arthroplasty (10, 11). In our case we decided to perform immediate reimplantation, which re-



Figure 4. CT, X-ray and MRI of left ankle and foot after 24 months of follow. No signs of avascular necrosis

cent studies have suggested to be a safe treatment (11). Literature reports very few cases of successful primary reimplantation of talus. Usually talus reimplant was performed using external fixation and showed some complications such as infection or avascular necrosis of talus, promoted by damage of slight talus vascular supply. The immediate replacing need a previous plentiful debridement and serial irrigations to avoid or at least reduce the risk of infection. In a study (2) Authors preferred to delay reimplantation to avoid risk of infection and employed talus-shaped antibiotic cement while waiting for cultural results. We preferred to immediately reimplant talus under antibiotic coverage after serial irrigation and accurate debridement of wound and talus. To perform talus fixation we used just three K-wire and other two to reduce tarsus-metatarsus dislocation. After 5 years of follow up from the injury, the



Figure 5. Clinical examination after 5 years of follow up

patient showed a satisfying functional recovery with the sole limitation of ankle dorsiflexion. However this limitation does not impair his daily life activities (fig. 5). The patient has not developed avascular necrosis, as showed by MRI exams, or infection that in many other cases required a second surgical intervention to realize a tibio-calcaneal arthrodesis.

Conclusions

We concluded that the management of traumatic total extrusion of talus with a primary talus reimplantation and fixation with K-wires is a reasonable and treatment choice to preserve ankle fucti and normal hindfoot anatomy. Therefore this type of treatment doesn't preclude a successive ankle arthroplasty or arthrodesis. The success of such a treatment supports our therapeutic choice. Literature often cites the high probability of side effects such as avascular necrosis, infection, talar collapse; notwithstanding we did not observe them in our case, achieving a good fuctional outcome by means of a less invasive procedure.

Informed Consent: The patient gives his informed consent to the publication of this case report.

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Received: 8 February 2017

Accepted: 14 March 2017

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