



## Case report

# Treatment and outcome of open dislocation of the ankle with complete talar extrusion: A case report



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## ABSTRACT

**Background:** Open total talar extrusion is a severe, disabling ankle injuries. The most appropriate treatment (reimplantation versus talar body removal and tibiocalcaneal arthrodesis) is still a controversial challenge; outcomes and fearful potential complications are not predictable.

**Objective:** To report the case of an open ankle dislocation with talar extrusion, focusing on treatment modality and outcomes.

**Method:** Immediate reduction, surgical debridement and external fixation were performed under antibiotic coverage. Wound closure was achieved with accurate debridement, postoperative strict clinical surveillance and meticulous handling of medications. The patient maintained external fixator for three weeks, then kept non-weight bearing with a cast for an additional four weeks.

**Results:** The patient's wound healed with no complications. Full weight-bearing was gained at 12 weeks postoperation. At 18 months postoperatively, the patient did not develop any infection or avascular necrosis, which are the major complications associated to talar extrusion.

**Conclusions:** Good treatment procedure for a such severe open trauma, based on accurate debridement, wound care and stable temporary immobilization with external fixation allow reduction of infection risk and made preservation of extruded talus a successful option to preserve function and normal hindfoot anatomy at first instance. Talectomy should be considered as a salvage procedure.

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## 1. Introduction

Open total talar extrusion is rare but it is one of the most severe, disabling ankle injuries. It requires a high-energy trauma and it is often accompanied by severe soft-tissue damage, wound contamination and fractures of the malleoli, talar body or neck [1]. Complete dislocation of the talus without a concomitant fracture is extremely rare, estimated at 0.06% of all dislocations and 2% of all talar injuries [2,3]. It was first reported by the German surgeon Fabricius Hildanus in 1680 and treated by talectomy [4]. Given the rarity of this type of injury, current literature describes only few case reports and small series with limited follow-up [1,5–9]. Since indications for talar reimplantation versus talar body removal are still controversial, there is no established treatment protocol

yet [8,10]. It is well demonstrated that disruption of the vascular supply and contamination lead to major complications, such as infection, osteomyelitis and avascular necrosis (AVN). The high risk of these complications is associated both with the traumatic ankle injury itself and subsequent talar reimplantation into the mortise [6,11–13]. On the other hand, early talectomy with tibiocalcaneal arthrodesis have not demonstrated satisfactory results [8,11,13]. We report the case of an open, complete dislocation and extrusion of the talus, focusing on outcomes of talar reimplantation and the importance of prompt reduction, debridement and external fixation for a favorable prognosis.

## 2. Case report

A 17-year-old man injured his left foot in a motorcycle accident on February 2012. The patient was brought to the Emergency Department of our level-II Trauma Center 30 min after the accident. The vital findings of the patient were stable; clinical examination revealed a 15-cm transverse skin cut on the anterolateral side of the ankle and the tibio-fibular mortise was exposed with the talus completely enucleated laterally; soft tissues of the ankle were

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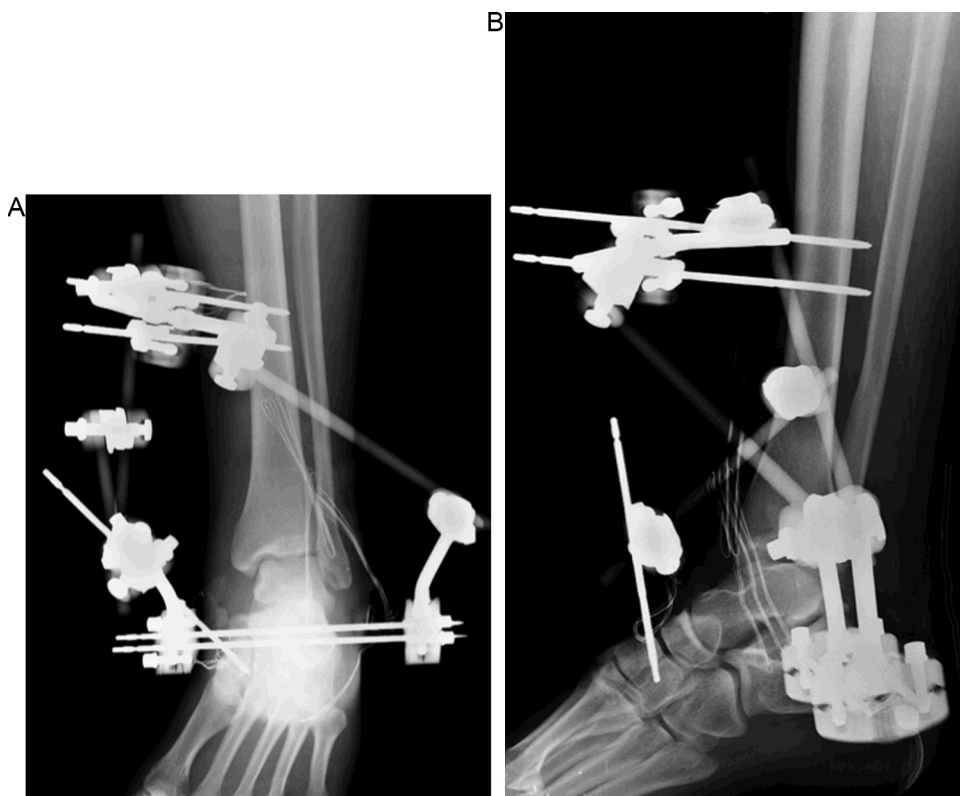
**Fig. 1.** Clinical picture. Clinical presentation of the injured ankle with total talar extrusion.

contaminated and seriously damaged (Fig. 1). There were no associated malleolar fractures, or grossly apparent fracture of the talus nor articular cartilage damage. The dorsalis pedis and posterior tibial arterial pulses were absent. Thus, after a quick irrigation with saline solution and povidone iodine, an immediate manual traction was applied to the calcaneus and pressure was exerted in posteromedial direction holding the foot in extremely supination, thus placing back the talus in its physiological position (Fig. 2). The talus was loosely held by a few remaining capsule-ligamentous strands, which were left intact and reapproximated anatomically upon reduction. Standard radiographs were not obtained because of the urgency to treat the open injury. Arterial pulses got back to being palpable after reduction of talar dislocation. Broad-spectrum intravenous antibiotics were administered. The patient was brought to the operating room within 1 h from the injury to complete



**Fig. 2.** Post-injury presentation. Photograph of the ankle after talar reduction and reimplantation.

the surgical procedure. Intraoperatively, the soft tissues of the anterolateral side of the ankle were severely crushed and grossly contaminated with grass and asphalt. Under general anesthesia, the wound was irrigated with saline solution, chlorhexidine, povidone iodine and hydrogen peroxide; repeated irrigations were then performed by using 5 L of normal saline solution and gentamicin. After irrigating and debridement, the wound was explored to ensure that neurovascular structures, tendons, and bones were intact. After a fluoroscopic control of the left foot and ankle, a temporary stabilization of the ankle was obtained by using an external fixator Hoffmann® II System (Stryker Trauma AG, Selzach, Switzerland) in a delta-frame construct across the left ankle with two pins in the tibial diaphysis, two transosseous pins through the calcaneus and one through medial cuneiform, and the ankle was stabilized in a



**Fig. 3.** External fixator positioning. (A) Postoperative anteroposterior radiographs showing external fixator positioning (B) lateral radiographs of the operated ankle.

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