



Case report

Open tuber calcaneus fracture caused by a meat cleaver: A case report

Serkan Tuna ^a, Tahir Mutlu Duymus ^b, Serhat Mutlu ^{b,*}, Ismail Emre Ketenci ^a^a Department of Orthopaedics, Haydarpasa Numune Training and Research Hospital, Istanbul, Turkey^b Department of Orthopaedics, Kanuni Sultan Suleyman Training and Research Hospital, Istanbul, Turkey

HIGHLIGHTS

- Avulsion fractures of tuber calcanei are very rarely observed.
- Direct blunt trauma to the back of the leg and direct penetrating injury (gunshot) are also infrequent causes.
- Computed tomography is beneficial in specifying the type and size of the fracture.
- Anatomic reduction and early mobilisation are the advantages of surgical treatment.
- Delaying surgery may lead to skin necrosis and severe soft tissue complications.

ARTICLE INFO

Article history:

Received 20 January 2015

Received in revised form

16 July 2015

Accepted 16 July 2015

Keywords:

Open calcaneal avulsion fracture

Meat cleaver

Cannulated screw

ABSTRACT

Introduction: Avulsion fractures of the tuber calcanei classically occur after falling on the foot, due to the forced dorsiflexion and the sudden contraction of the Achilles tendon. Direct trauma to the back of the leg and a direct penetrating injury are also infrequent causes and may be observed predominantly in younger patients.

Presentation of case: We present a case of an open tuber calcaneus fracture resulting from a penetrating trauma in a 37-year-old patient. The fracture was reduced through the open wound and fixed using two cannulated screws. Bone union was radiologically and clinically observed at the end of the first year.

Discussion: During a physical altercation, the posterior of the patient's heel was struck directly with a meat cleaver. The position of the patient during the trauma can be considered to have increased the severity and depth of the injury. In addition, even though the injury radiologically resembled an avulsion fracture and was caused by direct trauma, the fact that it was open and that the mechanism of injury differed from the norm means that it should not be evaluated as a classic avulsion fracture in the full sense. Emergency open reduction and internal fixation were applied to an open calcaneal tuberosity fracture, and the patient was started on intravenous antibiotic therapy.

Conclusion: Surgical techniques are successful in the treatment of open tuber calcanei fractures and an open intervention is usually required. Using cannulated screws is a good treatment option.

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1. Introduction

Calcaneal fractures are the most frequently observed type of tarsal fracture. Although they account for 2% of all bone fractures, 25%–40% of these are extra-articular fractures [1,2]. Avulsion fractures of the tuber calcanei also account for between 1.3 and 2.7% of all calcaneal fractures [3]. The back end of the fracture in particular

may be displaced towards the posterosuperior aspect and may pierce the skin.

An avulsion fracture of the tuber calcaneus is a rare condition that occurs due to a sudden contraction of the Achilles tendon [4]. Osteoporosis, osteomalacia, diabetes mellitus, peripheral neuropathy, and long-term immunosuppressive treatment are all important risk factors for avulsion fractures of the calcaneus [5]. The frequency of these fractures has been reported to increase in the seventh decade in females, in parallel with a reduction in bone density [5,6]. Tuberosity avulsion fractures usually occur due to a sudden and violent pull of the gastrocnemius–soleus complex caused by a forced flexion of the foot during a low-energy stumble and fall [1,5].

* Corresponding author. Orthopedics and Traumatology Department, Kanuni Sultan Suleyman Education and Research Hospital, Atakent Mahallesi, Turgut Ozal Caddesi, No:1, 34303 Kucukcekmece/Istanbul, Turkey.

E-mail address: serhatmutlu@hotmail.com (S. Mutlu).



Fig. 1. Open avulsion fracture of the calcaneus.

Although the majority of calcaneal fractures are treated conservatively, calcaneal avulsion fractures require surgical treatment [2,7]. As the calcaneus is the point of attachment of the Achilles tendon, there is a permanent displacement of the fracture fragment. However, as in all other open fractures, open avulsion fractures require urgent intervention and treatment. This study evaluated the relationship between the position of the patient at the time of injury, the type of instrument (i.e., a direct cutting instrument) that caused the injury, and the location of the injury.

2. Case presentation

A 37-year-old male was admitted to the emergency room with a deep cut in the posterior aspect of his right foot, caused by a penetrating trauma originating from a meat cleaver. During a physical fight the patient fell to his knees, with his ankle in dorsiflexion and toes in extension, and was exposed to a manual, direct cutting injury. The patient's history was uneventful. Physical examination revealed a 12-cm long, deep transverse laceration on the posterior aspect of the right ankle, which had intersected the bone (Fig. 1). The avulsed section of the calcaneus was visible through the open wound line. The patient was unable to stand on his toes or to walk, and the Thomson's test was negative. Radiological evaluation



Fig. 2. Radiological view.



Fig. 3. X-ray on the first postoperative day.

indicated a beak-type calcaneal avulsion fracture, which was classified as Type II according to the Beavis classification (Fig. 2).

The wound site was dressed after debridement and thorough irrigation, and a splint was applied. The patient was vaccinated against tetanus, and Cefazolin sodium (1 g) was administered intravenously as antibiotic prophylaxis and was continued for 2 weeks at a dose rate of 3×1 g. The patient underwent surgery the following day. Without creating an additional incision, the fracture



Fig. 4. Wound healing.

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