

# Avulsion Fracture of Calcaneal Tuberosity and Heel Pad in Compound Injury: Treatment with an improved technique.

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## Abstract

*Avulsion fracture of the calcaneal tuberosity with complete tendo-achillis tendon discontinuity is a rare extra-articular injury which is difficult to treat. We present a young male patient who sustained a road traffic accident (RTA) presented with calcaneal tuberosity, complete tendo-achillis and heel pad avulsion in a compound wound. The purpose of this report is to emphasize the comparative rarity of this case particularly those that are due to direct trauma and to highlight that it should be treated urgently to avoid soft tissue complications and with an improved operative technique for the above injury showing immediate full range of motion and early full weight bearing.*

*Keywords: avulsion of calcaneal tuberosity, compound injury, tension band wiring*

## Introduction

Avulsion fractures of the calcaneal tuberosity are rare extra-articular injuries that usually occur indirectly from forced ankle dorsiflexion. Direct trauma to the calcaneal tuberosity is an infrequent cause particularly in young adults. These fractures associated with compound injury along with heel pad avulsion are rare [1-5]. Failure to treat these injuries on urgent basis may result in soft tissue complications. The purpose of this report is to emphasise the rarity of the fracture with heel pad avulsion in a compound injury and the improvised technique for fixation of the both at same time.

## Case presentation

A young male presented to trauma centre with the compound calcaneal avulsion injury. X-ray showed small avulsed fragment of the calcaneum (Fig 1). On examination of the compound wound there was complete discontinuity of the tendo-achillis tendon along with heel pad avulsion. Wound culture was taken. He was posted for emergency surgery with needful investigations. Intra-operatively it was found that the upper one-third of the calcaneal tuberosity was avulsed with the bony fragment.

Two K-wires were passed from avulsed heel pad and the bony fragment was reduced and fixed with the same K-wires (Fig 2). Further compression given by fig. of 8 circlage wiring. Both the K-wires were bend and fully rotated further increasing the stability of fracture as well as fixing the avulsed heel pad at same time (Fig 3a,b). The

compound wound was sutured with prolene suture material. The patient was discharged in a below-knee cast in planterflexion with window at the surgical site. At 2 wks during follow-up when the surgical wound got completely healed. Physiotherapy in the form of full range of dorsiflexion and planterflexion was allowed. At 6 wks he was allowed to partial weight bearing and followed by full weight bearing after 8 wks. During this period the patient was referred to physio-therapist with an emphasis on heel cord stretching. X-rays taken after 8 wks showed early signs of union (Fig 4). After union, an ankle orthosis was given for further 3 to 4 wks. The patient returned to work 9 wks after the injury. The patient had no residual disability.

## Discussion

Avulsion fractures of the calcaneal tuberosity and heel pad in compound injury are rare. It has been described as occurring from direct trauma in RTA which is an infrequent cause [3,4]. Management and treatment is urgent debridement and fixation of the fracture fragments. It should be remembered that the soft tissue overlying the Achilles tendon and calcaneal tuberosity is thin with a precarious blood supply [2,6]. For these reasons these fractures should be treated as emergencies with open reduction and internal fixation.

Methods of fixation include suturing of the avulsed bone fragment, suture anchors, screw fixation and tension band wiring (TBW) as performed in the present case report. A better method of fixation would be TBW as described by Brunner and Weber. Union in these fractures has been reported in the literature from 10 wks to a year. Cooper, et al., reported a similar case of an open fracture of calcaneal tuberosity. The patient was treated with wound debridement, open reduction and internal fixation and intravenous antibiotics as an emergency. The fracture united with no disability. In our case too the fracture united without any complications.

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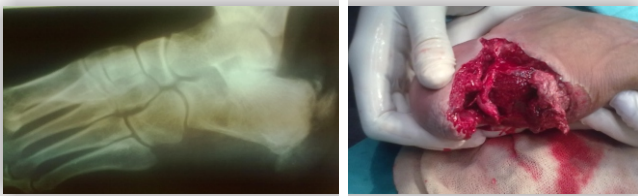


Figure 1. Radiograph showing Figure 2: Intra-operative calcaneal tuberosity avulsion showing heel pad and fracture calcaneal tendon avulsion.



Figure 3a: Intra-operative photograph showing tension band wiring.

Figure 3b: Radiograph showing reduction of fracture with tension band wiring.



Figure 4: Radiograph at 8 wks after removal of implant showing good fracture union.

Figure 5: Pt standing full weight bearing after 9 wks with wound completely healed.

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### Conclusion

Compound tuberosity avulsion fractures are rare, particularly those due to direct trauma. They represent a subset of calcaneal fractures that should be addressed urgently to avoid complications. Non-operative treatment has been shown to yield poor results. The golden standard is early surgical intervention when indicated. We have a newer technique to manage both heel pad and calcaneal avulsion at the same time with TBW.

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