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## A Rare Case of Avulsion Fracture of Calcaneum Tuberosity.

G Sundaresan, Anwar Sathik S\*, and Mathivanan.

Department of Orthopaedics, Sree Balaji Medical College & Hospital, Bharath University, Chrompet, Chennai 600044, Tamil Nadu, India.

### ABSTRACT

Calcaneal tuberosity Avulsion fracture are pretty rare and accounts about 1.5% to 2% of calcaneum fracture. The initial evaluating physician must recognize the signs of skin at risk so that treatment can be offered urgently. Conservative treatment has been shown to yield poor results. Hence early surgical intervention is mandatory.

**Keywords:** avulsion fracture, tuberosity.

*\*Corresponding author*

## INTRODUCTION

Calcaneal tuberosity Avulsion fracture are pretty rare, and form of extraarticular injury. This type of fracture accounts about 1.5% to 2% of calcaneum fracture. These fractures occur mostly in females in seventh decade.

## CASE REPORT

56 year old female Patient came with h/o slip and fall at home and C/O Pain & swelling in the left ankle. Movements of left ankle are painful and restricted and not able to weight bear or plantarflex.

### On Examination

There was Severe tenderness present over the posterior aspect of the calcaneum. Range of movements painful and restricted. There was slackening of the Achilles tendon. No gap was felt in tendoachilles. Thompson test positive (Calf muscle compression). No distal neurovascular deficits. Preoperative evaluation was done



Patient was taken up for surgery. ORIF with cannulated cancellous screws with washer fixation was done.



Regular dressing done the fracture is then protected in a below knee Equinus cast for six to eight weeks non-weight bearing. X-ray was taken and see for fracture uniting and patient was send to Physiotherapy for tendoachillis stretching exercises and then full weight bearing. Patient was able to stand on heels, climb stairs.

**ANATOMY**

The posterior facet of calcaneum is the main weight bearing surface and the largest facet, Calf muscle is strong lever arm which helps the body to transmit weight to the ground.

The middle facet is anterior and medial and is on sustandaculam. The sustendaculam is under the talar neck and is medial to calcaneal body. It is attached to the talus by talocalcaneal ligament. In lateral surface is origin of adductor digiti minimi. Abductor hallucis muscle gets origin from medial process and is major weight bearing structure in hind foot. Achilles tendon is inserted in to posterior tuberosity of calcaneun.

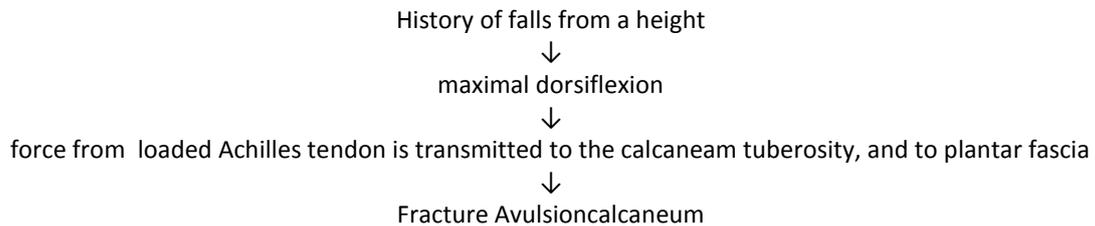
**Mechanism of Injury:**

1. Dorsiflexion violence
2. Violent gastro-soleus muscle contraction with simultaneous extension of the knee
3. Direct blow to the hind foot
4. Direct penetrating trauma
5. Neuropathic fractures

**Etiology:-**

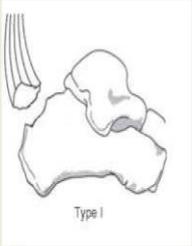
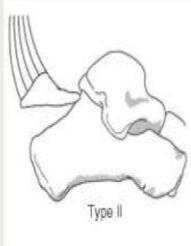
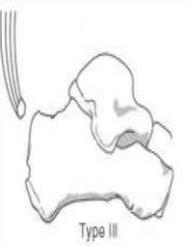
1. Fall from height causing dorsiflexion of foot
2. Sprinting
3. Gunshot
4. Blunt Trauma

**Pathogenesis:**



**Classification**

**Beavis, et al Classification**

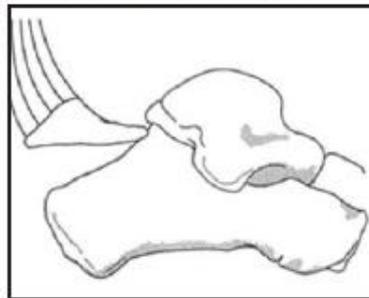
TYPE 1	TYPE 2	TYPE 3
True avulsion fracture or 'sleeve' type tuberosity fracture described by Rothberg.	This is a 'Beak' type of avulsion fracture. In these fractures there is an oblique fracture line running posteriorly from just behind the Bohler's angle.	Infrabursal avulsion fracture from the middle third of the posterior tuberosity. <sup>12</sup> This is very rare.
		
Type I	Type II	Type III

**Our case comes under Type 2 (Beak type Avulsion fracture)**



**TYPE 2**

This is a 'beak'-type of avulsion fracture. In these fractures there is an oblique fracture line running posteriorly from just behind the Böhler's angle.



**Figure 9. Type 2**

**Risk factors**

- Age : Degeneration of tendoAchilles insertion and diminished bone density in the elderly particularly females.
- Osteoporosis : Diminished bone density.
- Neuropathic disorders: Repeated microtrauma. e.g diabetes mellitus.
- Metabolic diseases : Diseases like osteomalacia, hyperparathyroidism, amyloidosis, end stage renal failure, rheumatoid arthritis.
- Drugs : FLUROQUINOLONES, SMOKING, CORTICISTEROIDS..

**Methods of fixation include**

- Avulsed bone fragment can be sutured,
- suture anchors,
- tension band wiring and
- screw fixation with metal washer as reported.
- The treatment of choice depends on
- Size of the avulsed fragment and the degree of osteopenia.
- It there is radiological evidence of bony union.healing takes longer time as the screw purchase is poor.
- The fracture is then protected in below knee equinus cast for six to eight weeks non-weight bearing



### **CONCLUSION**

These are rare extra articular injuries, which Occurs due to forced dorsi flexion. These represent 1.3% of calcaneal fractures, Tuberosity avulsion fractures due to direct trauma is rare. They represent a subset of calcaneal fractures that should be addressed urgently to avoid skin complications, and sepsis. The initial evaluating physician must recognize the signs of skin at risk so that treatment can be offered urgently. Conservative treatment has been shown to yield poor results. Hence early surgical intervention is mandatory [1-6].

### **REFERENCES**

- [1] Rothberg AS. Avulsion fracture of the os calcis. JBS 193921A: 218-220.
- [2] Heckman JO. Fractures and dislocations of the foot. In:
- [3] Rockwood CA, Green DP, Bulchoz RW, Heckman JO (editors).
- [4] Rockwood and Greens Fracture in Adults. Volume 2, 4th ed.
- [5] Philadelphia: Lippincott-Raven 1996: 2332-2333.
- [6] Beavis RC, Rouke K, Court-Brown C. Avulsion fracture of the calcaneal tuberosity. Foot & Ankle International/2008:863-6.