



Case Study

AVULSION FRACTURE OF THE CALCANEAL TUBEROSITY: REPORT OF TWO CASES WITH LITERATURE REVIEW

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ABSTRACT

Avulsion fractures of the calcaneal tuberosity remains rare; they usually caused by forced ankle dorsiflexion; direct trauma occur infrequently; it must be treated immediately; to avoid the skin necrosis of the posterior heel; the treatment approach is of interest in this rare injury and the operative management is based on a review of the literature. ;

Non operative treatment is classically associated with bad results. Hence the surgical intervention is generally the treatment of choice. The authors report two cases of unusual avulsion fractures of the calcaneal tuberosity treated by open reduction and internal fixation with a good functional result.

KEY WORDS: avulsion fracture, calcaneal tuberosity, treatment

INTRODUCTION

Calcaneal tuberosity Avulsion fractures are relatively uncommon extra-articular injury. This type of fracture accounts about 1.3% to 2.7% of calcaneum fracture [1]; they usually caused by forced ankle dorsiflexion; other fractures are due to sudden concentric contraction of the gastrocnemius-soleus with simultaneous extension of the knee[2] ,such risk factors have been reported as Osteoporosis ,ostopenia, Neuropathic disorders Metabolic diseases [3]. The fracture must be reduced and fixed urgently to avoid skin complications and the choice of technique depends on the size of the avulsed bone fragment and the quality of bone

PRESENTATION OF CASES

Case n ° 1

A 40 year old male patient sustained a fall during a sporting exercise; the position of ankle was in forced dorsiflexion; he presented with pain and swelling of right ankle, on examination; the movement of ankle are painful and restricted; with loss of plantar flexion power. ; The imagery shows avulsion fracture of the calcaneal tuberosity Figure 1 the patient treated by open reduction of small bone fragment which is introduced and secured in a tunnel drilled through the calcaneum. And fixed by screw of interference followed by a plaster immobilization for 6 weeks associated with functional rehabilitation

Case n ° 2

A 50 year old male patient ; diabetic; sustained a left ankle closed injury following a fall, when climbing stairs, one



week prior to presentation . The patient reported immediate pain and restricted movement of the left ankle. . On physical examination, there was mild swelling of the left ankle, with prominence of the heel and plantar flexion deficit

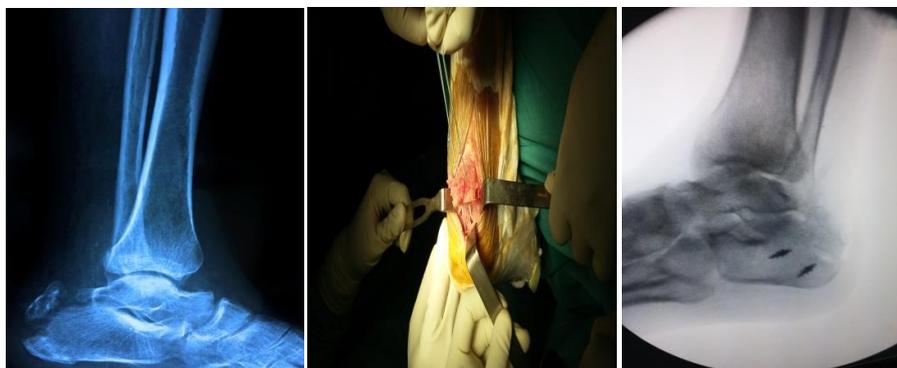
The radiographs revealed avulsion fracture or ‘sleeve’ type tuberosity fracture. Figure 2

The patient treated by open reduction of avulsed fragment and fixation by anchors suture. Followed by Immobilisation in short-leg equinus cast for a period of six weeks followed by functional rehabilitation.

Figure 1: Pre-operative and post operative radiographs of infrabursal avulsion involving superficial fibers of Achilles tendon (type3 Beavis et al)



Figure 2: Pre-operative and post operative radiographs of a fracture of posterior calcaneal tuberosity.(type 1 Beavis et al)



DISCUSSION

Avulsion fractures of the calcaneal tuberosity are rare occurrence injuries. The incidence reported for these particular fractures in the literature range between 1.3% to 2.7% of all calcaneal fractures 1. A high rate was observed in older women because of diminished bone density 4 Most of these injuries are a result of indirect trauma produced by falls causing sudden forced dorsiflexion; with pull of Achilles tendon; the forces transmitted mainly via Achilles tendon to calcaneal tuberosity causing avulsion of a fragment of bone.

According to the literature 6, tuberosity avulsions were classified into two types; those that do not involve the insertion of the Achilles tendon and those that do involve the insertion of the Achilles. Beavis and al 7 modified this classification through addition of another avulsion type 3 in which there is an infrabursal avulsion involving superficial fibers of Achilles tendon

Management and treatment is often dependent on many factors as the age, type of avulsion; the size of avulsed fragment; quality of bone; and functional demands of the patient 2

Avulsion fracture of the tuberosity of the calcaneum has been previously described by malgaine in 1843 5

Though Prothere 8stated that the operative correction is an emergency because of the risk of pressure necrosis of skin overlying displaced fragments and the Achilles tendon

Non operative treatment is done by closed reduction followed by an immobilization. In a short-leg non weight bearing equinus cast for 6 to 12 weeks; the reduction is achieved by simultaneous flexion knee and the ankle, with pushing the displaced fragment. Such complications have been reported after non operative treatment as re-displacement, nonunion and loss of plantar flexion power 9.

For these reasons; many authors recommend treatment with open reduction and internal fixation 10.

Various Methods of fixation include suturing of the avulsed bone fragment, suture anchors, tension band wiring and screw fixation 2

In contrast to the other techniques, the use of suture anchors or interference screw was technically simple and these repair agents are elegant solution since they are thrust into the bone; therefore they don't cause a pressure of the thin skin at the back of the heel. And the two patients treated operatively using these techniques of fixation, had a good final outcome;.

CONCLUSION

These are rare and infrequent injuries. Which should be treated as an emergency to avoid complications; the outcome is dependent on the method of treatment and presence of risk factors. Two of our cases, had a successful outcome. We therefore recommend internal fixation using the suture anchors or interference screw we found this technique simple and easy to perform without the fear of damaging the skin of posterior heel.

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