Avulsion fracture of the calcaneal tuberositu:Case report and literature review

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Introduction

Avulsion fractures of the calcaneal tuberosity are extra-articular and have an incidence of 1-3% of all calcaneal fractures. Elderly women with medical conditions associated with poor bone quality are more susceptible to sustain these fractures.

The most frequent mechanism implied is a sudden and violent contraction of the gastrocnemius-soleus complex combined with forced dorsiflexion of the foot. As the tuberosity is the insertion site of the Achilles tendon, these fractures cause avulsion of a fragment that is generally displaced superiorly.

Neuropathic fractures are a different entity, usually related with peripheral neuropathy. Patients usually have diminished pain perception and proprioception and present in the hospital without a history of trauma.

Calcaneus has a poor vascularization that is performed by terminal branches of the tibial posterior artery, which gradually decrease with aging. For this reason, skin necrosis is a potential complication of calcaneus fractures. Delays in performing surgery are associated with higher rates of soft tissue impairment.

Surgery is the treatment of choice for the majority of the cases in order to restore the function of the sural triceps muscle and prevent secondary soft tissue complications. Open reduction and internal fixation with lag screws is the most accepted method. However, several other fixation methods have been described in the literature with satisfactory results reported.

The aim of this work is to present a case of an avulsion fracture of the calcaneal tuberosity successfully treated.

Clinical case

- **Female, 72 years old**
- Presented at ER after a fall preceded by a sudden movement of her left leg. At physical examination the patient had deformity of the ankle and was unable to bear weight on the affected limb.
- Thompson test +.
- Normal neurovascular examination.
- **CT**: **Comminuted fracture of the posterior calcaneal tuberosity with displacement of a fragment that contained the insertion of the Achilles tendon.**
- Treatment: Under fluoroscopic control, **open reduction and fracture fixation with two lag screws** was performed and anatomic reduction was achieved.
- The affected leg was immobilized with a cast for **6 weeks** and partial weightbearing was allowed.
- **Follow up:** the patient had no soft tissue impairment in her ankle and gradually recovered her ability to walk.

Fig. 1 – Rx at admission

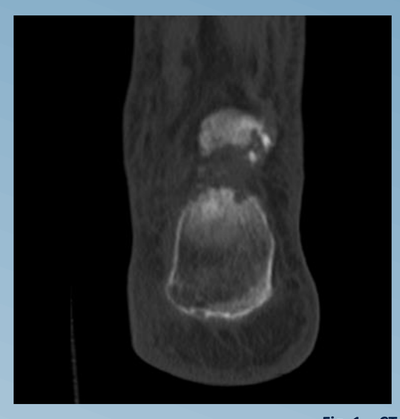

Fig. 1 – CT at admission

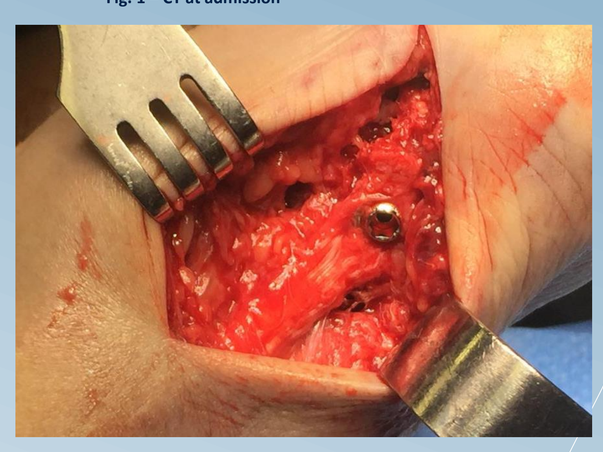

Fig. 4 and 5: Intra operative images before and after fixation with lag screws

Fig. 6: RX after surgery

Conclusion:

Despite its rarity, it is expected that the incidence of avulsion fractures of the calcaneal tuberosity will rise in the next years, due to the increasing prevalence of aging and medical conditions associated with loss of bone quality, such as diabetes and osteoporosis.

Fixation of the fragment with lag screws is an effective technique but might not be the best option for all cases due to the tensile forces supported by the Achilles tendon during daily activities. These forces can be 10 times higher than the body weight and stronger fixation methods may be required for fractures with smaller fragments or for patients with poor bone quality. For this reason, a detailed preoperative evaluation is necessary to achieve more stable osteosynthesis with fewer complications.

Referências

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