

Rupture of the distal achilles tendon by osseous avulsion: transcalcaneal reintegration by anchors: a case report

Abstract

The frequency of calcaneal tendon ruptures is on the rise. Typically, they are situated in the mid-tendon region. Calcaneal avulsion is an exceptional variety. A 50-year-old male, who was diabetic and on insulin, sought medical attention for an acute distal rupture of the left calcaneal tendon. The patient was under observation for 12 months due to tendinopathy. A bony avulsion of the calcaneal insertion of the tendon was observed during surgery, accompanied by an inflammatory aspect. Two anchors enabled the distal reinsertion of the calcaneal tendon, which was subsequently immobilised for eight weeks and subsequently subjected to a rehabilitation protocol. The Achilles tendon's function was partially restored, and the ankle's mobility was flawless. The results were deemed adequate.

Keywords: calcaneus tendon, tendon rupture, avulsion, anchors

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Lahrach Kamal, Radi Jihad, Marzouki Amine, Boutayeb Fawzi

Department of Traumatology and Orthopedics A of CHU Hassan II Sidi Mohammed Ben Abdellah University of Fez, Morocco

Correspondence: Lahrach Kamal, Department of Traumatology and Orthopedics A of CHU Hassan II Sidi Mohammed Ben Abdellah University of Fez, Morocco, Email k.lahrach@hotmail.com

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Introduction

The frequency of Achilles tendon ruptures is on the rise. The average age is 40 years, and males predominate.¹ The rupture site is typically situated in the hypovascularized mid-tendon zone, proximal of the calcaneal insertion, and is subject to variation. Avulsion of the calcaneus is an exceptional form, while the rupture is musculotendinous nearer the site. Chronic tendinopathy or acute rupture of the calcaneal tendon can result from a variety of causes.² In the majority of instances, it is an indirect mechanism; it is uncommon for a direct impact or trauma to occur. The clinical diagnosis is based on the presence of a positive Thompson sign, a loss of physiological equinus, impossible monopodal support in plantar flexion, and palpable depression at the hindfoot level. A posterior calcaneal avulsion is the primary objective of a lateral ankle radiograph. In the evaluation of chronic ruptures and the differentiation of potential partial ruptures from complete ones, ultrasound and MRI are particularly beneficial.

Clinical evaluation

A 50-year-old male, who was diabetic and on insulin, sought medical attention for an acute distal rupture of the left calcaneal tendon. The patient was under observation for 12 months due to tendinopathy. Initially, the tendinopathy was treated with analgesics and anti-inflammatory medications; however, there was no improvement. Following this, a corticosteroid infiltration was done. The patient reported experiencing the typical symptoms of a calcaneal tendon rupture during an abrupt acceleration. These symptoms included a cracking sound that resembled a kick in the lower calf, discomfort in the hindfoot, and functional impotence of the lower limb. A positive Thompson sign, a loss of physiological equinus, and a distal notch were identified during the clinical examination of the tendon path. A bone avulsion of the calcaneal tuberosity was observed on the lateral ankle radiograph (Figure 1).



Figure 1 The lateral ankle radiograph showed a bone avulsion of the calcaneal tuberosity.

Technical description

A transosseous reinsertion is implemented. The procedure was conducted in the ventral decubitus position under spinal anaesthesia. The posterior longitudinal approach (Figure 2) revealed an avulsion of the bony insertion of the calcaneal tendon with an inflammatory appearance (Figure 3). The posterosuperior face of the calcaneus was refreshed, and the calcaneal tendon was reinserted using two transosseous anchors (Figure 4). A resin brace that maintains the ankle at 30° flexion for 8 weeks, followed by a rehabilitation phase that involves a progressive resumption of support under the cover of a compensatory heel for 1 month. The ankle was painless and had an excellent recovery of strength at six months. Consequently, a strength deficit of only 25% was observed, which did not have a significant influence on the ankle's functionality.



Figure 2 Posterior longitudinal approach.



Figure 3 Avulsion of the bony insertion of the calcaneal tendon with an inflammatory appearance.



Figure 4 Reinsertion of the calcaneal tendon using two transosseous anchors.

Discussion

Currently, there are numerous studies being conducted to investigate the impact of diabetes on calcaneal tuberosity avulsion fractures. For example, Hong et al discovered that diabetes was present in two-thirds of fracture patients.³ Avulsion fractures may be exacerbated by low-energy forces due to the reduced calcaneal bone mineral density in diabetic patients. The bone mineral density of diabetic patients has been found to be lower in certain investigations.⁴ Almost all patients reported in the literature take corticosteroids, which are a significant factor in the occurrence of tendon ruptures. Glucocorticoids inhibit fibroblast proliferation⁵ and stimulate collagenase activity.⁶ Diverse histological manifestations of inflammation have been documented at the rupture site:⁷ collagen degeneration, vacuolar myopathy,

neovascularisation, and perivascular mononuclear inflammatory infiltrate. There is no internationally recognised standard treatment for AT avulsions. Consequently, the inability to perform percutaneous tenorrhaphy or open suture is a consequence of the insufficient calcaneal tendon remnant. However, there are alternative methods, such as transosseous tendon reinsertion by anchors.⁸ Skin closure is one of the primary challenges associated with reinsertion surgery for an avulsed AT, as it is imperative to prioritise the gastrocnemius muscle and skin retraction. Despite the fact that numerous transverse incisions have been documented, the majority of surgical techniques employ longitudinal skin incisions of varying lengths. Hanna⁹ described a case of distal calcaneal tendon rupture without bone avulsion that was treated by transcalcaneal reinsertion using an anchor, a technique that is similar to ours. Bunnell sutures were employed to facilitate the reinsertion of the calcaneal tendon by anchors. Janis and Massa¹⁰ reported a case of chronic rupture of the calcaneal tendon with bone avulsion following immobilisation for 5 weeks with a cruro-pedal splint and subsequent rehabilitation. After the degenerative portion was excised and the posterior surface of the calcaneus was refreshed, a fastener with a washer was used to reinsert it. Nevertheless, Muller¹¹ has identified a potential risk of tendon necrosis associated with this technique. The reinsertion technique employed by Maniscolo et al.¹² involved the use of three titanium anchors, with passive rehabilitation commencing in the third week. This was followed by the use of a walking brace, which resulted in a progressive reduction of equinus over approximately four weeks. This method provides a higher level of resistance to the assembly, which enables earlier rehabilitation.

Conclusion

The literature rarely contains descriptions of the distal Achilles tendon being ruptured by osseous avulsion. Early diagnosis is feasible through meticulous examination. The optimal treatment for the restoration of ankle mobility and strength appears to be transosseous reinsertion of the tendon.

Acknowledgments

None.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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