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Case Report

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Anterior fibulocalcaneus muscle: a must-see when performing arthroscopic Brostrom

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ABSTRACT

Accessory muscles of the ankle and hindfoot are rare anatomical variants that are typically asymptomatic but may become clinically significant following trauma or surgery. The anterior fibulocalcaneus muscle (AFCM) is a rare accessory muscle, with limited documentation in the literature and no previously reported symptomatic cases requiring surgical intervention. The authors present the case of a 32-year-old man with persistent lateral ankle pain and instability following high-energy trauma and surgical fixation of a medial malleolar fracture. Despite appropriate bone healing, the patient's symptoms persisted until MRI identified an accessory muscle tendon consistent with the AFCM, originating from the distal fibula and inserting onto the anterolateral calcaneus. Its superficial trajectory over the anterior talofibular ligament (ATFL) risked intraoperative misidentification as part of the lateral ligament complex, potentially leading to inadvertent preservation or tensioning during repair. Surgical excision of the AFCM tendon, combined with lateral ligament repair, resulted in complete resolution of symptoms and full functional recovery. This case highlights the importance of considering accessory musculature that can mimic or obscure native ligaments and complicate surgical management of chronic post-traumatic ankle pain, and demonstrates that surgical excision can be effective when such variants are implicated.

Keywords: Accessory muscle, Anterior fibulocalcaneus muscle, Ankle pain, Foot and ankle surgery, Post-traumatic ankle

INTRODUCTION

Accessory muscles in the ankle and hindfoot represent anatomical variations with variable prevalence. While the peroneus tertius (with a frequency varying from 40 to 98%) and peroneus quartus (4–18%) are relatively common, others like the AFCM remain less documented, with no established prevalence rates reported. 1–6 While generally asymptomatic, these structures may become clinically relevant when they contribute to compressive neuropathies, alter biomechanics, or mimic native anatomical structures intraoperatively.[7–10] Usually, if present, pain is localized to anterolateral aspect of the tibiotalar joint, resulting from mechanical stress of the tendon against the bone. The AFCM typically originates from the anterior aspect of the distal fibula and inserts onto the anterolateral surface of the calcaneus, superficial to the anterior talofibular ligament.[2,11]

No previously reported cases have described a symptomatic AFCM requiring surgical excision or interfering with lateral ligament reconstruction. This report highlights the AFCM's surgical relevance, particularly its potential to interfere with lateral ligament repair. The authors present a case of persistent post-traumatic ankle pain attributed to a symptomatic AFCM, successfully managed via excision and concurrent ATFL repair.

CASE REPORT

A 32-year-old male sustained a high-energy bicycle accident that resulted in an atypical anterior shearing fracture of the medial malleolus and an associated osteochondral fracture of the medial talar dome. Initial radiographs and CT scans where useful in further characterization of the fracture, however no magnetic resonance imaging (MRI) scans where performed.

The patient underwent open reduction and internal fixation of the medial malleolus with screws, along with treatment of the osteochondral injury using Autologous Matrix-Induced Chondrogenesis (AMIC) (Chondro-Gide®, Geistlich). His postoperative recovery was uneventful.

At 12 weeks postoperatively, radiographic evidence confirmed bony healing. However, the patient continued to experience persistent lateral ankle pain, reporting a visual analog score (VAS) of 7/10 and a Foot and Ankle Ability Measure (FAAM) score of 65, indicating significant functional limitation. Clinical examination revealed increased lateral laxity of the ankle. Consequently, further evaluation with MRI was performed. While the radiology report described injury to the lateral ligament complex, a thorough review of the images revealed a rare accessory muscle originating from the anterior distal fibula. The tendon coursed superficially over the anterior talofibular ligament and inserted on the anterolateral calcaneus-features consistent with the AFCM (Figures 1 and 2).

Given the course of the muscle's tendon, there was concern for mechanical impingement and pain, as well as potential entrapment during arthroscopic repair of the anterior talofibular ligament (ATFL), which could exacerbate symptoms.Given the patient's symptoms of give-away, and lateral pain, surgery was planned to address instability and excise the accessory tendon. Surgical intervention was performed through a minimal incision, 1 cm distal to the ATFL, where the tendon was found running directly superficial to the ligament.

Intraoperative findings confirmed the presence of the accessory muscle tendon with the described origin and insertion. The AFCM was completely excised (Figure 3) via a 2 cm incision, cutting the tendon as proximally and distally as possible using a tendon graft harvester. Simultaneously, a modified arthroscopic Broström-type lateral ligament repair was performed using two knotless suture anchors (Arthrex®) to address the functional instability.Postoperatively, the patient experienced progressive improvement, achieving complete symptom resolution (VAS 1/10) and full functional recovery (FAAM score: 96) by 12 weeks, returning to unrestricted recreational activities.At one-year follow-up, the patient remains asymptomatic with full functional recovery and no reported complications. Postoperative MRI clearly demonstrates the intact Broström-type repair anchor and confirms complete excision of the ACFM (Figure 5).

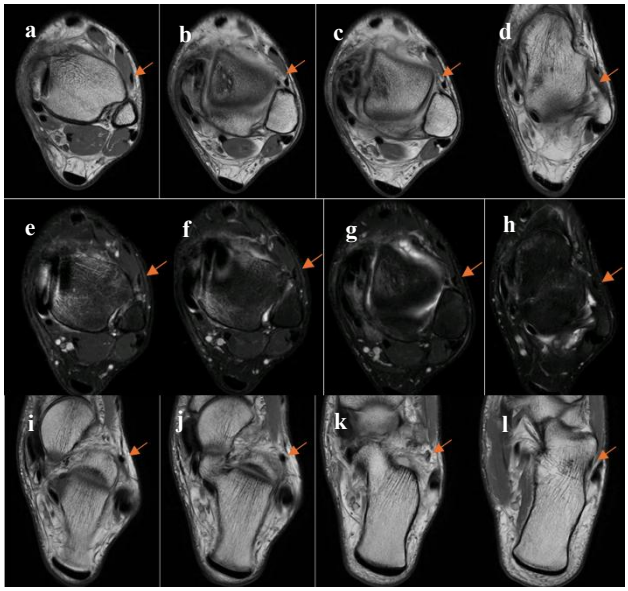

Figure 1(a-l): MRI axial sequences in T1 and T2, evidencing the AFCM (orange arrow).

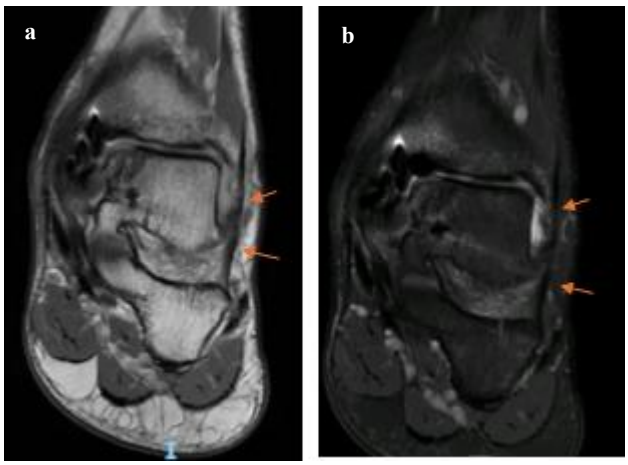

Figure 2 (a and b): MRI coronal image IN T1 and T2, evidencing the AFCM (orange arrow).

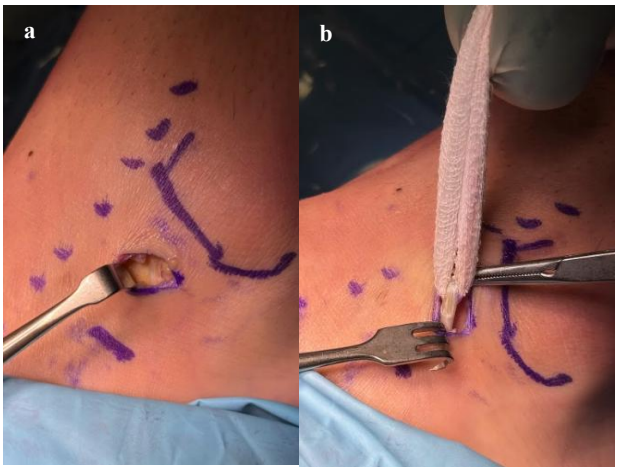

Figure 3 (a and b): Intraoperative photograph showing excision of the AFCM (orange arrow).

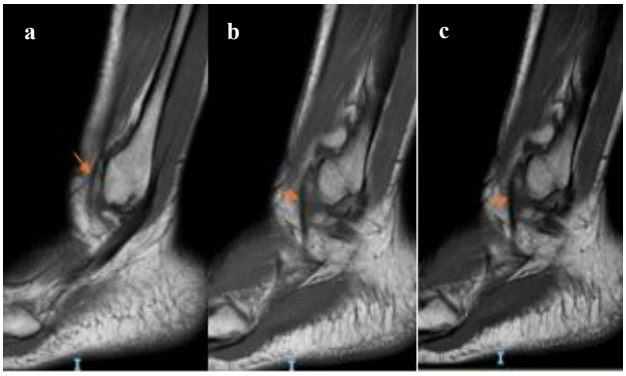

Figure 4 (a-c): MRI sagittal images in T1 illustrating the anatomical relationship of the AFCM (orange arrow) to the ATFL, highlighting the potential for misidentification during surgery.

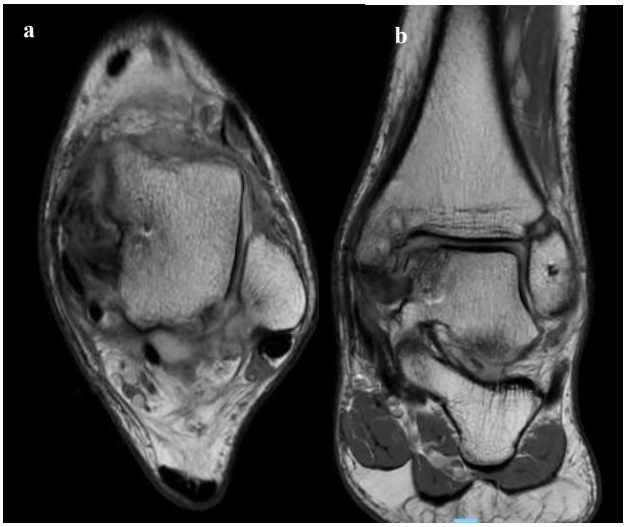

Figure 5 (a and b): Post-operative axial and coronal T1-weighted MRI images demonstrating the Broström-type lateral ligament repair anchor site with complete absence of the excised AFCM.

DISCUSSION

The anterior fibulocalcaneus muscle, first described in anatomical literature in 2010, exemplifies a rare variant within the anterior compartment of the leg and is not recognized in standard anatomical nomenclature.[1] This muscle's evolutionary significance likely relates to its potential contribution to foot eversion and dorsiflexion, reflecting functional overlap with the fibularis tertius.[1,2] Awareness of its existence remains important in clinical practice, as the AFCM may mimic pathology or other tendinous structures during imaging and surgery.

The ACFM is a rarely documented accessory muscle, with only a few anatomical and radiological reports available in the literature.[1,2,11–13] It originates from the distal fibula and courses anterolaterally across the ankle joint, superficial to the anterior talofibular ligament, inserting onto the lateral aspect of the calcaneus near the Gissane angle.[2,11] While typically asymptomatic, its presence can contribute to pain, nerve entrapment, or functional impingement, particularly following trauma or surgery.[11,13] Care should be taken to distinguish between the peroneus quartus and the AFCM. In this case, the patient presented with both: the peroneus quartus located posteriorly and the AFCM anteriorly. Also, other causes of lateral pain such as chondral lesions and impingement should be discarded.

The superficial trajectory of the AFCM tendon over the anterior talofibular ligament is of particular surgical relevance.[2] If unrecognized, it may be mistaken for part of the lateral ligament complex and inadvertently tensioned or preserved during repair, potentially perpetuating mechanical symptoms (Figure 4). This highlights the necessity for meticulous preoperative imaging assessment, especially in patients with persistent, unexplained pain following lateral ligament injury or surgery. Moreover, the rare nature of this condition limits the ability to broadly define clear surgical indications, representing an important limitation of the study.

To knowledge, this is the first report of a symptomatic AFCM tendon treated with surgical excision. The favorable outcome emphasizes the importance of maintaining a broad differential diagnosis in cases of chronic post-traumatic ankle pain, as well as the surgeon's ability to interpret complex imaging such as MRI for surgical planning. In this case, the presence of the AFCM tendon could likely interfere with repair of the ATFL.

CONCLUSION

Anomalous muscles such as the anterior fibulocalcaneus muscle tendon, although uncommon, can potentially complicate surgical repair of the lateral ligaments, particularly when using arthroscopic techniques. Awareness and identification of such anatomical variants are essential. When appropriately indicated, surgical excision of the AFCM tendon can result in complete symptom resolution and restoration of function.

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