



Case Report

IJSEHR 2020; 4(2): 44-45
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www.sportsscienceandresearch.com
Received: 12-06-2020
Accepted: 20-08-2020

Isolated Tibialis Posterior Muscle Strain: A rare sporting injury

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Abstract

We present the case of an isolated tibialis posterior muscle strain in an Australian Rules Football (AFL) player, an injury not previously described in the medical literature. The elite footballer presented with calf tightness following a game of AFL. The clinical history, examination findings and treatment regime followed a course similar to more typical "calf strains" involving the gastrocnemius and soleus muscles, however Magnetic Resonance Imaging (MRI) revealed a low grade isolated muscle strain of tibialis posterior. The only inciting factor was the use of new football boots. This novel case will alert radiologists and sports physicians to a new potential source of calf pain in athletes.

Keywords: Tibialis Posterior, Strain, Calf, Muscle.

INTRODUCTION

Pathology of the tibialis posterior tendon, from chronic tibialis posterior dysfunction leading to acquired pes planus, to acute rupture in forced eversion injuries, are well documented [1,2]. Tibialis posterior muscle strains are rare with only one published case in the chiropractic literature, diagnosed on clinical grounds in a triathlete and supported by an ultrasound demonstrating "limited inflammation" in the calf [3].

CASE REPORT

We present the case of a 27-year-old right foot dominant professional male AFL player who presented with right calf pain following a game of AFL football. There was no specific incident during the game. The player described medial calf tightness deep to the distal musculotendinous junction of gastrocnemius, aggravated by "toe-off" while walking. He had no past history of soft tissue injury and had not missed a game of AFL football in the previous five years.

Except for the use of new football boots- considered tighter than his usual boots and exchanged at half time- there was no other obvious precipitants for the injury. The medical team investigated the player's training and game speed, volume of running, leg weights and ground surface conditions. There was no significant change in any of these variables in the lead up to the game to suggest they played a role in the injury.

Clinical examination revealed low grade pain on calf stretch with the knee flexed and extended. The player experienced 2/10 pain on single leg calf raise and on hopping. There was pain on resisted foot inversion, however no tenderness to palpation. Lumbar spine examination was unremarkable for referred pain. The player was initially thought to have sustained a mild deep distal soleus muscle strain.

At Magnetic Resonance Imaging (MRI) an isolated low-grade strain of the tibialis posterior tendon was revealed. There was intramuscular high signal intensity surrounding the distal intramuscular tendon, but without tendinous disruption (Figures 1a and 1b), consistent with a grade 2B British Athletic Classification injury.

The player was treated with rest, ice, compression and gentle water-based recovery for 48 hours immediately post-game. He performed only light running over the next week due to calf tightness before recommencing normal training on day 8. He remained asymptomatic on testing maximum acceleration, sprinting, agility and kicking on day 9. By day 10 he was able to play a full game of AFL football and

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remained asymptomatic thereafter. The player completed every senior AFL game for the rest of the season pain free and therefore follow-up MR imaging was not performed.

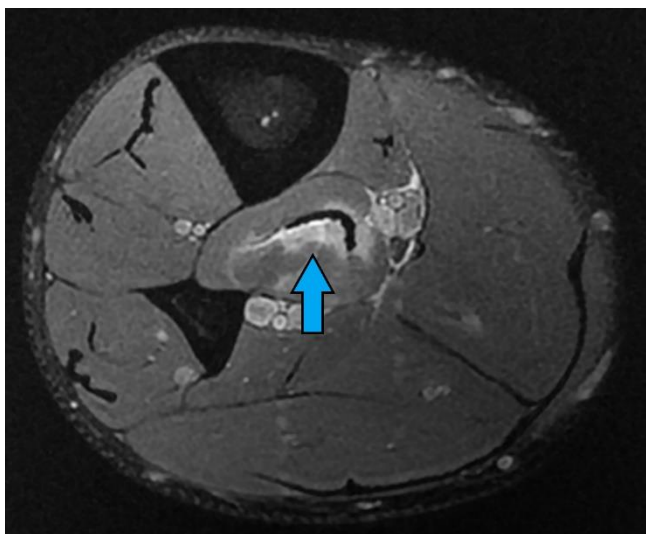


Fig 1a-b: 27-year-old male with isolated tibialis muscle strain. Grade 2B British Athletic Classification injury

DISCUSSION

The posterior tibialis muscle plays a vital role in the gait cycle. It acts to plantarflex the ankle, invert the foot and stabilise the medial longitudinal arch. It locks the calcaneocuboid and talonavicular joints creating a rigid midfoot lever for forward propulsion. Tibialis posterior

is active during the stance phase with low level activity in the swing phase [4, 5].

The tibialis posterior muscle is contained within the deep posterior compartment of the lower limb. It originates from the interosseous membrane and adjacent posterior tibial and fibular surfaces in the proximal third of the leg. The tendon forms in the distal third of the leg before curving around the medial malleolus beneath the flexor retinaculum in the tarsal tunnel. The bulk of the tendon inserts onto the navicular tubercle, while several slips insert onto the cuneiforms and second to fourth metatarsal bones [4, 5]. The tibialis posterior muscle is contained in its own osseofascial compartment, separate from the rest of the deep posterior compartment, with studies showing the existence of isolated exertional compartment syndrome in the tibialis posterior muscle [6]. This anatomic isolation may help explain the pathogenesis of isolated injuries to this muscle.

Howitt *et al* [3] focussed much of their discussion on tibialis posterior tendon dysfunction with only fleeting references made to posterior tibialis muscle strain. They provide little information on the possible pathophysiology behind posterior tibialis muscle strains except to state, "the mechanism of the strain is relatively straightforward as a force imparted into the muscle exceeds its strength".

In this case, the change to a new, tighter playing boot, potentially changed the mechanics and direction of pull on the tibialis posterior muscle during running and contributed to his injury. The usual risk factors of calf strains (albeit pertaining to gastrocnemius and soleus strains) of increasing age and prior injury, were absent from the player's past history in this instance.

CONCLUSION

There are some limitations in study. The muscle strength was evaluated manually and posture analysis couldn't be evaluated with a comprehensive device. It is thought that muscle strength and posture analysis should be demonstrated more objectively and follow-up time should be considered in further studies.

Conflict of Interest

The authors declare no conflict of interest.

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