

LETTER TO THE EDITOR

ADDITIONAL TENDINOUS ORIGIN AND
ENTRAPMENT OF THE PLANTARIS MUSCLE

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INTRODUCTION

The human plantaris muscle (PM) is a small, spindle-shaped muscle that originates from the femur just above the lateral condyle and the adjacent posterior ligament of the articular capsule, in close association with the lateral head of the gastrocnemius. Its proximal region varies from a thin fibrous structure to a muscle belly, equal in size to the lateral head of the gastrocnemius. Ordinarily it terminates in a flat, slender tendon that inclines medially while descending between the gastrocnemius and the soleus on its way to the inner border of the calcaneal tendon. Extending along the medial edge of this tendon, it usually terminates on the dorsal surface of the calcaneum and in the neighboring fibrous tissues.¹

Le Double (1897), Henle (1871), and Daseler and Anson (1943) described that the PM may originate in the following areas: (i) the lower part of the linea aspera; (ii) the posterior ligament of the knee at the intercondylar space; (iii) the fascial covering of the popliteus; (iv) the fibula, between the flexor hallucis longus and the peroneus longus; (v) the oblique line of the tibia, under cover of the soleus; or (vi) the lateral condyle of the femur above the origin of the lateral head of the gastrocnemius. The insertion of the plantaris tendon (PT) is likewise subject to considerable variations, with its attachment to neighboring structures taking place at almost any point along the tendon's course. PT insertion has been reported in the following areas: (i) the soft tissues between the muscle bellies of the gastrocnemius and the soleus, (ii) the inner border of the calcaneal tendon, (iii) the dorsomedial surface of the calcaneal tendon at the latter's

insertion, (iv) the bursa between the calcaneal tendon and the calcaneum, (v) the fibrous and fatty tissues situated immediately in front of the calcaneal tendon, and (vi) the plantar aponeurosis.¹⁻³ According to Moore and Dalley (2006), the PM is often found to be absent.⁴ Daseler and Anson (1943) found that the muscle was absent in 6.67% of 750 lower extremities that they examined.¹ The presence of a double PM has also been reported in the medical literature.⁵

CASE DESCRIPTION

During routine dissection of the right lower limb of a 51-year-old male cadaver, we observed an additional tendon (length 10.2 cm; width 0.4 cm) of the PM arising from the fascia covering the popliteus muscle and joining the tendon of the PM. Both tendons then merged to form a single tendon that attached to the tendocalcaneus. The PM originated from the capsule of the knee joint and the lateral head of the gastrocnemius. In the same limb, the PM was entrapped between the tibial nerve and its branch to the soleus muscle (Figure 1).

Discussion

The PM is sometimes double and is absent in 10% of cases.⁶ The origin of an additional tendon of the PM from the fascia covering popliteus, as found in the present case, is a rare occurrence. Knowledge of such an origin of the PM is important for surgeons performing tendon transfer operations and clinicians diagnosing muscle tears.

In the present variation, the PM was also entrapped between the tibial nerve and its branch to the soleus muscle. Das and Vasudeva (2006) reported a similar case in which they mentioned that any tear of the plantaris muscle in such a situation may involve the nerve to the soleus.⁷ They also

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Figure 1 - Popliteal surface and flexor compartment of the right lower leg. Lg, lateral head of gastrocnemius; Mg, medial head of gastrocnemius; Fcp, fascia covering popliteus muscle; P, plantaris muscle; S, soleus muscle; T, tibial nerve; 1, tendon of plantaris; 2, additional tendon of plantaris originating from fascia covering popliteus muscle; 3, common tendon of plantaris. Note the black and white arrows, which indicate the nerve to the soleus that crosses the plantaris muscle belly superficially

mentioned that a close relationship between the plantaris tendon and the two nerves, as seen in our case, may also confuse surgeons. Prior knowledge of such rare variations may be helpful during surgical operations involving the popliteal fossa and the posterior compartment of the leg. The additional tendinous origin of plantaris, as found in our case, may confuse surgeons and create hindrances in surgical procedures involving the popliteal fossa.

The role of the PM in the pathogenesis of tennis leg is quite controversial. Initially, tennis leg was believed to arise from a rupture of the plantaris tendon in the medial aspect of the calf. An ultrasonographic investigation by Delgado et

al. (2002) showed that tennis leg occurred due to the rupture of the plantaris tendon at the middle of the leg in only 1.4% of cases. They found that 66.7% of cases of tennis leg occurred due to the rupture of the medial head of the gastrocnemius, without rupturing the PM.⁸ The presence of an additional plantaris tendon, as observed in the present case, may confuse clinicians when diagnosing a posterior knee injury and/or tennis leg. The observation made here will supplement our knowledge of variations in the posterior aspect of the knee joint, which may be useful for surgeons and orthopaedicians during tendon transfer and diagnosis of tennis leg.

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