Unilateral Double Plantaris Muscle: A Rare Anatomical Variation

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SUMMARY: The occurrence of a unilateral second plantaris muscle was discovered during the anatomical dissection of a 47 year old female with Huntington Chorea Disease. The cadaver was found to possess bilateral plantaris muscles and a distinct anomalous muscle morphologically resembling a second plantaris on the medial right leg. The inner and outer bellies of the anomalous plantaris arose proximally from the medial condyle of the femur and formed a short tendon that fused distally with the tendon of the lateral plantaris muscle.

CASE REPORT

An anomalous unilateral double plantaris muscle was found during the routine dissection of a 47 year old female cadaver as part of a medical education program. The muscle was meticulously displayed by dissection and delineation of neighboring structures. The specimen was measured morphometrically and photographed.

OBSERVATIONS

The positions of proximal attachment of both right leg plantaris muscles were measured with calipers relative to the position of their fused tendon and are expressed in millimeters and as multiples of bipedal breadth of the femur. The proximal insertion of the anomalous median plantaris muscle (117 mm, 1.44) was superior to the lateral plantaris muscle (103 mm, 1.27). The common tendon traveled between the soleus and gastrocnemius muscles to within 1 cm of the medial side of the calcaneus where it then split sending fibers anterolaterally to calcaneal attachments. The main tendon split forming three distinct attachments on the posteromedial side of the calcaneus anterior to the medial side of the calcaneal tendon.
Fig. 1. Posterior view of dissected superior lower right leg. A. Anomalous medial plantaris muscle. B. Typical lateral plantaris muscle. C. Lateral head of gastrocnemius muscle, reflected. D. Soleus muscle.

Fig. 2. Medial view of dissected lower right leg. A. Anomalous medial plantaris muscle. B. Typical lateral plantaris muscle. C. Fused plantaris muscle tendon.

Fig. 3. Medial view of dissected Achilles tendon. A. Fused plantaris muscle tendon. B-D. Distal plantaris muscle tendonous calcaneal attachments.
The typical plantaris muscle observed on the left leg had a proximal attachment on the lateral condyle of the femur. Its tendon traveled in an anteromedial course between the soleus and gastrocnemius muscles, wrapping superficial to the gastrocnemius briefly, before attaching independently to the calcaneous anterior to the medial side of the calcaneal tendon.

DISCUSSION

The plantaris muscle commands interest from a phylogenetic perspective. It has been suggested that the plantaris is a vestigial remnant of human’s quadruped ancestry. It is believed that the muscle originally attached to the plantar aponeurosis as seen in the American Bear and that the distal attachment has migrated proximally with the onset of bipedalism (Daseler & Anson).

The plantaris tendon has elicited further interest because of its potential use as a graft (Simpson et al., 1991). Removal of the plantaris muscle does not typically hinder the patient’s lower extremity function in the presence of a normal soleus and gastrocnemius. Surgeons have recognized the notable tensile strength of the tendon. They have used the structure successfully in flexor tendon replacement in the hand and have suggested its use in atrioventricular valve repair (Shuhaiber & Shuhaiber, 2003).

Clinically, the plantaris muscle is primarily of concern in the differential diagnosis of lower extremity pain as its rupture is indistinguishable from deep vein thrombosis without the assistance of high resolution ultrasound or MRI (Lopez et al., 2009). Due to the infrequency of the double plantaris variation, it is not possible to estimate the predisposition of extra plantaris muscles to rupture. However, the presence of variations should remind physicians that this unpredictable anatomy requires careful examination in cases of unexplained lower leg pain.

REFERENCES


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