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Bilateral Accessory Peroneal Muscle - A Case Report

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ABSTRACT

The presence of accessory muscles in the peroneal compartment of human leg is one of the known anatomical variations. Its identification is important as it might become a cause of various peroneal tendinopathies, chronic ankle pain, and subluxation or undergo repeated dislocations. Also, such anomalous tendon can be potentially used for surgical reconstruction. In routine cadaveric dissection, we found bilateral accessory muscle in the lateral- peroneal compartment of a 45 years male cadaver, who was without any obvious congenital anomalies or any ankle pathology. The morphology of this muscle is entirely different from the most commonly known variant –the peroneus quartus muscle.

Accessory, peroneal muscle, tendinopathies, reconstructive surgery.

INTRODUCTION:

Muscular variations in the lower extremity are frequently encountered when performing cadaveric dissections. The peroneal compartment of leg exhibits various anatomical variations like fusion of the peroneus brevis and longus muscles and the existence of several accessory muscles which include: peroneus quartus, peroneus accessories, peroneus digiti quinti, low lying belly of peroneus brevis, anomalous insertions of peroneus longus (7, 8, 9, 10). Amongst these, the peroneus quartus shows a higher prevalence of 13% to 26% (10). The peroneus quartus muscle classically arises from the peroneus brevis, courses posterior & medial to both peroneus brevis and longus tendons, and is variably inserted into calcaneum, cuboid, peroneus longus, inferior peroneal retinaculum, or an often enlarged retrotrochlear eminence. (3, 13, 10)

However; the muscle that we have noticed is altogether different in its origin, course and insertion & hence should not be classified as typical peroneus quartus

When such a muscle gets ruptured or is diseased, & becomes symptomatic; at that time it can be identified by using recent modalities of investigations like radiography, musculoskeletal sonography and M R I scans.

Accidental identification of such accessory muscles while performing investigations for some other cause is also very common.

CASE REPORT

In routine cadaveric dissection in the Department of Anatomy,

in 1 out of 8 cadavers, an accessory muscle was noted in the peroneal compartment, along with the peroneus longus and peroneus brevis muscles. It was seen in both the legs.

Both these muscles, one on each side, originated from upper half of medial surface of fibula. The origin intervened between that of peroneus longus and extensor digitorum longus muscles. Each muscle was in the form of a thin belly, which became tendinous in the lower half of the leg.

In the lower half of the leg, each tendon was seen running between the tendons of the peroneus longus & the peroneus brevis muscles. It was seen in a superficial plane, intervening between the above mentioned tendons.

Behind the lateral malleolus of fibula, each tendon was enclosed in the common sheath for the peroneus longus & the peroneus brevis tendons and was seen intervening between the two muscles.

At insertion each tendon gave two slips: 1. to the peroneal trochlea 2. in the infratrochlear region. The 2nd slip was seen merging with the regional connective tissue.

Each of these muscles was pierced by the superficial peroneal nerve, which supplied them. Hence it can be stated that these muscles functionally belong to the peroneal compartment of the leg. As other peroneal muscles, including even the peroneus quartus, this accessory muscle is proposed to act as an evertor of foot and lift the lateral edge of the foot.(3)



3
The accessory peroneal muscle in lower half of leg



4
Insertion of the accessory peroneal muscle into
1) Peroneal trochlea
2) Regional connective tissue



1
The accessory peroneal muscle



2
1) The accessory peroneal muscle
2) Peroneus brevis muscle
3) Peroneus longus muscle
4) Extensor digitorum longus muscle

DISCUSSION:

The accessory bilateral muscles that we have found in our case differ from the typically described peroneus quartus muscle.

In our case the muscles that we found neither originate from peroneus brevis, nor run posteromedial to peroneus longus & peroneus brevis. Their insertion also was not seen into the retrotrochlear region.

So we can say that findings in our case appear to be comparatively rare.

While conducting an educational musculoskeletal sonography scanning session, Yusef Sayeed(12) described another rare variant in the right peroneal compartment of a 88 – years – old female cadaver. The third tendon in his findings originated from upper half of the leg adjacent to the proximal musculotendinous junction of peroneus longus, running anterior to the peroneus longus and lateral to the peroneus brevis muscles. Distally it bifurcated into a large slip to the inferior peroneal retinaculum and a small slip to the normal sized retro-trochlear eminence.

In our study, the third tendon, originates from upper half of leg, intervening between the peroneus longus & extensor digitorum longus muscles, runs in between the peroneus longus & peroneus brevis muscles. Its insertion is on the peroneal trochlea and into the infratrochlear region, thus contrasting with Yusef's findings.

We also ruled out presence of any calcification of the accessory tendon, bone hypertrophy at the site of insertion or laxity of the peroneal retinaculum secondary to thinning, predisposing to subluxation or dislocation. One of the factors contributing to peroneal tendinopathies is a flat convex distal fibula & pes cavus. (1, 4).

CLINICAL SIGNIFICANCE:

Presence of an extra peroneal tendon may result in crowding

of tendons deep to the retromalleolar groove leading to anterior or subluxation of the peroneus brevis, mechanical attrition, or longitudinal tear of peroneal tendons. Bone hypertrophy at the site of insertion is known to be associated with tenosynovitis. Such anomalous tendon may lead to chronic ankle pain as a result of trauma or calcification. (5, 6, 10)

When 3 tendinous structures are seen behind the lateral malleolus, the differential diagnosis is usually limited to a split peroneus brevis tear with two hemi tendons or a peroneus quartus (2). While scanning a patient for peroneal tendinopathy the sonologist must be aware of the uncommon entities of peroneal musculature, such as the present report's finding.

So it is advisable to trace the accessory tendon cephalad towards its origin and to identify it as distinct muscle. Otherwise chances of misdiagnosing an anatomical variant for pathological split tear are likely to occur.

Like Mick and Lynch(8), who, in 1987, recognized a peroneus quartus muscle and used it to reconstruct the retromalleolar groove to act as a stabilizing strap for the peroneus longus muscle, here we hypothesize that the accessory tendon that we found can be used for reparative foot surgeries.

Identification of such anomalous tendon appears challenging for radiologists as well as sonologists. MRI scanning proves to be excellent for detecting soft tissue and bone variants and abnormalities related to the lateral ankle. (11) Also, ultrasonography is becoming a common modality for the assessment of ankle tendon abnormalities. (3)

CONCLUSION:

Thus, presence of an accessory tendon in the peroneal compartment of leg calls attention not only of the anatomists, but also is equally significant for sonologists as well as the orthopedic surgeons for various reconstructive surgeries.

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