



An anatomic variant insertion of peroneus longus in a cadaver — a case report

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Abstract

We report a case of additional slips at the insertion of peroneus longus. Variation of insertion of a muscle claims to be useful in biomechanics, movement and stability of joints. We believe, this study may have a potential role in highlighting the morphological description of an anomalous disposition of peroneal tendons with their clinical relevance. Awareness of such anatomical variants is important to an orthopedist while undertaking reconstructive procedures. It will also help to better understand the symptoms associated with peroneus longus tendon pathologies, and also highlights the role played by the peroneus longus tendon in maintaining the arch of the foot. On regular dissection of the right lower limb of a 48-year-old male embalmed cadaver, additional slips at the insertion of peroneus longus were observed. Out of the four slips of insertion, one slip was inserted on the bases of 3rd, 4th and 5th metatarsals in continuation. Two slips were attached on medial cuneiform and one slip was inserted on the base of 1st metatarsal. The variations seen in the mode of insertion of the peroneus longus muscle may be regarded as developmental arrest in the process of migration from the fibular digit to the tibial digit and finally to the medial cuneiform. Clinically, this bipenniform muscle of lateral compartment can be used for translocation in treatment of paralytic pes calcaneus.

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Key words [cadaver] [dissection] [insertion] [peroneus longus]

Introduction

Peroneus longus is one of the two muscles in the lateral compartment of the leg [1.] It arises from head of fibula, proximal 2/3 of lateral surface of fibula, deep surface of fascia cruris, anterior and posterior crural intermuscular septa and few fibers from lateral condyle of tibia. The tendon inserts by two slips. One is inserted on the lateral side of base of first metatarsal and the other on the medial cuneiform [2]. The function of peroneus longus is the eversion and plantar flexion at the ankle joint and also stabilization of subtalar motion [1, 3, 4].

Orthopedic pathologies related to the peroneus longus insertion may be tendinitis, tenosynovitis, dislocation, acute rupture, chronic tear, and avulsion fractures. The study of peroneus longus tendon insertion is clinically important because of its importance in maintaining the arch of the foot [5]. The use of an accessory tendon obviates the sacrifice or weakening of a tendon that is used for routine function of the foot and the ankle [6]. Morphologically, peroneus longus should be inserted on the fibular side of the foot. Peroneus longus has shifted its insertion from the base of the fibular digit, across the sole, to the base of tibial digit and finally also to the medial cuneiform. The migration of the tendon of muscle across the sole of the foot from fibular to the tibial border is a gradual process in the ontogeny of man and a repetition of

the phylogeny of the muscle. The morphological evolution of the muscle can readily be followed in the mammalian series. The muscle may get inserted anywhere between these two digits and also give fibrous expansions to the neighboring structures [7].

Case Report

During routine dissection of cadavers for undergraduate medical students, we detected additional slips at the insertion site of peroneus longus, unilaterally on the right side of a 48-year-old male embalmed cadaver. Out of the four slips, one slip inserted to the bases of 3rd, 4th and 5th metatarsals, two slips to medial cuneiform and one slip to the base of the 1st metatarsal. The slips were dissected carefully to expose the origin, course and insertion. The specimen was photographed (Figure 1). The left limb of when dissected to see any variation, showed usual anatomical organization.

Discussion

Conventionally, the insertion of the peroneus longus tendon is at the plantar surface of 1st cuneiform and proximal 1st metatarsal [1]. Macalister reported the insertion of this muscle as three tendinous slips to fifth, third and first metatarsal bones respectively and occasionally one of the slips gets attached to intermediate cuneiform bone [8]. According to Bergman et al.'s observation, it may be inserted by three

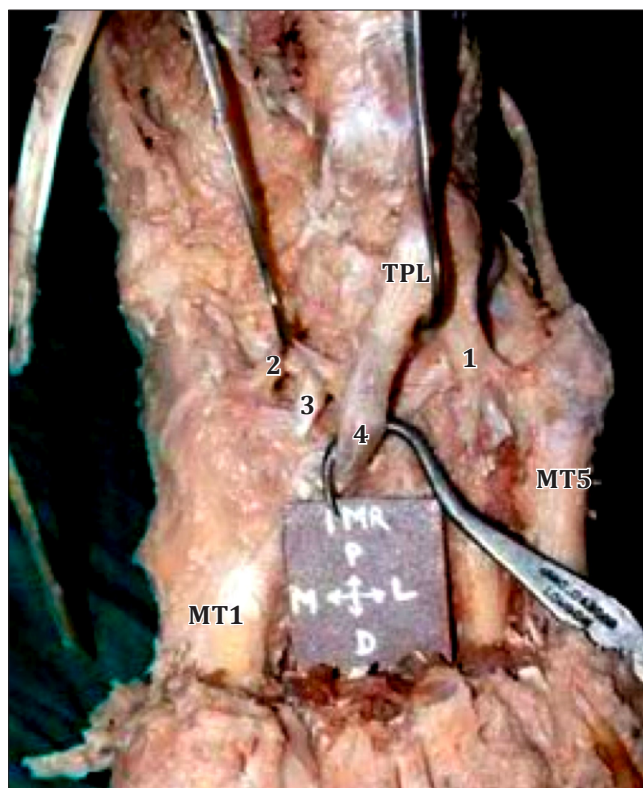


Figure 1. Figure shows *tendon of peroneus longus (TPL)* dividing into four slips. One of the slips is inserted on the bases of 3rd, 4th and fifth *metatarsals (MT)*. Two slips are inserted on medial cuneiform and the last one on the base of 1st metatarsal.

tendons, to the fifth, third, and first metatarsals at their tarsal ends. Out of the three slips of insertion, two may get inserted at the metatarsal, and the third one at the intermediate cuneiform bone. Sometimes a slip may get inserted to the fifth metatarsal behind the peroneus brevis [9].

According to Borley et al., sometimes a 3rd slip may be present which is inserted on base of 2nd metatarsal or to the base of the 3rd, 4th and 5th metatarsals [2]. Bardeen also reported the insertion on the 5th metatarsal [10]. Bhargava et al. observed its insertion on all the metatarsals [7]. Whereas, Anson found the slips to 2nd and 3rd metatarsals in his study. [11]. In a study by Srinivasan et al., out of 26 cadaveric feet, the distal band was present in 46% and was attached to 4th and 5th metatarsals, and 15% also had slips to 3rd metatarsal [1]. In another study by Jayakumari et al., the tendon was found to be divided into two equal parts; one was inserted into the lateral side of base of first metatarsal and medial cuneiform in the usual manner; other into the tuberosity of the fifth metatarsal bone [12].

In our case report, additional slips (four) of insertion of peroneus longus were present. Out of the above-mentioned four slips of insertion, one slip was inserted to the bases of 3rd, 4th and 5th metatarsals. Two slips were attached to the medial cuneiform and one slip to the base of the 1st metatarsal (Figure 1).

Clinically, the peroneal muscles are often stretched and injured from traction during inversion of foot. Moreover, such variations of peroneus longus with additional tendinous slips at the insertion may act as an additional support and protection against twisting injuries of the ankle joint and may also help to enhance the stability of talocalcaneonavicular joint [12].

Conclusion

In the current case, we encountered multiple insertion slips of peroneus longus. The presence of an accessory tendon slip may prevent the wear and tear, and weakening of the tendon used for routine function of the foot and the ankle. It may act as an extra support and play an important role in the stability and protection of ankle joint against twisting. This variation may be considered as morphological evolution of the muscle followed in the mammalian series.

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