



A Cadaveric Study of the Fibularis Tertius Muscle

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ABSTRACT:

The Fibularis Tertius (formerly peroneus tertius) is occasionally absent in humans, but it is rarely found in other primates. The muscle is a small partially separated portion of the extensor digitorum longus, as is the fifth tendon but has an important role in locomotion and in evolution of human beings. It supports and stabilizes the longitudinal arches of the foot while standing and locomotion during bipedalism. It particularly assists in everting the foot, which is characteristically a human movement.

In this study, 104 legs were dissected from 52 cadavers. The muscle was unexpectedly absent in a large number of cadavers (26.92%). It was present in (73.08%) of cases.

Keywords: Cadaveric, Fibularis Tertius, Dorsiflexion.

The Fibularis Tertius is found in the anterior compartment of the leg is described as a partially separated portion of the extensor digitorum longus. It arises from the distal third or more of the medial surface of the fibula, the adjoining anterior surface of the interosseous membrane and anterior crural intermuscular septum (Romanes 1986). It inserts into the medial part of the dorsal surface of the base of the fifth metatarsal bone and its shaft.

It assists in dorsiflexion of the ankle joint and in everting the foot (Ayyappa 1997). The fibularis tertius pulls upon the lateral longitudinal arch of the foot to stabilize the arch from the action of fibularis longus muscle, which acts to increase the general concavity of the sole (Kunnika et al 2004).

The presence of the muscle is generally discussed in anatomy texts. The discussion of the absence is often neglected. However, Gray's Anatomy states that the fibularis tertius was missing in 4.4% of dissections according to Werneck (1957). Jungers et al (1993) also reported that the frequency of peroneus tertius in human is approximately 95%.

The fibularis tertius is absent in 5-17% of the human white population. The absence of the muscle is rare in Thai population. It was found only in 4.45%. It is completely absent in 4.4% of cases. Subjects without fibularis are not at higher risk for an ankle ligament injury and do not exhibit decreased eversion or dorsiflexion

strength (Erik Witvrouw et al. 2006)

The purpose of this study is finding the frequency of the fibularis tertius by dissecting the cadavers used for Medical students of the Department of Anatomy, Faculty of Medicine, Nnamdi Azikiwe University, Nnewi Campus.

MATERIALS AND METHODS

The anterior compartments of the legs were dissected from cadavers used by medical Students. Dissection was done as outlined by Cunningham's Manual of practical Anatomy. The study was performed over two academic sessions, twenty six cadavers in 2004 and another twenty six in 2005. The cadavers were all male and the dissection was done on both right and left legs. The other muscle in the anterior compartment are tibialis anterior, extensor, hallucis longus and extensor digitorum longus. The fibularis tertius muscles, if present were identified and cleaned.

RESULTS

The fibularis tertius was carefully studied by detailed dissection and cleaning of the lower extremities. A total of 52 cadavers were studied. The cadavers were all male. The dissection was done on both on both legs in all the cadavers. From the 104 legs, fibularis tertius was absent in 28 legs or 26.92% and present in 7.08%.



DISCUSSION

From these results, the absence of the fibularis tertius muscle in this study is 26.92% which varies widely from a report by Wernek, 1957 the muscle is absent in 4.4% of cases. Erik Witvrouw et al (2006) reported an absence of 5-17% of the human white population. Kunnika et al (2004) reported 4.4% of Thai population studied. The result of the present study suggests a racial difference. The absence of fibularis tertius appears higher in the black population (26.92%). It was observed that the muscles are attached mainly to the body of the fifth metatarsal bone and in 4 legs (3.92%), the tendon passed through the extensor digitorum brevis before attaching to the body of fifth metatarsal bone. This observation is different from the standard

anatomy texts. The fibularis tertius muscle occurs infrequently in other anthropoid primates but in extremely high frequency in humans, representing a highly derived condition presumably linked to the evolution of terrestrial bipedalism. It is one of the most important muscle which aid people to stand upright and walk. It is found in the embryo early in its development. There, it must be a specific characteristic evolved from early human trend (Kunnika et al 2004).

During bipedalism, the fibularis tertius functions in concert with the extensor digitorum longus and tibialis anterior as a swing phase muscle in order to level the foot and help the toes clear the ground Wernek, 1957. Its function is considered to be identical to the extensor digitorum longus in maintaining the ankle and subtalar joint in the neutral position at the beginning of the gait cycle which is referred to as the initial contact I.

Concerning the arches of the foot, the fibularis tertius acts as a sling to support the medial longitudinal arch which is the highest and most important of the three arches. The medial longitudinal is a dynamic arch, which changes mostly during locomotion. For this reason, this muscle plays a role of stabilizing not only the medial arch but also the lateral longitudinal arch. A study done in human subjects without fibularis tertius shows that they are not at higher risk for an ankle injury and they do not exhibit decreased eversion dorsiflexion strength.

CONCLUSION

In this study, the absence of fibularis tertius muscle is 26.92% while it is present in 73.08%.

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