

Case of Bilateral Absence of the Fibularis (Peroneus) Tertius Muscle in our Anatomy Laboratory

Case Report

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Abstract

The peroneus tertius muscle (PT) has been an underestimated muscle in the medical community due to its unclear clinical relevance. It seems that this muscle varies in frequency depending on the region of the world. Up to 2022, the database exhibited no literature on bilateral or unilateral absence of the peroneus tertius in the Puerto Rican population. This finding in 2019 of bilateral absence of PT in an 80 year old male cadaver, represents the first documented case in Puerto Rico. Reporting the variations of such a muscle in different world populations is crucial to gain greater understanding of its function as well as more about its clinical and anthropological significance.

Keywords: Peroneus Tertius; Fibularis Tertius.

Background

The peroneus tertius (PT), also known as the fibularistertius (FT), is a muscle of the lower extremities that lies proximal to the extensor digitorum longus (EDL) and inserts at the fifth metatarsal. The morphology of this muscle may vary with insertion in the fourth metatarsal bone as well.[1] In regard to its anatomical function, the role of the PT in walking and posture is still being debated even though its function is to assist in dorsiflexion and foot eversion. No significant advantage has been found in individuals with the PT in contrast to those without. Interestingly, other accessory muscles have been present when the peroneus tertius is absent. In a study where 7 cases displayed different accessory muscles, 5 presented fibularis digitiminimi tendon inserted in the fifth metatarsal and 2 presented fibularis quartus muscle and tendon inserting in the 5th metatarsal.[2] The study demonstrates that the extent of anatomical diversity is broader with the presence or absence of this muscle. Different studies have been conducted to determine population frequencies of PT and morphological variations. However, no case has been reported in the Puerto Rican population, which raises the inquiry about whether its lack of report is due to not noticing its absence or because it was in fact absent at all.

The PT has shown variable prevalence in different populations in the world where it has been reported to be missing in different human populations. A translational research study was conducted to analyze the prevalence of the PT muscle in five Arab populations and explore the correlation between the presence or absence of the PT muscle and ankle injury.[3] The clinical study determined that the prevalence of the PT in three Asian countries was observed in 42% in Bahrain, 38.5% in Saudi Arabia, and 41.2% in Kuwait. For two North African populations, the prevalence was 67.7% in Tunisians and 52.8% in Egyptians.[3] Out of the five countries, all presented with right side prevalence except for Bahrain, which showed bilateral prevalence. The authors concluded that although the presence of the PT was variable among all five populations studied, there was a positive correlation between its presence and ankle injury. It also provides a large sample (N = 1,248) and a comparison between five different populations.

Another study of populations located geographically closer to Puerto Rico reported cadaver frequencies from Bolivia, Brazil and Chile. With frequencies of 100%, 2 studies for Brazil 92% and 97%, and 51% respectively. [4] From an evolutionary perspective, the data from other countries is critical for an anthropological ex-

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amination. If more data regarding the absence of the PT muscle in the Puerto Rican population can be gathered, we can examine if there are any correlations with ankle injuries and this muscle. In addition, we can contribute to the chronicling of the anatomical variations of our species across time and geographic locations.

In order to make deductions about its role, more documentation of its prevalence is required. Studies regarding the prevalence of PT in the Puerto Rican population could assist in further understanding its significance and the genetic variations it may carry while present or absent.

Case Presentation

During routine cadaveric dissection in the Anatomy laboratory of the San Juan Bautista School of Medicine in October 2019, one cadaver showed a bilateral absence of the PT muscle. The variation was found in the right and left anterior compartments of the legs. The subject was identified as an approximately 80 year old Puerto Rican male with a bilateral absence of the PT muscle. Image 1 is a photograph of the right foot from the cadaver reported. Image 2 shows a photograph of the left leg of the same cadaver. Image 2 shows the anatomical relation the PT has with other structures of the leg, the PT is highlighted in neon green. No other anatomical structures appeared to be missing in the cadaver.

Image 1: Absence of Peroneus tertius (PT), right foot.



Image 2: Absence of Peroneus tertius (PT), left foot.



Image 3: Peroneus tertius.



Conclusion

There are no previous reports on the absence of the peroneus tertius in a cadaver or live patient of Puerto Rican descent. Although we don't disregard the possibility that there may be more subjects with the absence, we acknowledge that to our understanding the data has not been collected. Therefore, this would be the first case report on the island with a bilateral absence of PT. This muscle has been underestimated, which accounts for few studies exploring its anatomical and clinical relevance and debates continue regarding its significance.

Thus, PT should continue to be studied in order to understand the history and future evolution of this muscle. The contribution of this case report could support the database on future studies of the PT and its anatomical variations in cadavers or living patients in Puerto Rico

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