

Anatomical Feasibility Study of Flexor Hallucis Longus Transfer in Treatment of Achilles Tendon and Posterior Ankle Arthroscopy

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Introduction/Purpose: The aim of this study was to evaluate the occurrence of anatomical variations of the musculotendinous junction of the flexor hallucis longus (FHL) muscle, the relationship between FHL tendon or muscle and the tibial neurovascular bundle at the level of the posterior ankle joint in human cadavers.

Methods: Seventy embalmed feet from 20 male and 15 female cadavers, the cadavers' mean age was 65.4 (range from 14 to 82) years, were dissected and anatomically classified to observe FHL muscle morphology define the relationship between FHL tendon or muscle and the tibial neurovascular bundle. The distance between the musculotendinous junction and the relationship between FHL tendon or muscle and the tibial neurovascular bundle was determined.

Results: The three morphology types of FHL muscle were identified: a long lateral and shorter medial muscle belly, which was observed in 63 specimens (90%); equal length medial and lateral muscle bellies, this variant was only observed in 5 specimens (7.1%); a lateral and no medial muscle belly, which was observed in 2 specimens (2.9%). No statistically significant difference was observed according to gender or side ($p > 0.05$). Two patterns were identified and described between FHL tendon or muscle and the tibial neurovascular bundle. Pattern 1, the distance between the neurovascular bundle and FHL tendon was 3.46 mm (range, 2.34 to 8.84, SD = 2.12) which was observed in 66 specimens (94.3%); Pattern 2, there was no distance which was observed in 4 specimens (5.7%).

Conclusion: Knowing FHL muscle morphology variations provide new important insights into secure planning and execution of a FHL transfer for Achilles tendon defect as well as for the interpretation of ultrasound and magnetic resonance images. During posterior arthroscopic, posteriomedial portal may be introduced into the posterior aspect of the ankle without gross injury to the tibial neurovascular structures.

