Anatomical variations and dimensions of the popliteus muscle in cadaveric specimens

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ABSTRACT

Introduction

The popliteus muscle is located at the flexor aspect of the leg and is supplied by the tibial nerve. This is the only muscle in the back of leg, which actions on the knee joint and never over the ankle joint. This is considered as the knee's unlocking muscle. It laterally swaps the femur over tibia, while walking when one foot is on the ground. It also causes medial rotation of the tibia on the femur bone, once the foot is over the ground. Along with lateral collateral ligament and popliteo-fibular ligament, the tendon of popliteus plays instrumental role in the stabilization of the posterolateral part of knee (1). The lateral femoral condyle and lateral meniscus at its posterior horn, offers the origin of popliteus. Its origin is tendinous and it is interesting to know that there exists variability in its origin like from the styloid process of the fibula (2).

Aims and Objective

The goal of this investigation is to describe the morphology of popliteus muscle with its tendon in context to its variability in origin, mode of insertion, innervation patterns and its dimensions. The objectives are to measure the length, thickness and width of the popliteus at various locations.

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Methodology

Study setting: Department of Anatomy, Kasturba Medical College, Mangalore

Study design: Institutional Based Descriptive Cross Sectional Study

Study participants:A meticulous dissection will be done in adult human cadaveric lower limb specimens and the morphology of the popliteus muscle will be tabulated for the statistical analysis.

Inclusion criteria: Lower limb specimens with an intact posterior compartment will be included

Exclusion criteria: The specimens showing fractures, any visible deformities and missing parts will be excluded.

Study duration: 3 months

Sample size: 25adult cadavers (25 right and 25 left sided lower limbs)

Sampling method: The sample size is similar to the earlier study performed by Olewnik et al. (1).

Data collection methodology: The variability of the origin of popliteus and the insertion of popliteus will be noted down. To study the morphometry, the popliteus muscle is divided into certain sections extending from the origin to its final insertion into the posterior surface of the tibia. The parameters considered in the study are measuring the length, width and thickness of the muscle belly and its tendon, which will be taken by digital Vernier caliper.

Data analysis: The
data collected as above will be analyzed by applying paired samples t test.

Implications

The anatomy and biomechanics of popliteus makes it an
important structure, which keeps the knee stable. But its involvement is
ignored in the complex injury of the knee joint (3). The isolated
involvement of popliteus is seen in sports injuries and it may be
misinterpreted as a tear of lateral meniscus. The sports like tennis,
basketball and downhill running may put additional stress on the tendon of
popliteus (3). In this context, the morphometric data of popliteus are clinically
important for the effective treatment of the
popliteus muscle spasticity (4).

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