



“Anatomical & Clinical significance of Popliteus muscle (जानू पृष्ठीका)” - A Critical Review

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Abstract:

The **popliteus** is a muscle within the deep compartment of the posterior leg. It lies behind the knee joint, forming the base of the popliteal fossa. It originates from the lateral condyle of the femur and the lateral meniscus of the knee joint. It inserts onto the proximal tibia, immediately above the origin of the soleus muscle. It helps move the knee joint and flexes the leg.

The Popliteus is a small, thin, flat, triangular shaped muscletendinous complex of the lower leg with the popliteus muscle and the popliteofibular ligament and constitutes a part of the posterolateral corner of the knee. It is a deep muscle of the knee joint, forming the floor of the popliteus fossa. Lateral rotation of the femur relative to the tibia. This ‘unlocks’ the knee joint so that flexion can occur. The innervation at popliteal muscle is Tibial nerve. The blood supply to popliteal muscle is by Popliteal artery.

Popliteus ruptures are usually associated with acute or chronic posterolateral instability of the knee.

So, clinical significans of Popliteus muscle (जानू पृष्ठीका) is necessary to study from anatomy & clinical point of view.

Keywords: Popliteus muscle (जानू पृष्ठीका)

Introduction:

Definition: Despite its small size, the popliteus is a major stabilizing muscle of the knee. The popliteus is involved in both the closed chain phase and open-chain phase of the gait cycle. During the closed chain phase, which is when the foot is in contact with the ground, the muscle externally rotates the femur on the tibia.¹

Popliteus is a triangular shaped muscle that is found deep in the popliteal fossa at the back of the knee, just below the joint.

The **popliteus muscle** in the leg is used for unlocking the knees when walking, by laterally rotating the femur on the tibia during the closed chain portion of the gait cycle (one with the foot in contact with the ground). In open chain movements (when the involved limb is not in contact with the ground), the popliteus muscle medially rotates the tibia on the femur. It is also used when sitting down and standing up. It is the only muscle in the posterior (back) compartment of the lower leg that acts just on the knee and not on the ankle.²

Aims & Objectives:

To study the anatomical & clinical significance of Popliteus muscle.

Material & Methods:

Manual Searching & Collection.

Origin & Insertion:³ (structure)

Popliteus arises from the outer surface of the lateral femoral condyle, from within the joint capsule, below the lateral epicondyle and the superior attachment of the lateral collateral ligament.

The stout tendon passes backwards, downwards and medially over the outer border of the lateral meniscus, to which it attaches. As the tendon leaves the joint capsule, fleshy fibers arise and continue downwards and medially attaching to a triangular area on the back of the tibia, just above the soleal (aka popliteal) line in a fan-like fashion.

Function: ⁴

The popliteus also assists in knee flexion. Its function is dependent on whether the lower extremity is in a weight-bearing or non-weight-bearing state; it is considered the primary internal rotator of the tibia in the non-weight-bearing state. "Locking" the knee occurs with extension during weight-bearing. This describes the femur medially rotating on the tibia, allowing for full extension without muscular expenditure. When "unlocking" the knee, the popliteus contracts causing flexion and lateral rotation of the femur on the tibia. This is why some refer to the popliteus as the "key" to the locked knee.

There are attachments between the popliteus and the lateral meniscus. When the knee motions into flexion, the popliteus retracts the lateral meniscus posteriorly to avoid becoming entrapped between the femur and tibia.

Blood Supply and Lymphatics:⁵

Arterial supply to the popliteus is provided by the medial inferior genicular branch of the popliteal artery and muscular branch of the posterior tibial artery. Lymphatic drainage extends to the popliteal nodes and subsequently drains to the deep inguinal nodes of the thigh. Mapping and determining lymphatic flow is important when considering infectious or metastatic processes.

Nerves: The tibial nerve innervates the popliteus from spinal nerve roots L5 through S1. Previous studies revealed approximately 2 to 3 parallel tibial nerve branches

Discussion:

Popliteus problems are fairly rare but usually present with pain behind the knee, particularly when bending the knee, straightening it against resistance e.g. coming up from squatting or on stairs, running and walking downhill. There may also be some swelling behind the knee.⁶

The two most common problems related to popliteus are:

- **Popliteus Tendinitis:** Inflammation or degeneration of the popliteus tendon
- **Popliteal Bursitis:** Inflammation of the popliteal bursa, more commonly known as a Bakers Cyst.

Clinical significance: ⁷

The popliteus is most often injured as part of an associated posterolateral corner (PLC) knee injury. PLC injuries occur secondary to: Direct blows to the anteromedial knee, Varus blows to the flexed knee, Varus/hyperextension (contact or non-contact injuries) & Knee dislocations.

In any setting of these injuries mentioned above, an urgent evaluation of the patient's neurovascular status of the limb is performed. In the setting of knee dislocations, the vascular status of the limb is assessed, followed by a closed reduction of the knee joint. The vascular status is then reassessed, typically utilizing ankle-brachial index (ABI) measurements.

Isolated Popliteus Injuries:

The Garrick test can assist in assessing the popliteus muscle as the etiology of the lateral knee pain. Popliteus tendinopathy is a condition presenting as posterolateral knee pain that can be difficult to single out due to other more common knee pain etiologies in the vicinity.

Conclusion:

1. Popliteal muscle injury symptoms which include swelling, tenderness, oedema, bleeding, patient keeping the leg (tibia) in lateral rotation during knee flexion.
2. The treatment for popliteus muscle pathology is the same as per any soft tissue injury and muscle injury or tendinopathy. RICE Therapy or PRICE Therapy (protection, rest, elevation, compression, elevation, and other anti-inflammatory drugs are given.
3. Injury to the Popliteus causes posterolateral rotatory instability of knee. This can be treated with Arthroscopic Popliteus Sling reconstruction using the popliteus portal.

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