

## Popliteal Fossa

The popliteal fossa is a diamond-shaped intermuscular space situated at the back of the knee (Fig. 10.41). The fossa is most prominent when the knee joint is flexed. It contains the popliteal vessels, the small saphenous vein, the common peroneal and tibial nerves, the posterior cutaneous nerve of the thigh, the genicular branch of the obturator nerve, connective tissue, and lymph nodes.

### Boundaries

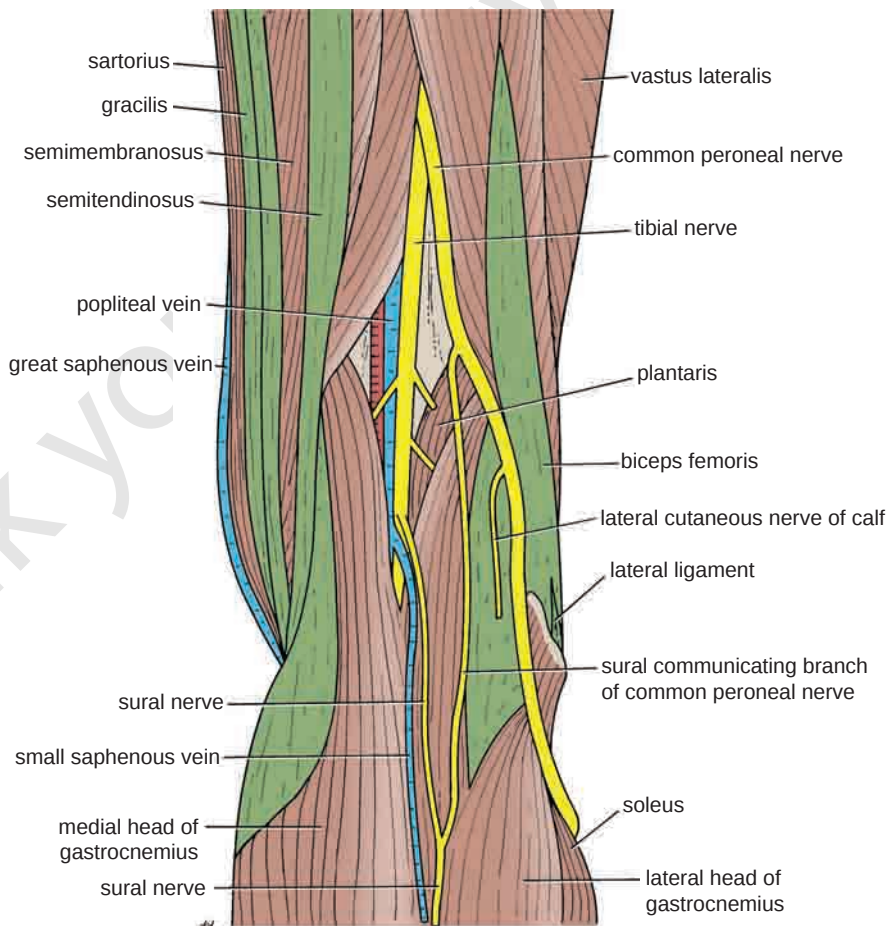
- **Laterally:** The biceps femoris above and the lateral head of the gastrocnemius and plantaris below (Fig. 10.41)

- **Medially:** The semimembranosus and semitendinosus above and the medial head of the gastrocnemius below (Fig. 10.41)

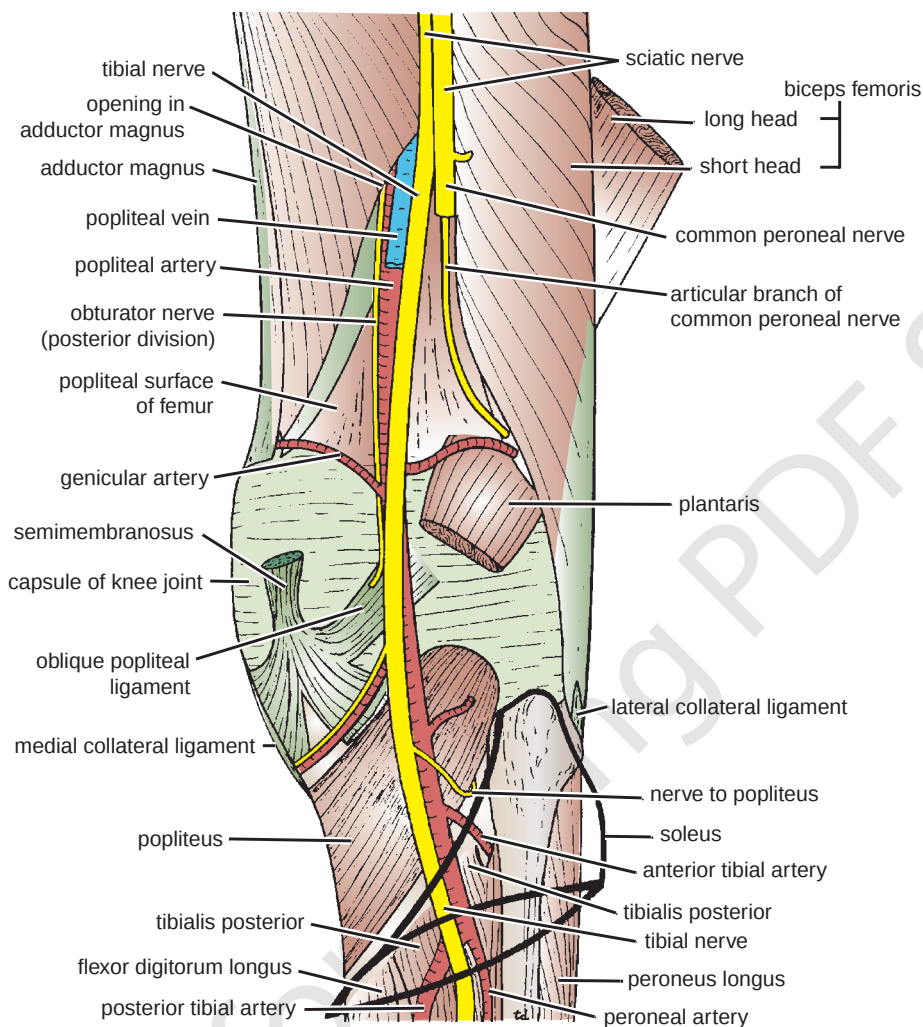
The **anterior wall or floor** of the fossa is formed by the popliteal surface of the femur, the posterior ligament of the knee joint, and the popliteus muscle (Figs. 10.41 and 10.42).

The **roof** is formed by skin, superficial fascia, and the deep fascia of the thigh.

The **biceps femoris**, the **semimembranosus**, and the **semitendinosus** muscles are described in the section on the back of the thigh, on page 465. The **gastrocnemius** and **plantaris** are described in the section on the back of the leg, on page 487.



**FIGURE 10.41** Boundaries and contents of the right popliteal fossa.



**FIGURE 10.42** Deep structures in the right popliteal fossa. The proximal end of the soleus muscle is shown in outline only.

## Popliteus Muscle

The popliteus muscle plays a key role in the movements of the knee joint and will be described in detail.

- **Origin:** From the lateral surface of the lateral condyle of the femur by a rounded tendon and by a few fibers from the lateral semilunar cartilage (Figs. 10.42 and 10.43).
- **Insertion:** The fibers pass downward and medially and are attached to the posterior surface of the tibia, above the soleal line. The muscle arises within the capsule of the knee joint, and its tendon separates the lateral meniscus from the lateral ligament of the joint. It emerges through the lower part of the posterior surface of the capsule of the joint to pass to its insertion.
- **Nerve supply:** Tibial nerve.
- **Action:** Medial rotation of the tibia on the femur or, if the foot is on the ground, lateral rotation of the femur on the tibia. The latter action occurs at the commencement of flexion of the extended knee, and its rotatory action slackens the ligaments of the knee joint; this action is sometimes referred to as “unlocking the knee

joint.” Because of its attachment to the lateral meniscus, it also pulls the cartilage backward at the commencement of flexion of the knee.

## Popliteal Artery

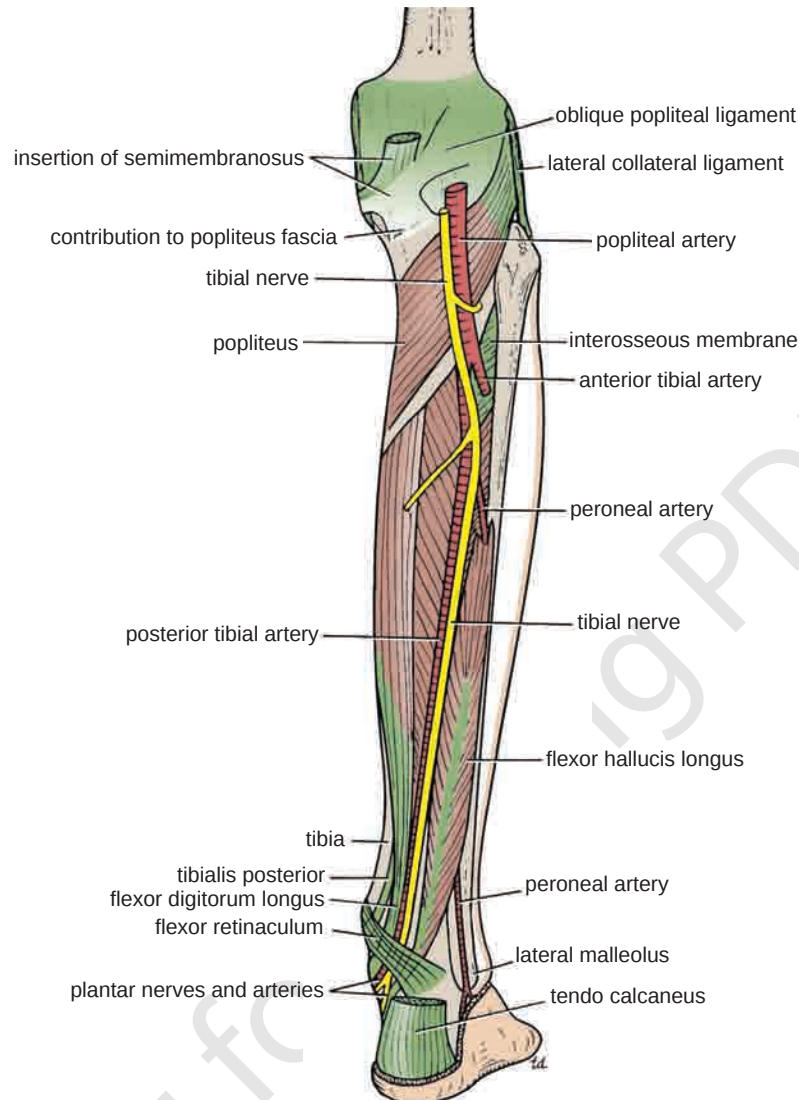
The popliteal artery is deeply placed and enters the popliteal fossa through the opening in the adductor magnus, as a continuation of the femoral artery (Fig. 10.42). It ends at the level of the lower border of the popliteus muscle by dividing into anterior and posterior tibial arteries.

### Relations

- **Anteriorly:** The popliteal surface of the femur, the knee joint, and the popliteus muscle (Fig. 10.42)
- **Posteriorly:** The popliteal vein and the tibial nerve, fascia, and skin (Figs. 10.41 and 10.42)

### Branches

The popliteal artery has **muscular branches** and **articular branches** to the knee.



**FIGURE 10.43** Deep structures in the posterior aspect of the right leg.



## CLINICAL NOTES

### Popliteal Aneurysm

The pulsations of the wall of the femoral artery against the tendon of adductor magnus at the opening of the adductor magnus are thought to contribute to the cause of popliteal aneurysms.

### Semimembranosus Bursa Swelling

Semimembranosus bursa swelling is the most common swelling found in the popliteal space. It is made tense by extending the knee joint and becomes flaccid when the joint is flexed. It should be distinguished from a Baker's cyst, which is centrally located and arises as a pathologic (osteoarthritis) diverticulum of the synovial membrane through a hole in the back of the capsule of the knee joint.

## Popliteal Vein

The popliteal vein is formed by the junction of the venae comitantes of the anterior and posterior tibial arteries at the lower border of the popliteus muscle on the medial side of the popliteal artery. As it ascends through the fossa, it crosses behind the popliteal artery so that it comes to lie on its lateral side (Figs. 10.41 and 10.42). It passes through the opening in the adductor magnus to become the femoral vein.

### Tributaries

The tributaries of the popliteal vein are as follows:

- Veins that correspond to branches given off by the popliteal artery.
- **Small saphenous vein**, which perforates the deep fascia and passes between the two heads of the gastrocnemius muscle to end in the popliteal vein. The origin of this vein is described on page 487.

## Arterial Anastomosis Around the Knee Joint

To compensate for the narrowing of the popliteal artery, which occurs during extreme flexion of the knee, around the knee joint is a profuse anastomosis of small branches of the femoral artery with muscular and articular branches of the popliteal artery and with branches of the anterior and posterior tibial arteries.

## Popliteal Lymph Nodes

About six lymph nodes are embedded in the fatty connective tissue of the popliteal fossa (Fig. 10.4). They receive superficial lymph vessels from the lateral side of the foot and leg; these accompany the small saphenous vein into the popliteal fossa. They also receive lymph from the knee joint and from deep lymph vessels accompanying the anterior and posterior tibial arteries.

## Tibial Nerve

The larger terminal branch of the sciatic nerve (see page 467), the tibial nerve arises in the lower third of the thigh. It runs downward through the popliteal fossa, lying first on the lateral side of the popliteal artery, then posterior to it, and finally medial to it (Figs. 10.41 and 10.42). The popliteal vein lies between the nerve and the artery throughout its course. The nerve enters the posterior compartment of the leg by passing beneath the soleus muscle. Its further course is described on page 489.

### Branches

- **Cutaneous:** The **sural nerve** descends between the two heads of the gastrocnemius muscle and is usually joined by the **sural communicating branch** of the common peroneal nerve (Figs. 10.41 and 10.17). Numerous small branches arise from the sural nerve to supply the skin of the calf and the back of the leg. The sural nerve accompanies the small saphenous vein behind the lateral malleolus and is distributed to the skin along the lateral border of the foot and the lateral side of the little toe.
- **Muscular** branches supply both heads of the gastrocnemius and the plantaris, soleus, and popliteus (Figs. 10.41 and 10.42).
- **Articular** branches supply the knee joint.

## Common Peroneal Nerve

The smaller terminal branch of the sciatic nerve (see page 467), the common peroneal nerve arises in the lower third of the thigh. It runs downward through the popliteal fossa, closely following the medial border of the biceps muscle (Fig. 10.42). It leaves the fossa by crossing superficially the lateral head of the gastrocnemius muscle. It then passes behind the head of the fibula, winds laterally around the neck of the bone, pierces the peroneus longus muscle, and divides into two terminal branches: the superficial peroneal nerve and the deep peroneal nerve (Fig. 10.44). As the nerve lies on the lateral aspect of the neck of the fibula, it is subcutaneous and can easily be rolled against the bone.

### Branches

- **Cutaneous:** The **sural communicating branch** (Figs. 10.16 and 10.41) runs downward and joins the sural nerve. The **lateral cutaneous nerve of the calf** supplies the skin on the lateral side of the back of the leg (Figs. 10.1 and 10.41).
- **Muscular** branch to the short head of the biceps femoris muscle, which arises high up in the popliteal fossa (Fig. 10.42).
- **Articular** branches to the knee joint.



### CLINICAL NOTES

#### Common Peroneal Nerve Injury

The common peroneal nerve is extremely vulnerable to injury as it winds around the neck of the fibula. At this site, it is exposed to direct trauma or is involved in fractures of the upper part of the fibula. Injury to the common peroneal nerve causes **footdrop**.

## Posterior Cutaneous Nerve of the Thigh

The course of the posterior cutaneous nerve of the thigh through the gluteal region and the back of the thigh is described on page 465. It terminates by supplying the skin over the popliteal fossa (Fig. 10.1).

## Obturator Nerve

The course of the posterior division of the obturator nerve in the medial compartment of the thigh is described on page 465. It leaves the subsartorial canal with the femoral artery by passing through the opening in the adductor magnus (Fig. 10.42). The nerve terminates by supplying the knee joint.