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DEPARTMENT: AHS (DPT)

Q1 Write down a comprehensive note on blood supply and venous return of lower limb.

Blood Supply of lower limb

Femoral artery is the primary artery of the lower limb. It is the extension of the external iliac artery. External iliac transforms into femoral artery after crossing over the inguinal ligament. Then it enters the femoral triangle.

The profoundA femoris artery in the femoral triangle travels distally and posteriorly and gives rise to three more branches:

- **Perforating Branches:** It helps to supply the muscles which are present in the medial and posterior thigh and it penetrates the adductor magnus.
- **Medial Femoral Circumflex Artery:** It furnishes the neck and head of Femur. It is present around the lateral side of the Femur. If a fracture of the neck occurs this artery can be damaged easily.
- **Lateral Femoral Circumflex:** As the name indicates it is present on the lateral side of the Femur and furnishes some of muscles which are present on the lateral side of the thigh.

The Femoral artery leaves the femoral triangle and travels down to and travels down to the thigh through the adductor canal (a tunnel), it supplies the anterior thigh muscles. The Femoral artery enters the posterior part of the thigh by passing through the adductor magnus. After which it is called Popliteal Artery.

Other Arteries in Thigh:

Some other vessels also supply the lower limb. The Obturator Artery divides into two branches:

- **Anterior Branch:** Pectineus, Adductor muscles, Gracilis and Obturator externus are supplied by this branch.

- **Posterior Branch:** Deep Gluteal muscles are supplied by this branch. Superior and inferior Gluteal arteries supply the Gluteal. Also, the inferior Gluteal artery contributes towards vasculature of the posterior side of the thigh.

Arteries in the Leg:

The Popliteal Artery goes to the Posterior thigh and give rise to the branches which furnish the knee joint. After going through the Popliteal fossa, it exits in between Popliteal muscles and Gastrocnemius.

The Popliteal artery ends by splitting in Tibioperoneal trunk and anterior tibial artery. After that the Tibioperoneal trunk branches into fibular arteries and posterior Tibial arteries:

- **Fibular Arteries:** Another name for this artery is Peroneal Artery. It furnishes the lateral part of the leg through its perforating branches which overrun the intermuscular septum.
- **Posterior Tibial Artery:** It supplies the posterior part of the leg and also the planter surface of the foot by entering the sole of the foot through the Tarsal tunnel. It is accompanied by the tibial Nerve.

The anterior tibial artery which is another branch of the popliteal artery goes entirely between fibula and tibia, via the interosseous membrane's gap. It then covers and travels through the entire leg, into the foot where it is then called Dorsalis Pedis Artery.

Arteries in the foot

The blood supply to the foot is given through these two arteries:

- **Dorsalis Pedis:**
It is the extended version of the anterior tibial artery. The anterior tibial artery when enters the foot it is called Dorsalis Pedis. It goes over the dorsal part of tarsal bones. After that it moves inferiorly towards the planter portion of the foot. This artery furnishes the tarsal bones and the metatarsal's dorsal aspect. It also supplies the toes through deep planter arch.
- **Posterior Tibial Artery:**
It enter the sole of the foot via the tarsal tunnel after which it divides into the lateral and medial planter arteries, which supply the plater region of the foot and it also does its part in supplying the toes through the deep planter arch.

Venous return of the lower limb

The veins of the lower limb are divided into two categories, deep and superficial. These veins clear out the deoxygenated blood and bring it back to the heart.

- **Deep veins:** They are present under the fascia of the lower limb.
- **Superficial:** These veins are present in the subcutaneous tissues.

Venous drainage of the foot and leg

The primary venous drainage structure is the dorsal venous arch. It drains in the superficial veins. Some veins from the arch pierce deep into the leg which forms the anterior tibial vein.

On the plantar side of foot, the medial and lateral plantar veins arise. When these veins combine and form the posterior tibial and fibular veins.

In the knee on the posterior side anterior tibial, fibular and posterior tibial veins combine and make the popliteal vein. This vein then goes through the adductor canal to the thigh.

Venous Drainage of thigh :

When the popliteal vein enters the thigh is then called femoral vein. Profunda Femoris vein is the primary structure in the thigh, the blood from the thigh muscles is drained through this vein into the distal section of the femoral vein, femoral vein exits the thigh by running under the inguinal ligament, where it is called the external iliac vein.

The Gluteal Region

The draining in this region is done by superior and inferior gluteal veins which then empty into the internal iliac veins.

Superficial Veins of the lower limb

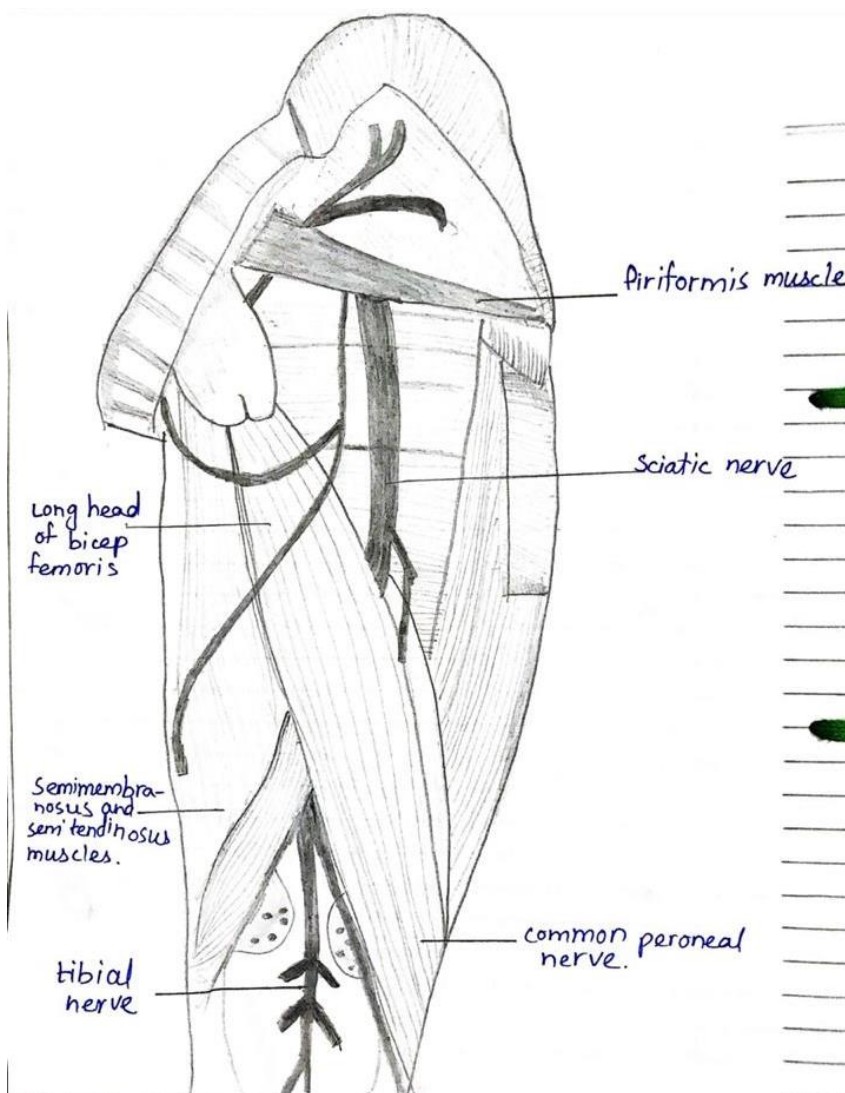
There are two superficial veins of the lower limb.

- **The Great Saphenous vein:** Dorsal venous arch of the foot and dorsal vein of the great toe combine to make the great Saphenous vein. It goes upward in the medial region of the leg and passes crossing posteriorly the medial condyle (Knee) and medial malleolus (ankle). As it moves upwards it combines with the other small veins (Superficial). This vein ends by draining in the femoral vein.
- **The Small Saphenous vein:** The dorsal vein of little toe and the dorsal venous arch of the foot combine to make the small saphenous vein. On the posterior region of the leg it

moves up. It passes posteriorly to the lateral malleolus along the lateral border of the calcaneal tendon. This vein runs between the two head of the gastrocnemius muscle and then it empties in the popliteal vein within the popliteal fossa.

Describe anatomical course of femoral and sciatic never with the help of diagrams

Anatomical Course of Sciatic Nerve

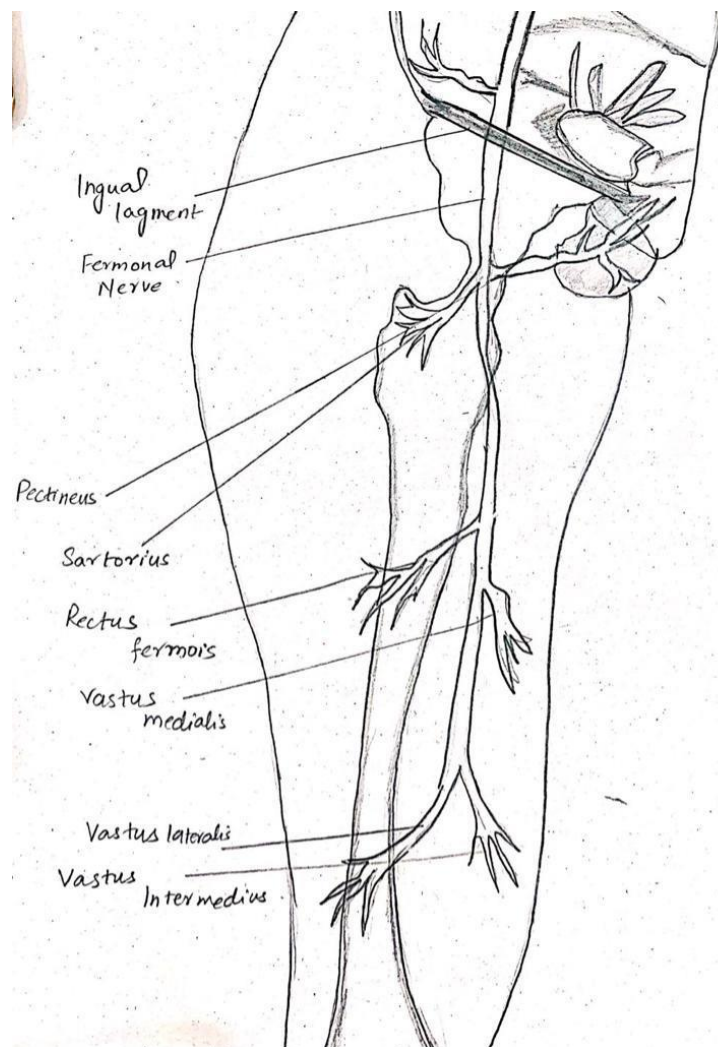


Sciatic is the largest nerve in the body and it extended or derived from the lumbosacral plexus. When it is formed it exits the pelvis and moves to the gluteal region through the sciatic foramen. It appears inferior to the piriformis muscle and goes down in an inferolateral direction.

After moving through the gluteal area, it passes through the posterior side of obturator internus, superior gemellus, inferior gemellus and quadratus femoris muscle. After with it sets its foot the posterior thigh.

The nerve then gives rise to branches to the adductor magnus and hamstring muscle within the thigh. The sciatic nerve ends when it reaches the apex of popliteal fossa and bifurcates in tibial fibular nerve.

Anatomical Course of Femoral Nerve



It is the largest branch of the lumbar plexus. It is the extension of anterior rami of nerve roots L2, L3 and L4.

It arises from the plexus and then moves through the psoas major muscle of the abdominal wall (Posterior), The femoral nerve before entering the thigh supplies branches to the pectineus and iliacus muscle.

The femoral nerve enters the femoral triangle by passing under the inguinal ligament. In this triangle the nerve is present lateral to the femoral vessels. The femoral nerve divides into anterior and posterior nerve 4cm below the inguinal ligament.

Anterior Branches:

- 1. Anterior Cutaneous Branches**
- 2. Branches to Pectineus**
- 3. Branches to Sartorius**

Posterior Branches:

- 1. Saphenous Nerve**
- 2. Branches to Quadriceps Femoris**