Subject: Anatomy II Total Marks 50

Final Term Assignment. Semester: DPT 2nd.

Q:1 *Enumerate muscles in the posterior compartment of the lower leg with clinical significances also write action and innervation of each posterior compartment muscle.*

- ***Answer:***

Muscles in the posterior compartment of lower leg:

- The posterior compartment of lower leg muscles are seven in numbers.
- The action of these muscles is to invert and plantarfelx the foot.
- The muscles of these compartments are arrange into 2 layers:

1. Superficial

2. Deep

- These layers are separated by bands of facia.
- In these three components the posterior leg is the largest leg.

- **Innervation:**

These muscles are invervated by a terminal branch of sciatic nerve called **tibial nerve**.

- **Superficial Muscles:**
  - These muscles are calf shape of posterior leg.
  - They are insert into the calcaneus of the foot the heel bone via the **calcaneal tendon**.
  - They reflex the test spinal root S1 and S2.
  - There are two bursae:

1. Subcutaneous calcaneal bursa: It is present between the skin and calcaneal tendon.
2. Deep bursa of the calcaneal tendon: It is present between the tendon and calcaneus.

1. Gastrocnemius:

The most Superficial muscle in the posterior leg.
It consist of two heads:
1. Medial
2. Lateral

- **Innervation:**

The Innervation of this muscles is tibial nerve.

- **Action:**

The action of this muscle is a flexor because it crosses the knee plantarfelx at ankle joint.

2. Plantaris:

- Plantaris is a small muscle with a short belly.
- Plantaris is a long slender tendon.
- It is absent about 10% of people.

- **Innervation:**

  The Innervation of this muscles is tibial nerve.

- **Action:**

  The **plantaris** action is to plantar flex the ankle joint and flex the knee joint.

3. Soleus:

- Its is flexor muscle of the ankle joint.
- It is located deep to the gastronemic muscles.
- It is large and flat muscles.
- It has resemblance with sole of flat fish that is why it is know as **soleus**.

- **Innervation:**

  The Innervation of this muscle is tibial nerve.

- **Action:**

  The action of this muscle is plantarflex the ankle joint.

4. Deep Muscles:

- The deep muscles consist of four muscles.
- **Politeus:** Acts only on the knee joint.
- **Tibialis posterior:** These are the remaining three muscles which flexor hallucis longus and flexor digitorium longus.
- These three muscles act on the ankle of foot.

- **Popliteus:**
  - It is a small muscle.
  - Popliteus is located superiorly in the leg.
  - It originates at the lateral epicondyle of the femur and the posterior horn of the lateral meniscus of the knee joint.
  - From there it runs mediodistally towards the tibia and inserts above the origin of the soleus **muscle**.

- **Innervation:**

  The Innervation of this muscle is tibial nerve.

- **Action:**
  - The **popliteus muscle** acts on its origin and laterally rotates the femur on the tibia.
  - This movement “unlocks” the knee and allows flexion to occur.
  - This **action** provides stability to the tibia during knee flexion.

- **Clinical Relevance of Ruptured Calcaneal Tendon:**
  - It is more common in people with chronic inflammation of tendon.
  - In this the patient is unable to plantarflex the foot against the resistance and the foot will permanently dorsiflex.
  - The complete and partial tear of tendon refers to rapture of calcaneal tendon.
  - The treatment of this ruptured calcaneal tendon is **Physiotherapy**.

Q:2 *Explain the following*

a) Foot drop
b) Deep venous thrombosis

Answer:

- **Foot Drop:**

Foot drop is a condition in which you cannot raise the front part of one or both feet. Foot drop can be a temporary problem, or it can be permanent, depending on what cause it.

- It is a clinical sign indicating paralysis of the muscles in the interior compartment of the leg.
- It is commonly seen when the common fibular nerve from which the deep fibular nerve arises is damaged.
- The muscles of the interior compartment are paralyzed in foot drop.

- **Symptoms:**

- People who have foot drop may drag their toes when they are walking.
- Symptoms include muscle weakness and "tingling" feelings in the leg.

- **Causes:**

Foot drop is caused by weakness of paralysis of the muscles involve in lifting the front part of the foot. Causes of foot drop might include:

- Nerve injury
- Muscle or nerve disorder
- Brain and spinal cord disorders

- **Deep venous thrombosis:**
  - It is the formation of blood clot in a deep vein, mostly common in the leg or pelvis.
  - Deep vein blood clots typically form in your thigh or lower leg, but they can also develop in other areas of your body.
  - Pulmonary occlusion prevents blood from returning to the heart resulting in **mechanical shock**.
- **Symptoms:**

Symptoms can include:

- Pain
- Swelling
- Redness
- Enlarged veins in the affected area
- Some DVTs have no symptoms

- **Causes:**

The following conditions can increase your risk of a DVT:

- An inherited condition that increases your risk of blood clots.

- Cancer and some of its treatments.
- Limited blood flow in a deep vein, due to injury, surgery, or immobilization
- Long periods of inactivity that decrease blood flow.
- Immobility after surgery or a serious injury.
- Being overweight

➢ **Treatment:**

Patients that are considered high risk of developing a **DVT** undergo **prophylactic treatment** to prevent thrombosis.

Q:3 *Explain blood supply of thigh and gluteal region with the help of diagram.*

➢ ***Answer:***

The Blood Supply Of Thigh:

- The blood supply of thigh directly comes from the external iliac artery.
- This external iliac artery becomes the femoral artery after it passes beneath the inguinal ligament and enters the femoral triangle.

➢ **Femoral Artery:**

- The **femoral artery** is a large artery in the thigh.
- It is the main arterial supply to the thigh and leg.
- It enters the thigh from behind the inguinal ligament as the continuation of the external iliac artery.

➢ **Profunda femoris artery:**

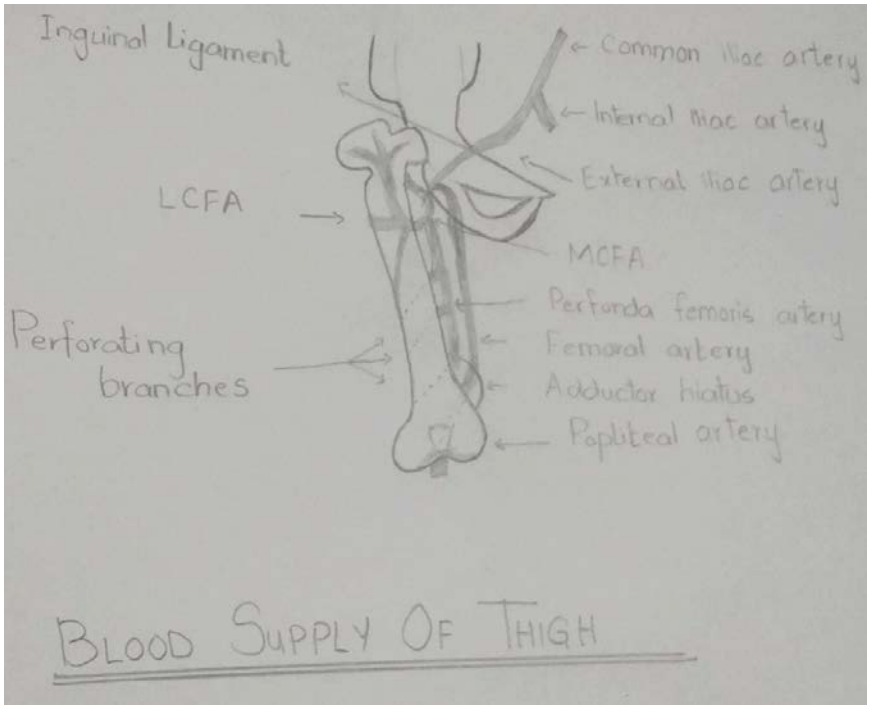
- It is the largest branch of femoral artery.
- This vessel is also known as deep artery of the thigh.
- It has 3 main branches:

1. Medial circumflex femoral artery

2. Lateral circumflex femoral artery

3. Perforating branches

Blood supply of thigh diagram:



➢ **Gluteal Region:**

- The **gluteal region** is an anatomical area.
- It is located posteriorly to the pelvic girdle, at the proximal end of the femur.
- The **muscles** in this region move the lower limb at the hip joint.
- This region is divided into two parts:

1. Superior gluteal region

2. Inferior gluteal region

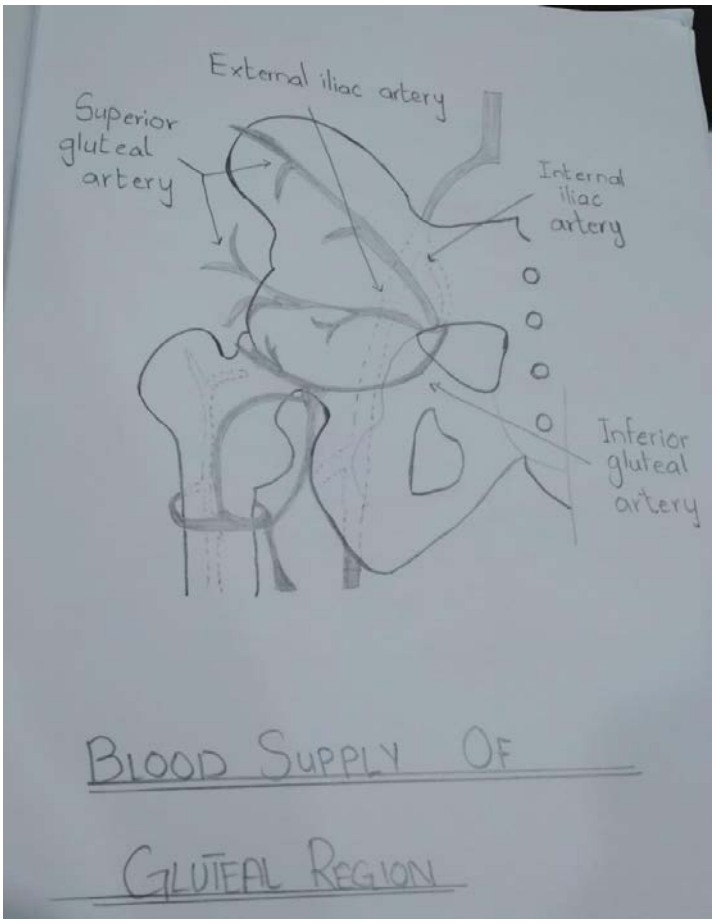
➢ **Superior Gluteal Region:**

- The **superior gluteal** nerve innervates the glutues medius and the glutues minimus.
- These **muscles** have an important role in stabilising the pelvis during locomotion.
- In the standing position, the **gluteus** minimus and medius contract when the contralateral leg is raised, preventing the pelvis from dropping on that side.

➢ **Inferior Gluteal Region:**

- The **inferior gluteal** nerve leaves the pelvis through the greater sciatic foramen and runs underneath the piriformis muscle.
- It then divides into **Muscular branches** to supply the gluteus maximus that pass posteriorly into the deep surface of the gluteus maximus muscle.

Blood Supply in gluteal region diagram:



Q 4: Describe anatomical course, motor and sensory function of Sciatic Nerve

- **Sciatic Nerve:**

  The sciatic nerve is the largest single nerve in the human body. It runs from each side of the lower spine through deep in the buttock into the back of the thigh and all the way down to the foot. It serves a vital role in connecting the spinal cord with the leg and foot muscles.

- **Explanation:**

  The sciatic nerve is formed by the combination of 5 nerves in the lumbar and sacral spine. These nerve fibers are typically responsible for motor and sensory functions of the lower body. The nerve leaves the pelvis along with its surrounding nerves and blood vessels through the greater sciatic foramen below the piriformis muscle. It progresses downward between the muscles of the thigh and is surrounded by a single long fatty sheath from the pelvis to the knee, where it divides.

- **Function Of Sciatic Nerve:**

- The function of sciatic nerve is;
- The sciatic nerve supplies major parts of the thighs, legs, and feet and has both motor and sensory functions.

- **Motor Functions Of Sciatic Nerve:**

- Motor functions of the sciatic nerve are following;
- Knee flexion like bending the knee.
- Hip adduction **i-e** bringing the thighs together/movement of the leg toward the midline of the body.
- Pointing the foot and Dorsiflexion of the foot.
- Extension of toes like pointing the toes upward.

- **Sensory Functions Of Sciatic Nerve:**

- Sensory functions of the sciatic nerve are ;
- The sciatic nerve provides sensations to the skin over the following areas:
- Front, back, and outer part of the thigh.
- Front, back, and outer part of the lower leg.
- The top and outer side of the foot.
- Sole of foot.
- The web between the first and second toes.
- Sensory symptoms such as burning, tingling, and/or numbness may be experienced when the sciatic nerve is inflamed or irritated.

Q 5: Enumerate Muscles of the medial compartment of thigh, what is tarsal tunnel syndrome?

- Answer:

The Medial Compartment Of Thigh:

The muscles in the medial compartment of thigh are collectively known as the **Hip Adductors.**

Muscles of the medial compartment of thigh:

- There are five muscles in this group:

1. Gracilis

2. Obturator externus

3. Adductor brvis

4. Adductor longus

5. Adductor mangus

- **Tarsal Tunnel Syndrome:**

Tarsal tunnel syndrome is a compression or sneezing, on the posterior tibial nerve that produces symptoms anywhere along the path of the nerve running from the inside of the ankle joint into the foot.

- Tarsal tunel syndrome is similar to the carpel tunnel syndrome, which occur in the wrist.
- Both syndrome arise from the compression of a nerve in a confined space.

- **Causes:**

Tarsal syndrome is caused by:

- Produces compression on the posterior tibial nerve.
- A person with flat feet is at risk for developing tarsal tunnel syndrome.
- An enlarged or abnormal structure that occupies space within the tunnel can compress the nerve.

- **Symptoms:**

Patients with tarsal tunnel syndrome experiences one or more of the following symptoms:

- Tingling, burning or a sensation similar to an electrical shock.
- Numbness
- Pain, including shooting pain

- **Diagnosis:**

The foot and ankle surgeon will examine the foot to arrive at a diagnosis and determine if there is any loss of feeling. During this examination, the surgeon will position the foot and tap on the nerve to see if the symptoms can be reproduced. He or she will also press on the area to help determine if a small mass is present.

- **Treatment:**

Tarsal tunnel is treated by:

1. Physical therapy

2. Non-surgical treatment

- **Physical therapy:**

Ultrasound therapy, exercises and other physical therapy modalities may be prescribed to reduce symptoms.

- **Nonsurgical Treatment:**

These includes:

1. Rest

2. Ice

3. Oral medications