

QUESTION NO 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 the leg contains seven muscles organized into two layers.

TWO LAYERS:

The two layers of posterior compartment of the lower leg is **Superficial** and **deep**

- Two layers is separated by a band of fascia.
- Posterior leg is the largest of the three compartments.
- Muscles in this area **plantarflex** and **invert** the foot.
- They are innervated by the **tibial nerve**, a terminal branch of the sciatic nerve.

SUPERFICIAL MUSCLES :-

• The superficial muscles form the characteristic ‘calf’ shape of the posterior leg. They insert into the calcaneus of the foot (**the heel bone**) through the calcaneal tendon. The reflex tests of **calcaneal** spinal roots **S1 S2**. During movement the minimise friction there are two bursa associated with the calcaneal tendon

SUBCUTANEOUS CALCANEAL BURSA:-

- In this condition that causes heel pain.
- This pain radiates from the bursa located between your Achilles tendon and skin.

DEEP BURSA OF THE CALCANEAL TENDON:-

The **tendon** is the retrocalcaneal (subtendinous) **bursa**, which is located between the **Achilles tendon** and the **calcaneus**.

GASTROCNEMIUS:-

The **gastrocnemius** muscle (plural gastrocnemii) is a superficial two-headed muscle that is in the back part of the lower leg of humans. It has two heads **medial** and **lateral** which converge to form a single muscle belly.

ATTACHMENT :-

- It originated from the two heads of the femur.
- The posterior surface of the medial condyle.
- The medial head originates from the popliteal surface of the femoral shaft

Actions:

- plantar flexes foot
- flexes knee

INNERVATION:-

- Tibial nerve

PLANTARIS:-

It is a small muscle with a long tendon, which can be mis taken for a nerve. It is absent in **10%**of the people.

ACTIONS :-

- It is Flexor here
- The pantarflexes at the ankle joint.
- It is not a vital muscle for these movements.

INNERVATION:-

- Tibial nerve

SOLEUS:-

- **It** is located deep to the gastrocnemius.
- It is large and flat, named soleus due to its resemblance of a sole – a flat fish

ACTIONS :-.

- Plantarflexes the foot at the ankle joint.

INNERVATION:-

- Tibial Nerve_

DEEP MUSCLES :-

There are four muscles in the posterior compartment of the leg

- Popliteus
- Tibialis posterior
- Flexor hallucis longus
- flexor digitorum longus

POPLITEUS:-

- It is located superiorly in the leg.
- It lies behind the knee Joint, forming the base of the popliteal fossa.
- Bursa (fluid filled sac) that lies between the popliteal Tendon and the posterior surface of the knee joint. It is called the Popliteus bursa.

ACTIONS :-

- Laterally rotates the femur on the tibia – ‘unlocking’ the knee joint so that flexion can occur

INNERVATION :-

- Tibial nerve.

TIBIALIS POSTERIOR :-

Act on the ankle foot

FLEXOR HALLUCIS LANGUS:

Act on the ankle foot

FLEXOR DIGITORUM LONGUS :-

Act on the ankle foot

CLINICAL REVELENCE:

The posterior compartment of the leg (often referred to as the “calf”) further divides into distinct superficial and deep compartments by the transverse intermuscular septum. The larger, superficial compartment of the lower leg contains the gastrocnemius, soleus (GS) and plantaris muscles.

QUESTION NO 2

Explain the following

- a) Foot drop b: deep venous thrombosis**

ANSWER :

A.Foot drop:

Foot drop is a gait abnormality in which the dropping of forefoot happens due to weakness, irritation, or damage to the common fibular nerve including sciatic nerve, or paralysis of the muscle in the anterior portion of the lower leg. Foot drop is characterized by inability or impaired ability to raise the toes or raise the foot from the ankle known as dorsiflexion. Foot

drop may be temporary or permanent, depending on the extent of muscle paralysis and it can occur in one or both feet.

Clinical relevance:

Patients with common fibular nerve damage will lose the ability to dorsiflex the foot at the ankle joint. Hence the foot will appear permanently plantarflexed known as foot drop.

B. Deep venous thrombosis

Deep venous thrombosis is the formation of blood clot within deep veins of the lower limb, causing blockage of the vessel. deep vein blood clots typically form in your thigh or lower leg, but they also develop in other areas of the body. The main complication of dvt is pulmonary embolism. Pulmonary occlusion prevents blood from returning to the heart, resulting in mechanical shock.

DVM symptoms:

Common symptoms of dvm include:

- Swelling in your foot, ankle or leg usually on one side
- Cramping pain in your affected leg
- Severe, unexplained pain in your foot and ankle
- Skin over the affected area turning pale or a reddish or bluish color

Causes of DVM

Dvm is caused by a blood clot . the clot blocks a vein ,preventing blood from properly circulating in your body. Clotting may occur for some reasons. these include;

Injury: damage to a blood vessels wall narrow or block blood flow

Reduced mobility: when you sit frequently, blood can collect in your legs, especially the lower limb parts so it may be unable to move for extended periods of time.

QUESTION NO 3

Explain blood supply of thigh and gluteal region with the help of diagram.

Answer :-

The arterial blood supply of the thigh comes directly from the external iliac artery. The external iliac artery becomes the femoral artery after it passes beneath the inguinal ligament and enters the femoral triangle. The femoral triangle is a useful anatomical landmark

ARTERIES OF THE THIGH:

The femoral artery runs in the middle of the femoral triangle. It supplies the anterior and anteromedial aspects of the thigh. The profunda femoris artery is the largest branch of the femoral artery

BRANCHES

- Medial circumflex femoral artery
- Lateral circumflex femoral artery
- Perforating branches

Medial femoral circumflex artery:

Wraps around the posterior side of the femur, supplying its neck and head. In a fracture of the femoral neck this artery can easily be damaged and avascular necrosis of the femur head can occur.

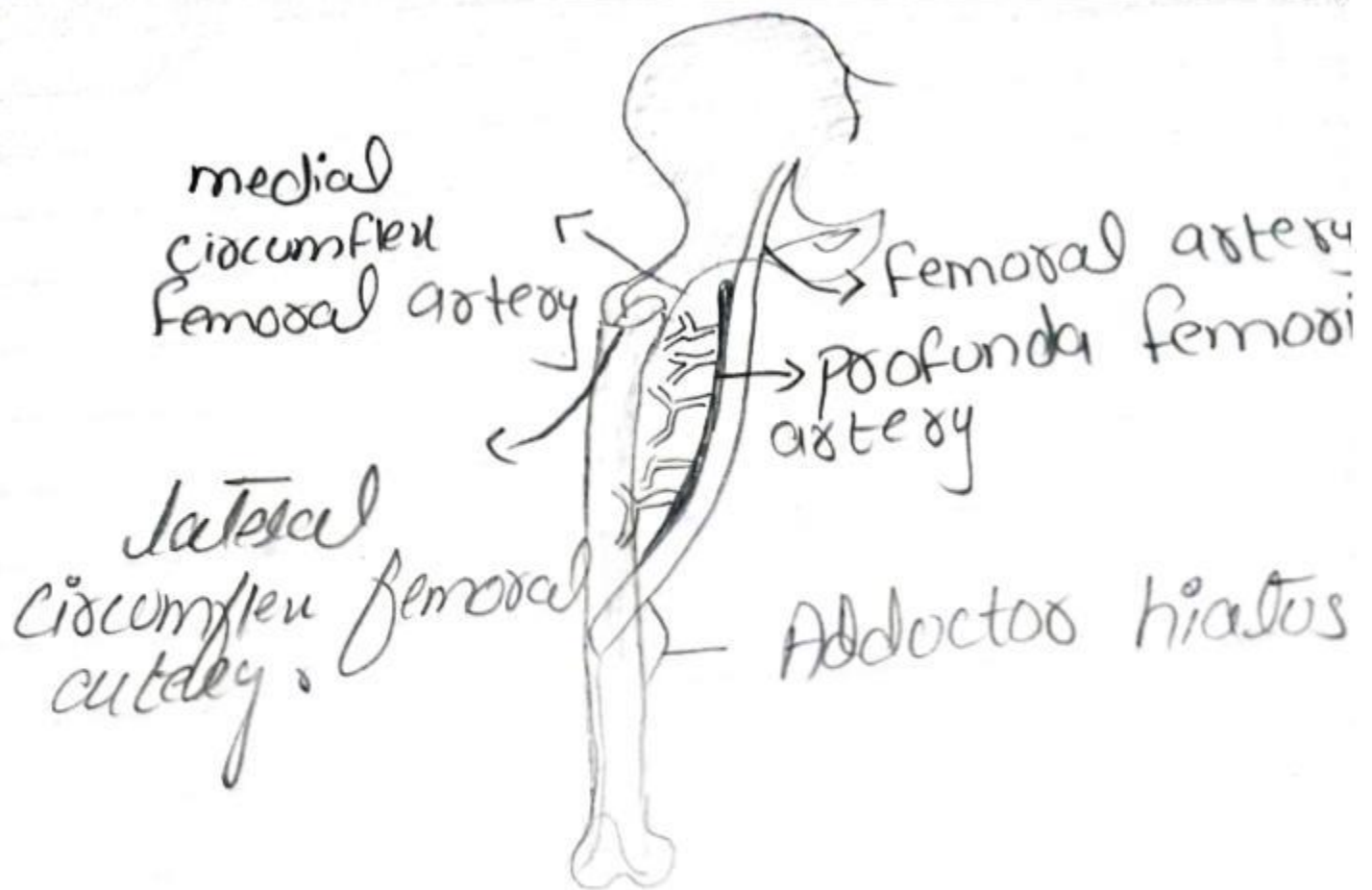
Lateral circumflex femoral artery:

Wraps around the posterior side of the femur, supplying some of the muscles on the lateral aspect of the thigh.

Perforating branches:

Consist of three four arteries that perforate the adductor magnus, contributing to the supply of the muscles in the medial and posterior thigh.

DIAGRAM



ARTERIAL OF THE GLUTEAL REGION:

The main arteries of the gluteal region are the

- superior gluteal
- inferior gluteal arteries

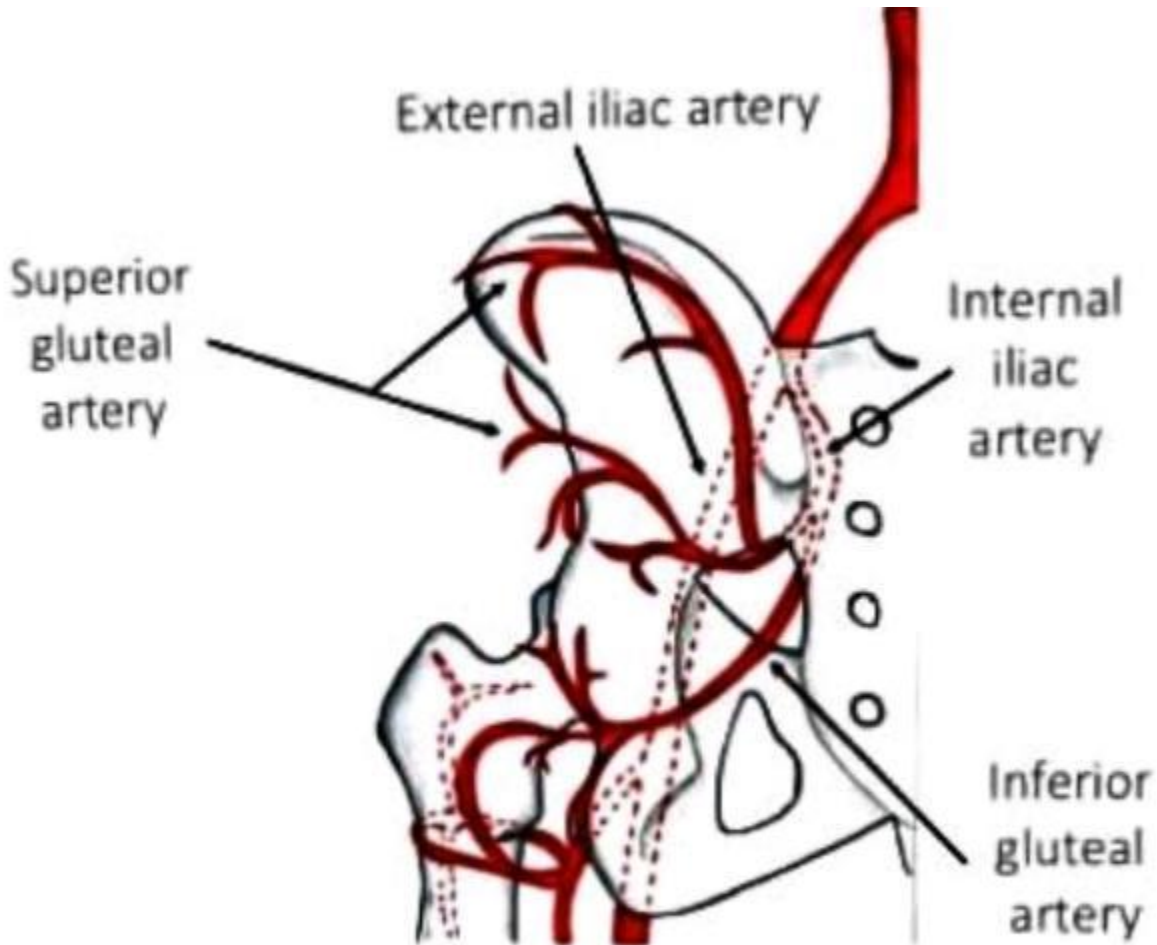
SUPERIOR GLUTEAL ARTERY:

The superior gluteal artery is the largest branch of the internal iliac artery and arises from its posterior division. It has superficial and deep branches which supply the gluteus maximus, gluteus medius, gluteus minimus and tensor fasciae muscles

INFERIOR GLUTEAL ARTERY:

The inferior gluteal artery originates from the anterior division of the internal iliac artery. This artery supplies blood to the gluteus maximus, piriformis, internal obturator, and inferior and quadratus femoris muscles. It also gives off a branch to the sciatic nerve.

DIAGRAM



Arteries of the gluteal region

QUESTION NO 4:-

Describe anatomical course, motor and sensory function of Sciatic Nerve?

ANSWER :-

SCIATIC NERVE:

NERVE ROOT: L4-S3

ANATOMICAL COURSE:

The sciatic nerve is a major nerve of the lower limb. It is a thick flattened band which is 2cm wide. It is the largest nerve in the body after its formation, it leaves the pelvis and enters the gluteal region by greater sciatic foramen. Within the posterior thigh, the nerve gives rise to the branches to the hamstring muscles and adductor magnus. When the sciatic nerve reaches the apex of the popliteal fossa, it terminates by bifurcating into the tibial and common fibular nerves.

MOTOR FUNCTION:

The sciatic nerve passes through the gluteal region but does not innervate any muscles there. The muscles of the posterior thigh and the portion of hamstring of the adductor magnus are innervated by sciatic nerve. The sciatic nerve also directly innervates several other muscles, into two terminal branches

TIBIAL NERVE:

The muscles of the posterior leg, calf muscles and some of the intrinsic muscles of the foot

COMMON FIBULAR:

The muscles of the anterior leg, lateral leg and the remaining intrinsic foot muscles

SENSORY FUNCTION

The sciatic nerve does not have any direct cutaneous function, it does provide indirect sensory innervation via its terminal branches

TIBIAL NERVE

Supplies the skin of the posterolateral leg, lateral foot and the sole of the foot

COMMON FIBULAR NERVE

Supplies the skin of the lateral leg and the dorsum of the foot

QUESTION NO 5:-

Enumerate muscles of the medial compartment of thigh, what is tarsal tunnel syndrome?

ANSWER :-

MUSCLES IN THE MEDIAL COMPARTMENT OF THE THIGH:-

The muscle of the medial compartment of the thigh is known as hip adductor.

There are five muscles in this part.

- Gracilis
- obturator externus
- adductor brevis
- adductor longus
- Adductor magnus

The **obturator nerve** innervates all the thigh muscles. It arises from the lumbar plexus. The arterial is through the obturator artery.

GRACILIS :-

The gracilis is the most medial and superficial of the muscles in this compartment. It crosses the both hip and knee joint. Some times it transplants into the hand or forearm to replace the damaged muscles.

OBTURATOR EXTERNUS :-

Obturator externus muscle is the short muscle of the gluteal regions that acts upon the hip joint. It externally rotates the femur when the hip is extended, but when the hip is flexed it actually abducts the thigh. Together with other short muscles around the hip joint, it contributes to the joint stability.

ADDUCTOR BREVIS :-

The adductor brevis is the muscle of the thigh situated deep in the pectineus and adductor longus. The adductor brevis is to pull the thigh medially. Adductor brevis is a flat, triangular muscle that is found in the inner thigh.

ADDUCTOR LONGUS :-

The adductor longus is a large fan shaped muscle located in the medial aspect of the thigh. In the human body, the adductor longus is a skeletal muscle located in the thigh.

ADDUCTOR MANGUS:-

The adductor magnus is a large triangular muscle, situated on the medial side of the thigh that performs adduction at the hip joint. , it arises from the pubis and the tuberosity of the ischium, which are also known as the sitz or sitting bones.

TARSAL TUNNEL SYNDROMES:-

Tarsal tunnel syndrome is a compression, or squeezing, on the posterior tibial nerve which it produces symptoms anywhere along the path of the nerve running from the inside ankle into the foot, carpal tunnel syndrome and tarsal tunnel syndrome both are similar.

SYMPTOMS :-

People with tarsal tunnel syndrome may experience pain, numbness, or tingling. This pain can be felt anywhere along the tibial nerve, but it's also common to feel pain in the sole of the foot or inside the ankle.

- This can feel like:-
- Pins and needles
- A burning sensation
- Sharp, shooting pains
- An electric shock

CAUSES:-

Tarsal tunnel syndrome results from compression of the tibial nerve, and it's often caused by other conditions.

- Inflammation from arthritis

- Diabetes, which makes the nerve more vulnerable to compression
- Lesions and masses like tumors or lipomas near the tibial nerve
- Severely flat feet, because flattened feet can stretch the tibial nerve
- Varicose veins in the membrane surrounding the tibial nerve, which cause compression on the nerve

TREATMENT :-

Nonsurgical treatment for TTS includes anti-inflammatory medications or steroid injections into the tarsal tunnel to relieve pressure and swelling. Braces splints or other orthotic devices may help reduce pressure on the foot and limit movement that could cause compression on the nerve.