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"Sawera"  
"15851"  
Section "A"

Q1:- Question:- 01

Enumerate muscles in posterior compartment of lower leg with clinical significances also write action and innervation of each posterior compartment muscle.

Answer:-

Muscles in posterior compartment of the leg:-

There are seven muscles in posterior compartment of leg which are organized into two layers:-

- ① Superficial layer
- ② Deep layer

⇒ Superficial layer:-

In posterior leg the superficial muscles form "calf" shape, of the posterior leg. These all insert through calcaneal tendon into the heel bone.

⇒ To reduce or minimizing the friction which is produced during movement there are two fluid filled sacs present there.



5

The two sacs are :-

- 1- Subcutaneous calcaneal bursa
- 2- Deep bursa of calcaneal tendon

1- **Sub-cutaneous calcaneal bursa:-**

It is present between the calcaneal tendon and the skin.

2- **Deep bursa of calcaneal tendon:-**

It is present between the calcaneus and tendon.

1:- **Gastrocnemius:-**

The most superficial muscle of posterior leg is the gastrocnemius.

**Heads:-**

There has two heads of gastrocnemius:-

- 1- Medial
- 2- Lateral

**Forms:-**

These two muscles forms the single muscle belly.

1) **Innervation:-**

It innervates tibial nerve.

2) **Action:-**

It plantar flexes at the joint of ankle.

2:- **Plantaris:-**

The small muscle with the long tendon is plantaris.



3

It descends down the leg.  
It is usually absent in 10% people.

**Innervation:-**

It innervates tibial nerve.

**Action:-**

It plantar flexes the joint of ankle.

3: **Soleus:-**

It is located deep to the gastrocnemius. It is flat and large. It is like a sole of a flat fish.

**Innervation:-**

It also innervates tibial nerve.

**Action:-**

It plantar flexes the joint of ankle of foot.

2 **Deep Muscles:-**

→ It has four muscles in the posterior leg, of deep compartment.

→ One muscle acts only on the joint of knee is popliteus.

→ There are three other muscles (tibialis posterior, flexor digitorum longus and flexor hallucis longus).

→ These three act on foot and ankle.



## 1. Popliteus:-

It is located superiorly in leg.

### Presence:-

It is present behind the joint of knee forms base of popliteal fossa.

### Bursa:-

There are fluid filled sac which are present between the posterior surface of knee joint and popliteal tendon. This bursa is called popliteus bursa.

### Innervation:-

It innervates tibial nerve.

### Action:-

It rotates the femur on the tibia laterally.

## Clinical Relevance:-

### Ruptured calcaneal Tendon:-

It is a complete or partial tearing of tendon.

### Calcaneal Tendinitis:-

It occur in people which has a history of calcaneal tendinitis.

### Back of leg:-

It mainly affects the back of lower leg.



## Plantar flexion:-

5

It usually extend during forceful plantar flexion of the foot.

## Resistance:-

The patient will not plantar flex the foot against the resistance.

## Dorsiflexed:-

The foot which is affected will be permanently dorsiflexed.

## Lump:-

The gastrocnemius and the soleus contract to form a lump in the region of calf.

## Treatment:-

The treatment is conservative physiotherapy.

## Question:- 02

Explain the following :-

- a) Foot drop
- b) Deep venous thrombosis

## Answer:-

### A:- Foot Drop:-

It is clinical relevance of anterior compartment of leg.

### Paralysis:-

It is the paralysis of muscles.

### Reasons:-

It happens due to weakness, irritation and damaging of common fibular nerve.



**Depend:-**

The muscles in the anterior compartment are paralyzed. It can be permanent or temporary depending on the extent of muscles.

**Permanent Plantar flexion:-**

Permanent plantar flexion is produce due to unopposed pull of the plantar flexor.

It cause interfere with walking.

**Symptoms:-**

=> Difficult to lift front part of the foot.

=> In some cases the top of foot and toes feels numb.

**b. Deep Venous thrombosis:-**

It is a serious condition occurs when a clot of blood forms deep inside a body.

**Clump:-**

This blood clot is a clump of blood which turned into a state of solid.

**Presence:-**

It is usually in thigh or lower leg.



### Symptoms:-

Common symptoms are:-

1. Swelling in foot, leg or ankle, on one side.
2. Cramping pain.
3. Warm skin
4. Skin turns pale or a reddish or bluish colour.

### Causes:-

Causes are:-

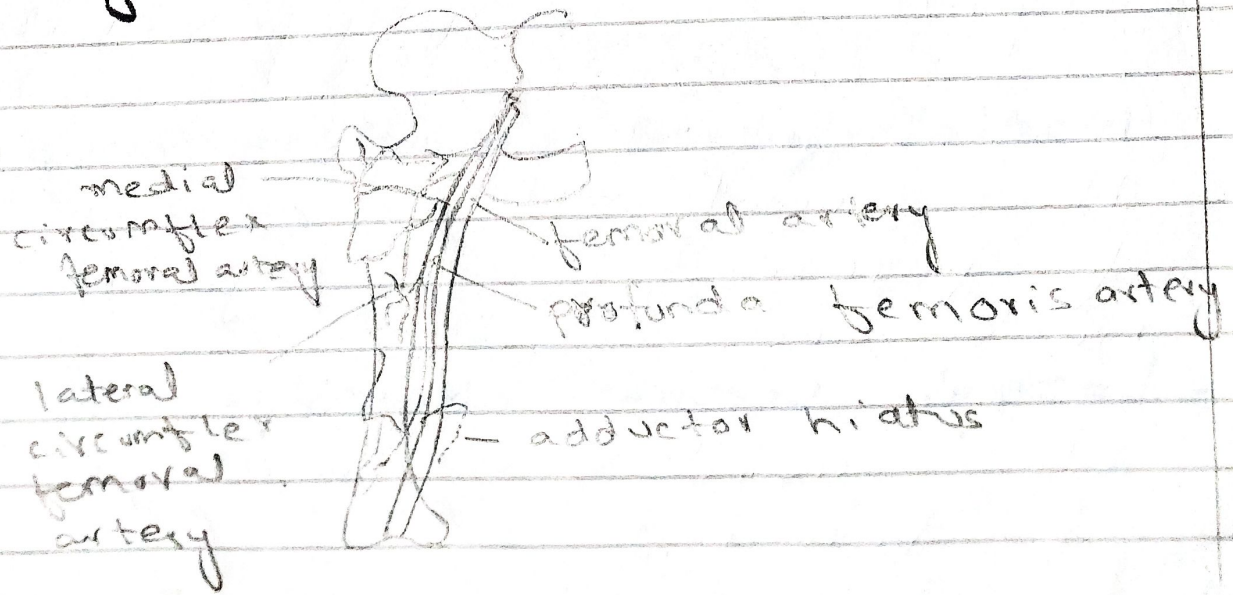
1. Injury
2. Surgery
3. Certain medications.

### Question:- 03

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

### Answer:-

Diagram:-





(8)

## Blood supply to thigh and gluteal region:-

### Femoral Artery:-

Main artery of thigh limb is femoral artery. Femoral artery is continuation of external iliac artery.

### Femoral Triangle:-

The external iliac artery becomes femoral artery when it enters the femoral triangle.

### Branches:-

In femoral triangle the profunda femoris artery arises which travels distally and posteriorly giving three branches:-

- 1- Perforating Branch
- 2- Lateral femoral circumflex artery
- 3- Medial femoral circumflex artery

### 1- Perforating Branch:-

It consist three or four arteries. It supply medial and posterior thigh.

### 2- Medial femoral circumflex artery:-

It surrounds posterior side of femur. It supply the neck and head.

### 3- Lateral femoral circumflex artery:-

It surrounds anterior side of femur and supply blood to lateral side of thigh.



9

## Adductor Canal:-

When exit femoral triangle the femoral artery descends down anterior surface of thigh through adductor canal. It supply anterior thigh muscles.

## Adductor hiatus:-

The adductor canal ends at the adductor magnus opening, called adductor hiatus.

## Entering:-

The femoral artery enters into posterior compartment through this opening.

## Popliteal Artery:-

The femoral artery is called as popliteal artery.

## Question:- 04

Describe anatomical course, motor and sensory function of sciatic nerve.

## Answer:-

## Anatomical Course of Sciatic nerve:-

The sciatic nerve is derived from lumbosacral plexus. when it forms it leaves that pelvis and enters into gluteal region through greater sciatic foramen.



### Inferolateral Direction:-

It originates inferiorly to piriformis muscle then descends in inferolateral direction.

### Crosses:-

When nerve moves through gluteal region it crosses the superior gemellus, obturator internus, inferior gemellus and quadratus femoris muscle.

### Bicep Femoris:-

Then it enters into posterior thigh by passing deep to long head of ~~biceps~~ biceps femoris.

### Branches:-

Then posterior thigh give branches to hamstring muscles and adductor magnus.

### Bifurcating:-

When sciatic nerve reach the popliteal fossa apex it terminate into tibial and common fibular nerve by bifurcating.

### Motor Function of Sciatic nerve:-

When sciatic nerve passes through gluteal region it does not supply blood to any muscle there.



## Innervation:-

The sciatic nerve does not supply directly the muscles in posterior compartment of thigh and hamstring portion of adductor magnus.

## Supply:-

The sciatic nerve indirectly supply blood to other muscles.

- ① Tibial nerve
- ② Common fibular nerve.

## → Sensory function of sciatic nerve:-

There is no direct cutaneous functions of the sciatic nerve.

## Indirect:-

It has indirect sensory innervation through its terminal branches:-

- 1. Tibial nerve
- 2. Common fibular nerve.

## Tibial Nerve:-

It supply to skin of leg, sole of foot and lateral foot.

## Common Fibular Nerve:-

It supply to lateral leg and dorsum of the foot.





### Question:- 05

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

### Answer:-

Muscles in medial compartment of thigh:-

Following are the muscles in the medial compartment of thigh:-

1. Gracilis
2. Obturator externus
3. Adductor brevis
4. Adductor longus
5. Adductor Magnus

### Hip Adductors:-

⇒ They all are known as hip adductors.

### Obturator Nerve:-

All the muscles of medial thigh are innervated by obturator nerve.

### Lumbar plexus:-

The obturator nerve arise from lumbar plexus.

### Arterial supply:-

The arterial supply of medial compartment of thigh is through obturator artery.

### ① Gracilis:-

The most superficial muscle



(3)

of medial compartment of thigh.

### 2. Adductor Magnus:-

The largest muscle of medial compartment of thigh is adductor magnus.

### 3. Adductor Longus:-

It is a flat and large muscle partially covers the adductor magnus and adductor brevis.

### 4. Adductor Brevis:-

It is a short muscle present under adductor longus.

### 5. Obturator Externus:-

It is smaller muscle in medial compartment of thigh.

### ⇒ Tarsal Tunnel Syndrome:-

Compression or squeezing on posterior tibial nerve is tarsal tunnel syndrome.

#### Similar:-

It is similar to carpal tunnel syndrome.

#### Nerve Compression:-

They both arise from nerve compression.

#### Causes:-

Person with flat feet,  
Injury like ankle sprain  
Diabetes, arthritis cause swelling which compress nerve.



Symptoms:-

- Burning
- Numbness
- Pain

Treatment:-

- Rest
- Icing
- Physiotherapy
- Shoes
- Surgery if needed.

