



*6<sup>th</sup> lecture*  
*sacral plexus*  
*(femoral & sciatic nerves)*

*This Lecture is done by:*

*Faten ALMohideb*

## sacral plexus (femoral & sciatic nerves)

### LUMBAR PLEXUS

Formation	Site	Main branch
Ventral (anterior) rami of the upper 4 lumbar spinal nerves (L1, 2, 3 and L4).	Within the substance of the <b>psoas major muscle</b> .	1- <b>iliohypogastric &amp; ilioinguinal</b> → to anterior abdominal wall. 2- <b>Obturator</b> → to medial (adductor) group of the thigh. 3- <b>Femoral</b> → to anterior group of the thigh.

### SACRAL PLEXUS

Formation	Site	Main branch
By the ventral (anterior) rami of a part of L4 & whole L5 (lumbosacral trunk) + S1, 2, 3 and most of S 4).	in front of the <b>piriformis muscle</b> .	1- <b>Pelvic splanchnic nerves</b> → the sacral part of the parasympathetic system and arise from the second, third, and fourth sacral nerves. <b>Note:</b> They are distributed to the pelvic viscera. 2- <b>Pudendal nerve</b> → to the perineum. 3- <b>Sciatic nerve</b> → to the lower limb.

## FEMORAL NERVE

Origin	Course	BRANCHES
from lumbar plexus (L2,3,4).	-Descends lateral to psoas major & enters the thigh behind the inguinal ligament. - Passes lateral to femoral artery & divides into ( anterior & posterior divisions).	<b>1-Muscular:</b> <u>In abdomen:</u> To iliacus (flexor of hip joint). <u>In lower limb:</u> To anterior compartment of the thigh. <u>To flexors of hip joint:</u> Sartorius & pectineus <u>To extensors of knee joint:</u> Quadriceps femoris. <b>2-Cutaneous:</b> To antero-medial aspects of the thigh. To medial side of knee, leg and foot ( <b>saphenous nerve</b> ).

## INJURY OF THE FEMORAL NERVE

### MOTOR EFFECT

Paralysis of	Movement affected
Iliacus (I)	Flexion of the hip
Sartorius (S)	Flexion and <b>ab</b> duction of the hip
Pectineus(P)	Flexion and <b>add</b> uction of the hip
<b>Quadriceps femoris</b>	Extension of the knee

**SENSORY EFFECT**  
Loss of sensation of the areas supplied by femoral nerve.

## GENERAL MANIFESTATIONS OF FEMORAL NERVE

### INJURY

#### MOTOR EFFECT

- 1- Wasting of quadriceps femoris.
- 2-Loss of extension of knee.
- 3-Weak flexion of hip (psoas major is intact).

#### SENSORY EFFECT

- 1-loss of sensation over areas supplied (antero-medial) aspect of thigh & medial side of leg & foot.

## SCIATIC NERVE

It is the largest nerve of the body.

<u>Origin</u>	<u>Course</u>	<u>Termination</u>
Sacral plexus (L4,5, S1, 2,3).	Leaves the pelvis through <b>greater sciatic foramen</b> , below <b>piriformis</b> & passes in the <b>gluteal region</b> (between ischial tuberosity & greater trochanter) then to posterior compartment of thigh.	Divides into <b>tibial &amp; common peroneal (fibular) nerves</b> in the middle of the back of thigh.

### 1- TIBIAL NERVE

#### Course:

Descends through popliteal fossa to the posterior compartment of leg, accompanied with posterior tibial vessels.

Passes deep to flexor

**retinaculum** (behind the medial malleolus) to reach the sole of foot where it divides into 2 terminal branches, (**medial & lateral planter nerves**).

#### Main Branches of Sciatic

### 2- COMMON PERONEAL (FIBULAR) NERVE

#### Course:

Leaves popliteal fossa & close to the lateral aspect of neck of the fibula.

Then divides into

**1-Superficial peroneal:**

descends into lateral compartment of leg.

**2-Deep peroneal:** descends into anterior compartment of leg.

## MUSCULAR:

-To Hamstrings (flexors of knee & extensors of hip).

-To all muscles in the leg & foot:

### 1-Common peroneal:

Muscles of anterior & lateral compartments of leg (**dorsiflexors of ankle, extensors of toes, evertors of the foot**).

### 2-Tibial:

Muscles of posterior compartment of leg & muscles of sole, (**plantarflexors of ankle, flexors of toes**).

## CUTANEOUS:

To all leg & foot **EXCEPT**: areas supplied by saphenous (blue), branch of femoral nerve.

**Note** : lesion in sciatic nerve lead to :

### **\*Sensory :-**

Sensation is lost *below the knee, except for a narrow area down the medial side of the lower part of the leg and along the medial border of the foot as far as the ball of the big toe, which is supplied by the saphenous nerve (femoral nerve).*

## OTHER BRANCHES OF SCIATIC NERVE

### Note:

Most nerve lesions are incomplete, and **in 90% of injuries, the common peroneal (part of the nerve) is the most affected.** Why?\_

- The common peroneal nerve fibers lie superficial in the sciatic nerve.

# SCIATIC NERVE INJURY

## CAUSES OF SCIATIC NERVE INJURY

II-Posterior dislocation of the hip joint

*The sciatic nerve is most frequently injured by...?*

I- Badly placed intramuscular injections in the gluteal region. To avoid this, injections should be done into the gluteus maximus or medius, (into the **upper outer quadrant of the buttock**).

## CLINICAL FEATURES OF SCIATIC NERVE

### Motor:-

The hamstring muscles are **paralyzed**, but *weak flexion of the knee is possible*. Why?

- because of the action of the sartorius (femoral nerve) and gracilis (obturator nerve).

-All the muscles below the knee are **paralyzed**, and the weight of the foot causes it to assume the *plantar-flexed position*. or *foot drop*.

### Sensory :-

Sensation is lost *below the knee*, **except for a narrow area down the medial side of the lower part of the leg and along the medial border of the foot as far as the ball of the big toe**, which is supplied by the saphenous nerve (femoral nerve).

## SCIATICA

Sciatica describes the condition in which **patients have pain along the sensory distribution of the -sciatic nerve**.

-Thus the pain is experienced in the posterior aspect of the thigh, the posterior and lateral sides of the leg, and the lateral part of the foot.

### Sciatica can be caused by:

1-Prolapse of an intervertebral disc, with pressure on one or more roots of the lower lumbar and sacral spinal nerves,

The **common peroneal nerve** is in an *exposed position* as it leaves the popliteal fossa it winds around neck of the fibula to enter peroneus longus muscle, (**dangerous position**).

The common peroneal nerve is commonly injured in:

by pressure from casts or splints.

fractures of the neck of the fibula .

## clinical features of the common peroneal nerve injury

### Motor:

The muscles of the anterior and lateral compartments of the leg are paralyzed,  
-As a result, the opposing muscles, **the plantar flexors of the ankle joint** and the **invertors of the subtalar joints**, cause the foot to be **plantar flexed (foot drop) and inverted**, an attitude referred to as **equinovarus**

## Tibial Nerve Injury

-The **tibial nerve** leaves the popliteal fossa by passing deep to the gastrocnemius & soleus.  
-Because of its deep and protected position, it is *rarely injured*.

Complete division results in the following clinical features:

### Motor:

-All the muscles in the back of the leg and the sole of the foot are paralyzed.  
-The opposing muscles **dorsiflex the foot at the ankle joint and evert the foot at the subtalar joint**, an attitude referred to as **calcaneovalgus**

### MCQs:

-Which of the following is supplied by the femoral nerve ?

- 1- Extensors of hip.      2- Skin of dorsum of foot.      3- Hamstrings.      4- **Extensors of knee.**

-Which of the following movement is lost when the common peroneal nerve is injured?

- 1- **Dorsiflexion of ankle.**      2- Inversion of foot.      3- Extension of knee.  
4- Flexion of toes.