

ANATOMY

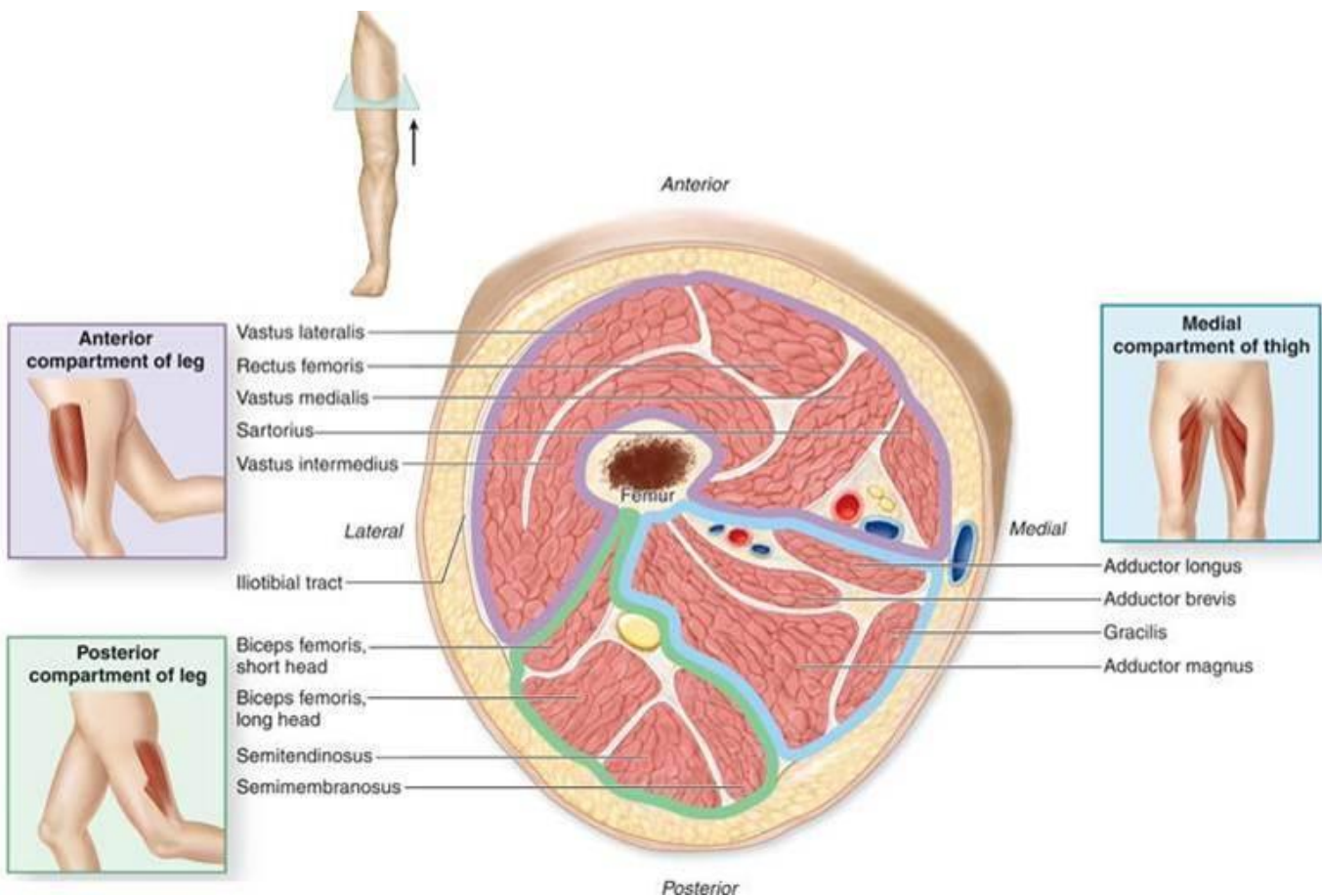
The Thigh



FASCIAL COMPARTMENT OF THE THIGH

- Three fascial septa pass from the inner aspect of the deep fascial sheath of the thigh to the linea aspera of the femur .
- by this mean the thigh is divided into 3 compartment each have M,N,A.

ANT. POST. MED.



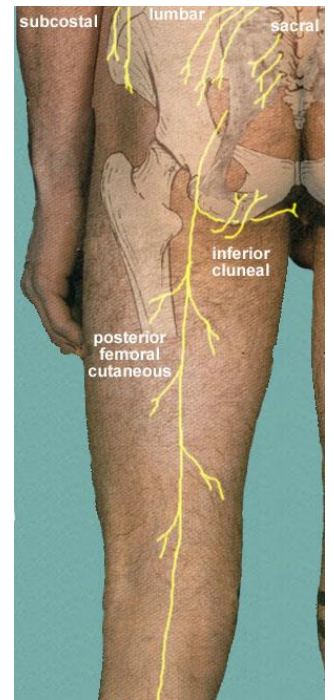
THE BACK OF THE THIGH (HAMSTRING COMPARTMENT)

SKIN

CUTANEOUS NERVES

The post. cut. n. of the thigh

- A branch of the **sacral plexus** leaves the gluteal region by emerging from beneath the lower border of the gluteus maximus m.
- It descends on the back of the thigh beneath the deep fascia pierce it supply the skin.

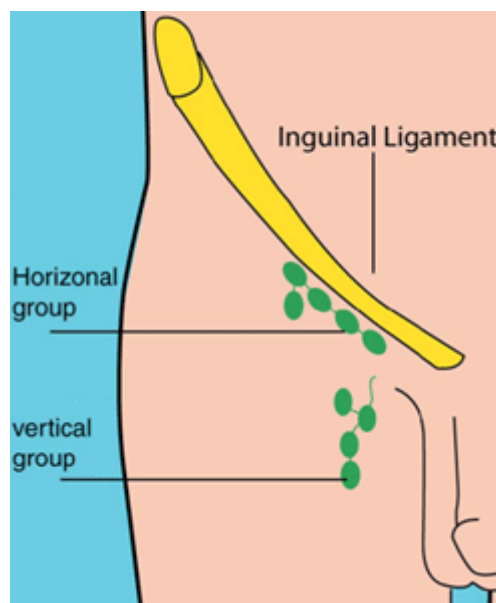


SUPERFICIAL VESSELS

Small curve around the **med. and lat.** aspect of the thigh drain into the **greater saphenous v.**

LYMPH VESSELS

Drain into **vertical group of superficial inguinal lymph nodes.**



DEEP FACIA

CONTENTS

- M. Bicepsfemoris**
 - Semitendinosus**
 - Semimembranosus**
 - Small part of adductor magnus.**
- V. Branches of Profunda femoris.**
- N. Sciatic n.**

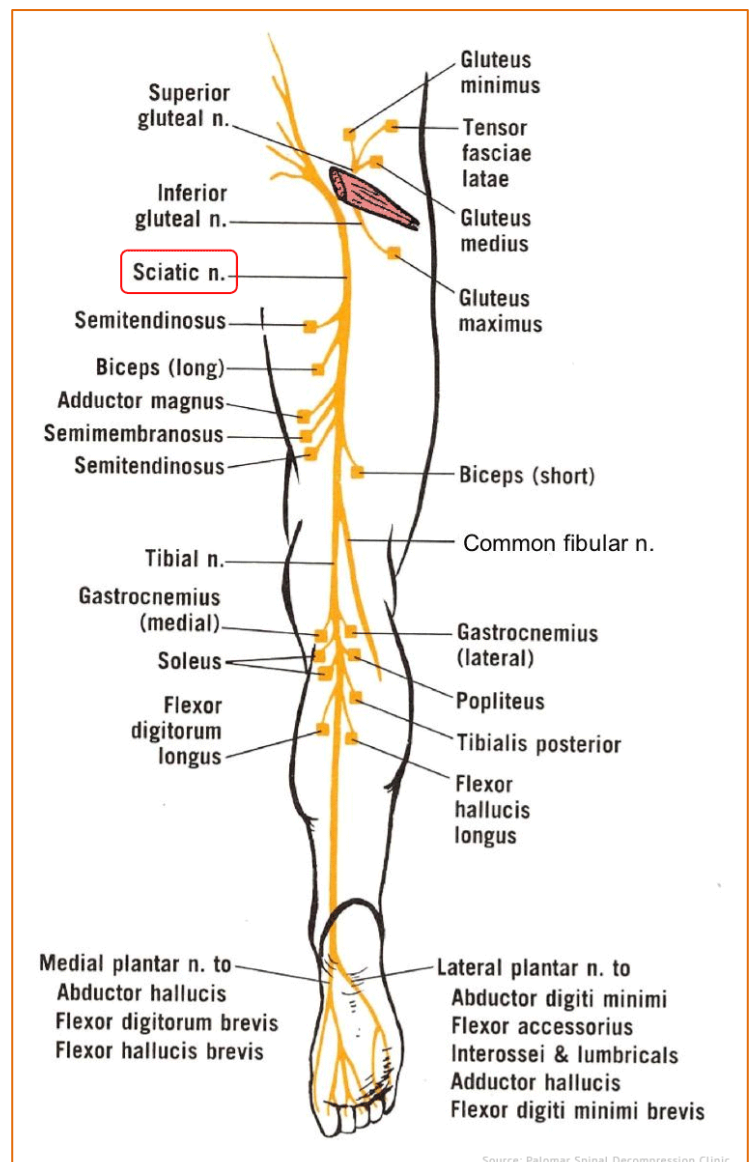
NERVES

Sciatic n.

- it descends in the **mid-line of post. compartment** of the thigh .
- ends by dividing into **tibial** and **common peroneal ns** usually just above the popliteal fossa, sometimes high up in the gluteal region.

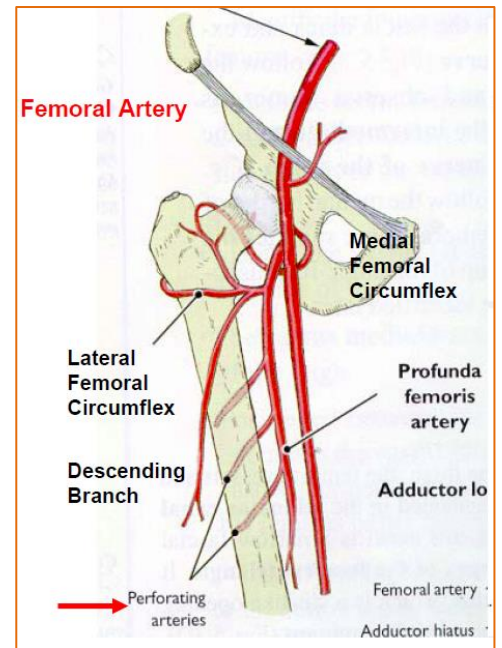
Branches:

- 1- **articular** : hip , knee
- 2- **muscular** : hamstring , ischial part of add. magnus
- 3- **terminal** : tibial and common peroneal



VESSELS

The four **perforating branches** of the profunda femoris A. provide a rich blood supply to this compartment.



MUSCLES

1. Semimembranosus

Origin:

A facet on the ischial tuberosity.

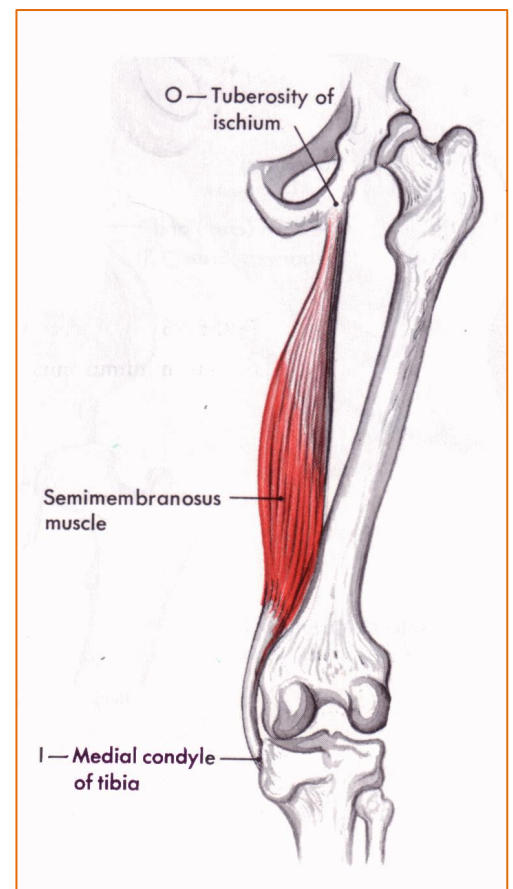
Insertion :

posteromedial aspect of the tibial condyle.

Tendinous expansion :

1- up ward to the lateral femoral condyle
(**oblique popliteal lig.**)

2- downward on to the soleal line of the tibia
(forming **popliteal fascia** over the popliteus m.)



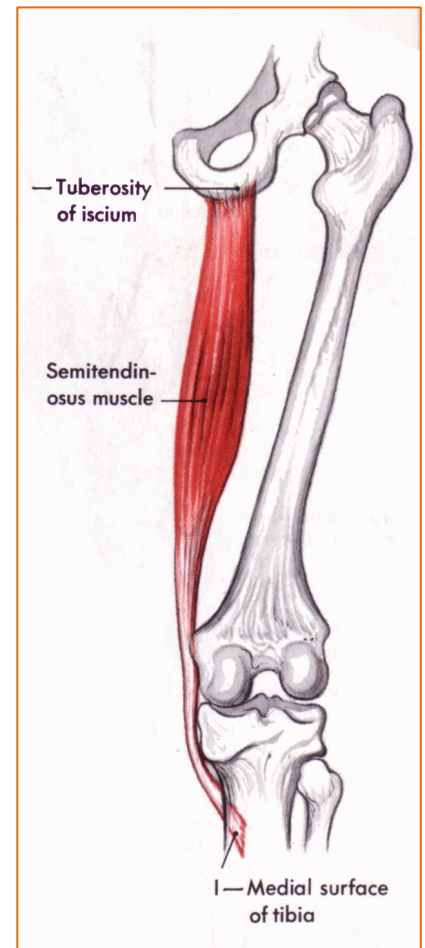
2. Semitendinosus

Origin:

a facet on the ischial tuberosity.

Insertion:

upper part of the medial surface of the tibia behind the attachment of gracilis and sartorius tendons.



3. Biceps femoris

Origin:

- 1- *long head* from a facet on the ischial tuberosity.
- 2- *short head* from linea aspera near the lateral lip and upper part of the lateral supracondylar line of the femur.

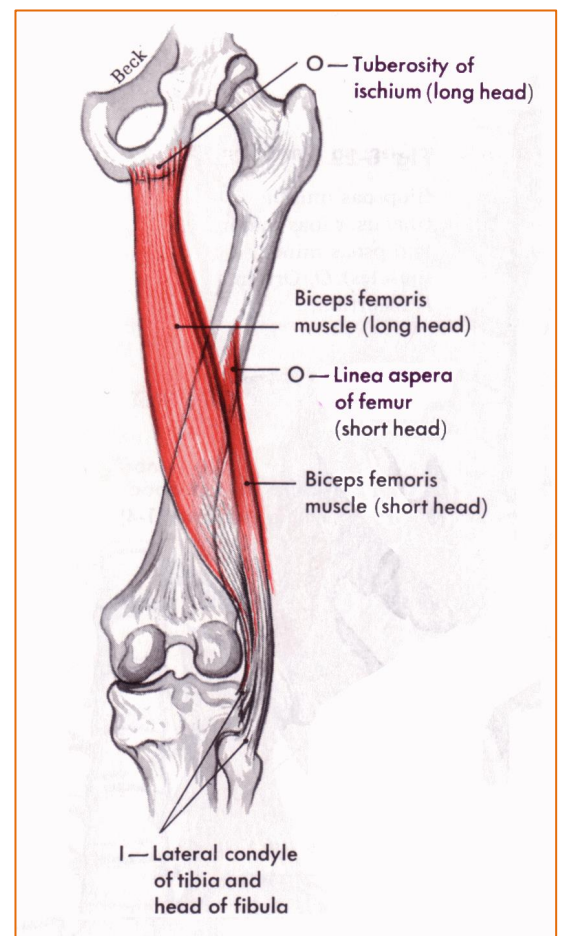
Insertion

head including apex of the fibula.

Nerve supply : sciatic nerve.

Action;

- 1- powerful flexor of the knee and extensor of the hip.
- 2- when the knee is flexed the muscles can produced a **small amount of med. and lat. rotation at the knee.**



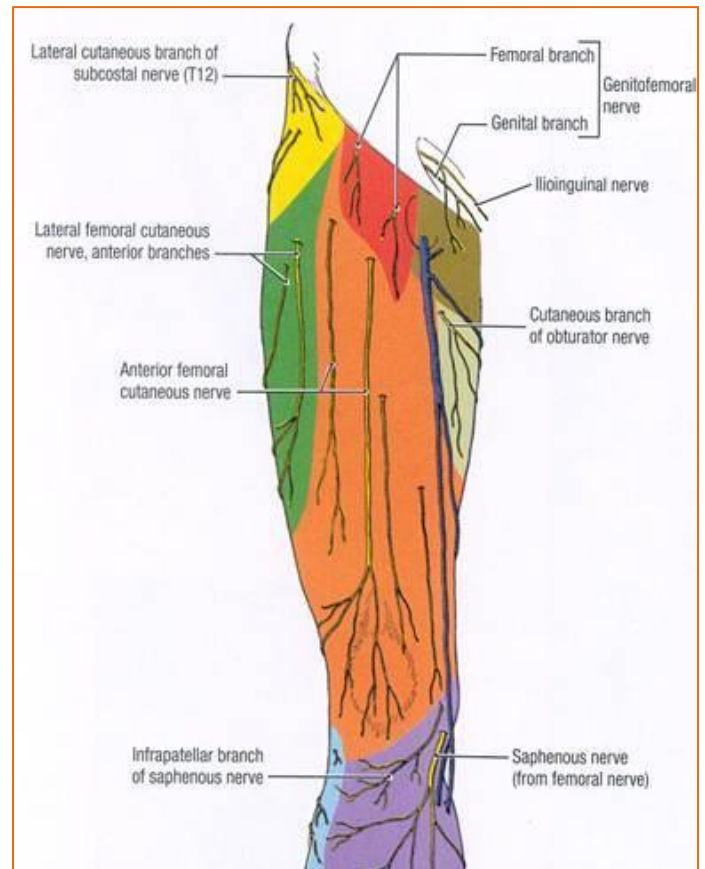
Tension in these muscles will restrict flexion of the hip.

FRONT AND MEDIAL ASPECT OF THE THIGH.

SKIN

CUTANEOUS NERVES

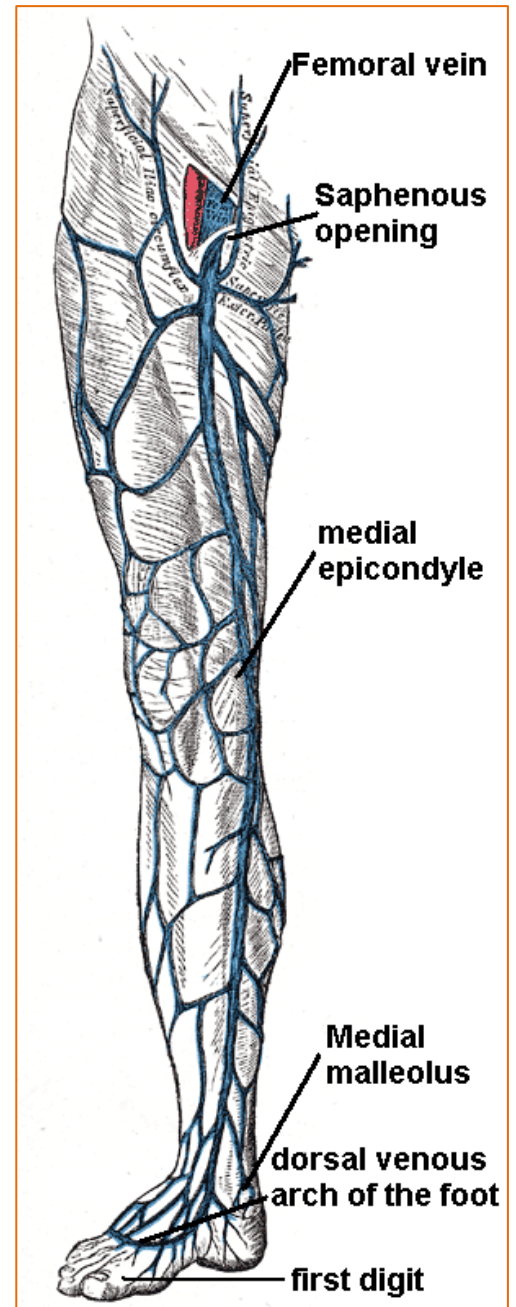
- **Lateral cut.n.of the thigh(L2,3)** enter the thigh behind the lateral end of the inguinal lig.,supplied the skin of the lateral aspect of the thigh and knee.
- **Femoral branch of the genitofemoral n.(L1,2)** enter the thigh behind the middle of the inguinal lig.
- **Ilioinguinal n.(L1)** enter the thigh through the superficial inguinal ring, supply the skin of root of the penis,adjacent part of scrotum(or root of glitoris and adjacent part of labia majus in female)
- **Medial cut.n.of the thigh** a branch of femoral n. supply the med. aspect of the thigh.
- **intermediate cut.n.of the thigh** a branch of femoral n. supply the ant. aspect of the thigh.
- **Patellar plexus** lies in front of the knee, is formed by terminal branches of
 - (lat. , intermediate , med.) cut.n.of the thigh
 - the infrapatellar branch of the saphenous n.
- **Saphenous n.** is the largest cutaneous branch of the femoral nerve supply the medial aspect of the thigh..



SUPERFICIAL VEINS

Great saphenous vein

- Drain the **medial end** of the dorsal venous arch of the foot and passes upward directly in front of the **medial malleolus**, it pass through the **lower part of saphenous opening** in the deep fascia and join the femoral vein 4cm **below and lateral to the pubic tubercle**.
- It posses numerous valves.
- It connect to the **small saphenous vein** by **one or two** branches that pass behind the knee.
- **Number of perforating veins**, connect the great saphenous vein with deep veins along the medial side of the calf.
- It receive 3 tributaries at the saphenous opening.
 - **Sup. Circumflex iliac v.**
 - **Sup. epigastric v.**
 - **Sup. External pudental v.**



- When emergency resuscitation with fluids is necessary, and standard intravenous access can not be achieved due to venous collapse, saphenous vein cut down may be necessary .

SUPERFICIAL LYMPH NODE

Superficial inguinal lymph node

- Lies in the superficial fascia below the inguinal lig.
- divided into horizontal and vertical groups.

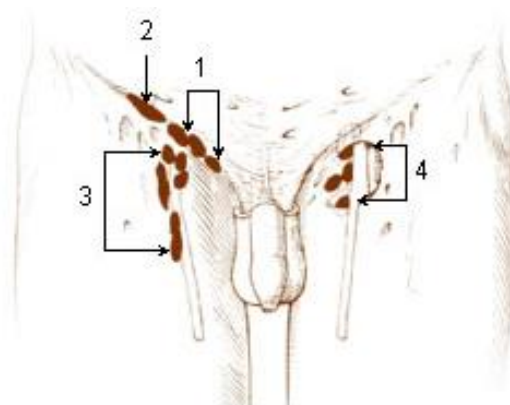
The horizontal group

- lies just below and parallel to the inguinal lig.
- the **medial members** receives superficial lymph vessels from :
 - ant. abdominal wall below the level of umbilicus
 - from perineum (urethral , external genitalia (not testis)
 - lower half of the anal canal.
- the **lateral group** receive lymph vessels from :
 - back below the level of iliac crest.

The vertical group

- lies along the terminal part of great saphenous vein receive majority of the superficial lymph vessels of the lower limb.

The efferent lymph vessel from S.I.L.N. join D.I.L.N. that lies along the medial side of the femoral vein and then through femoral canal to lymph nodes along the external iliac artery.



SUPERFICIAL FASCIA

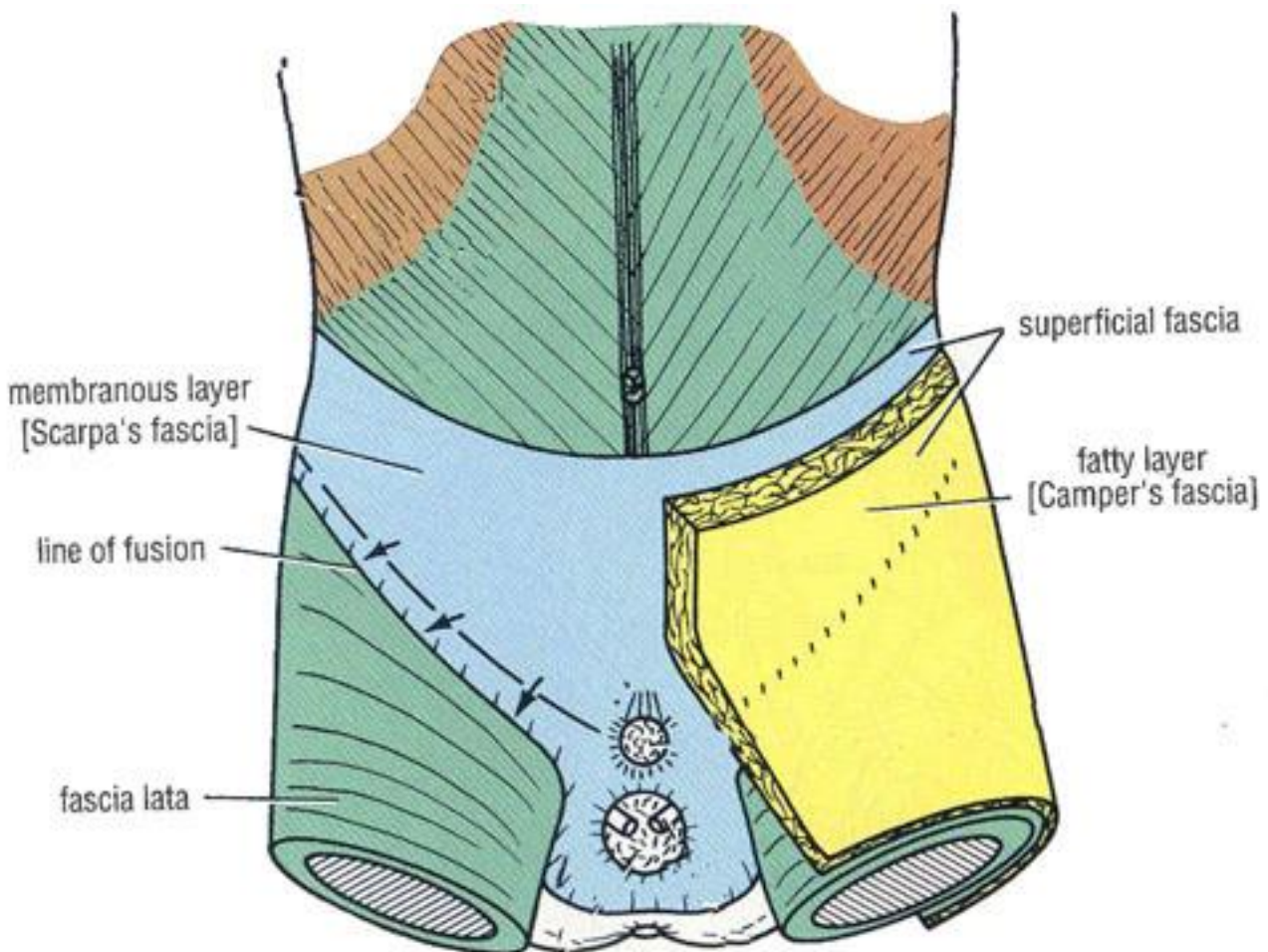
The fatty layer

of the superficial fascia (**campers fascia**) of the anterior abdominal wall extends into the thigh and continue down over the lower limb.

The membranous layer of

the superficial fascia (**scarpas fascia**) of the ant. abdominal wall extend in to the thigh and is attached to the deep fascia (**fascia lata**) about **finger breadth below the inguinal ligament** .

So rupture of the penile urethra may be followed by extravasations of urine into the (**scrotum , perineum and penis**) but not the (**thigh fascia**)



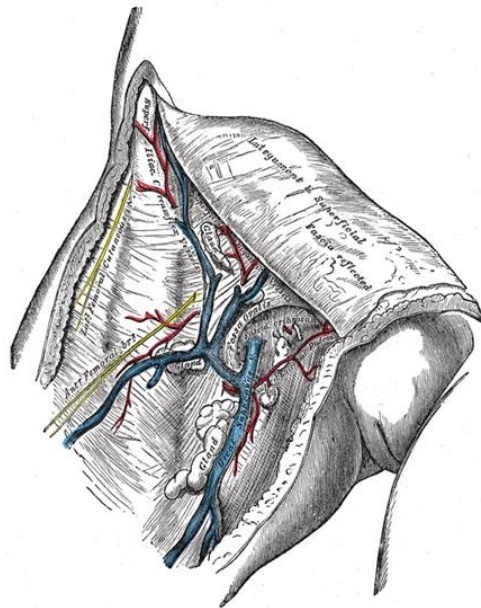
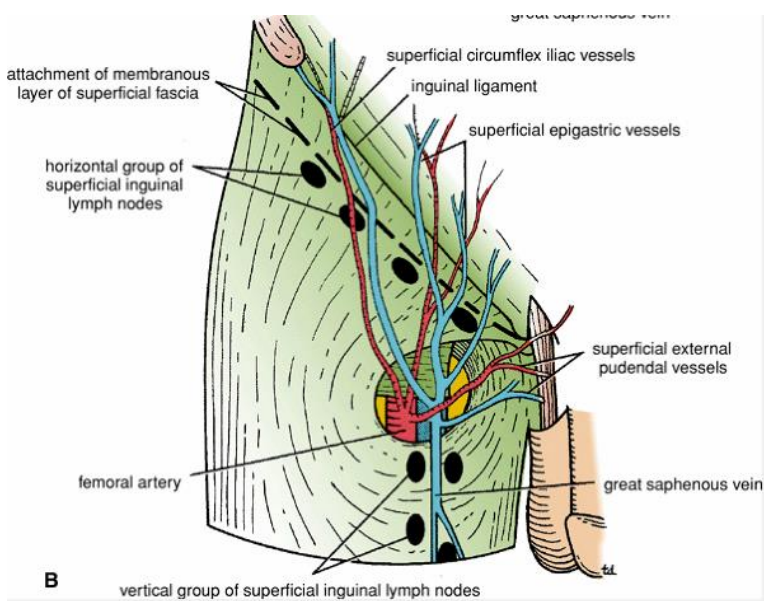
DEEP FASCIA (FASCIA LATA)

- It enclose the thigh like a trouser leg .
- at its upper end is attached to the pelvis and its associated ligaments.
- The **saphenous opening** is an oval opening in the deep fascia in front of the thigh 4cm below and lateral to the pubic tubercle.

It Transmits

- 1- the great saphenous vein .
- 2- Smaller vessels (like superficial epigastric artery and superficial external pudendal artery).
- 3- the femoral branch of the genitofemoral nerve
- 4- lymph vessels.

- It is filled with loose connective tissue called cribriform fascia.
- The deep fascia is attached to the whole length of the inguinal ligament above.



THE ANTERIOR FASCIAL COMPARTMENT OF THE THIGH.

M: Sartorius, Iliacus, Psoas, Pectineus, Quadricepsfemoris

A: Femoral A.

N: Femoral N.

MUSCLES

1. Sartorius

Origin : ant.sup.ilic spine.

Insertion : upper part of the medial surface of the tibial shaft.

Action : (flexion , abduction , lat. rotation)
of the thigh at the hip.

(flexion , med.rotation)
of the leg at the knee joint.

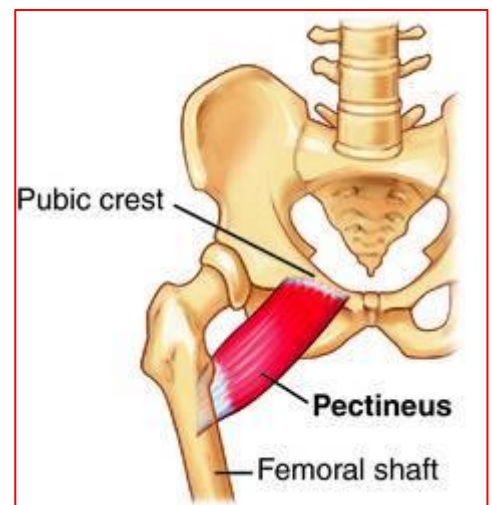


2. Pectineus

Origin: sup.ramus of the pubis

Insertion: upper end of the linea aspera just below the lesser trochanter.

Action: (flex & adduction)
of the thigh at the hip.



3. Iliopsoas

Iliacus

Origin: fan shaped m. arise from the **iliac fossa** within the abdomen.

Insertion: join the **tendon of psoas m.** insert on **lesser trochanter**

Action: (**flexion , med. rotation**) of the thigh at the hip

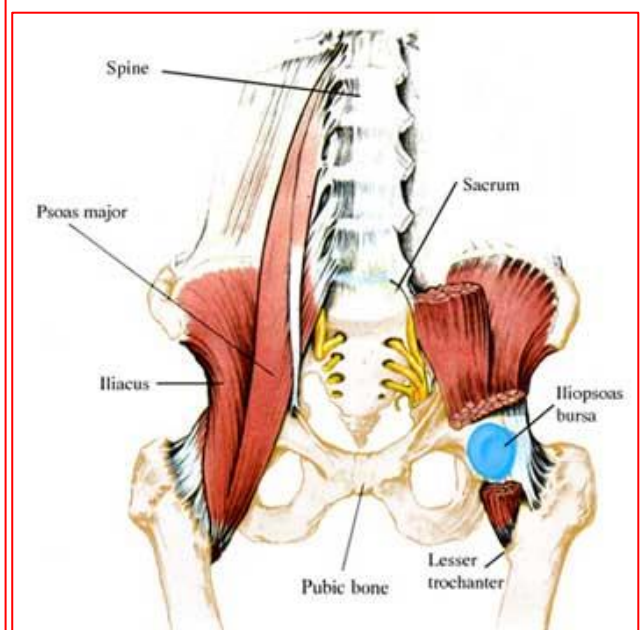
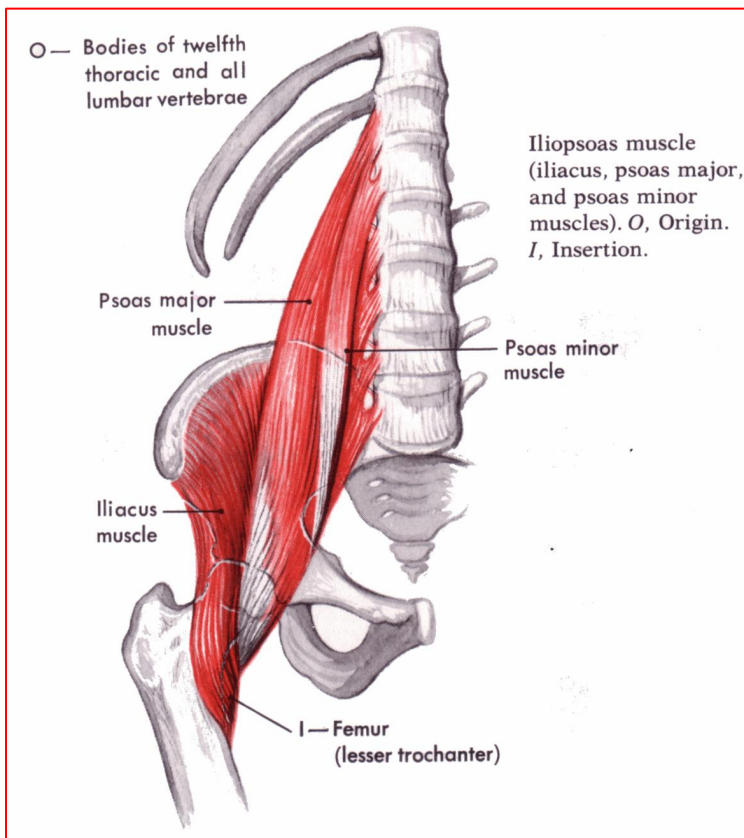
Psoas

Origin: long fusiform m. arise **within the abdomen** and descend in the thigh.

Insertion: iliopsoas tendon to the **lesser trochanter** of the femur.

□ A bursa intervenes between the tendon and the joint and may communicate with the joint.

Action: (**flexion , med. rotation**) of the thigh at the hip



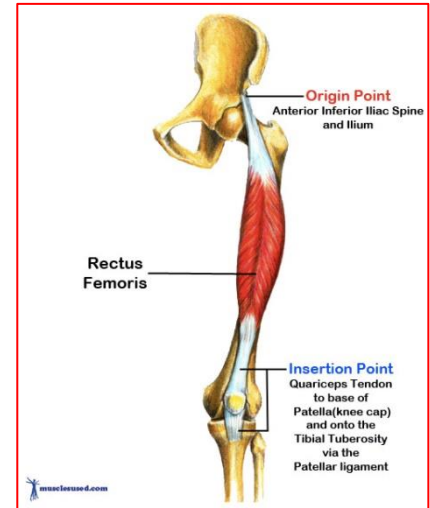
4. Quadriceps femoris

- Consist of **four muscles** which have a common tendon of insertion into the (**upper, lateral and medial**) border of the patella and then via the ligamentum patellae into the **tubercle of the tibia**.

Rectus femoris

Origin:

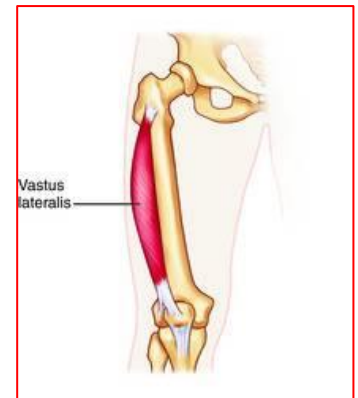
- **Straight head** : from anterior inferior iliac spine
- **Reflected head** : from ilium above acetabulum.



Vastus lateralis

Origin: from :

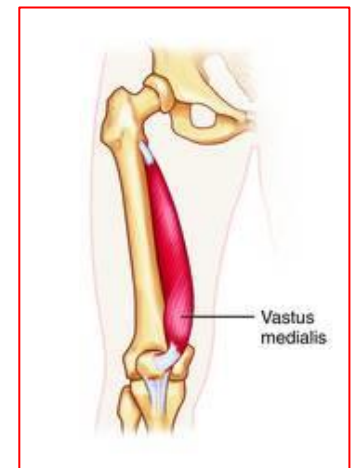
- intertrochanteric line
- the base of greater trochanter
- lat.lip of linea aspera of the femur
- lateral deep fascial septum.



Vastus medialis

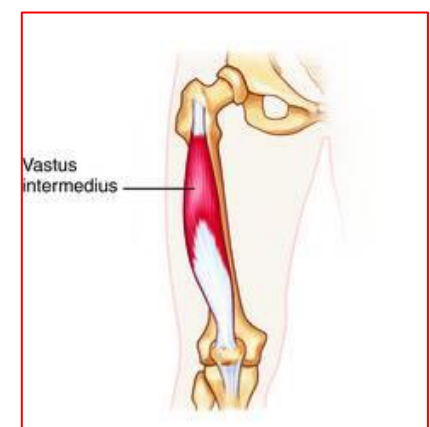
Origin: from :

- intertrochanteric line
- medial lip of the line a aspera
- medial fascial septum



Vastus intermediae

Origin: from ant. and lat. surface of the shaft of the femur.



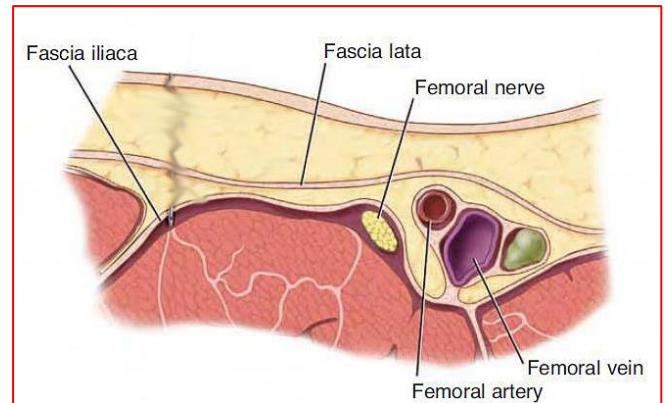
Action: powerful extensor of the knee joint.

Femoral sheath

□ Is a downward protrusion in to the thigh of the fascial envelop lining the abdominal wall .

Its anterior wall : is continues with the **fascia transversalis**

Its posterior wall : is continues with the **fascia iliaca** .



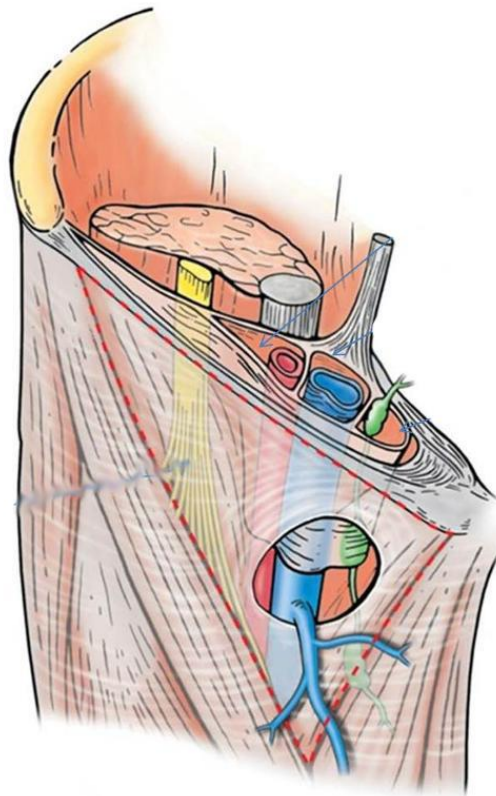
□ The sheath surrounds the **femoral vessels and lymphatics** for about **2.5cm below the inguinal lig.**

□ Septa divided it into three compartment containing :

Laterally: the femoral **A.**

Centerally: The femoral **V.**

Medially: fatty connective tissue **and** lymph nodes



□ The most medial compartment is known as the **femoral canal** which provides a **loose dead space** in to which femoral vein can expand during times of increased venous return from the lower limb.

FEMORAL CANAL

- Small medial compartment about 1.3cm long for lymphatic.
- its upper opening reffered as **femoral ring**.
- The femoral septum which is a condensation of extraperitoneal tissue closes the ring.

It contain :

- 1- fatty connective tissue
- 2- all the efferent lymph vessel from the deep inguinal lymph node
- 3- one of the deep inguinal lymph nodes drain directly from clitoris in female and glans penis in male.

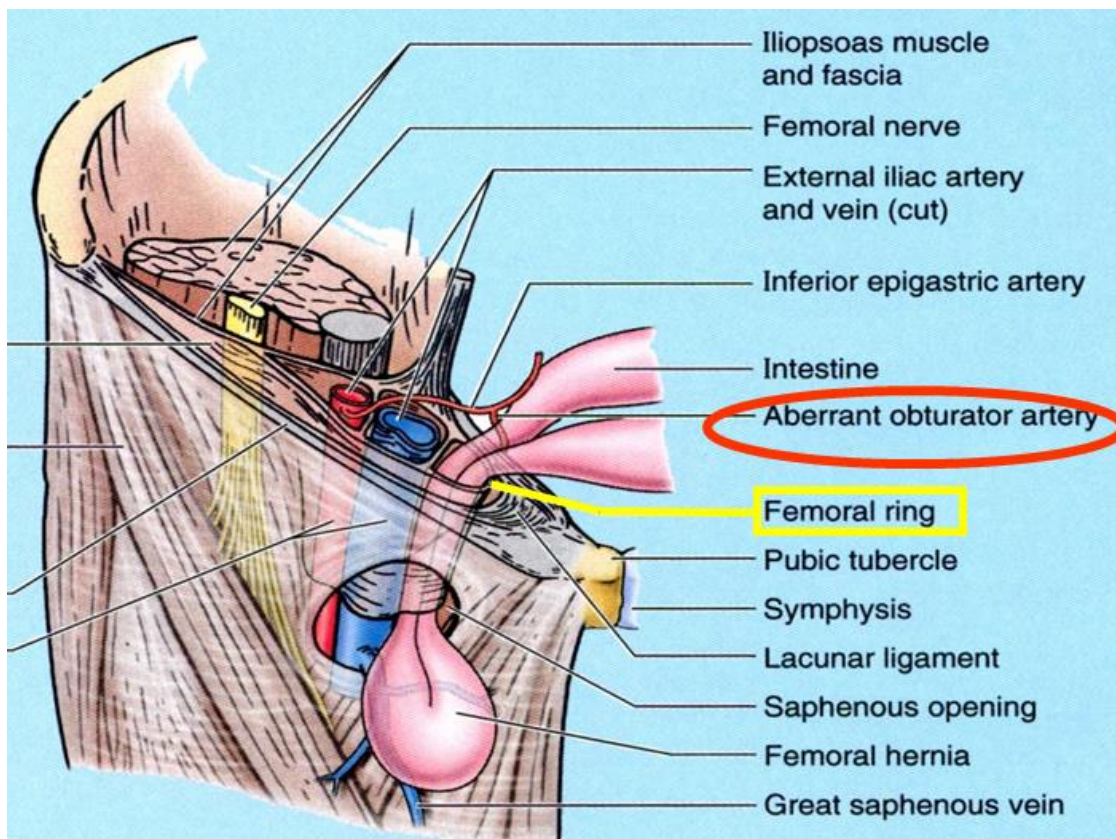
Boundaries of the femoral ring :

Ant.	inguinal lig.
Post.	<u>pectineus</u> covered by the <u>pectineal fascia</u> . superior ramus of the pubis.
Med.	the lacunar lig.
Lat.	the fibrous septum on the medial side of the the femoral vein.

- ✚ The femoral sheath is adherent to the walls of the blood vessels and inferiorly blend with tunica adventitia of these vessels.
- ✚ The lower end of the canal is normally closed by the **adherent of its medial wall to the tunica adventitia of the femoral vein**.
- ✚ It lies closes to the saphenous opening in the deep fascia of the thigh

Femoral hernia

- ◇ The most medial part of the sheath is **not adherent** to the walls of lymphatic vessels .
- ◇ it is this site that is potentially weak area in the abdomen so protusion of peritoneum could be forced down the femoral canal pushing the femoral septum before it ,such condition is known as a **femoral hernia**.
- ◇ Femoral hernias occur just below the inguinal ligament, when abdominal contents pass through a naturally occurring weakness called the femoral canal.
- ◇ Femoral hernias are a relatively **uncommon type**, accounting for only **3% of all hernias**.
- ◇ While femoral hernias can occur in **both males and females**, almost all of them develop in women because of the **wider bone structure of the female pelvis**.
- ◇ Femoral hernias are more common in adults than in children.



Femoral artery

- Enter the thigh behind the inguinal lig. as a continuation of the **external iliac artery** mid-way between the ASIS and the symphysis pubis (**mid inguinal point**)
- It is the main arterial supply to the lower limb.
- It descend almost vertically toward the **adductor tubercle of the femur** and ends at opening in the adductor magnus **10 cm above the knee joint** by entering the popliteal space as the **popliteal artery**.

Anteriorly	<ul style="list-style-type: none">◆ <u>in the upper part of its course</u> it is superficial and is covered by skin and fascia.◆ <u>In the lower part of its course</u> it passes behind the sartorius.◆ It is related to the ant. wall of the femoral sheath above and is crossed by the medial cutaneous n. of the thigh and the saphenous n. below.
Posteriorly	<ul style="list-style-type: none">◆ the artery lies on the psoas which separate it from the hip joint ,the pectineus and the adductor longus.◆ the femoral vein intervenes between the artery and the adductor longus.
Medially	it is related to the femoral vein in the upper part of its course.
Laterally	the femoral n. and its branches.

Branches :

- 1- Superficial circumflex iliac a.**
- 2- Superficial epigastric a.**
- 3- Superficial external pudendal a.**

4- Deep external pudendal a.

5- Profunda femoris

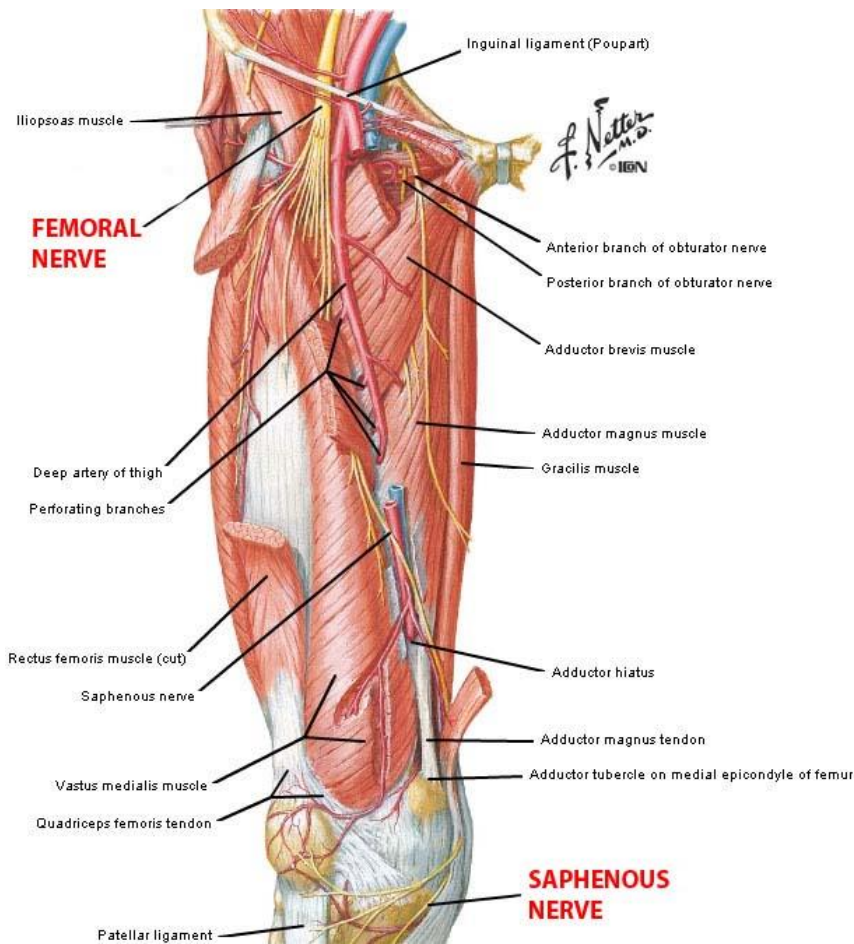
- ◆ is a large and important branch that arise from the lateral side of the femoral a. about 4cm below the inguinal lig.
- ◆ it passes medially behind the femoral vessels and enters the medial fascial compartment of the thigh by running behind the adductor longus.
- ◆ It ends by becoming the fourth perforating a.

At its origin it gives off the med. and lat. circumflex arteries and during the course it gives off three perforating arteries.

6-The descending genicular a.

- ◆ is a small branch that arise from the femoral a. near its termination
- ◆ it assist in supplies the knee joint.

In the femoral triangle the femoral vein lies medial to the artery.
in most of the adductor canal it is post.
and in the popliteal fossa the vein retain this relationship to the artery.



Femoral vein

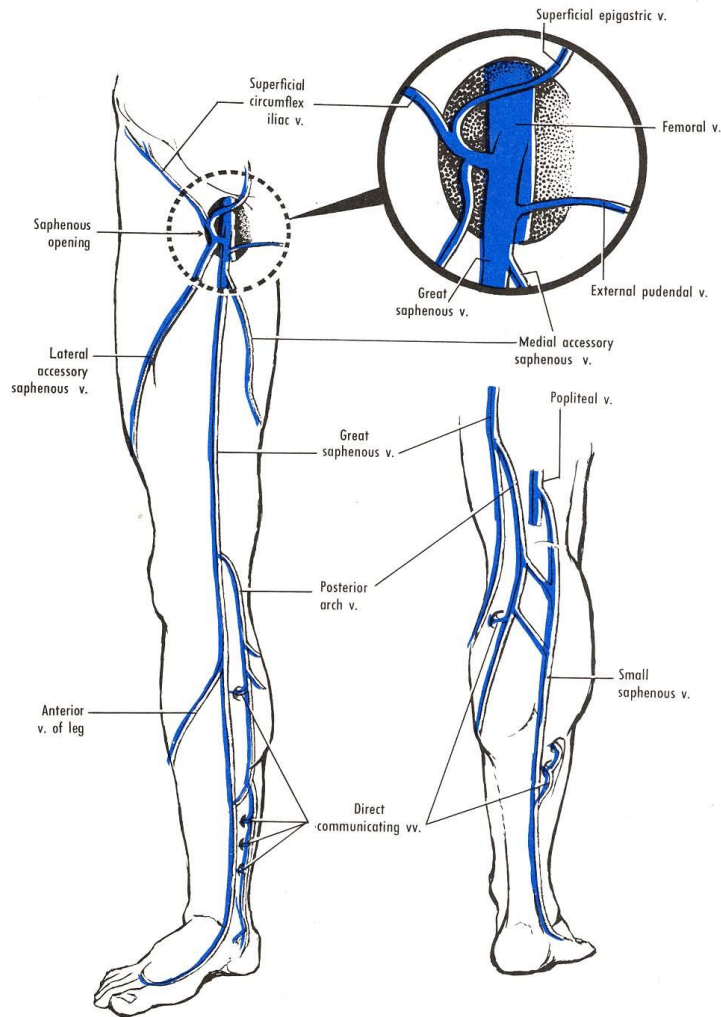
- ◆ It enters the thigh by passing through the **opening in the adductor magnus** as a continuation of the popliteal vein .
- ◆ it ascend through the thigh lying at first on the lat. side of the artery then post.to it and finally on the medial side.
- ◆ it leaves the thigh in the middle compartment of the femoral sheath then pass behind the inguinal lig. to become the external iliac vein.

Tributaries :

□ **Great saphenous vein. Its tributaries**

- Superficial circumflex iliac v.
- Superficial epigastric v.
- external pudendal v.

□ **Veins that correspond to branches of the femoral a.**

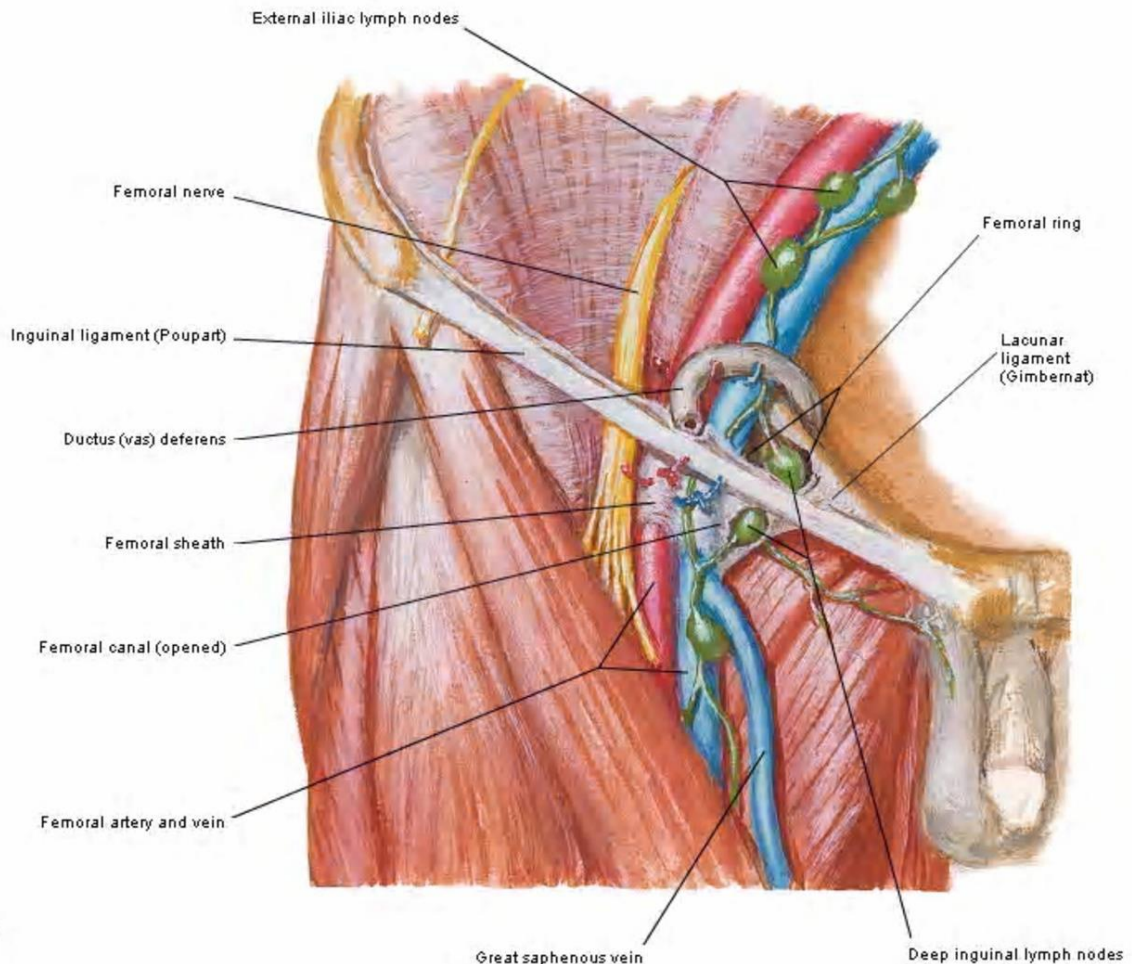


Deep inguinal lymph nodes

- Commonly are three along medial side of the terminal part of the femoral vein.
- the most superior is usually located in the femoral canal .

- ◆ They receive all lymph from **superficial group** via lymph vessels that pass through the cribriform fascia of the saphenous opening.
- ◆ Also receive lymph from deep structures of the lower limb.

- The efferent lymph from deep nodes ascend in to the abdominal cavity through the **femoral canal** and drain into the **external iliac nodes**.



Femoral nerve

- ◇ Is the largest branch of the **lumbar plexus**.
- ◇ it emerges from the lateral border of the psoas muscle within the abdomen and passes downward in the interval between psoas and iliacus.
- ◇ Enter the thigh **lateral to the femoral A. and the femoral sheath** behind the inguinal lig.
- ◇ About 4cm below the inguinal lig, it terminates by dividing into anterior and posterior division.
- ◇ it supplies all the muscles of the ant. compartment of the thigh.

Ant. division

- **Two cutaneous**

- ◇ medial cut. n. of the thigh
- ◇ intermediate cutaneous n. of the thigh.

□ **Two muscular**

- ◇ Sartorius
- ◇ Pectineus

Post.division;

□ **Cutaneous**

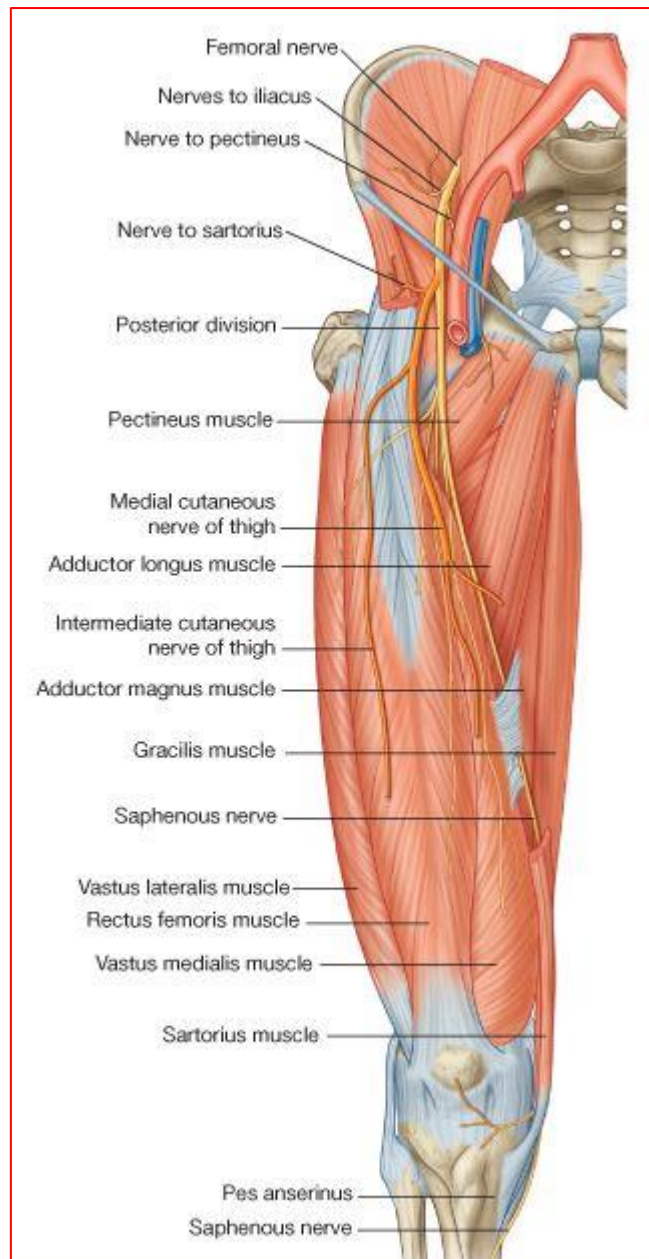
- ◇ Saphenous n.
 - ◆ cross the **femoral a.** from its lateral to medial side .
 - ◆ emerge between the tendons of **sartorius and gracilis** .
 - ◆ then runs down the medial side of the leg accompanying with the great saphenous vein.
 - ◆ it passes in front of the medial malleolus along the medial of the foot.

□ **Muscular :**

- ◇ Rectus femoris
- ◇ Vasti muscles.

□ **Articular**

- ◇ hip and knee joints.



Femoral triangle

Is a triangular depressed area situated in the **upper part of the medial aspect** of the thigh just below the inguinal lig.

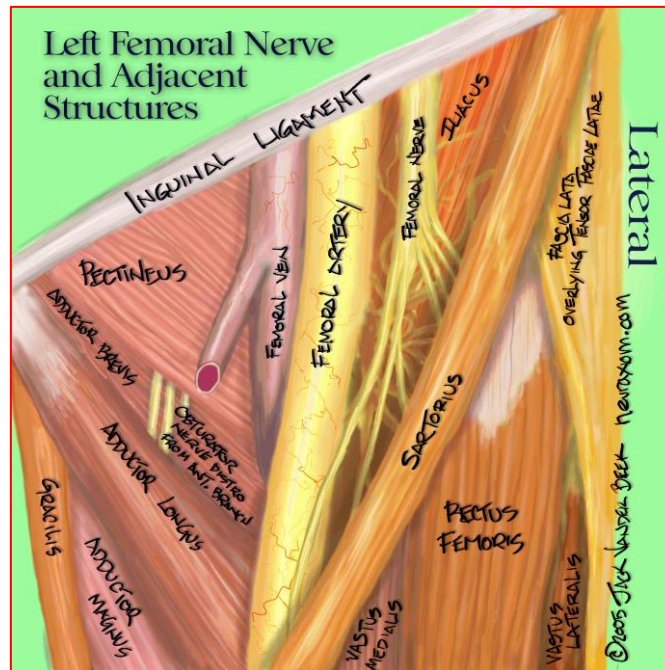
Boundaries

Superiorly	Inguinal lig.
Laterally	Sartorius m.
Medially	lateral border of the adductor longus m.
Floor	is a gutter shaped and formed from lateral to medial by : iliopsoas , pectineus and adductor longus
Roof	Skin and fascia of the thigh.

Content

from lateral to medial :

- terminal part of the femoral nerve and its branches
- femoral sheath
 - ◆ femoral artery and its branches
 - ◆ femoral veins and its tributaries
 - ◆ deep inguinal lymph nodes



Clinical significance

- 1-Since the femoral triangle provides easy access to a major artery, [coronary angioplasty](#) is often performed by entering the femoral artery at the femoral triangle.
- 2-Heavy bleeding in the leg can be stopped by applying pressure to points in the femoral triangle.
- 3-Medial to it lies the femoral vein. Thus the femoral vein, once located, allows for [femoral venipuncture](#) .
- 4-The [positive pulsation](#) of the femoral artery signifies that the heart is beating and also blood is flowing to the lower extremity.

5-The nerve is more lateral than the vein. This must be remembered when venous or arterial samples are required from the femoral vessels.

Adductor canal (sub sartorial)

- ◇ Is an intermuscular cleft situated on the medial aspect of the middle third of the thigh .
- ◇ commences above the apex of the femoral triangle and ends below at the opening in the adductor magnus.

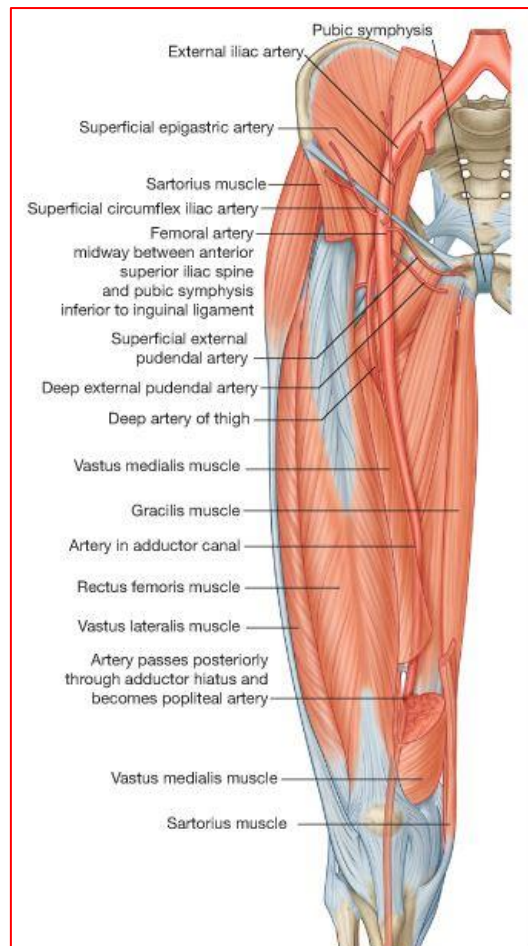
The anteromedial wall (roof) : is formed by a fibrous sheath deep to the Sartorius .

The posterior wall : adductor longus and magnus.

The lateral wall : vastus medialis .

Contents

- ◆ Terminal part of the femoral A.
- ◆ Femoral V.
- ◆ Deep lymph vessels
- ◆ Saphenous N.
- ◆ N.to vastus medialis.



Medial compartment of the thigh

content

Muscles : Gracilis, Adductor Longus, Adductor brevis, Adductor magnus and Obturator externus.

Blood supply : Profunda femoral A. and obturator A.

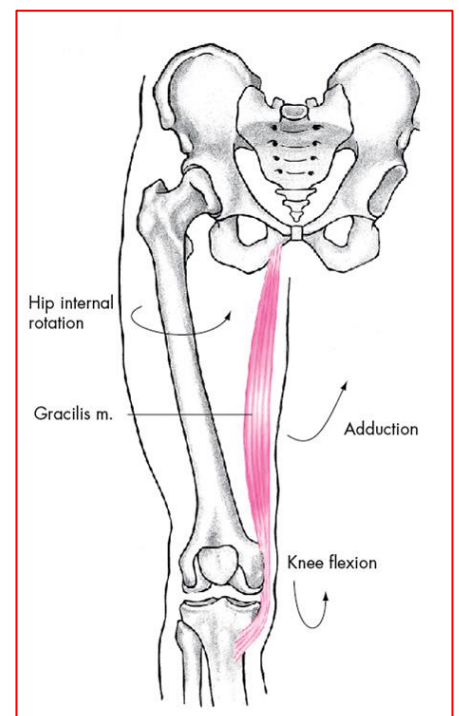
Nerve supply : Obturator N.

Muscles

1. GRACILIS

lies on the medial of the thigh & knee.

Origin: outer surface of the inferior ramus of the pubis and the ramus of the ischium.



Insertion: upper part of the medial surface of the tibial shaft.

Action: adduction of the thigh at the hip.

Flexion of the leg at the knee.

2. ADDUCTOR LONGUS

Origin: From the front of the pubis below and medial to the pubic tubercle.

Insertion: medial lip of the linea aspera.

Action:

- ◆ adduction of the thigh at the hip
- ◆ Assist lateral rotation

3. ADDUCTOR BREVIS

Origin: outer surface of the inferior ramus of the pubis

Insertion: linea aspera.

Action:

- ◆ adduction of the thigh at the hip
- ◆ Assist lateral rotation.

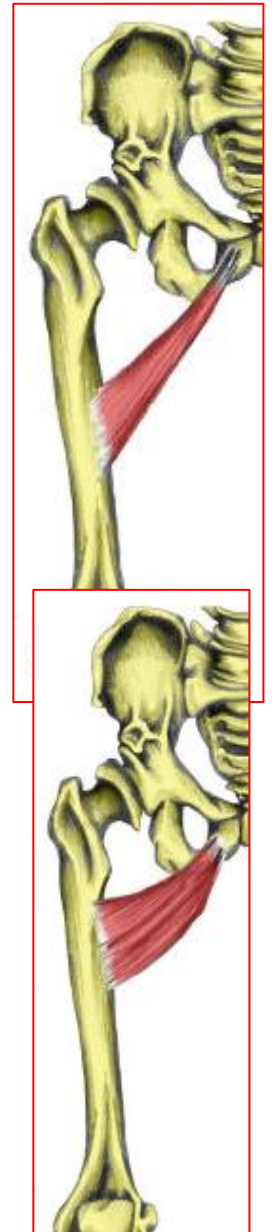
4. ADDUCTOR MAGNUS

◆ It is large muscle consist of adductor and hamstring portion.

Origin

- ◇ outer surface of the inferior ramus of the pubis
- ◇ the ramus of the ischium
- ◇ ischial tuberosity.

Insertion



Add. portion

posterior surface of the femur from quadrate tubercle above along the linea aspera to the medial supracondylar ridge below.

Hams. portion

adductor tubercle on the medial condyle of the femur.

N.supply

Add. portion: obturator N.

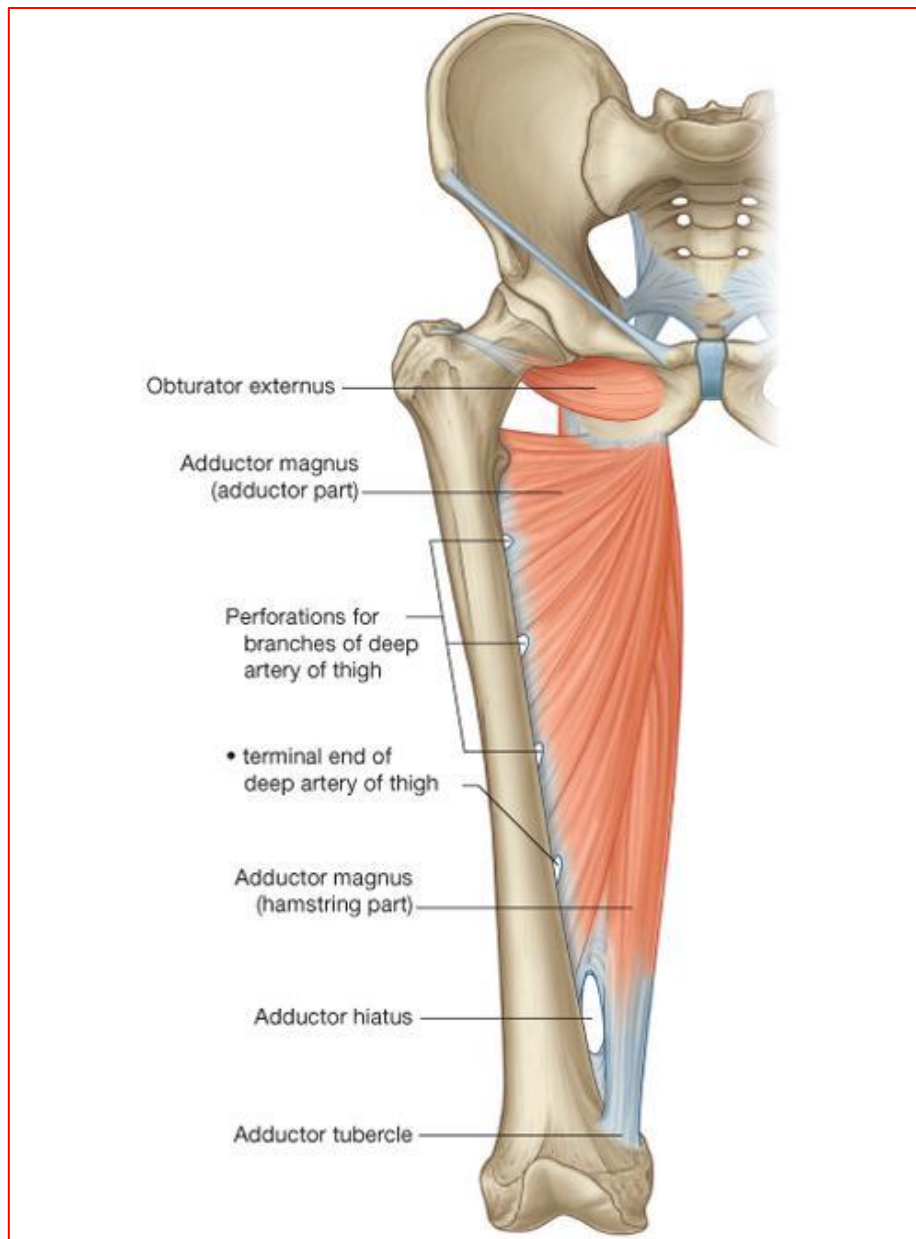
Hams. portion: sciatic N.

Action

add.portion: adduct the thigh at the hip **and** assist lateral rotation.

hams.portion: extend the thigh.

There is a gap **adductor hiatus** in the attachment of the muscle to the medial supracondylar ridge which permit the femoral vessels to pass from the adductor canal down ward in to the popliteal space.



OBTURATOR EXTERNUS

Origin:

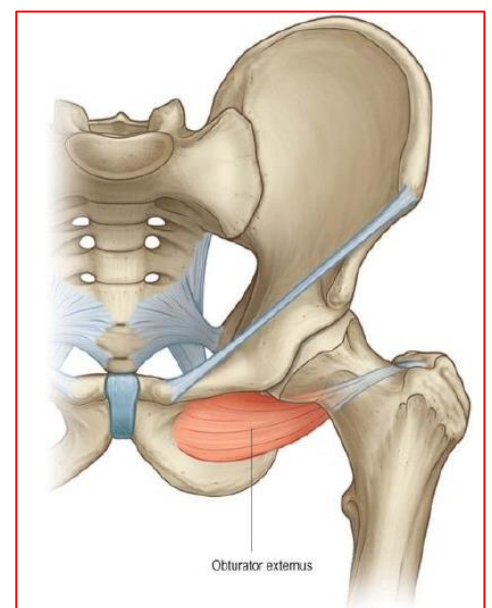
from outer surface of the obturator membrane and the adjacent of the pubic and ischial rami.

Insertion:

medial surface of the greater trochanter.

Action:

lateral rotation of the thigh at the hip..



Profunda femoris A.

- ◇ Arise from lateral side of the femoral A. in the femoral triangle **4cm below inguinal ligament** .
- ◇ It leaves the ant. fascial compartment by passing behind the adductor longus m.
- ◇ It descend in the interval between add.longus and add.brevis and then lies on add.magnus when it ends as fourth perforating A.

Branches

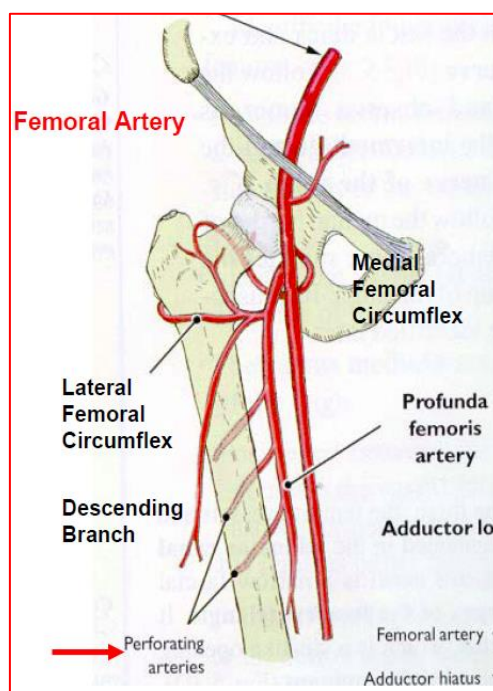
- 1- medial femoral circumflex A.
- 2- lateral femoral circumflex A.
- 3- four perforating As.

Run backward and laterally piercing the muscle layers .
they supply the muscles and terminate by anastomosing with :

- ◆ One another
- ◆ Inferior gluteal A.
- ◆ The circumflex femoral As. above
- ◆ The muscular branches of the popliteal A. below

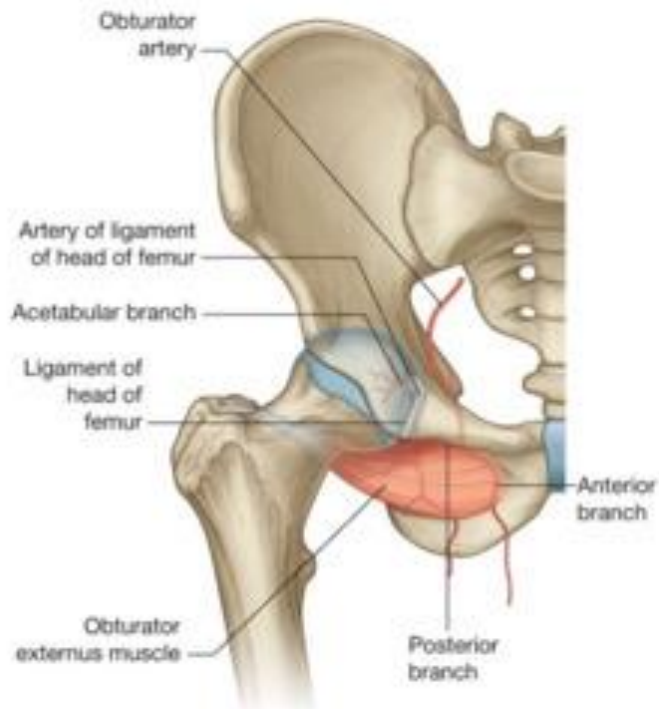
Profunda femoris V.

Receives tributaries corresponds to the branches of A. and drain in to the femoral vein.



Obturator artery

- ◆ Is a branch of **internal iliac A.** accompanied the obturator N. in the obturator canal.
- ◆ On entering the medial compartment of the thigh it divide in to **med. and lat. division.**



Obturator vein

- ◆ Receives tributaries that correspond to the branches of the artery .
- ◆ it drains in to the internal iliac vein.

Obturator nerve (L2,3,4)

- ◆ Emerge on the medial border of the psoas muscle within the abdomen
- ◆ At the upper part of the obturator foramen it divides into **ant. and post. division.**

Branches

1- Anterior division

in front : obturator externus and add. Brevis
and behind : the pectineus and add.longus.

M. gracilis , add.longus & brevis and pectineus.

Cut. medial side of the thigh

Art. Hip

2- Posterior division

- ◆ **pass behind** add.brevis **in front of** the add.magnus.
- ◆ It terminate by descending through the opening in the add. magnus to supply the knee.

M. Obturator externus , Add.magnus & brevis..

