
بسم الله الرحمن الرحيم


لا إله إلا الله محمد رسول الله

RETINACULA OF THE ANKLE

The retinacula are thickenings of

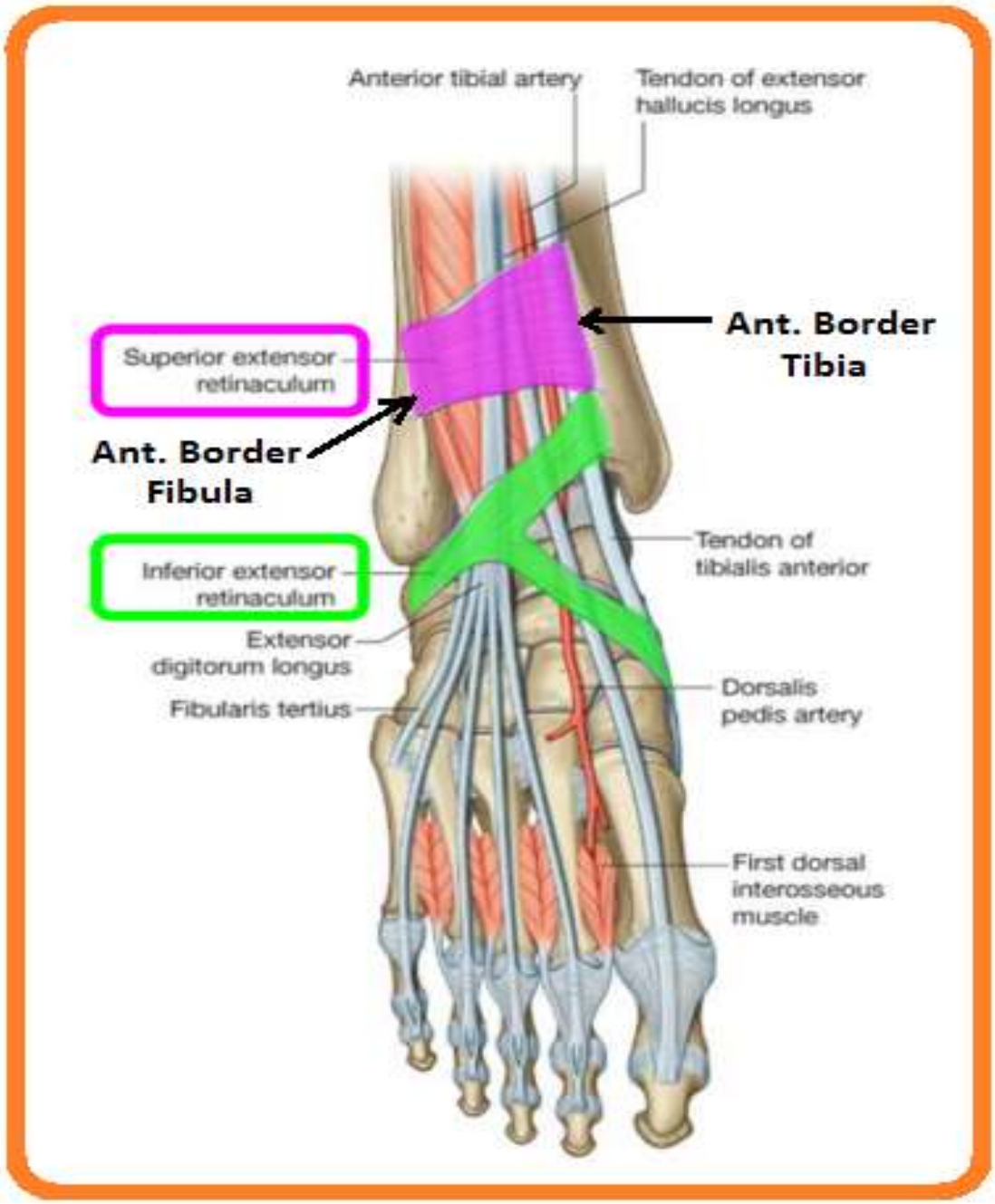
1. The deep fascia that

1. Keep the long tendons around the joint

1. Act as pulleys.

The superior extensor retinaculum is a transverse, roughly rectangular band located above the tibiotalar joint.

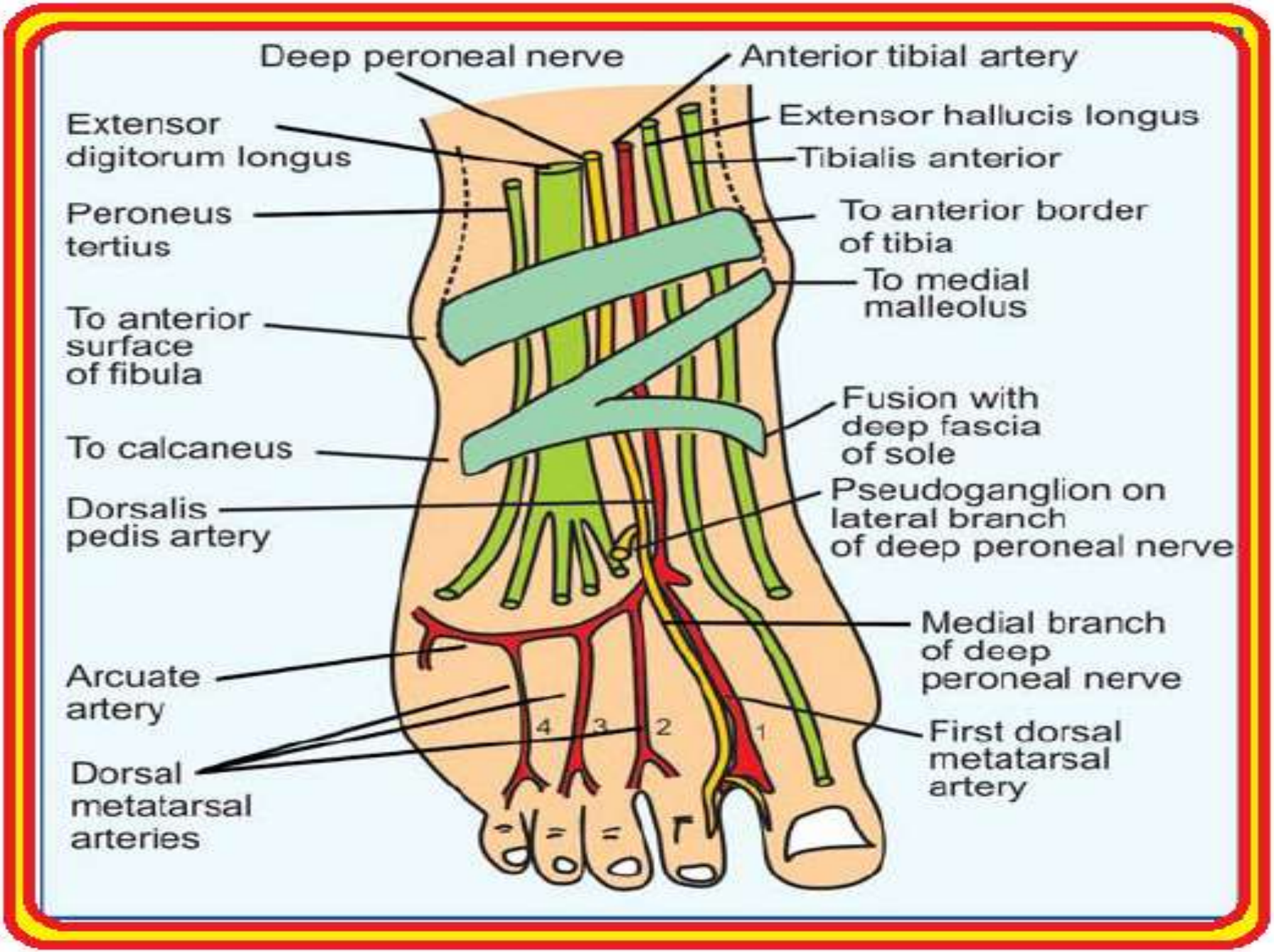
It is attached to lower end of anterior border of fibula and tibia

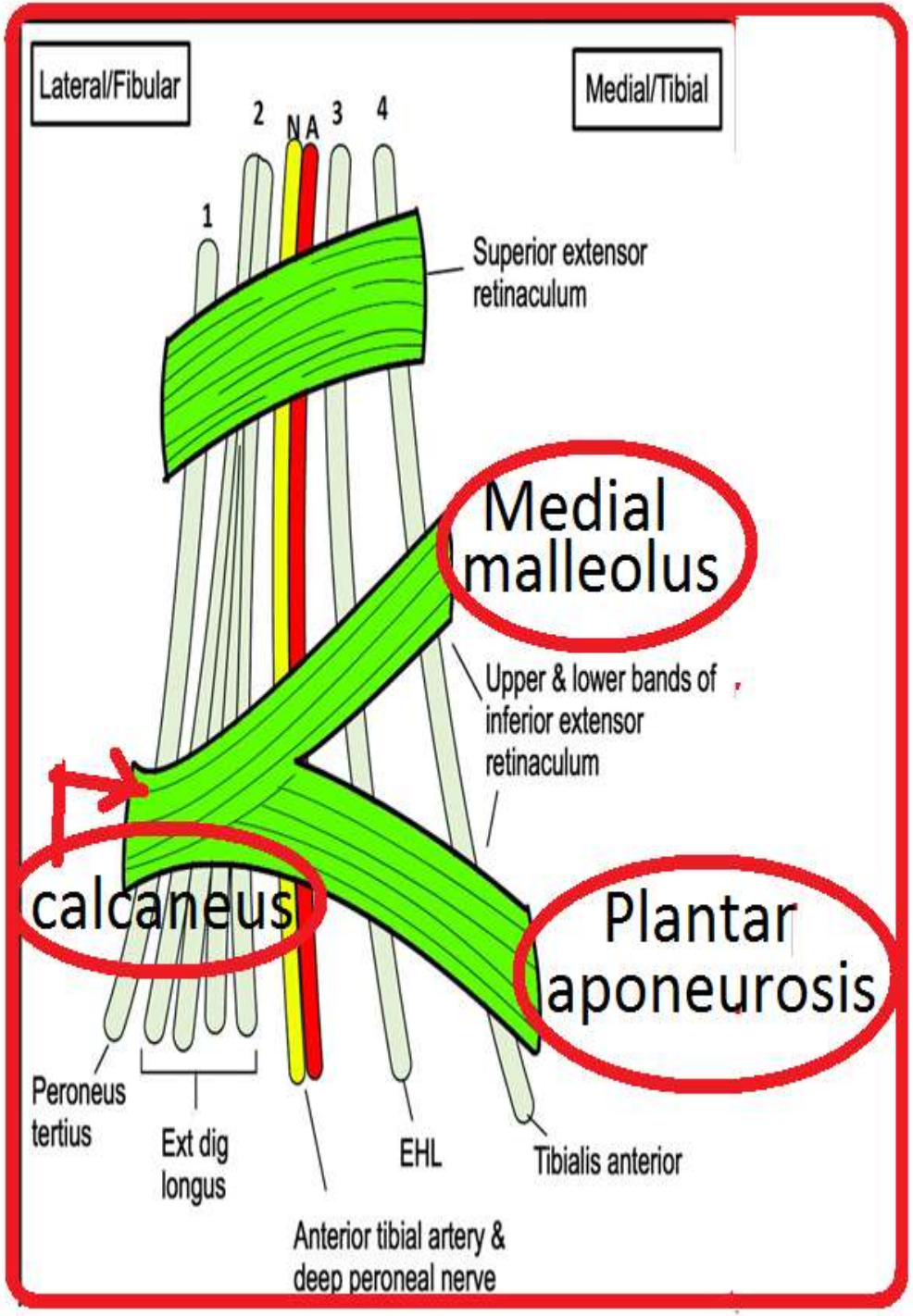


The superior extensor retinaculum houses

1. **The tibialis anterior,**
2. **Extensor digitorum longus,**
3. **Extensor hallucis longus,**
4. **Fibularis tertius tendons.**
5. **Anterior tibial vessels and**
6. **Deep fibular nerve**

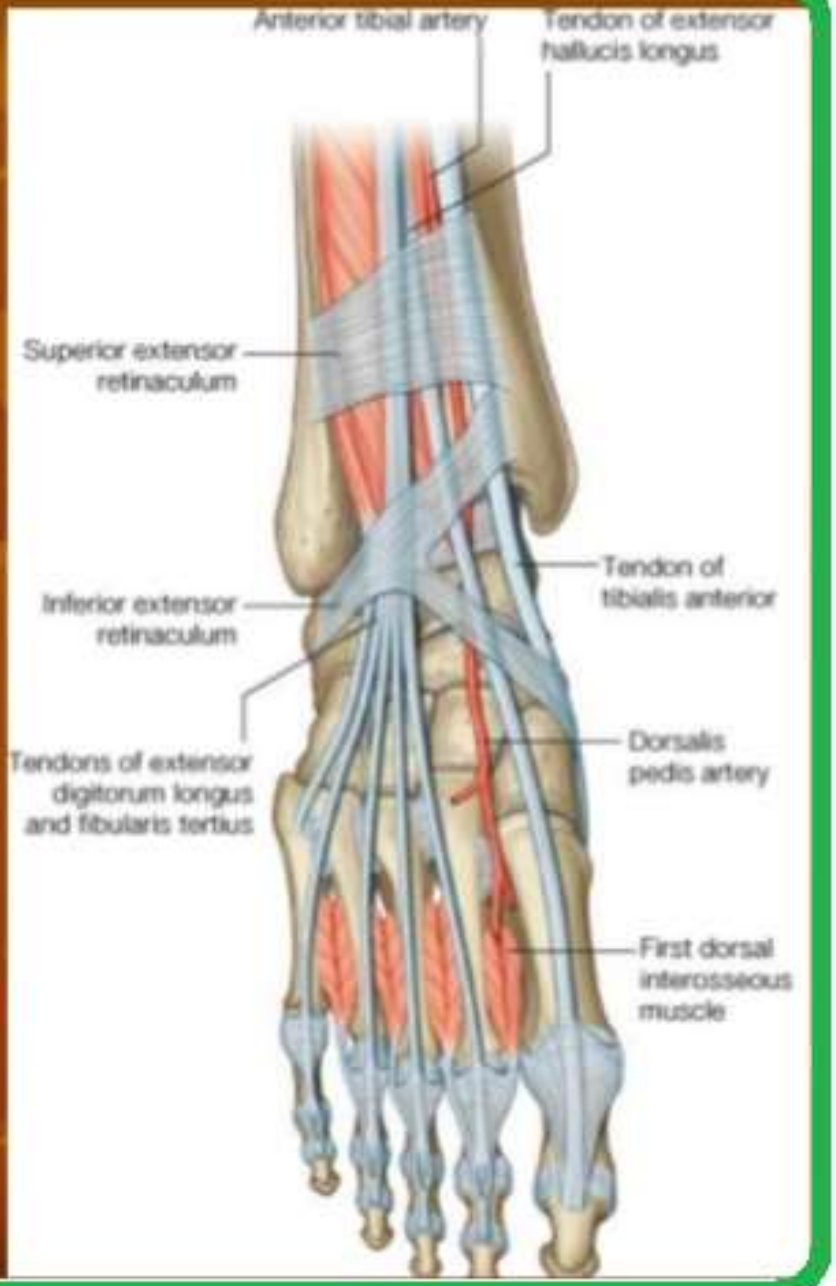
(the **superficial fibular nerve** passes superficially to it).

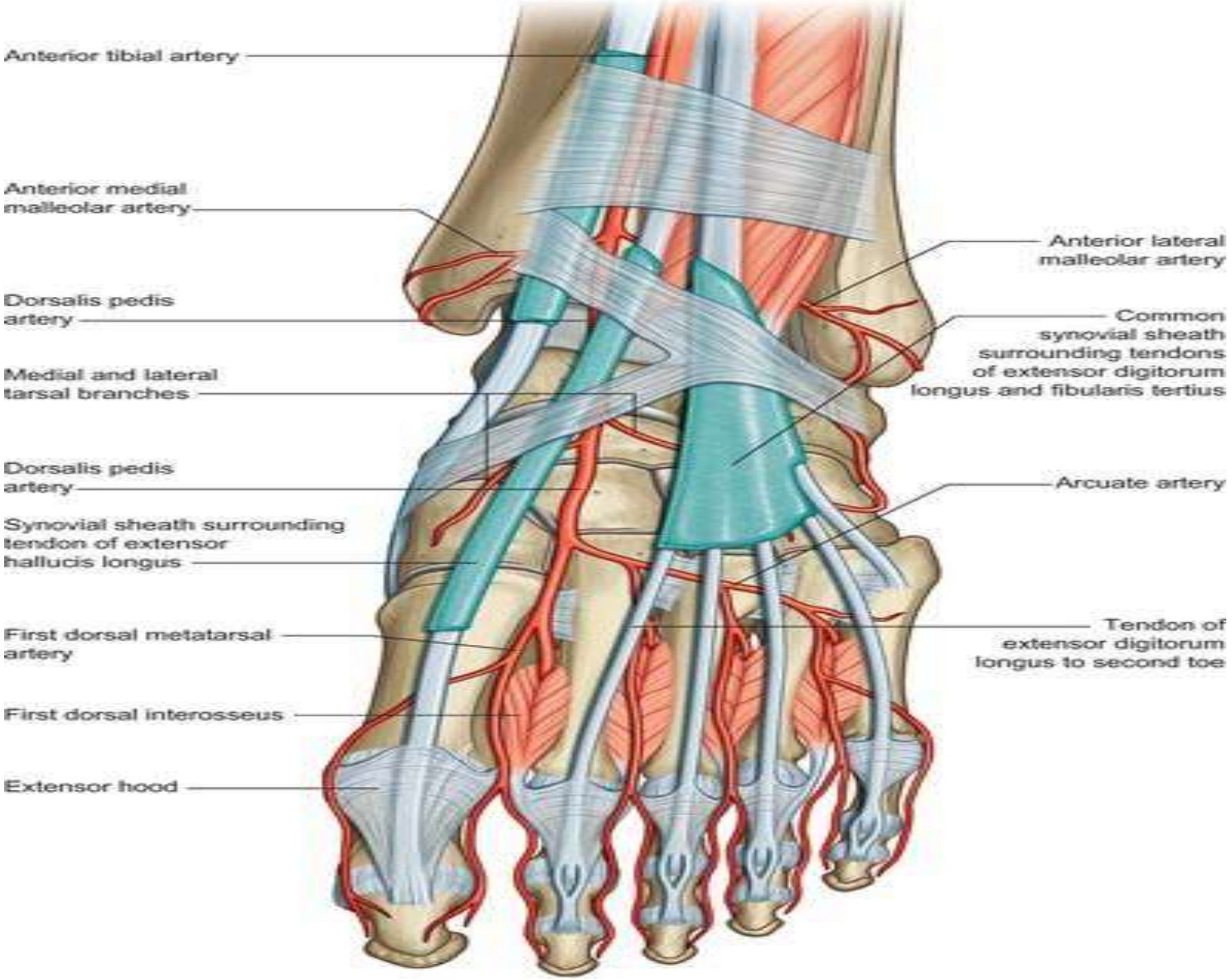

Deep peroneal nerve
Anterior tibial artery
Extensor digitorum longus
Extensor hallucis longus
Tibialis anterior
Peroneus tertius
To anterior border of tibia
To medial malleolus
To anterior surface of fibula
Fusion with deep fascia of sole
To calcaneus
Dorsalis pedis artery
Pseudoganglion on lateral branch of deep peroneal nerve
Medial branch of deep peroneal nerve
Arcuate artery
First dorsal metatarsal artery
Dorsal metatarsal arteries
4
3
2
1

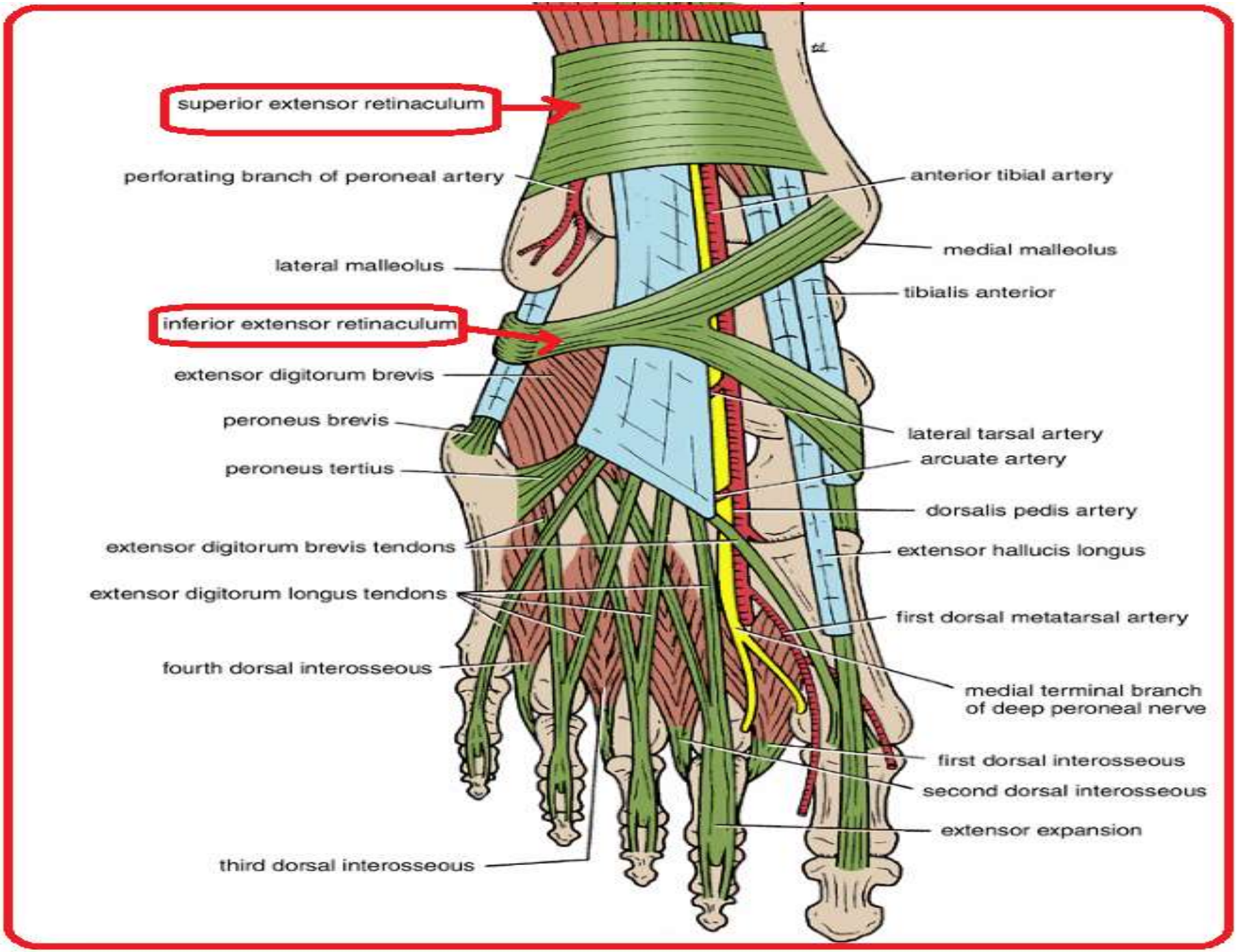


The inferior retinaculum is Y-shaped. The base of the “Y” attaches laterally on the calcaneus. The upper arm of the “Y” attaches to the medial malleolus, whereas the lower arm of the “Y” attaches medially on the plantar aponeurosis.

- Structures that pass anterior to the extensor retinacula from medial to lateral
- Saphenous nerve and great saphenous vein
- Superficial peroneal nerve (medial and lateral branches)
- Structure passes deep to the superior and inferior extensor retinacula from medial to lateral
- Tendons of tibialis anterior,
- extensor hallucis longus,
- anterior tibial vessels,
- Deep Peroneal Nerve
- extensor digitorum longus and peroneus tertius

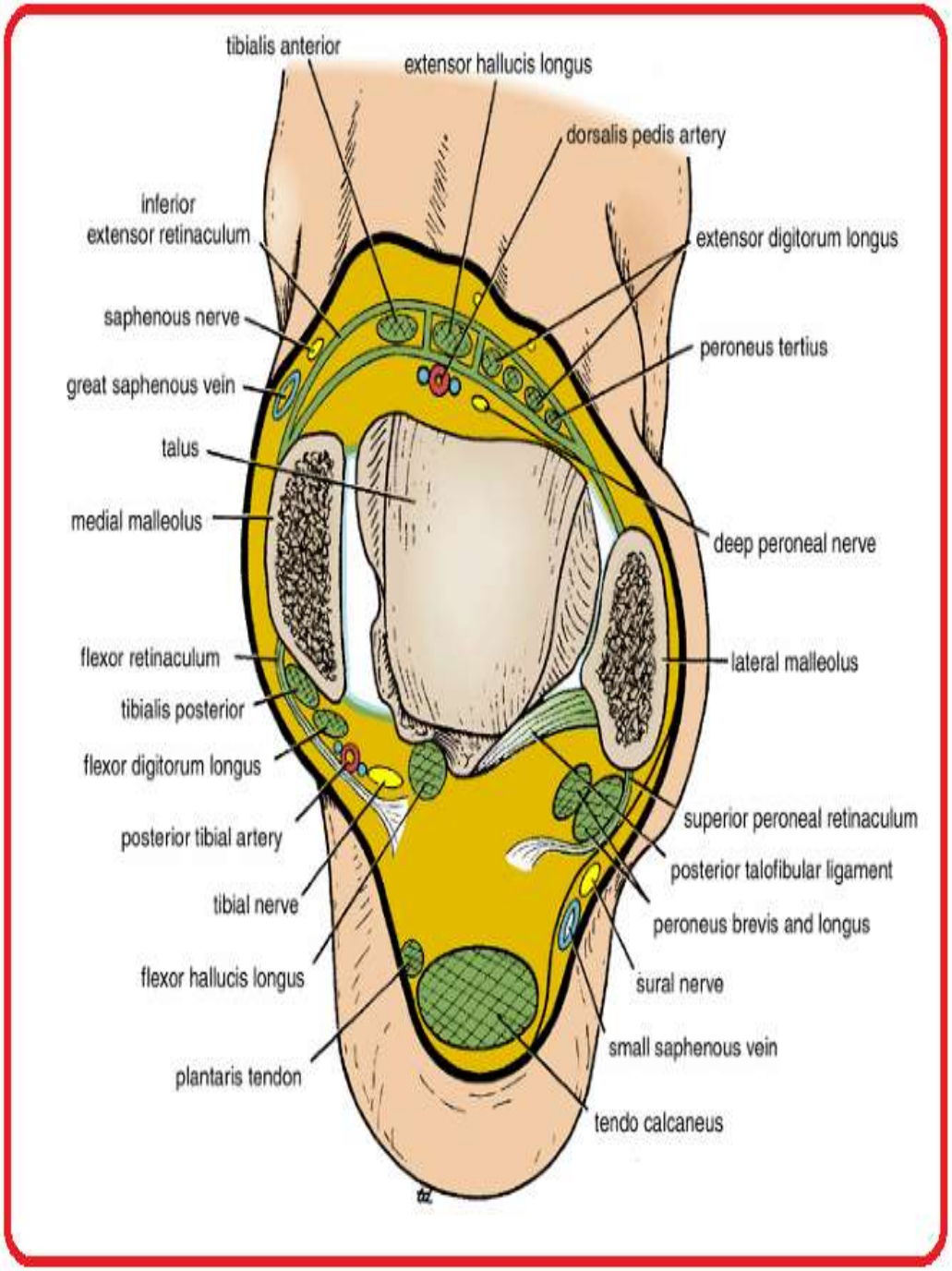



Anterior tibial artery
Anterior medial malleolar artery
Dorsalis pedis artery
Medial and lateral tarsal branches
Dorsalis pedis artery
Synovial sheath surrounding tendon of extensor hallucis longus
First dorsal metatarsal artery
First dorsal interosseus
Extensor hood
Anterior lateral malleolar artery
Common synovial sheath surrounding tendons of extensor digitorum longus and fibularis tertius
Arcuate artery
Tendon of extensor digitorum longus to second toe


superior extensor retinaculum
perforating branch of peroneal artery
anterior tibial artery
medial malleolus
lateral malleolus
tibialis anterior
inferior extensor retinaculum
extensor digitorum brevis
peroneus brevis
lateral tarsal artery
peroneus tertius
arcuate artery
dorsalis pedis artery
extensor digitorum brevis tendons
extensor hallucis longus
extensor digitorum longus tendons
first dorsal metatarsal artery
fourth dorsal interosseous
medial terminal branch of deep peroneal nerve
first dorsal interosseous
second dorsal interosseous
extensor expansion
third dorsal interosseous

Inferior Extensor Retinaculum

The inferior extensor retinaculum is a Y-shaped band located in front of the ankle joint. Fibrous bands separate the tendons into compartments, each of which is lined by a synovial sheath.



ANTERIOR COMPARTMENT

- **Contents of the Anterior Fascial Compartment of the Leg**
- **Muscles: The tibialis anterior, extensor digitorum longus, peroneus tertius, and extensor hallucis longus**
- **Blood supply: Anterior tibial artery**
- **Nerve supply: Deep peroneal nerve**

Artery of the Anterior Fascial Compartment of the Leg

Anterior Tibial Artery

The terminal branches of the popliteal artery.

In front of the ankle joint, the artery becomes the dorsalis pedis artery.

Deep Peroneal Nerve

The deep peroneal nerve is one of the terminal branches of the common peroneal nerve .

The nerve passes behind the extensor retinacula.

Branches

Muscular branches to the 1.

1. Tibialis anterior,
2. Extensor digitorum longus,
3. Peroneus tertius,
4. Extensor hallucis longus
5. Articular branch to the ankle joint

Table 10-5 Muscles of the Anterior Fascial Compartment of the Leg

Muscle	Origin	Insertion	Nerve Supply	Nerve Rootsa	Action
Tibialis anterior	Lateral surface of shaft of tibia and interosseous membrane	Medial cuneiform and base of first metatarsal bone	Deep peroneal nerve	**L4,** 5	Extendsb foot at ankle joint; inverts foot at subtalar and transverse tarsal joints; holds up medial longitudinall arch of foot
Extensor digitorum longus	Anterior surface of shaft of fibula	Extensor expansion of lateral four toes	Deep peroneal nerve	L5; S1	Extends toes; extends foot at ankle joint
Peroneus tertius	Anterior surface of shaft of fibula	Base of fifth metatarsal bone	Deep peroneal nerve	L5; S1	Extends foot at ankle joint; everts foot at subtalar and transverse tarsal joints

Table 10-5 Muscles of the Anterior Fascial Compartment of the Leg

Muscle	Origin	Insertion	Nerve Supply	Nerve Rootsa	Action
Extensor hallucis longus	Anterior surface of shaft of fibula	Base of distal phalanx of great toe	Deep peroneal nerve	L5; S1	Extends big toe; extends foot at ankle joint; inverts foot at subtalar and transverse tarsal joints
Extensor digitorum brevis	Calcaneum	By four tendons into the proximal phalanx of big toe and long extensor tendons to second, third, and fourth toes	Deep peroneal nerve	S1, 2	Extends toes

[a] The predominant nerve root supply is indicated by boldface type.

[b] Extension, or dorsiflexion, of the ankle is the movement of the foot away from the ground.

Anterior Compartment of the Leg Syndrome

- Soft tissue injury associated with bone fractures is a common cause, and early diagnosis is critical.
- The deep, increasing aching pain in the anterior compartment of the leg.
- As the pressure rises, the venous return is diminished, thus producing a further rise in pressure.
- In severe cases, the arterial supply is eventually cut off by compression, and the
- Dorsalis pedis arterial pulse disappears
- **AND MUSCLE IS PARALYSED AND GET GANGRENOUS**
- **Longitudinal incision through the deep fascia to decompress the area and prevent anoxic necrosis of the muscles.**

THANKS

Superficial veins of lower limb

Veins of the Lower Limb

1. Superficial V
2. Deep V
3. Perforating V

Superficial Veins

The great saphenous vein and their tributaries

The small saphenous vein and their tributaries

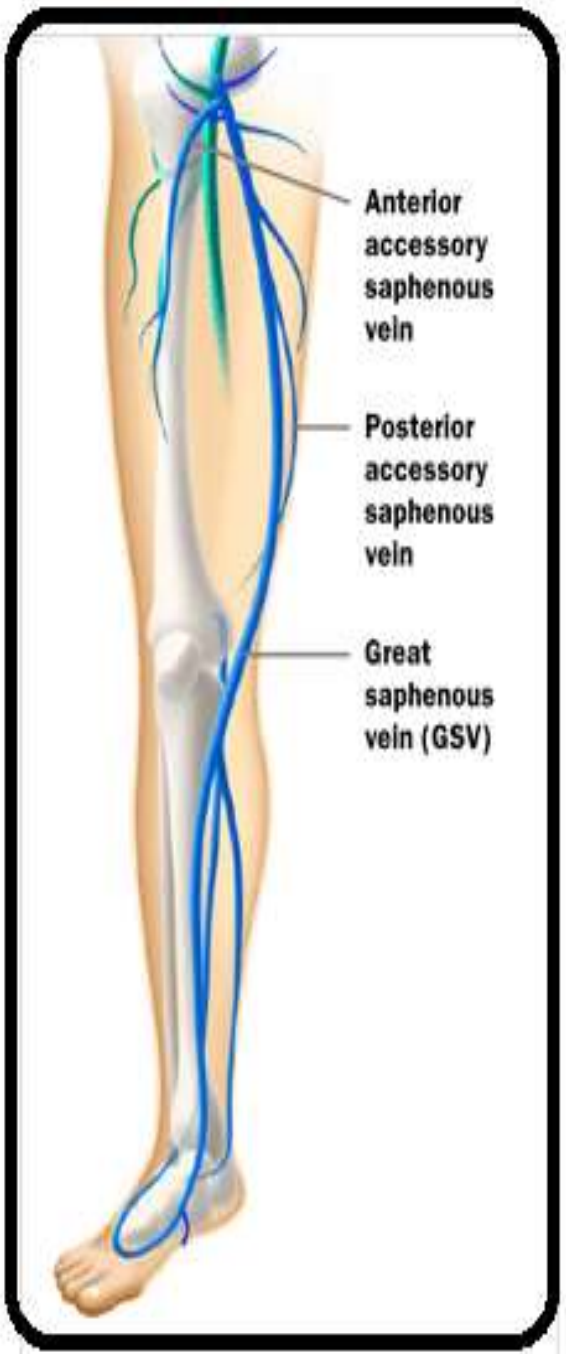
The great saphenous vein drains

1. The medial end of the dorsal venous arch of the foot and passes upward directly in front of the medial malleolus.

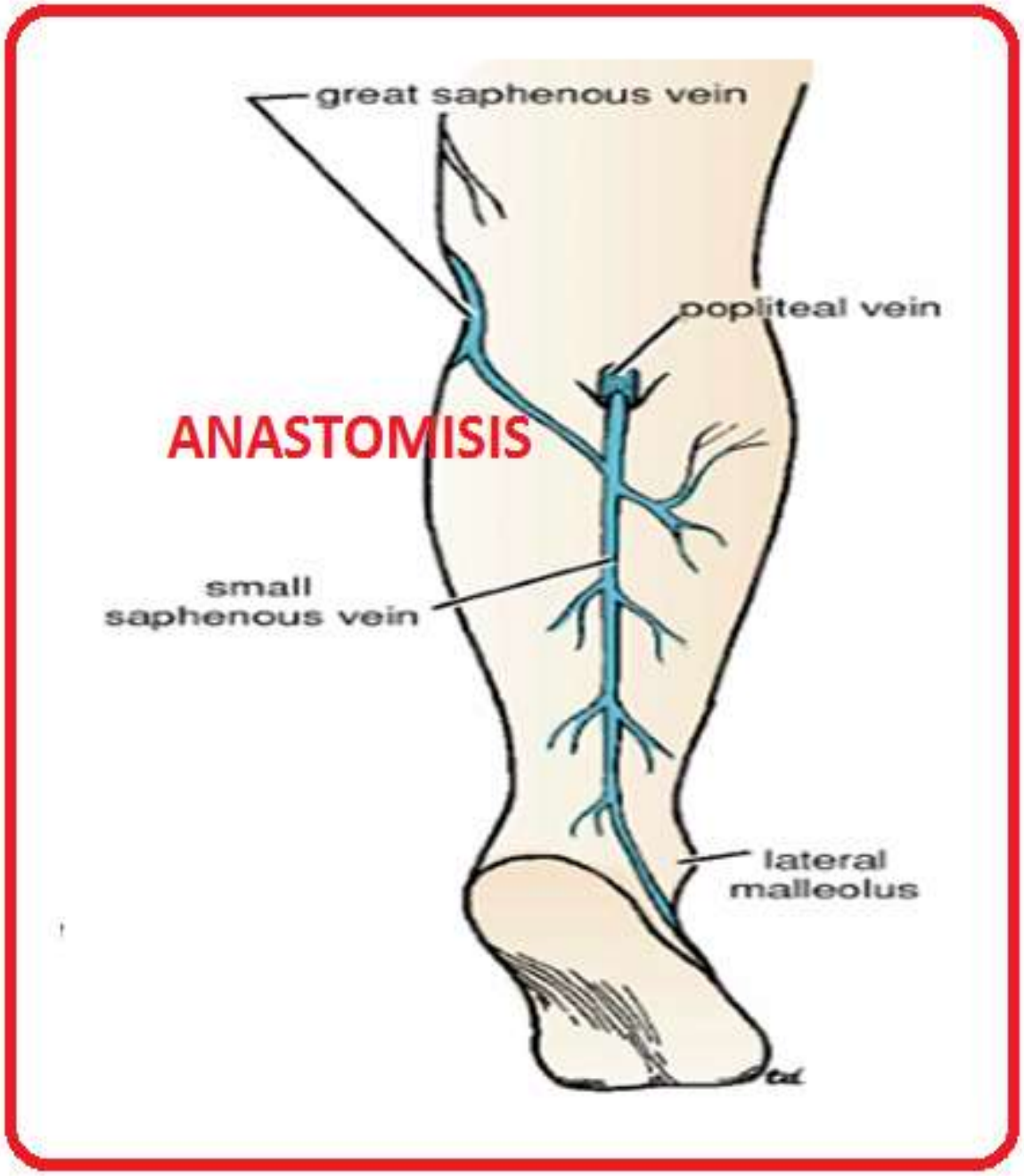
2. It then ascends in company with the saphenous nerve in the superficial fascia over the medial side of the leg.

The vein passes behind the knee and curves forward around the medial side of the thigh.

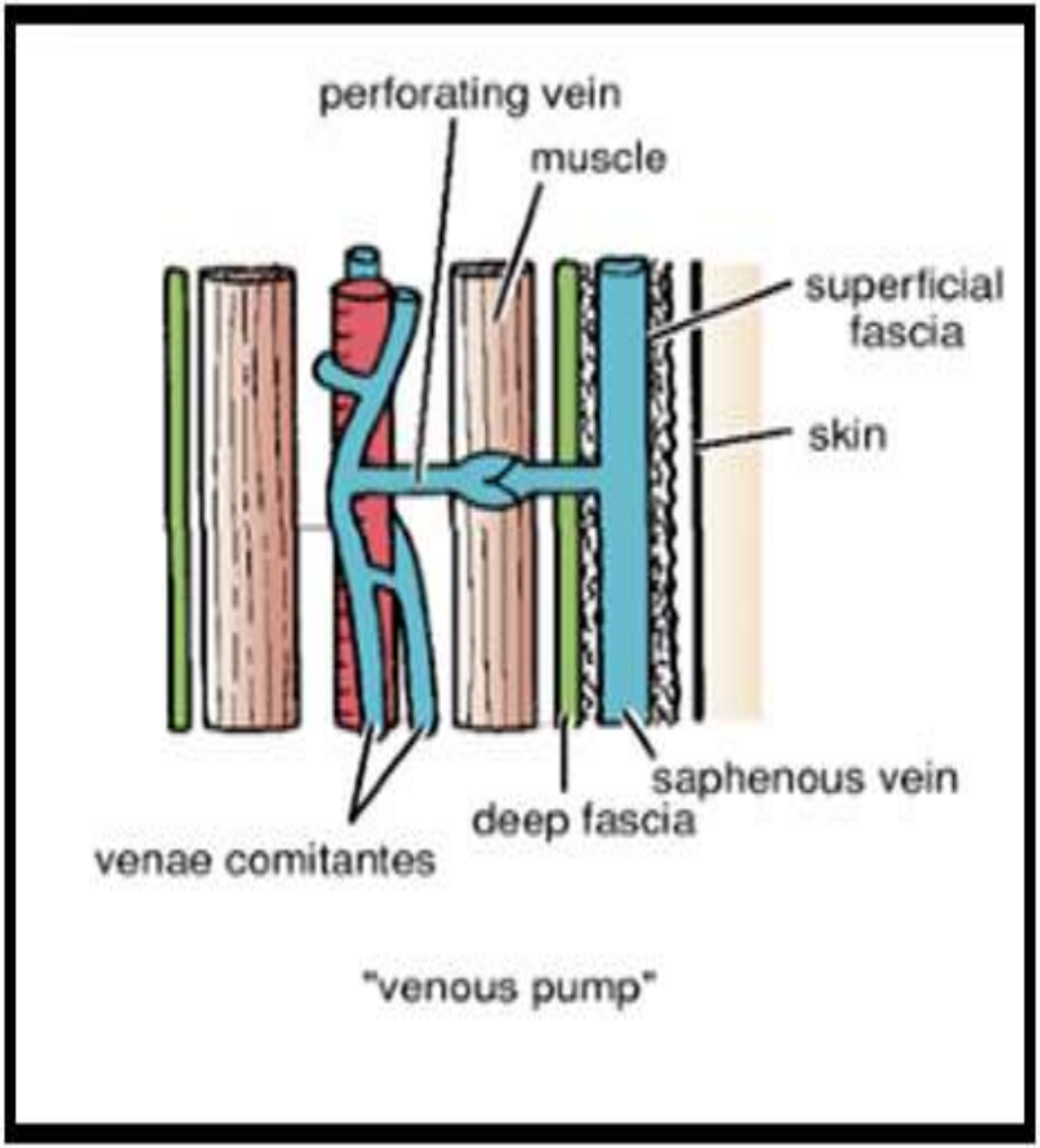
3. It passes through the lower part of the saphenous opening in the deep fascia and joins the femoral vein about 1.5 in. (4 cm) below and lateral to the pubic tubercle.

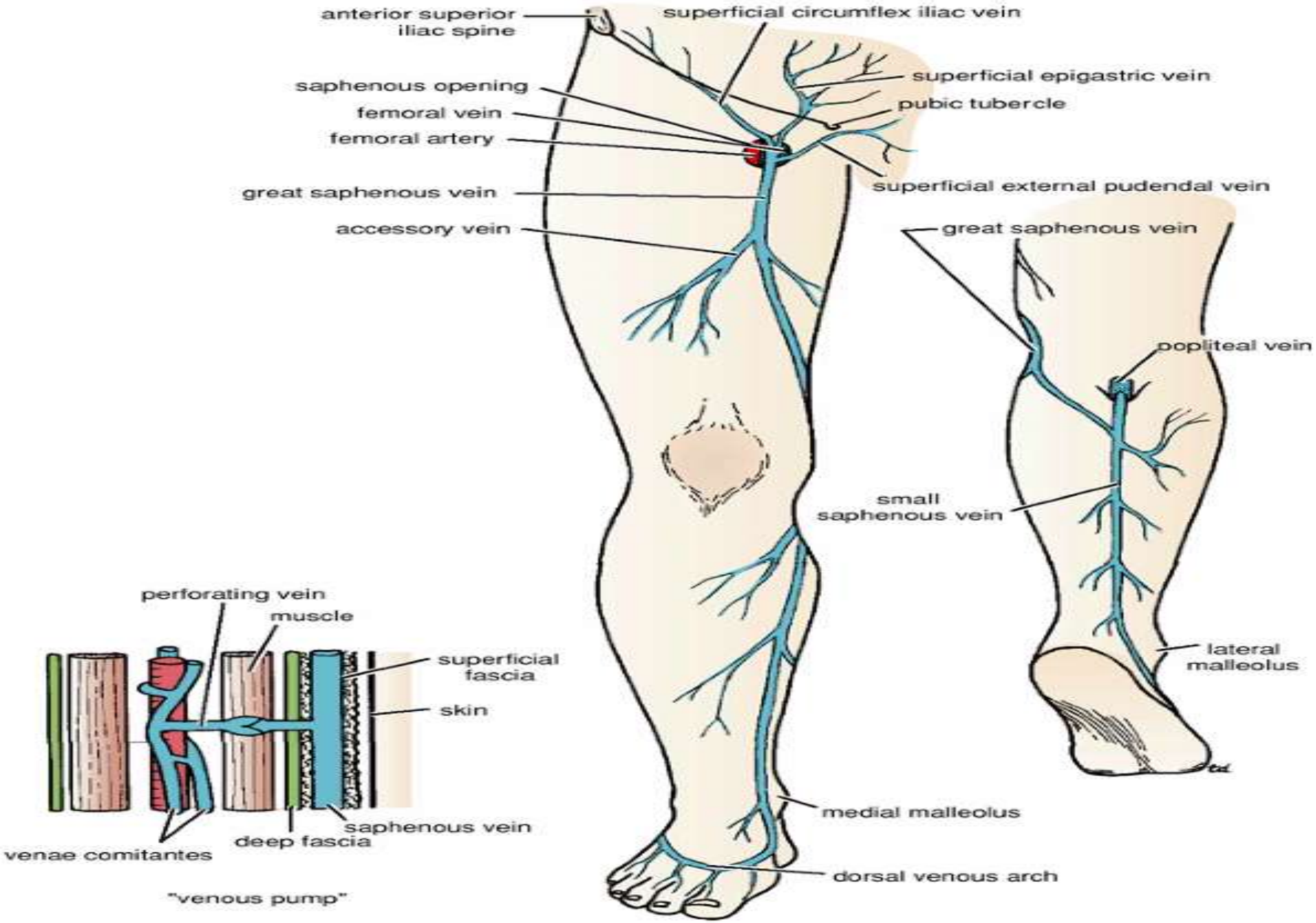


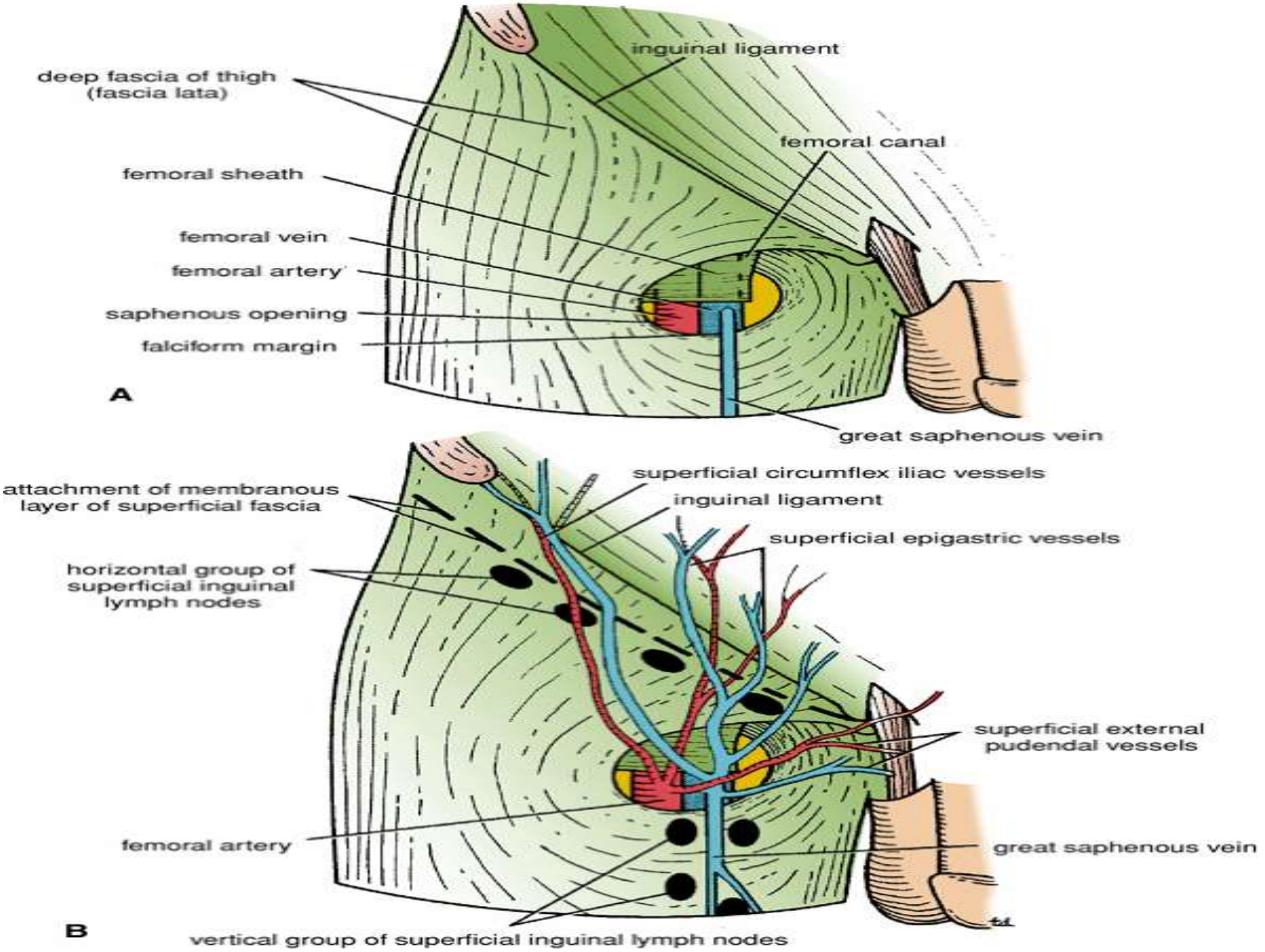
1. The great saphenous vein possesses numerous valves and is connected to the small saphenous vein by one or two branches that pass behind the knee.



- Several perforating veins connect the great saphenous vein with the deep veins along the medial side of the calf.



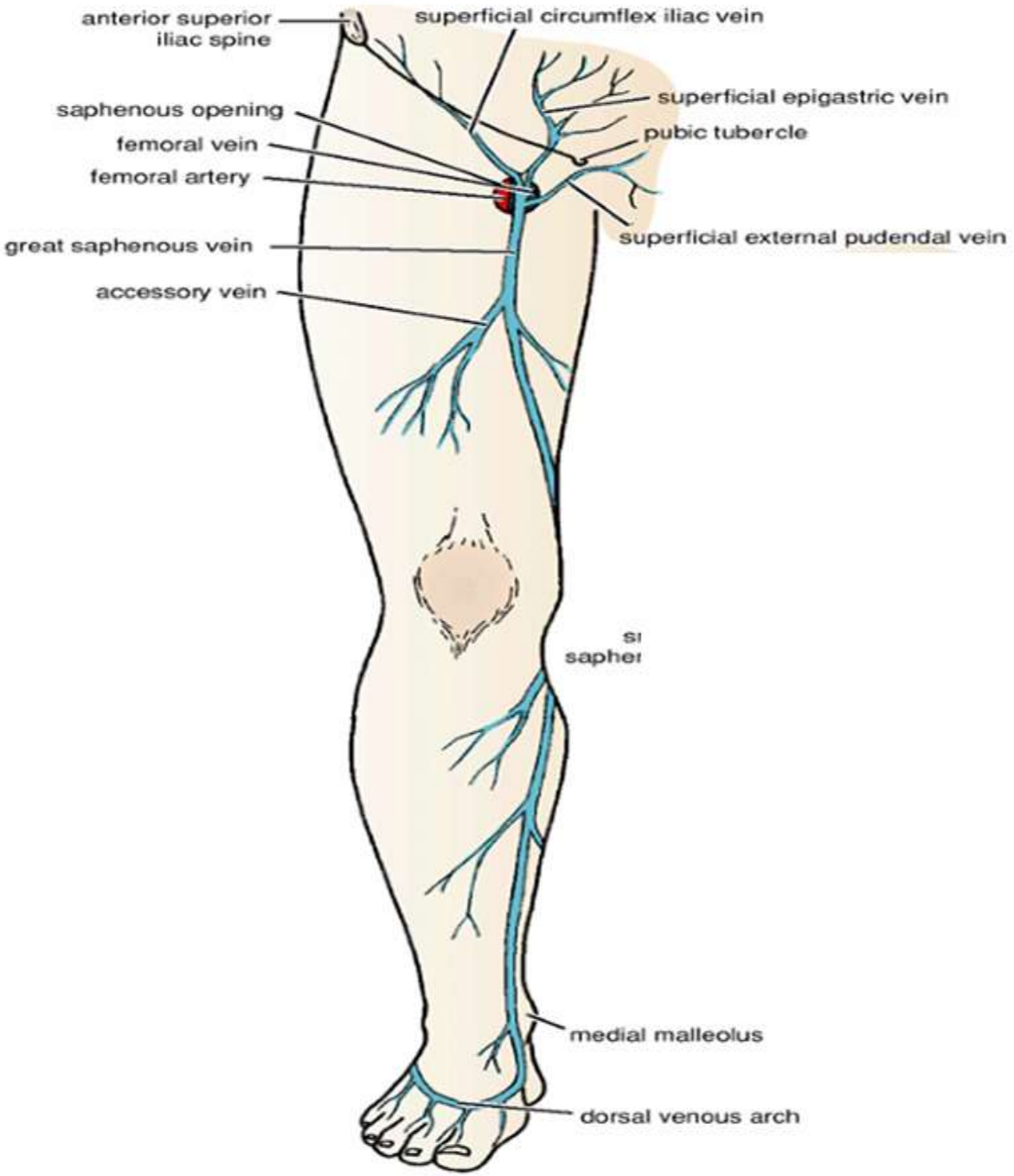

anterior superior iliac spine
superficial circumflex iliac vein
saphenous opening
femoral vein
femoral artery
great saphenous vein
accessory vein
superficial epigastric vein
pubic tubercle
superficial external pudendal vein
great saphenous vein
popliteal vein
small saphenous vein
lateral malleolus
medial malleolus
dorsal venous arch
perforating vein
muscle
superficial fascia
skin
saphenous vein
deep fascia
venae comitantes
"venous pump"


inguinal ligament
deep fascia of thigh
(fascia lata)
femoral canal
femoral sheath
femoral vein
femoral artery
saphenous opening
falciform margin
A
great saphenous vein
superficial circumflex iliac vessels
attachment of membranous
layer of superficial fascia
inguinal ligament
superficial epigastric vessels
horizontal group of
superficial inguinal
lymph nodes
superficial external
pudendal vessels
femoral artery
great saphenous vein
B
vertical group of superficial inguinal lymph nodes

At the saphenous opening in the deep fascia, the great saphenous vein usually receives three tributaries that are variable in size and arrangement:

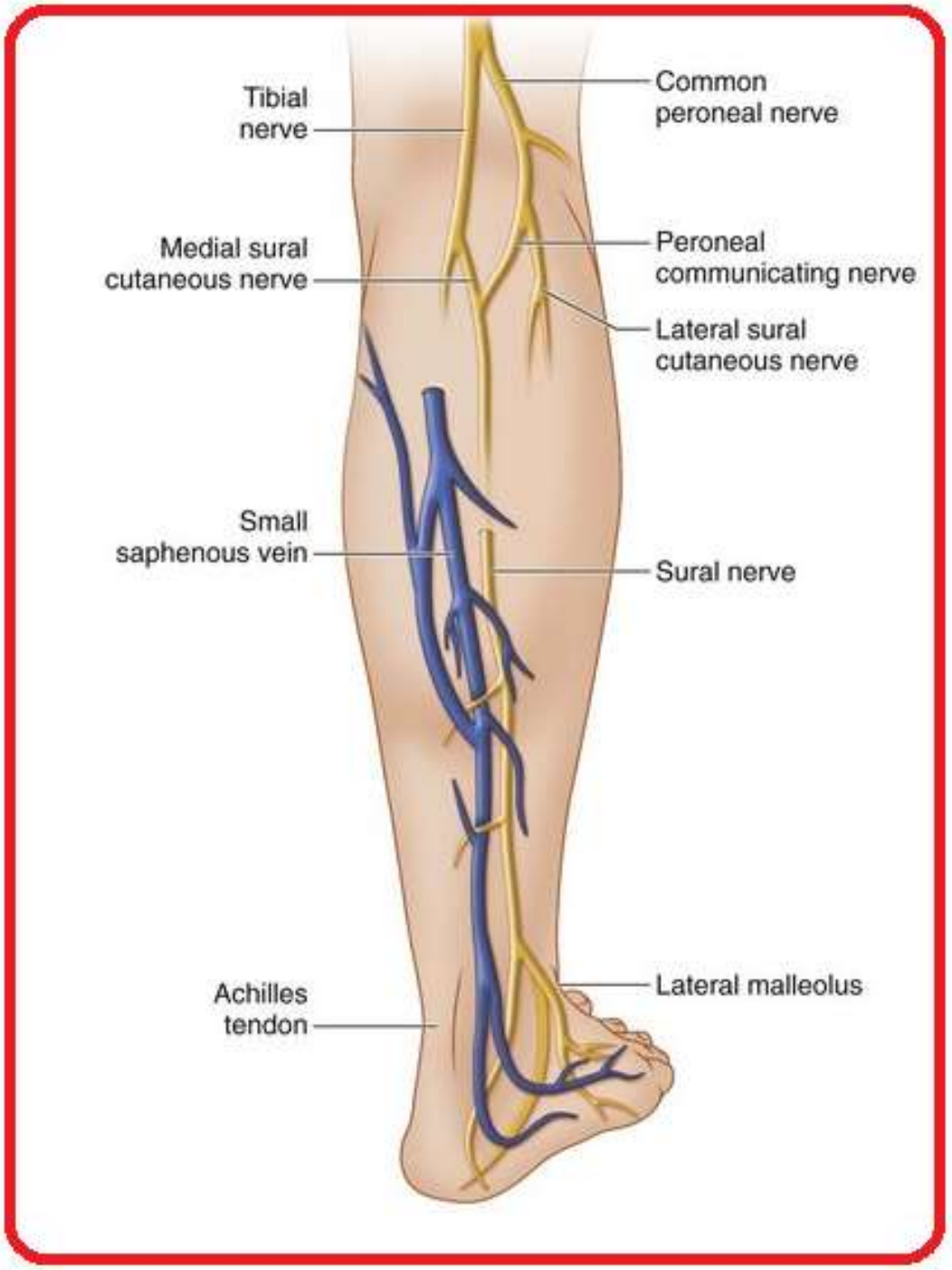
1. The superficial circumflex iliac vein,
2. The superficial epigastric vein,
3. And the superficial external pudendal vein.

An additional vein, known as the accessory vein, usually joins the main vein about the middle of the thigh or higher up at the saphenous opening.



The small saphenous vein (SSV)

1. Arises from the lateral part of the dorsal venous arch of the foot.
2. It ascends behind the lateral malleolus in company with the sural nerve.

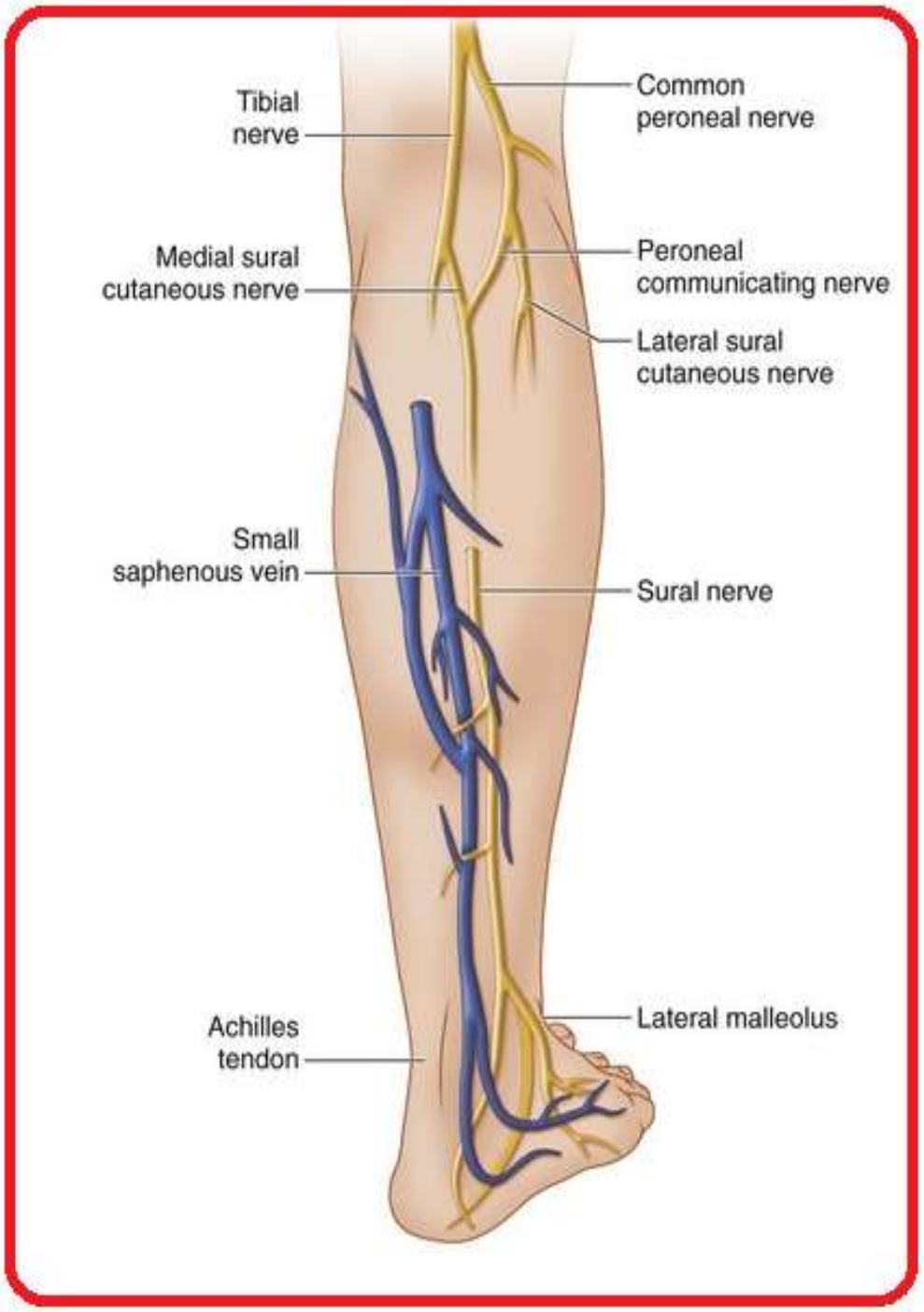


3. SSV follows the lateral border of the

tendo calcaneus and then runs up the middle of the back of the leg.

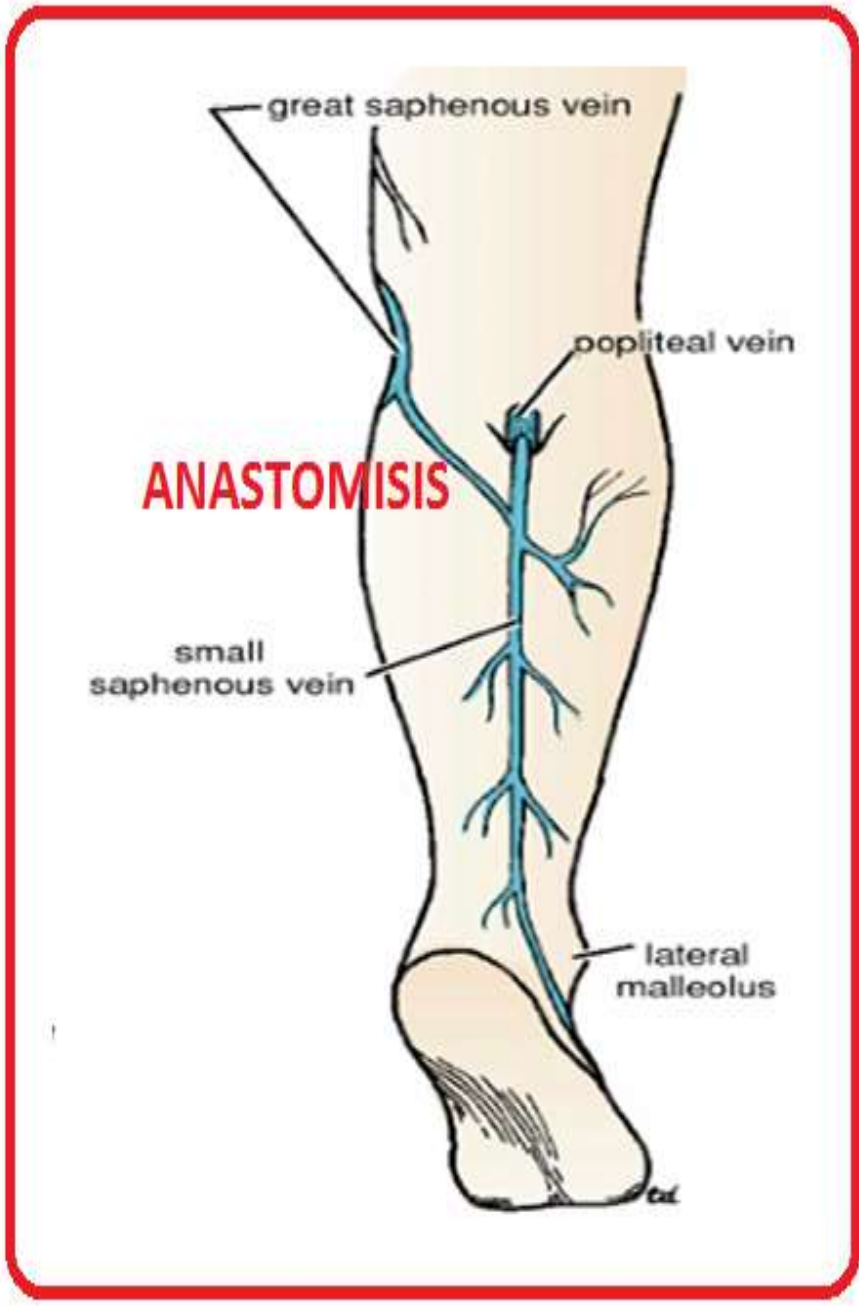
4. SSV the deep fascia and passes between the two heads of the gastrocnemius muscle in the lower part of the popliteal fossa; **it ends in the popliteal vein.**

5. The SSV has numerous valves along its course.



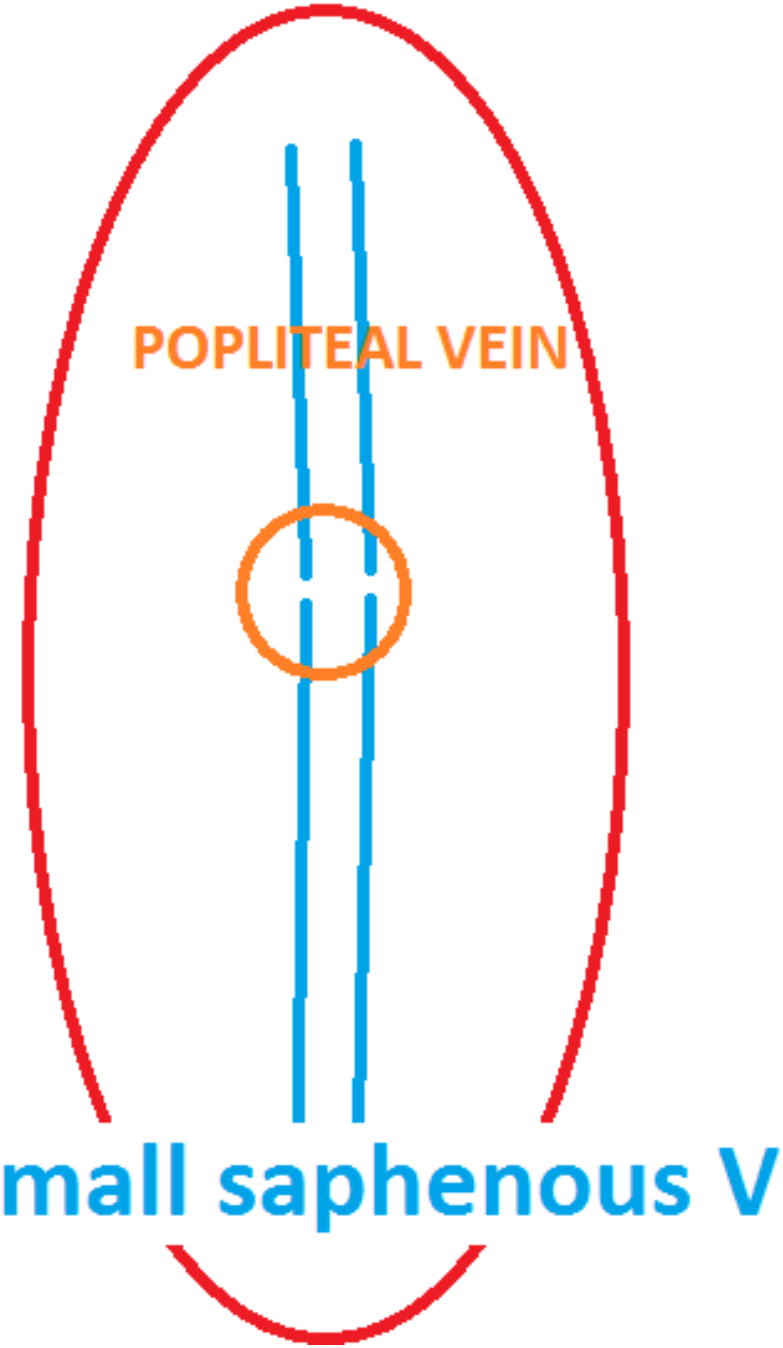
Tributaries

1. Numerous small veins from the back of the leg communicating veins with the deep veins of the foot
2. Important anastomotic branches that run upward and medially and join the great saphenous vein.



The mode of termination of the small saphenous vein is subject to variation:

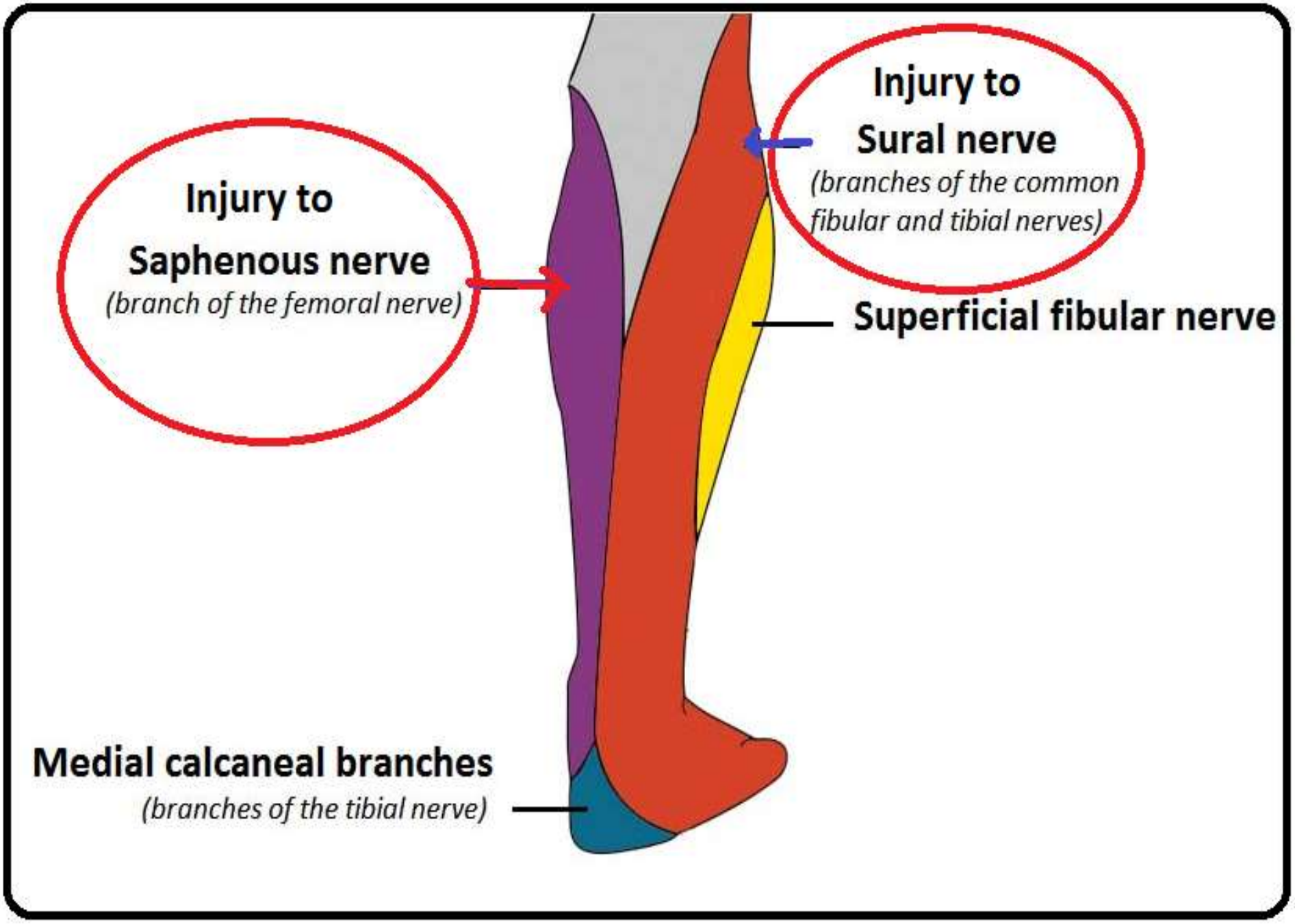
1. Commonly it join the popliteal vein;
2. It may join the great saphenous vein;
3. or it may split in two, one division joining the popliteal and the other joining the great saphenous vein.

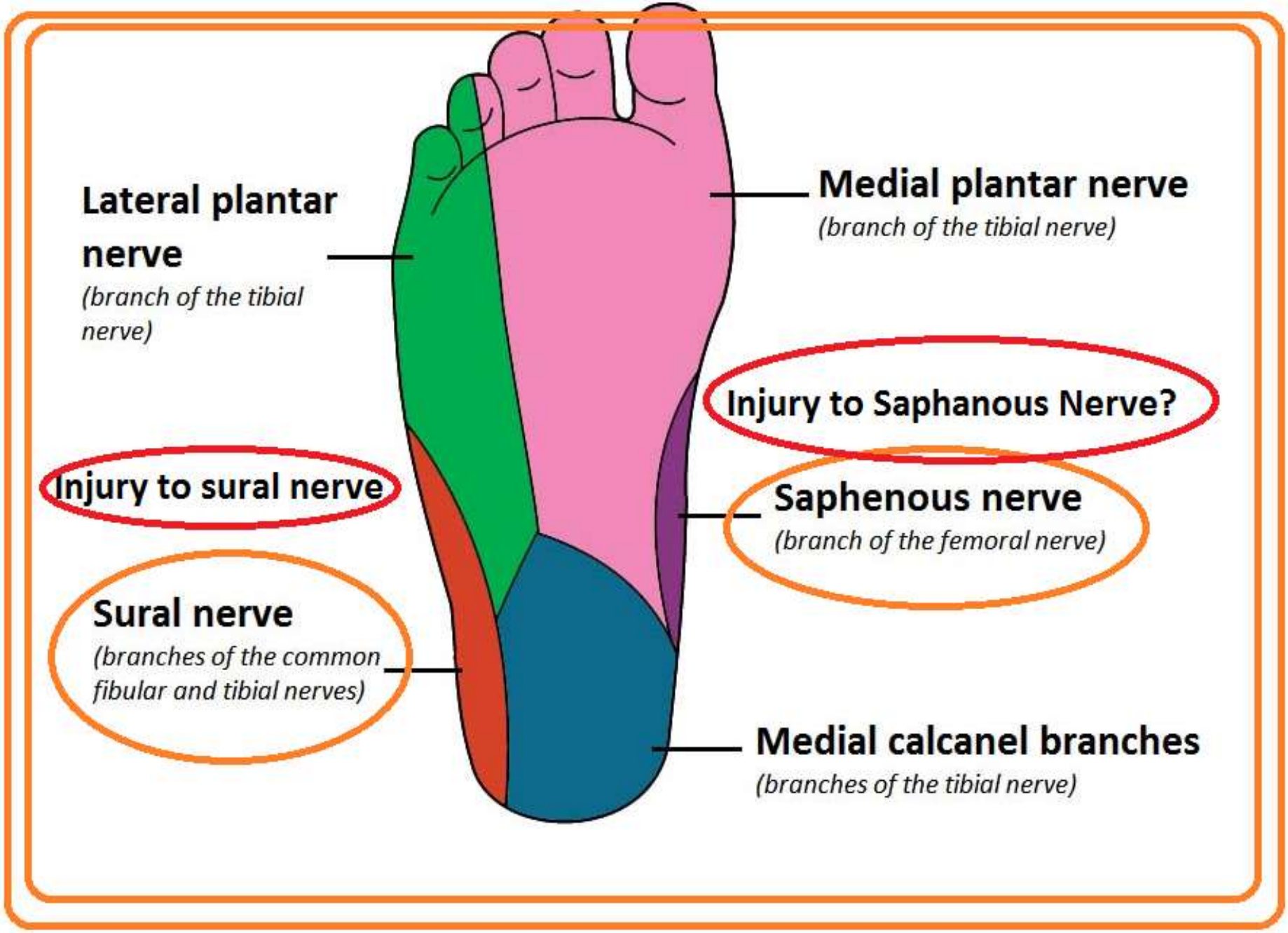


Clinical Application or Applied anatomy:

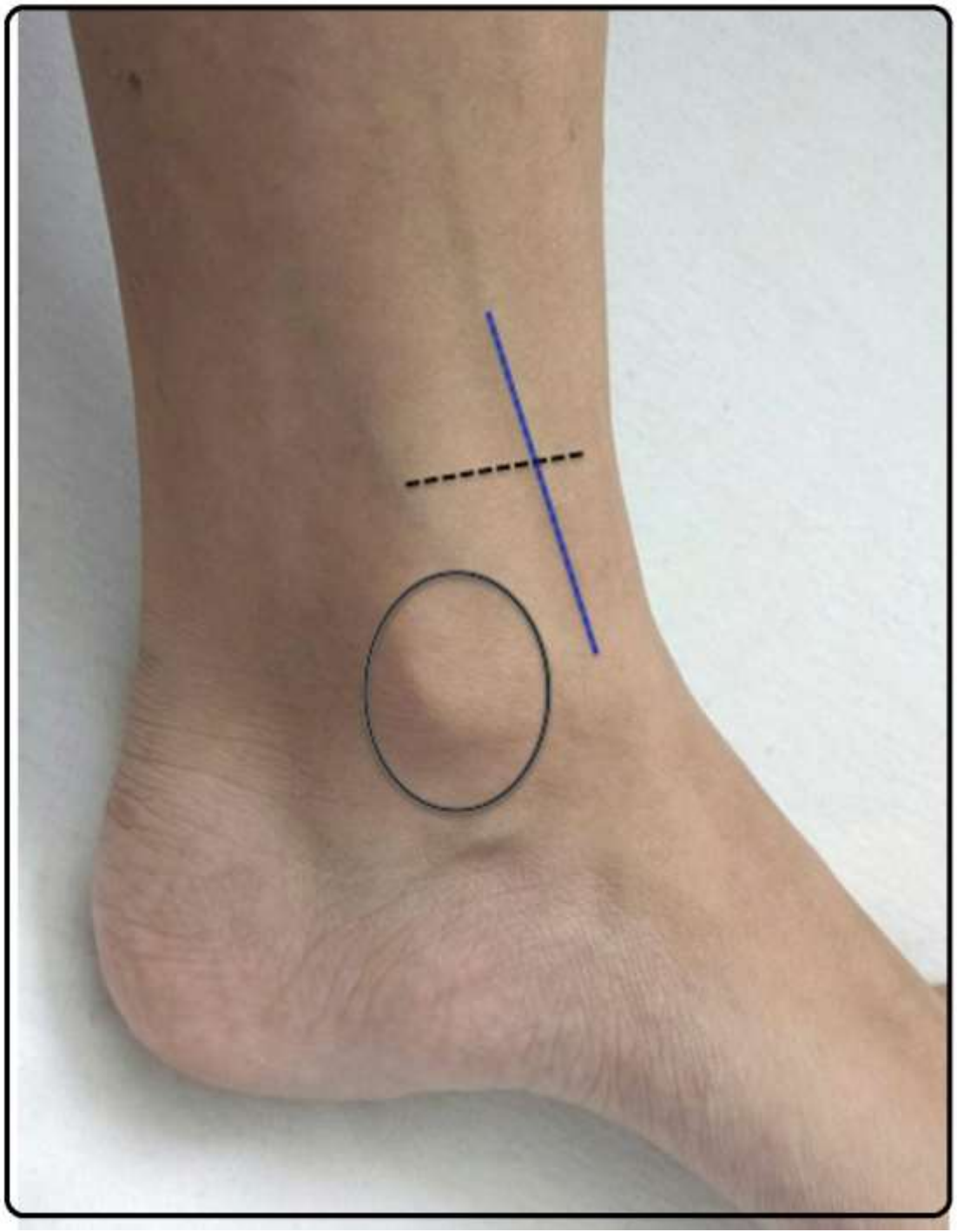
1. Varicose Veins

The saphenous vein is often stripped during management of **Varicose Veins can damage the** saphenous nerve.

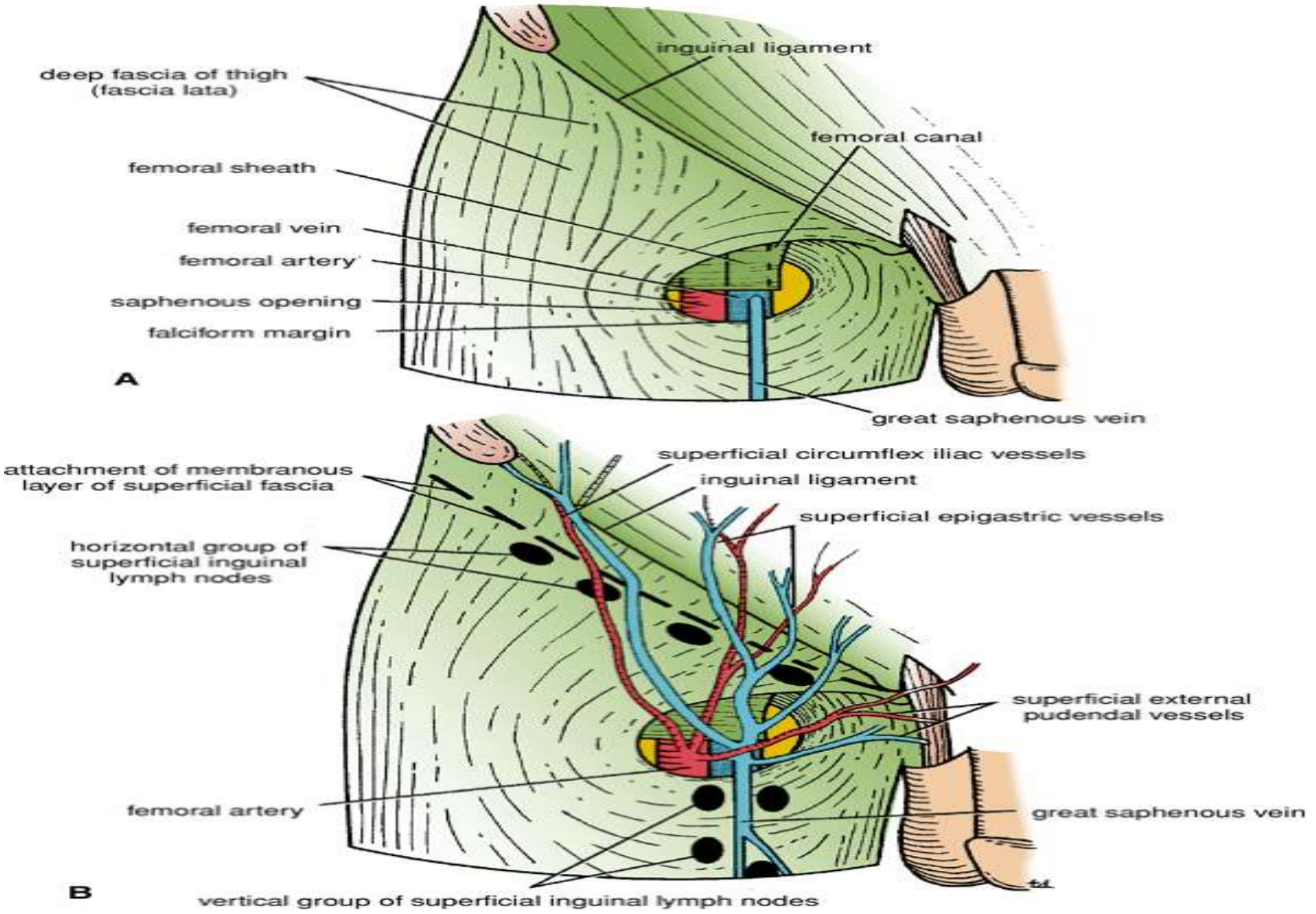

Injury to
Sural nerve
(branches of the common fibular and tibial nerves)
Injury to
Saphenous nerve
(branch of the femoral nerve)
Superficial fibular nerve
Medial calcaneal branches
(branches of the tibial nerve)

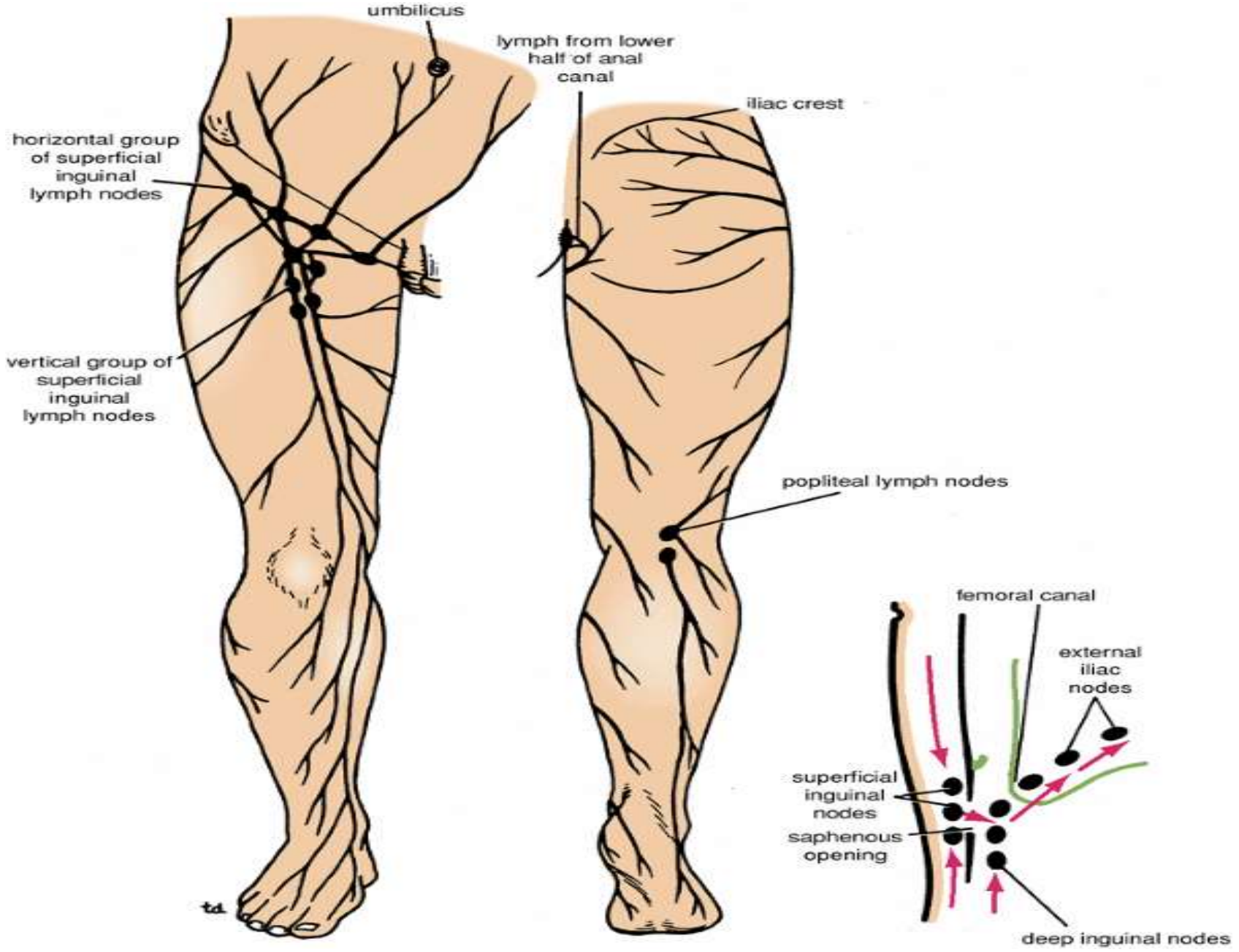

Lateral plantar nerve
(branch of the tibial nerve)
Medial plantar nerve
(branch of the tibial nerve)
Injury to Saphanous Nerve?
Injury to sural nerve
Saphenous nerve
(branch of the femoral nerve)
Sural nerve
(branches of the common fibular and tibial nerves)
Medial calcanel branches
(branches of the tibial nerve)

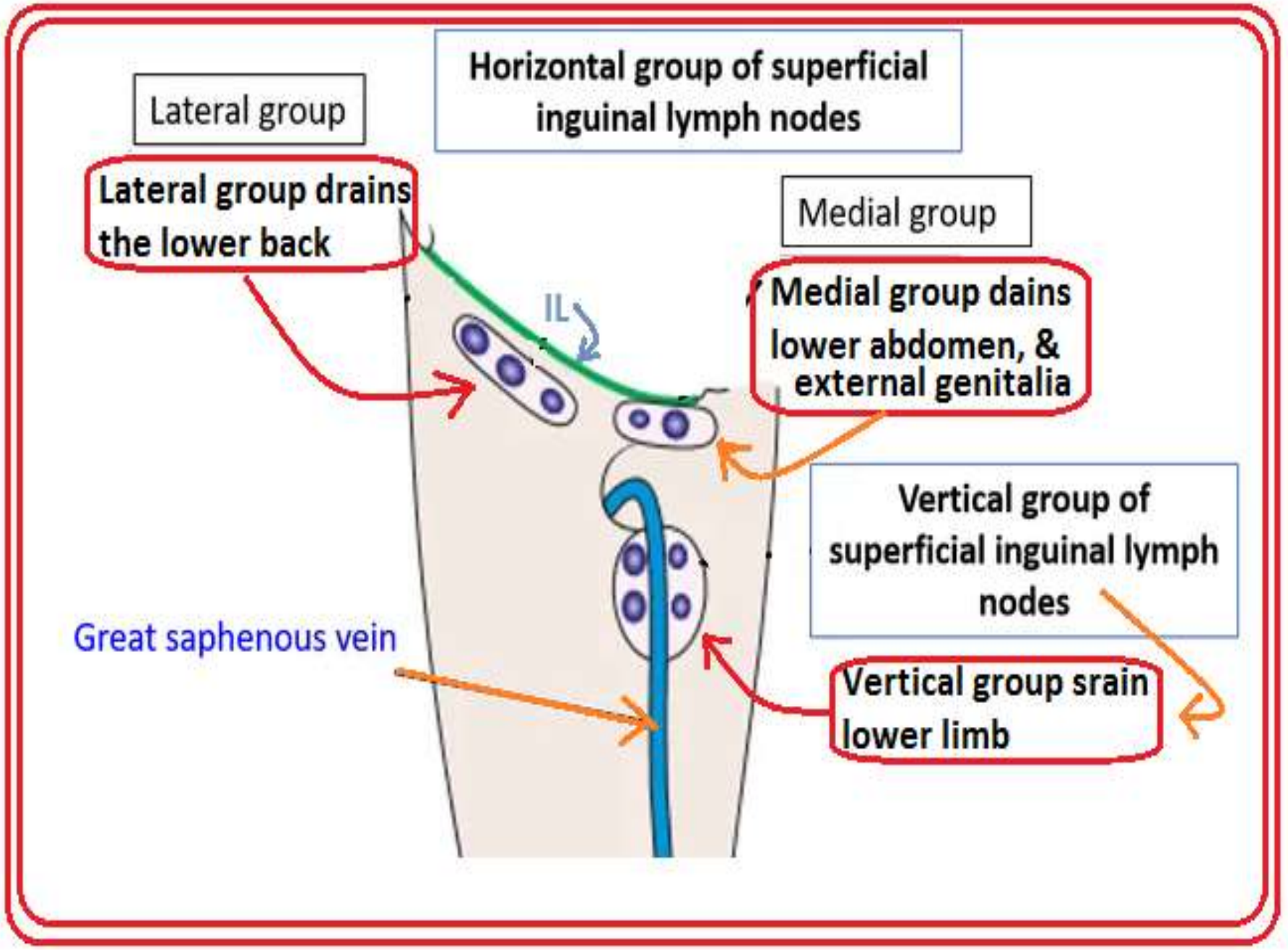
2. Great Saphenous Vein Cutdown



- **L. NODES OF LL**


deep fascia of thigh
(fascia lata)
femoral sheath
femoral vein
femoral artery
saphenous opening
falciform margin
inguinal ligament
femoral canal
great saphenous vein
A
attachment of membranous
layer of superficial fascia
horizontal group of
superficial inguinal
lymph nodes
superficial circumflex iliac vessels
inguinal ligament
superficial epigastric vessels
superficial external
pudendal vessels
femoral artery
great saphenous vein
vertical group of superficial inguinal lymph nodes
B


umbilicus
lymph from lower half of anal canal
iliac crest
horizontal group of superficial inguinal lymph nodes
vertical group of superficial inguinal lymph nodes
popliteal lymph nodes
femoral canal
external iliac nodes
superficial inguinal nodes
saphenous opening
deep inguinal nodes
td


Horizontal group of superficial inguinal lymph nodes
Lateral group
Lateral group drains the lower back
Medial group
Medial group dains lower abdomen, & external genitalia
IL
Vertical group of superficial inguinal lymph nodes
Great saphenous vein
Vertical group srain lower limb

Superficial Inguinal Lymph Nodes

The superficial nodes lie in the superficial fascia below the inguinal ligament and can be divided into a horizontal and a vertical group.

The horizontal group lies just below and parallel to the inguinal ligament.

- The medial members of the group receive superficial lymph vessels from the anterior abdominal wall below the level of the umbilicus and from the perineum .
- The lymph vessels from the urethra, the external genitalia of both sexes (but not the testes), and the lower half of the anal canal are drained by this route.

- The lateral members of the group receive superficial lymph vessels from the back below the level of the iliac crests.

The vertical group lies along the terminal part of the great saphenous vein and receives most of the superficial lymph vessels of the lower limb.

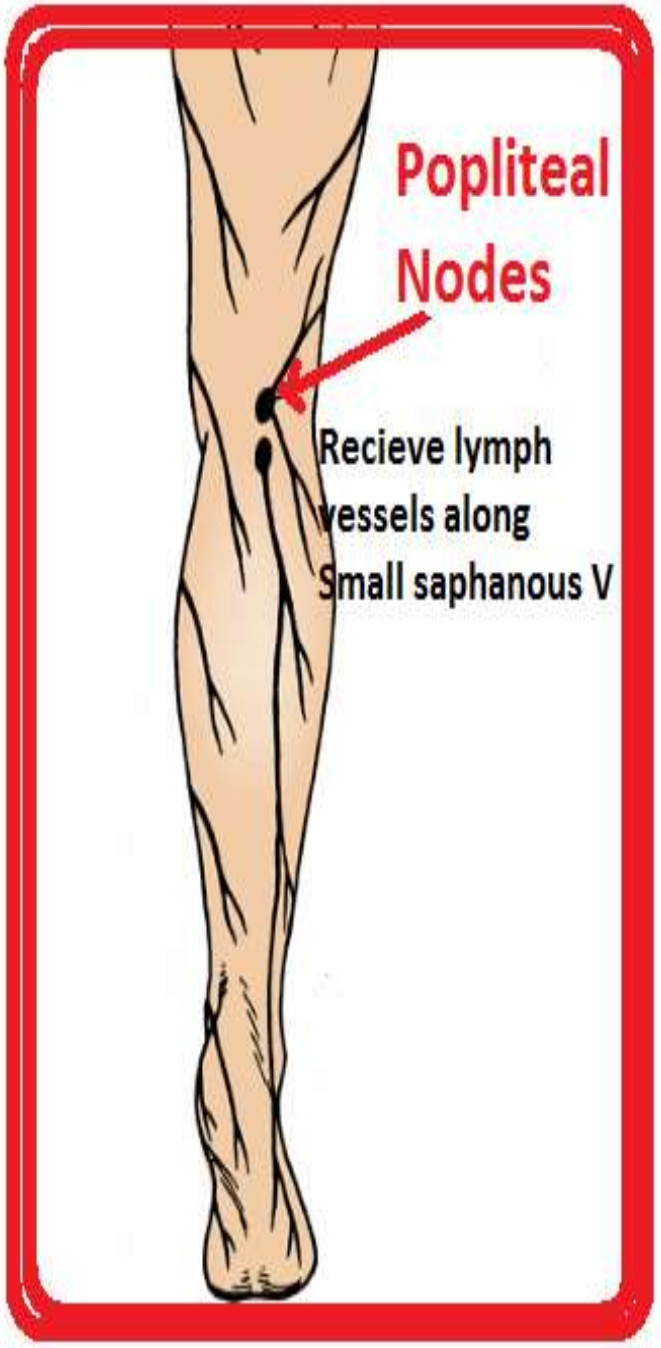
The efferent lymph vessels from the superficial inguinal nodes pass through the saphenous opening in the deep fascia and join the **deep inguinal nodes.**

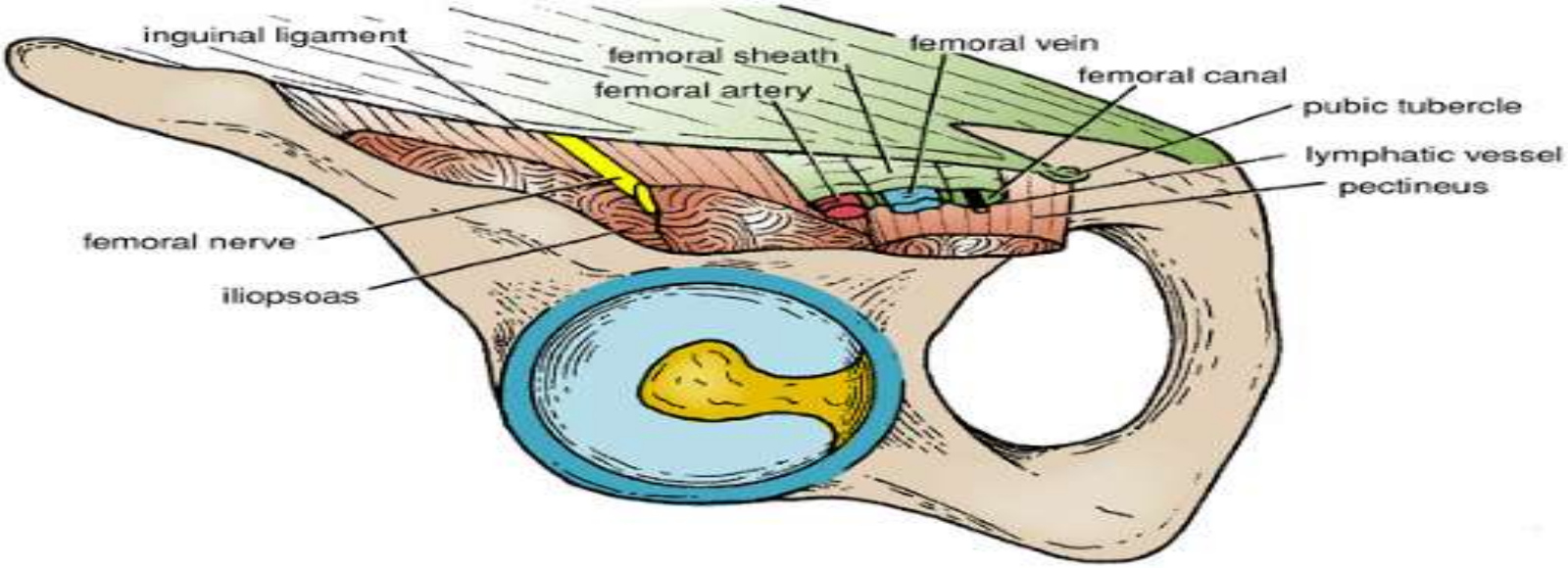
Deep Inguinal Lymph Nodes

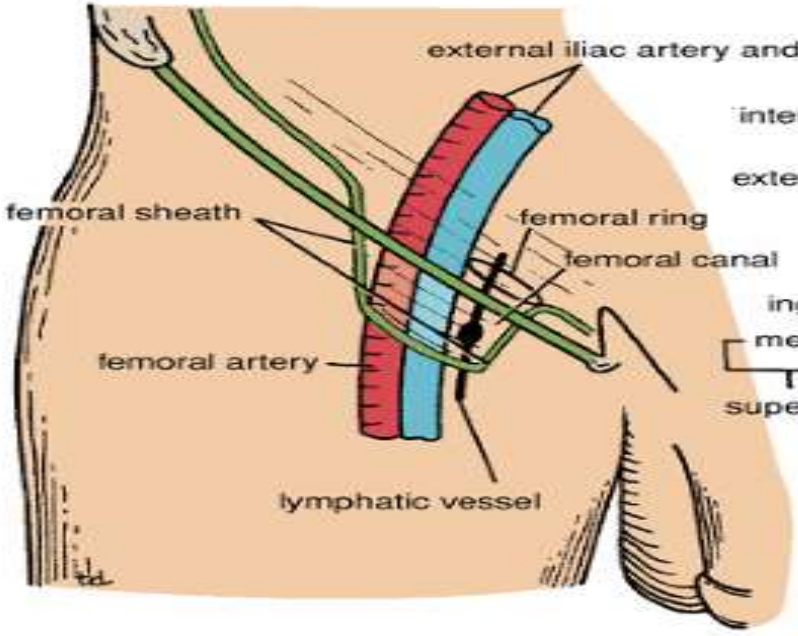
The deep nodes are located beneath the deep fascia and lie along the medial side of the femoral vein; the efferent vessels from these nodes enter the abdomen by passing through the femoral canal to lymph nodes along the external iliac artery.

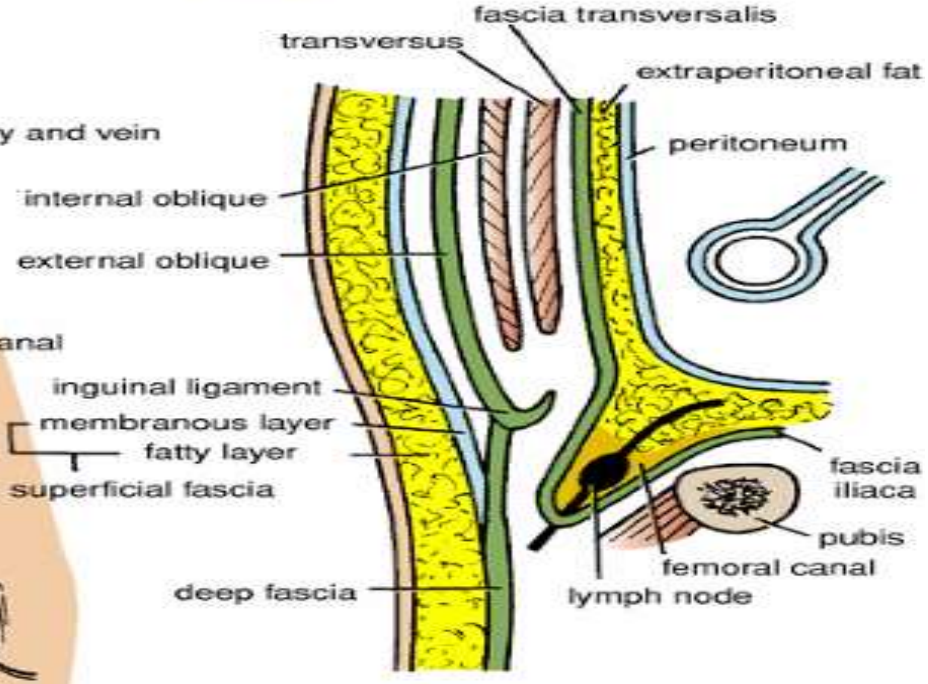
Popliteal Lymph Nodes

1. About six lymph nodes are embedded in the fatty connective tissue of the popliteal fossa.
2. They receive superficial lymph vessels from the lateral side of the foot and leg.
3. These accompany the small saphenous vein into the popliteal fossa. They also receive lymph from the knee joint and from deep lymph vessels accompanying the anterior and posterior tibial arteries.



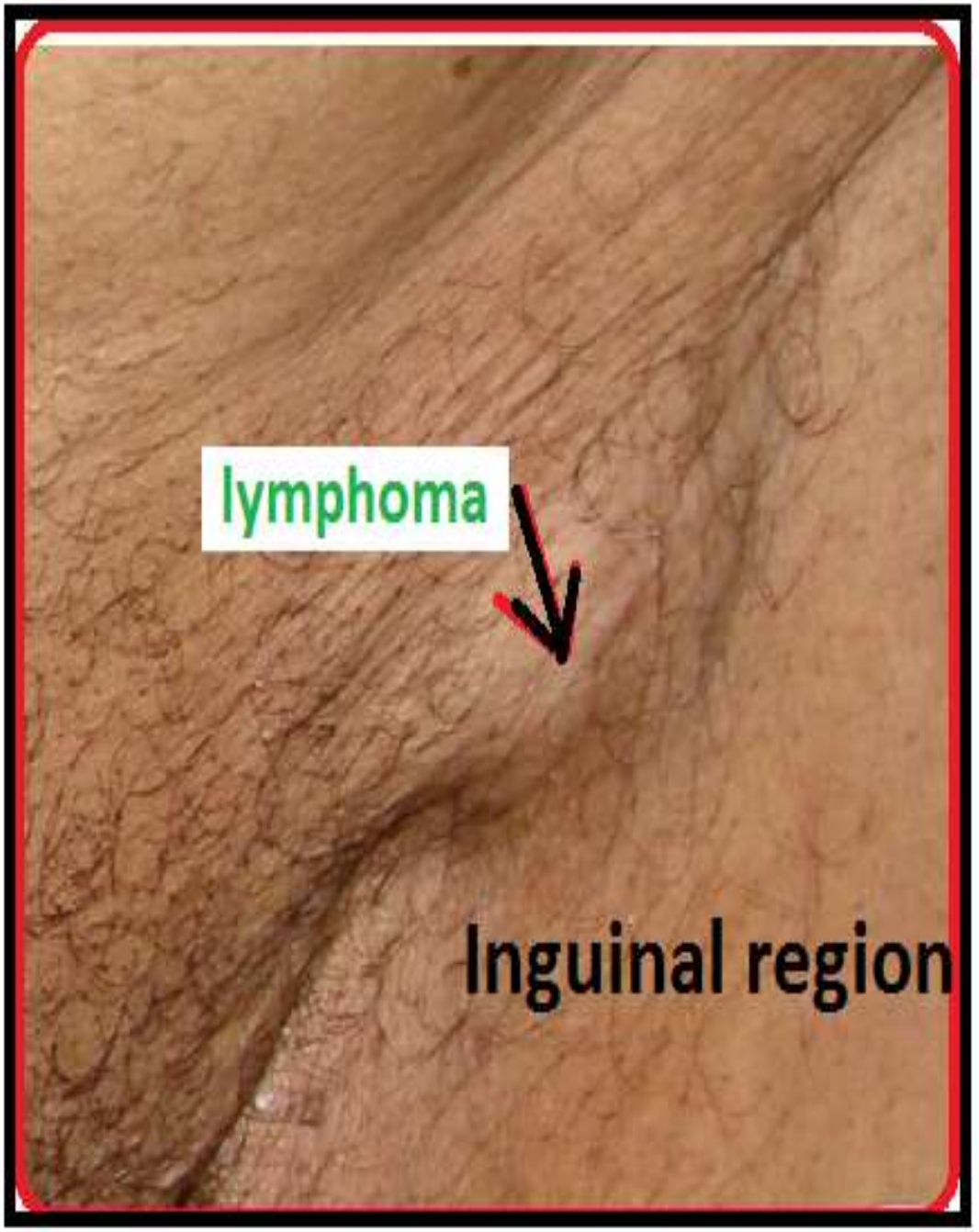

inguinal ligament
femoral sheath
femoral artery
femoral vein
femoral canal
pubic tubercle
lymphatic vessel
pectineus
femoral nerve
iliopsoas


external iliac artery and vein
femoral sheath
femoral ring
femoral canal
femoral artery
lymphatic vessel

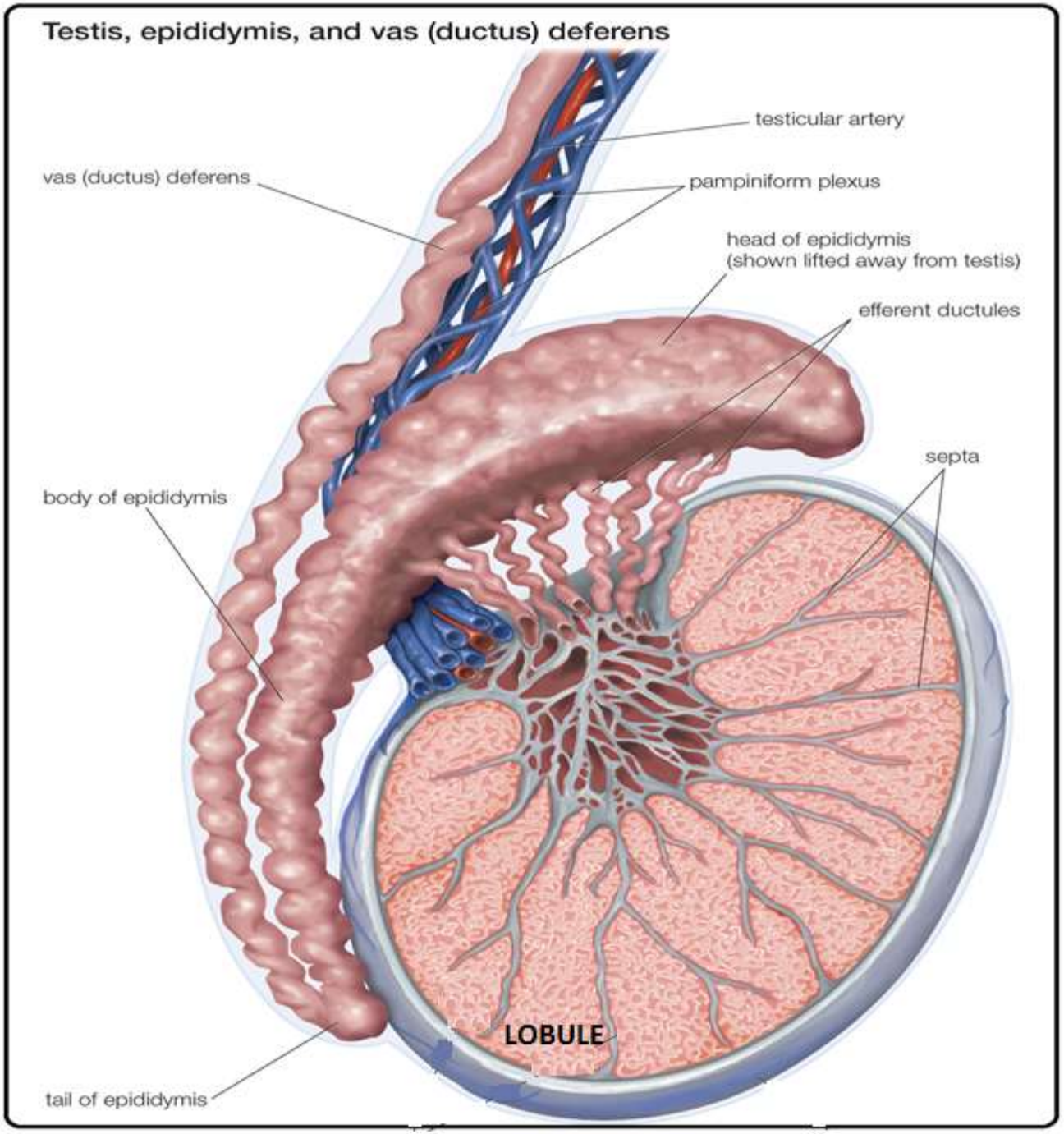

fascia transversalis
transversus
extraperitoneal fat
peritoneum
internal oblique
external oblique
inguinal ligament
membranous layer
fatty layer
superficial fascia
fascia iliaca
pubis
femoral canal
lymph node
deep fascia

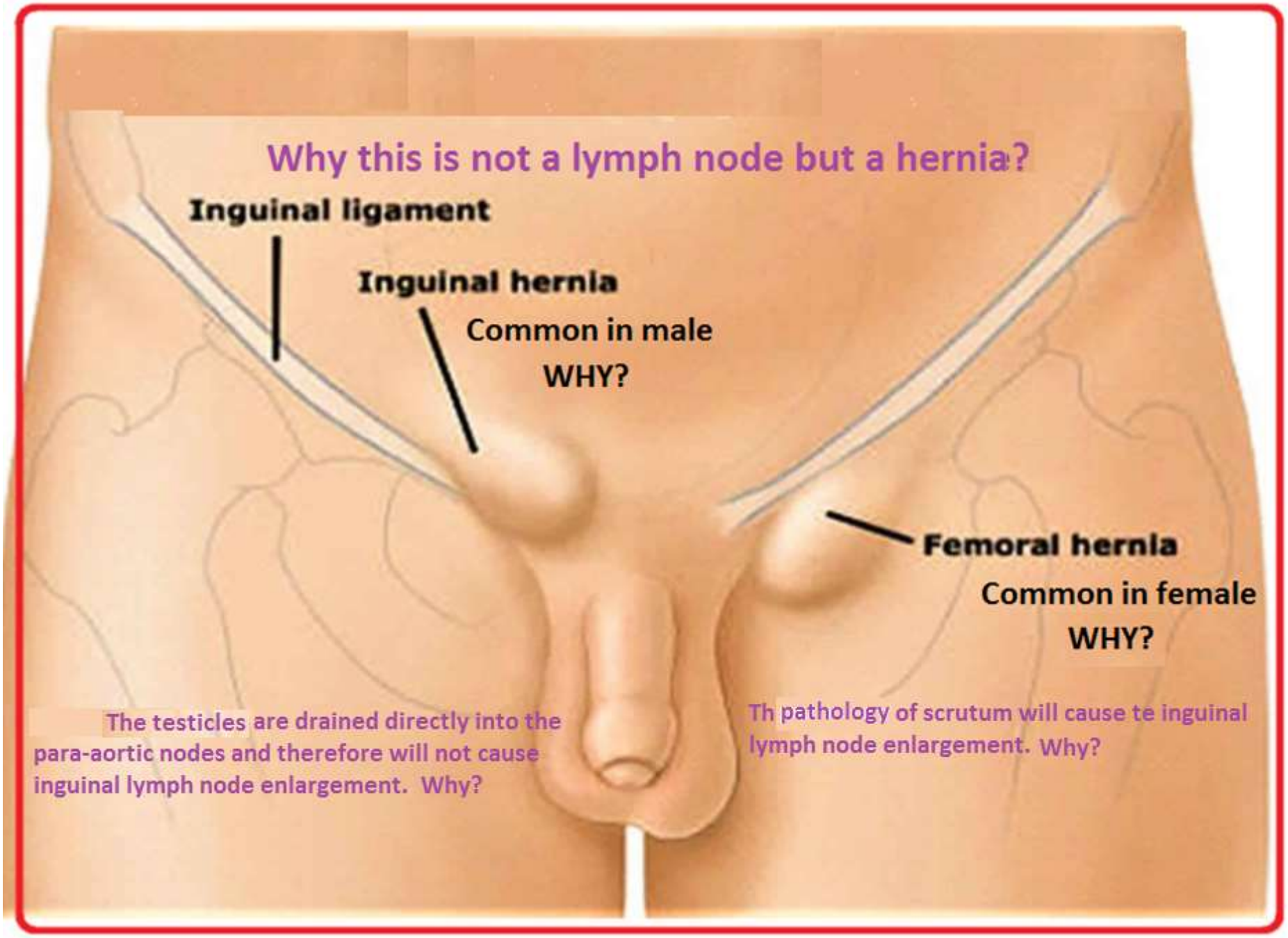
Clinical Applications of Lymphatics of the Lower Limb

1. The superficial and deep inguinal lymph nodes not drain all the lymph from the lower limb
2. But also drain lymph from the skin and superficial fascia of **abdominal wall.**

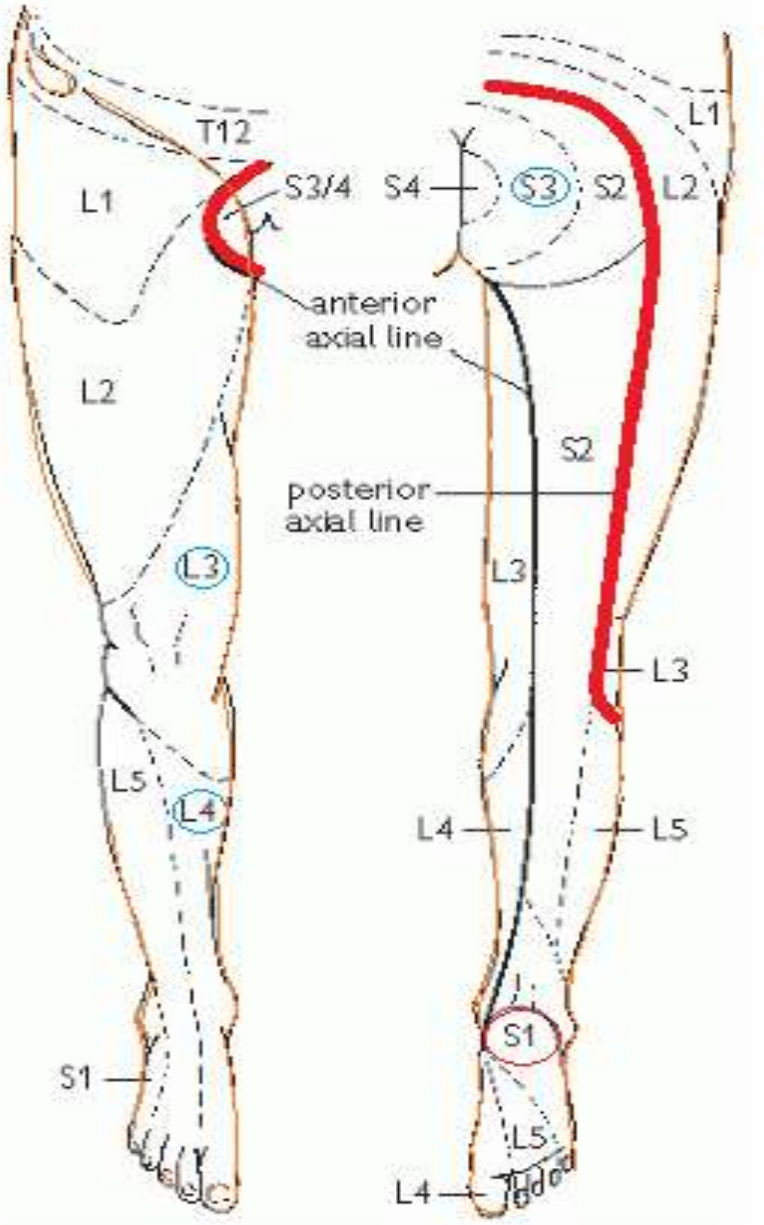


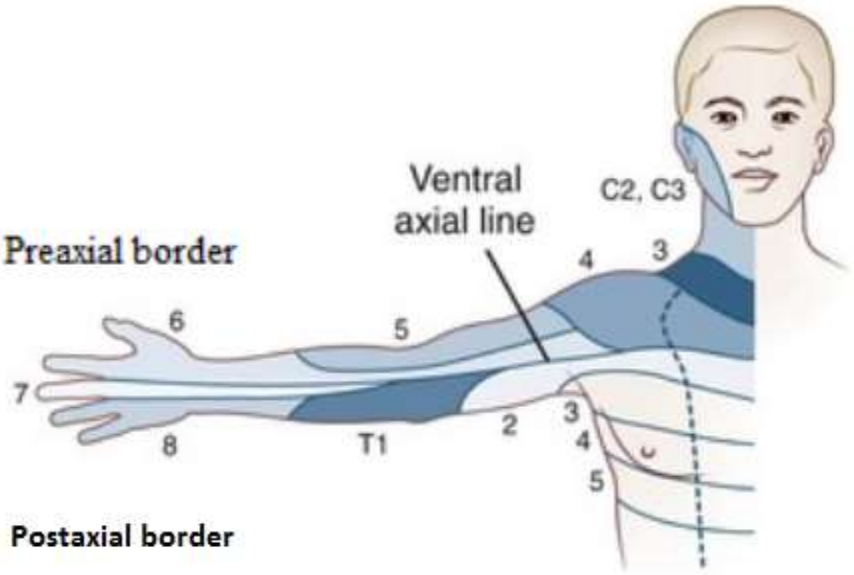
The testicles are drained directly to the para-aortic nodes and therefore will rarely cause inguinal lymph node enlargement.

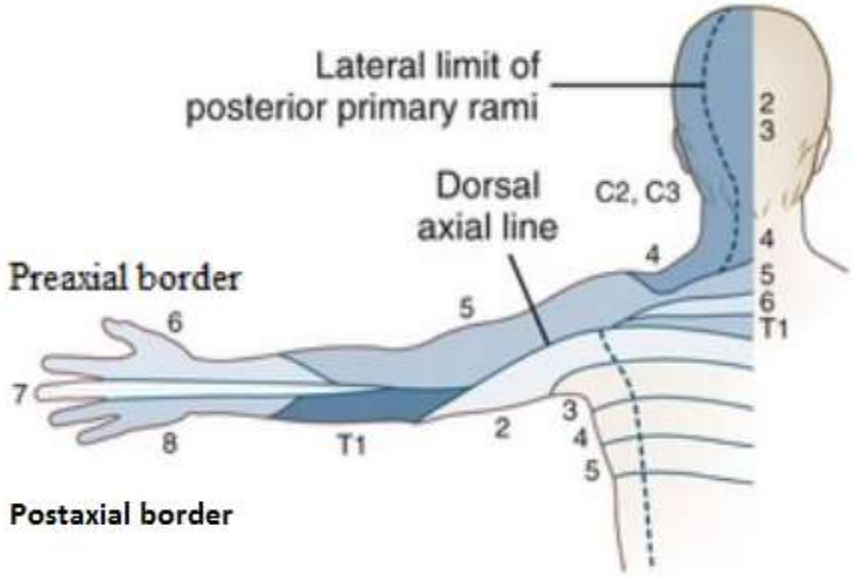


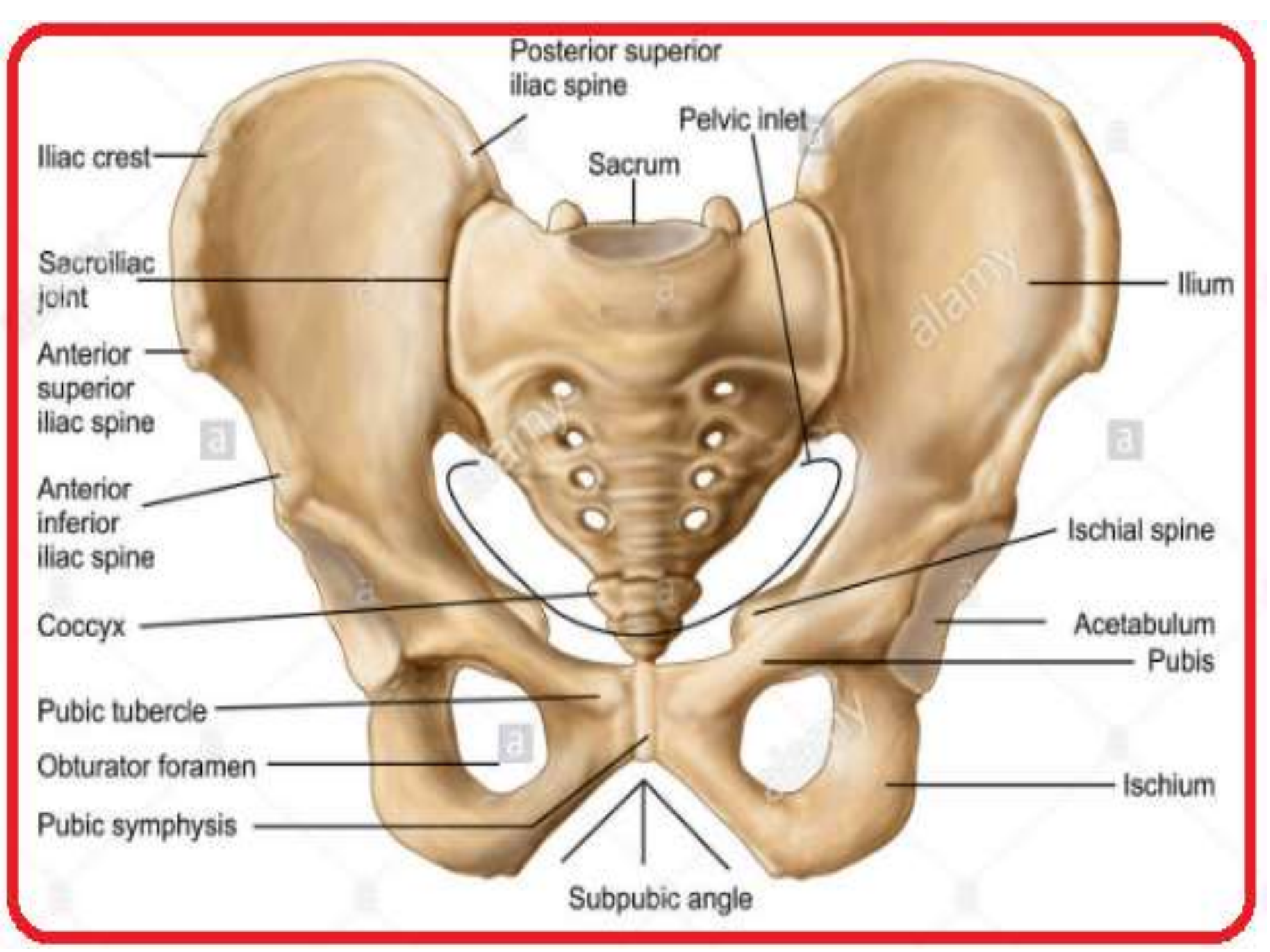

Why this is not a lymph node but a hernia?
Inguinal ligament
Inguinal hernia
Common in male
WHY?
Femoral hernia
Common in female
WHY?
The testicles are drained directly into the para-aortic nodes and therefore will not cause inguinal lymph node enlargement. Why?
Th pathology of scrutum will cause te inguinal lymph node enlargement. Why?

THANKS

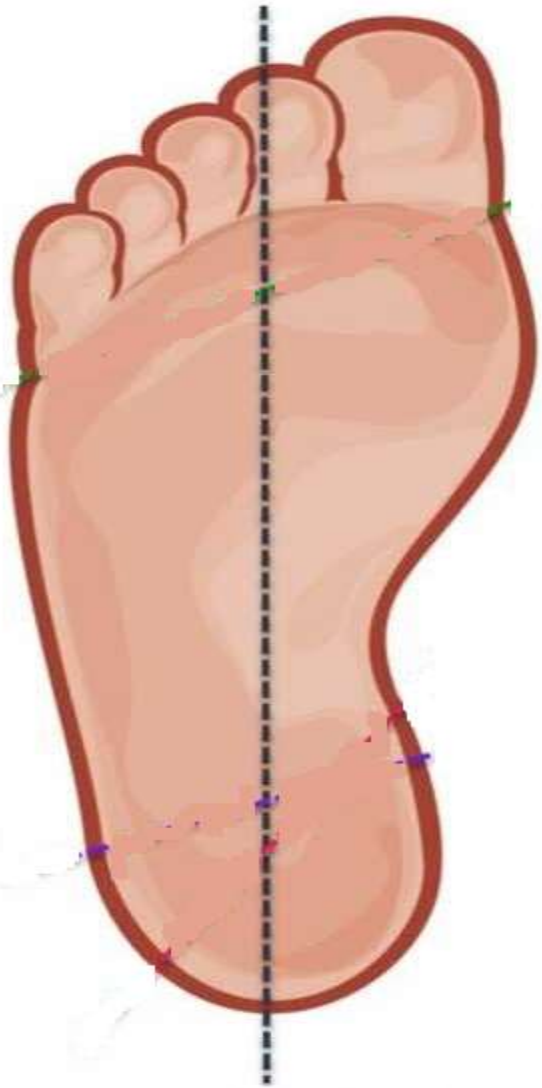

T12
L1
S3/4
S4
S3
S2
L2
L1
anterior
axial line
L2
S2
posterior
axial line
L3
L3
L5
L4
L4
L5
S1
S1
L5
L4


Ventral
axial line
C2, C3
Preaxial border
4
3
6
5
7
8
T1
2
3
4
5
Postaxial border


Lateral limit of
posterior primary rami
2
3
Dorsal
axial line
C2, C3
4
4
5
6
T1
Preaxial border
5
6
7
8
T1
2
3
4
5
Postaxial border


Posterior superior iliac spine
Pelvic inlet
Iliac crest
Sacrum
Sacroiliac joint
Ilium
Anterior superior iliac spine
Anterior inferior iliac spine
Ischial spine
Coccyx
Acetabulum
Pubis
Pubic tubercle
Obturator foramen
Ischium
Pubic symphysis
Subpubic angle


Hand Longitudinal axis
Foot longitudinal Axis

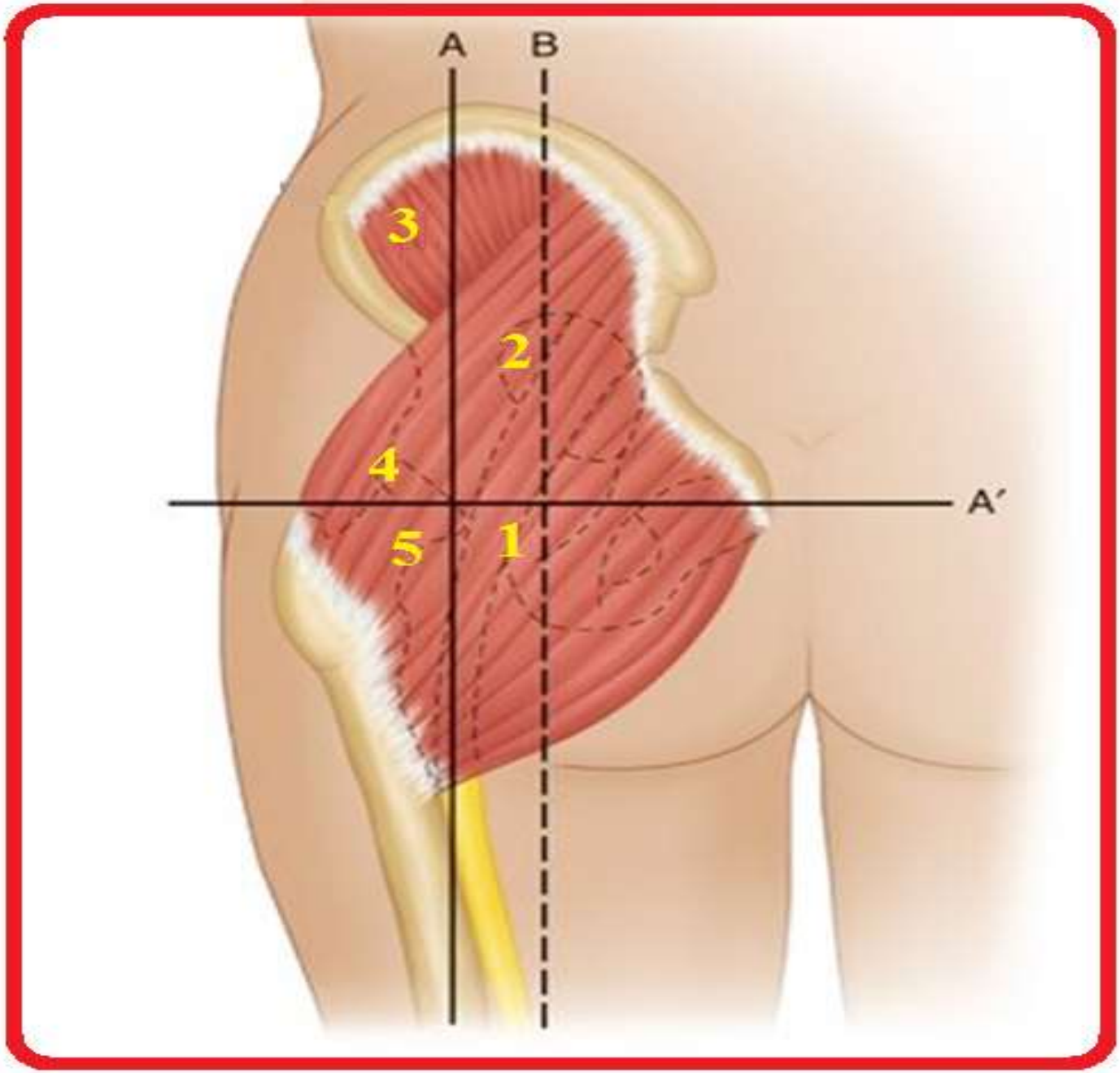


Longitudinal
Axis

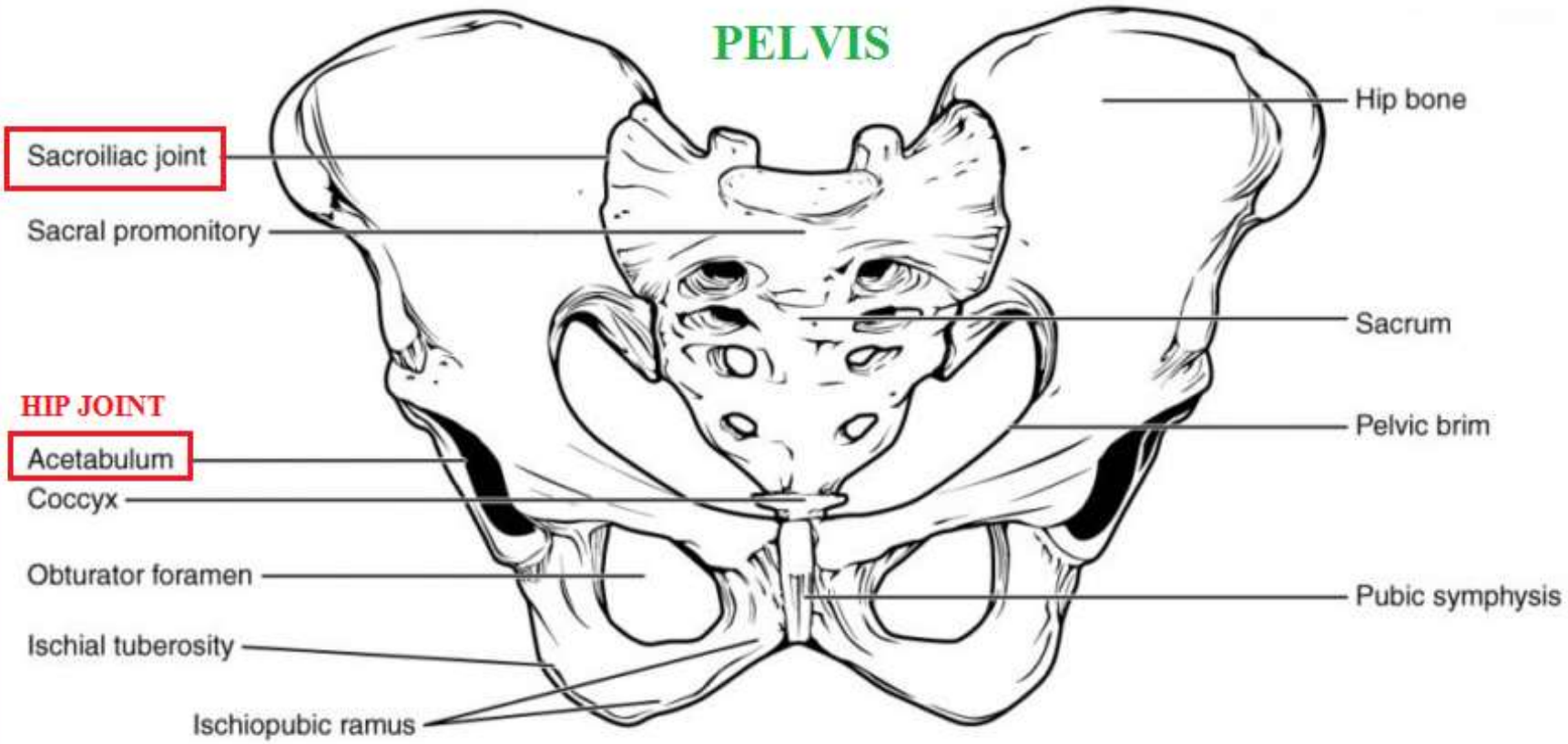
Axis of hand

The lower limb of man is built upon the same plan as the upper limb with the similar basic pattern.

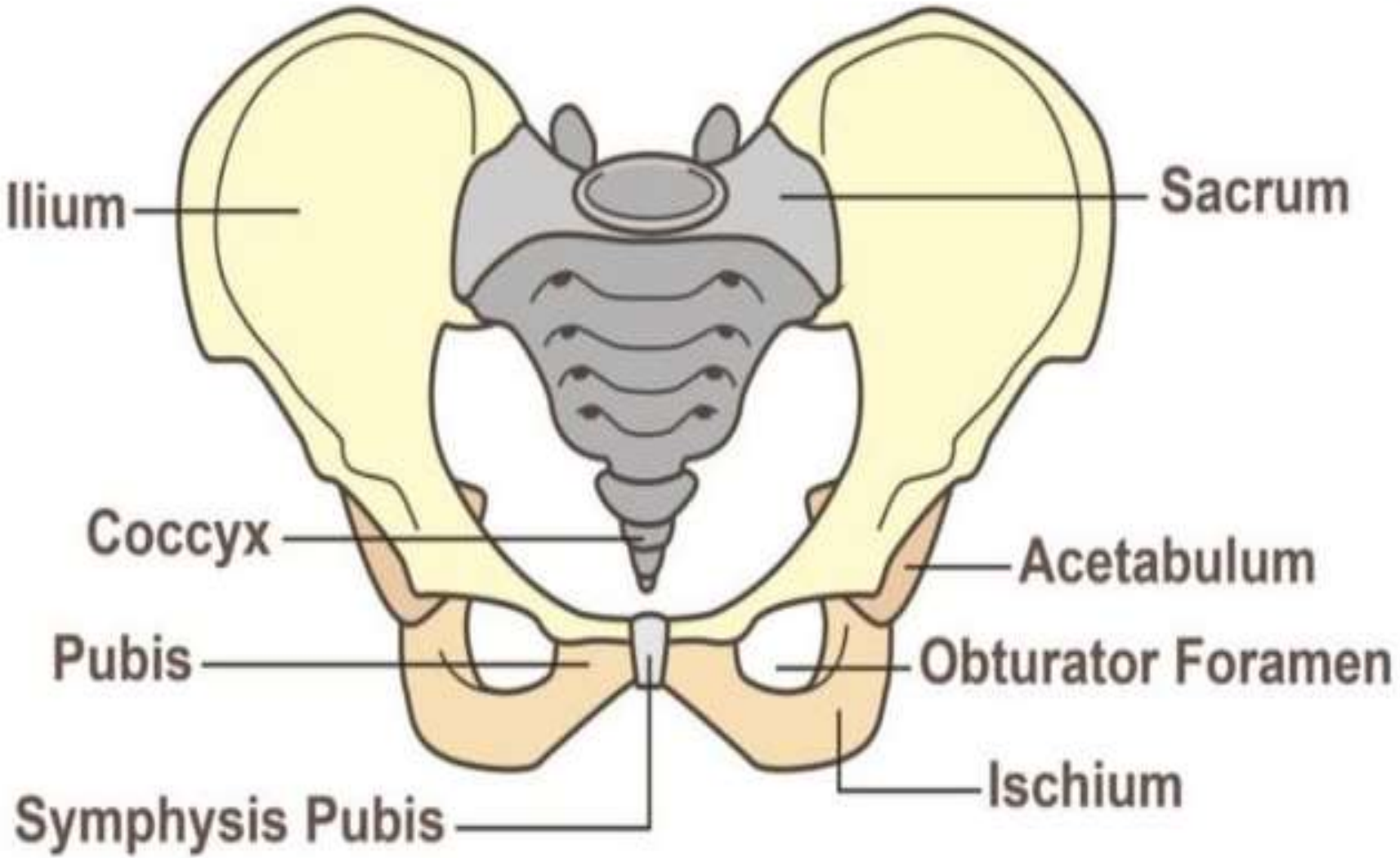
1. **Thigh and upper arm**
2. **Leg and forearm**
3. **Tarsus and carpus**
4. **Foot and hand and their longitudinal axis.**
5. **Upper limb buds and lower limb bud.**


A
B
3
2
4
A´
5
1

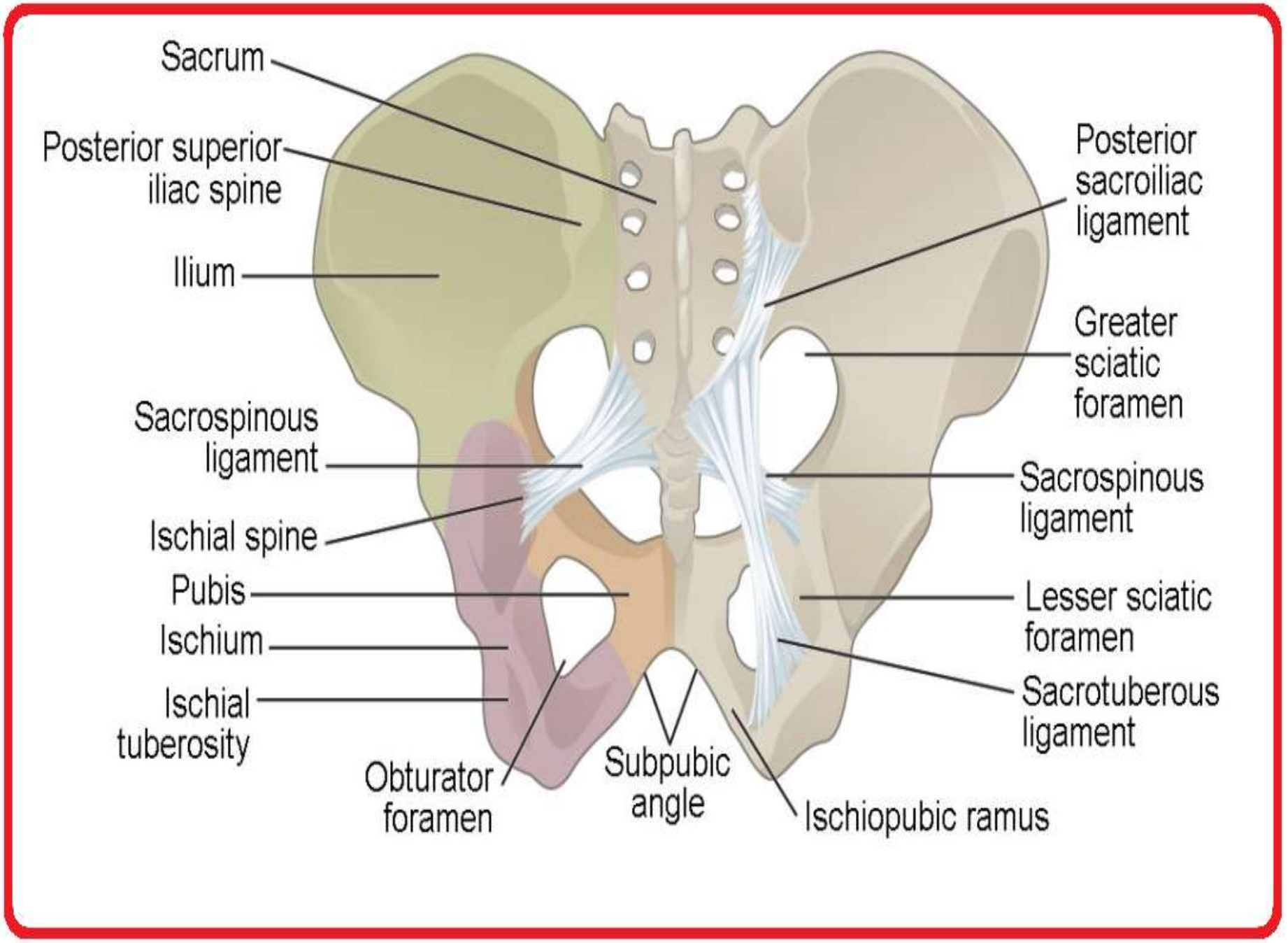
PELVIS

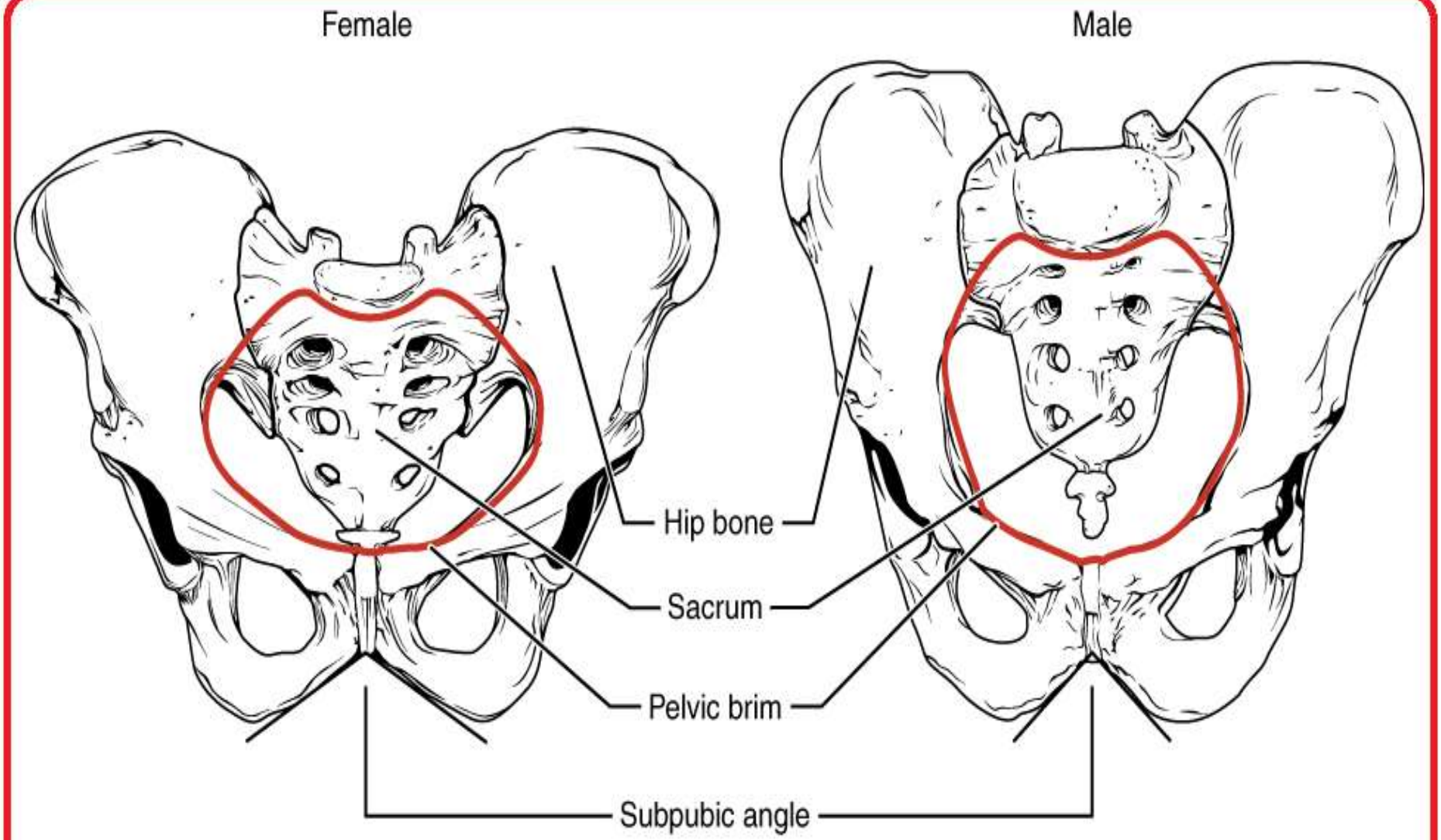


The Hip Bone. The adult hip bone consists of three regions. The ilium forms the large, fan-shaped superior portion, the ischium forms the posteroinferior portion, and the pubis forms the anteromedial portion

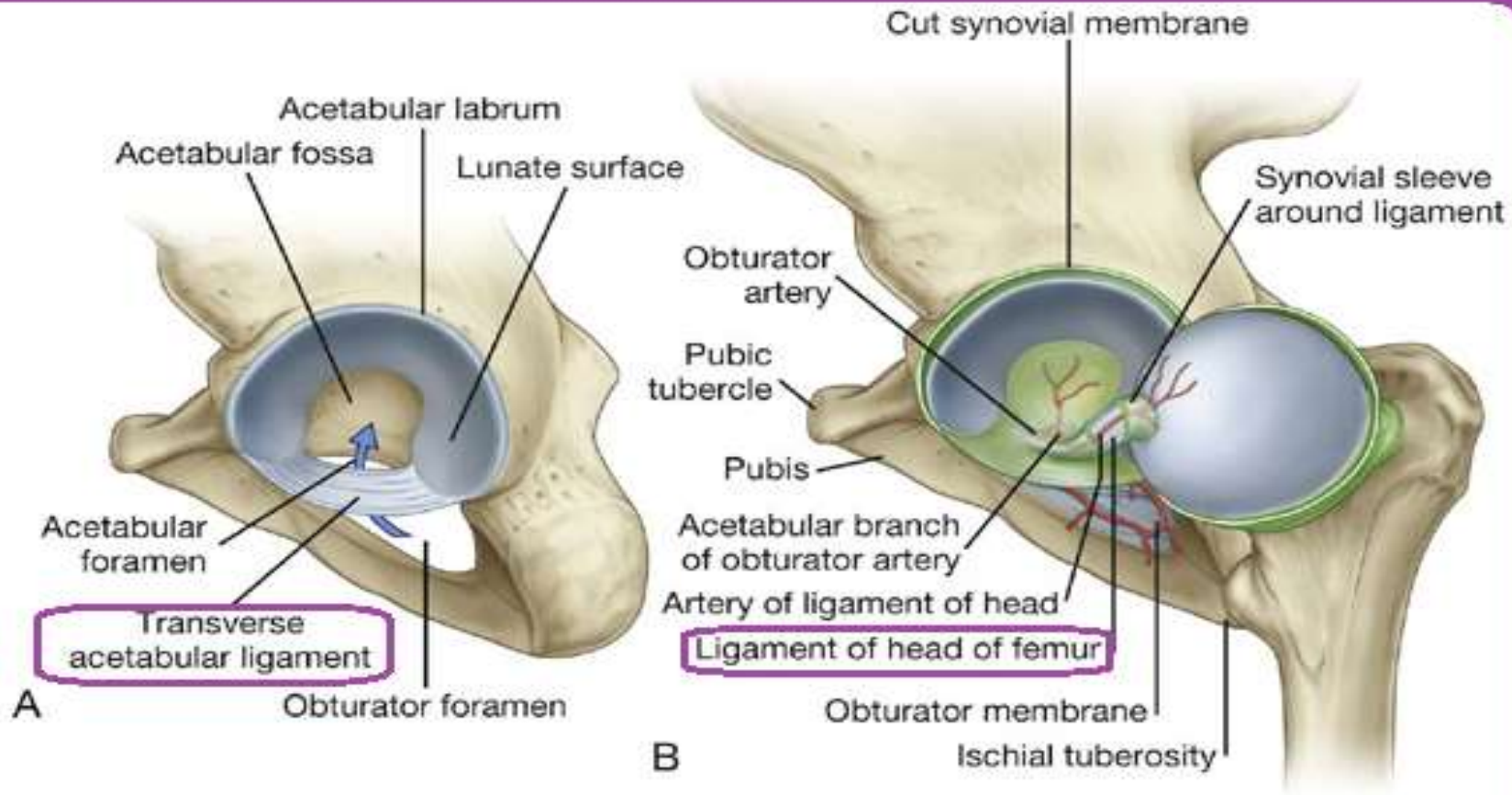

Ilium
Sacrum
Coccyx
Acetabulum
Pubis
Obturator Foramen
Ischium
Symphysis Pubis

PELVIS

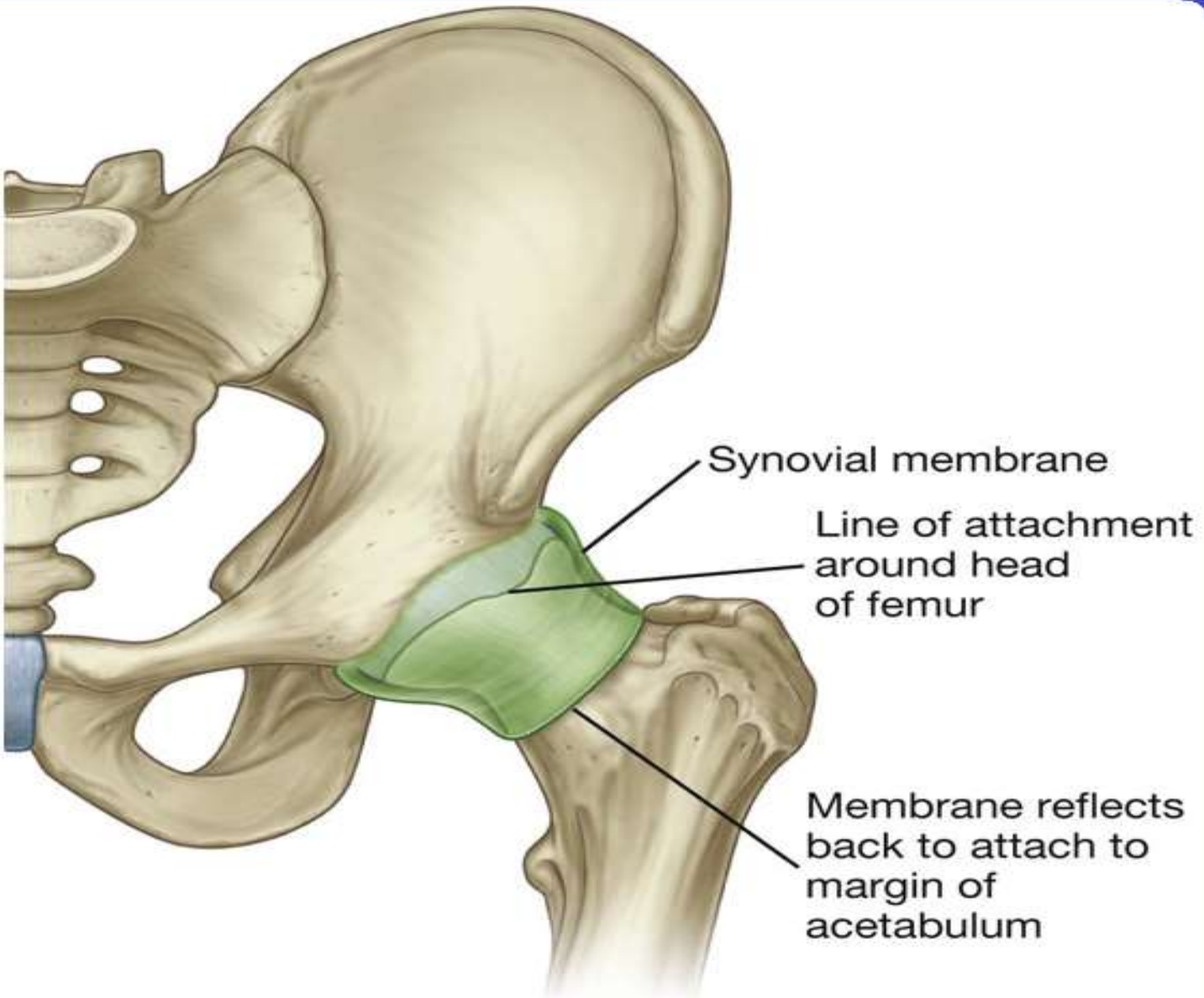

Sacrum
Posterior superior iliac spine
Ilium
Sacrospinous ligament
Ischial spine
Pubis
Ischium
Ischial tuberosity
Obturator foramen
Subpubic angle
Ischiopubic ramus
Posterior sacroiliac ligament
Greater sciatic foramen
Sacrospinous ligament
Lesser sciatic foramen
Sacrotuberous ligament



Male and Female Pelvis. The female pelvis is adapted for childbirth and is broader, with a larger subpubic angle, a rounder pelvic brim, and a wider and more shallow lesser pelvic cavity than the male pelvis.



Hip joint. A. Transverse acetabular ligament. B. Ligament of the head of the femur. The head of the femur has been laterally rotated out of the acetabulum to show the ligament.

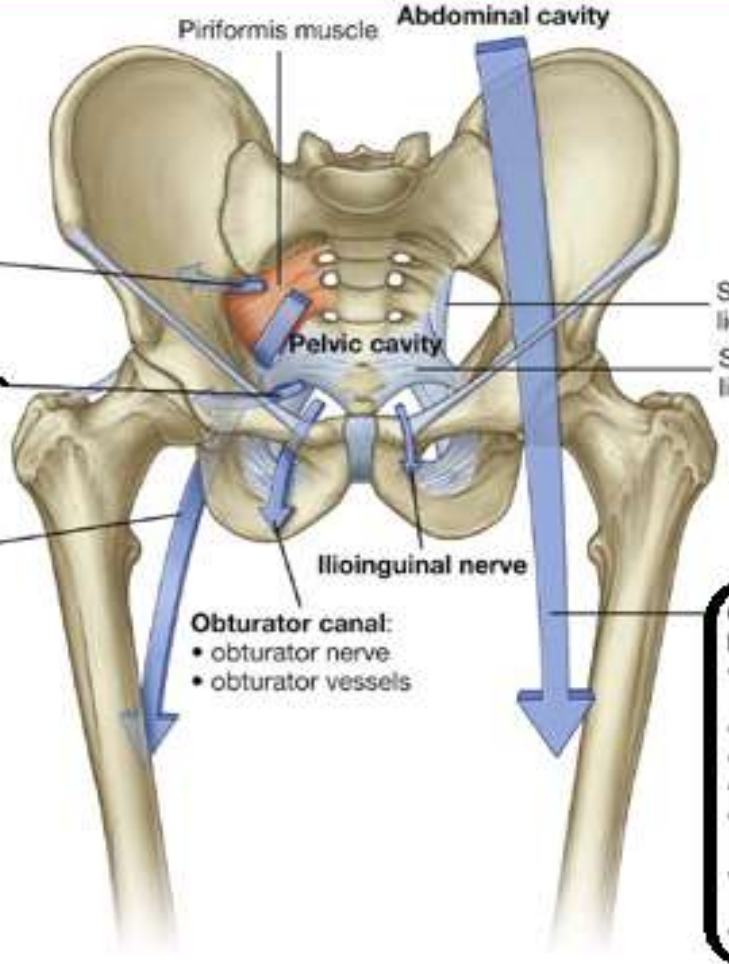


Synovial membrane of the hip joint.

Greater sciatic foramen above piriformis muscle:
- Superior gluteal nerve, artery, vein

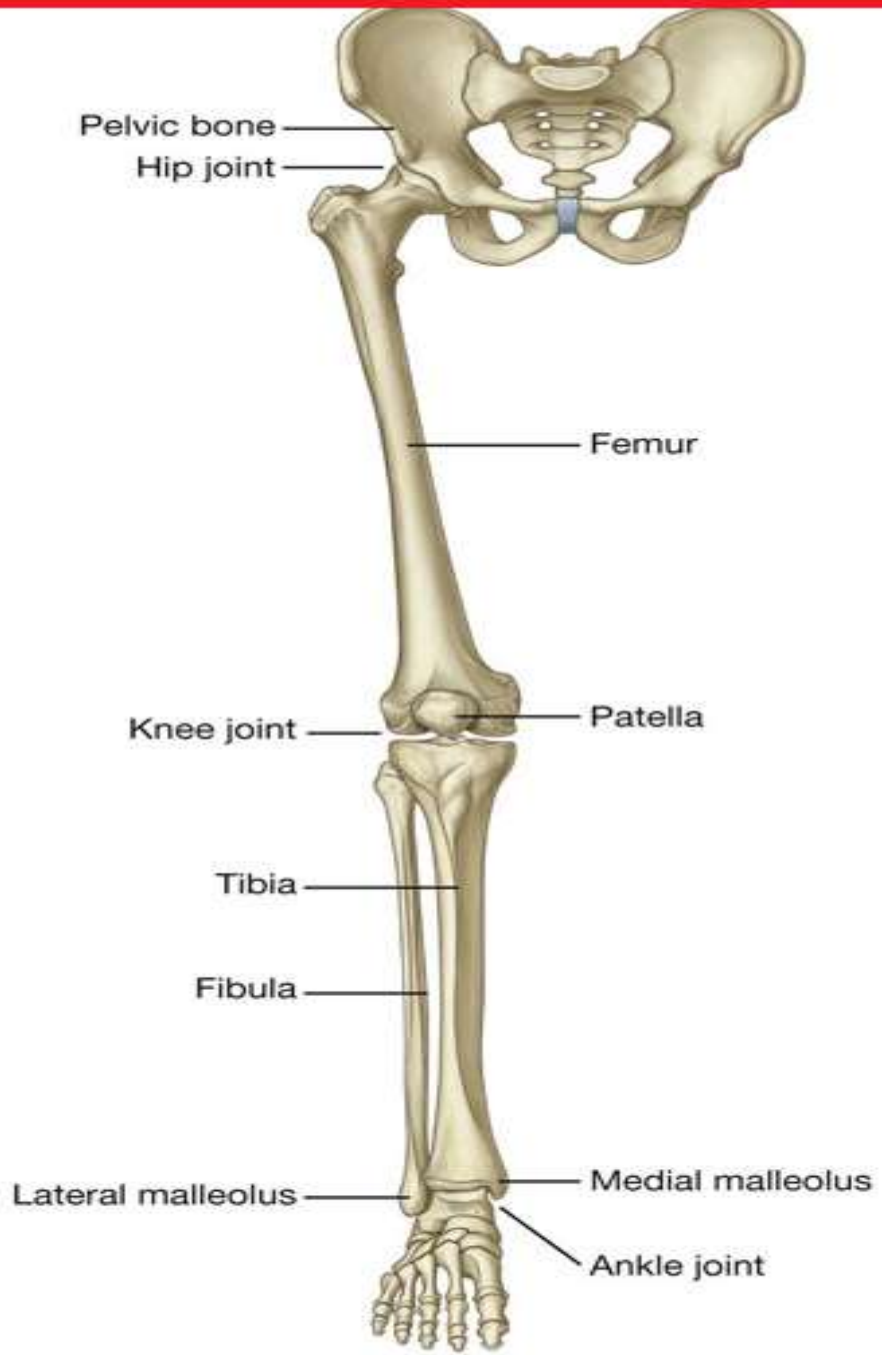
Lesser sciatic foramen:
- Obturator internus muscle tendon
- Pudendal nerve and internal pudendal vessels pass into perineum from gluteal region

Greater sciatic foramen below piriformis muscle:
- Sciatic nerve
- Inferior gluteal nerve, artery, vein
- Pudendal nerve
- Internal pudendal artery and vein
- Posterior femoral cutaneous nerve
- Nerve to obturator internus and gemellus superior muscles
- Nerve to quadratus femoris and gemellus inferior muscles

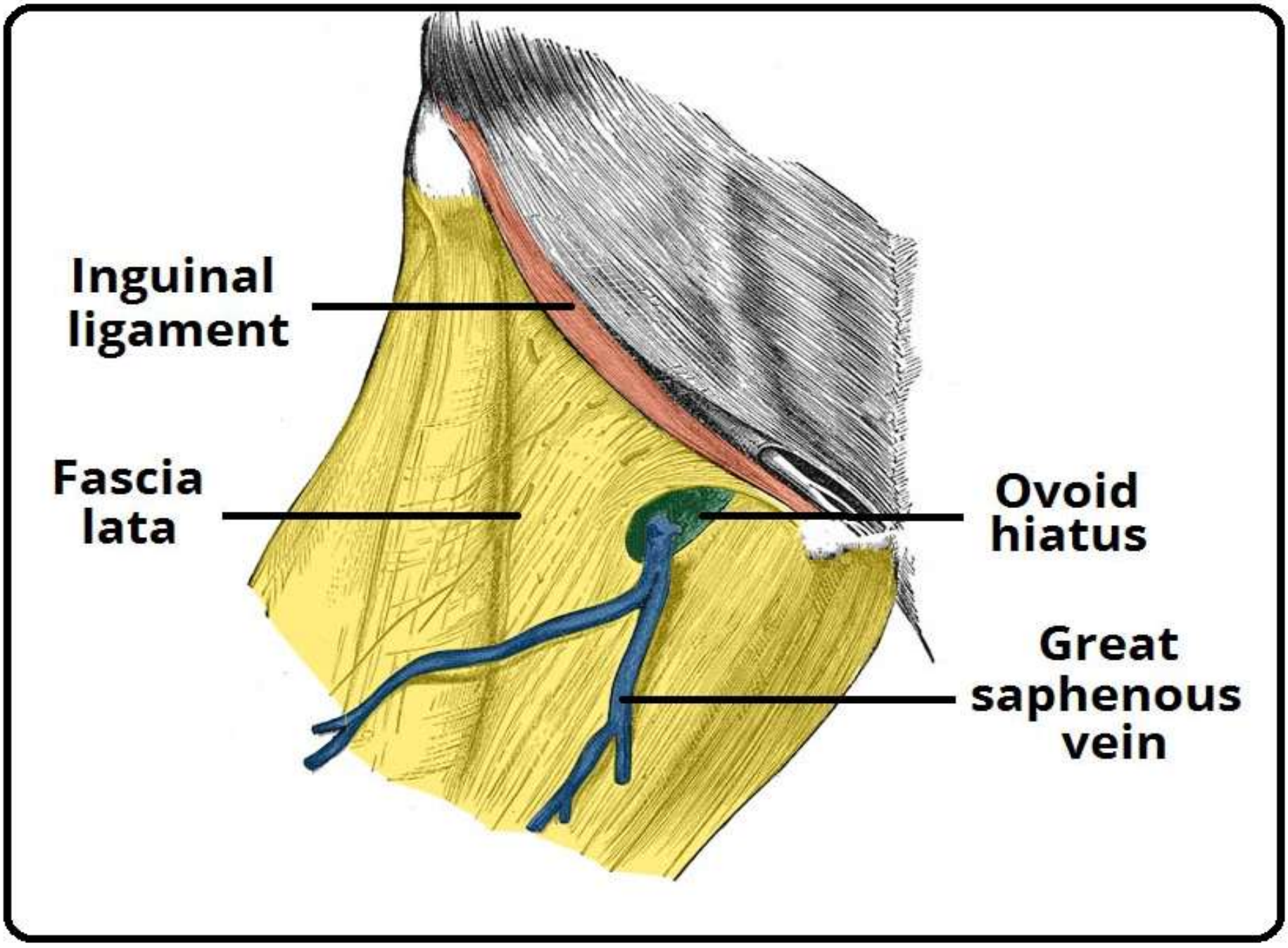


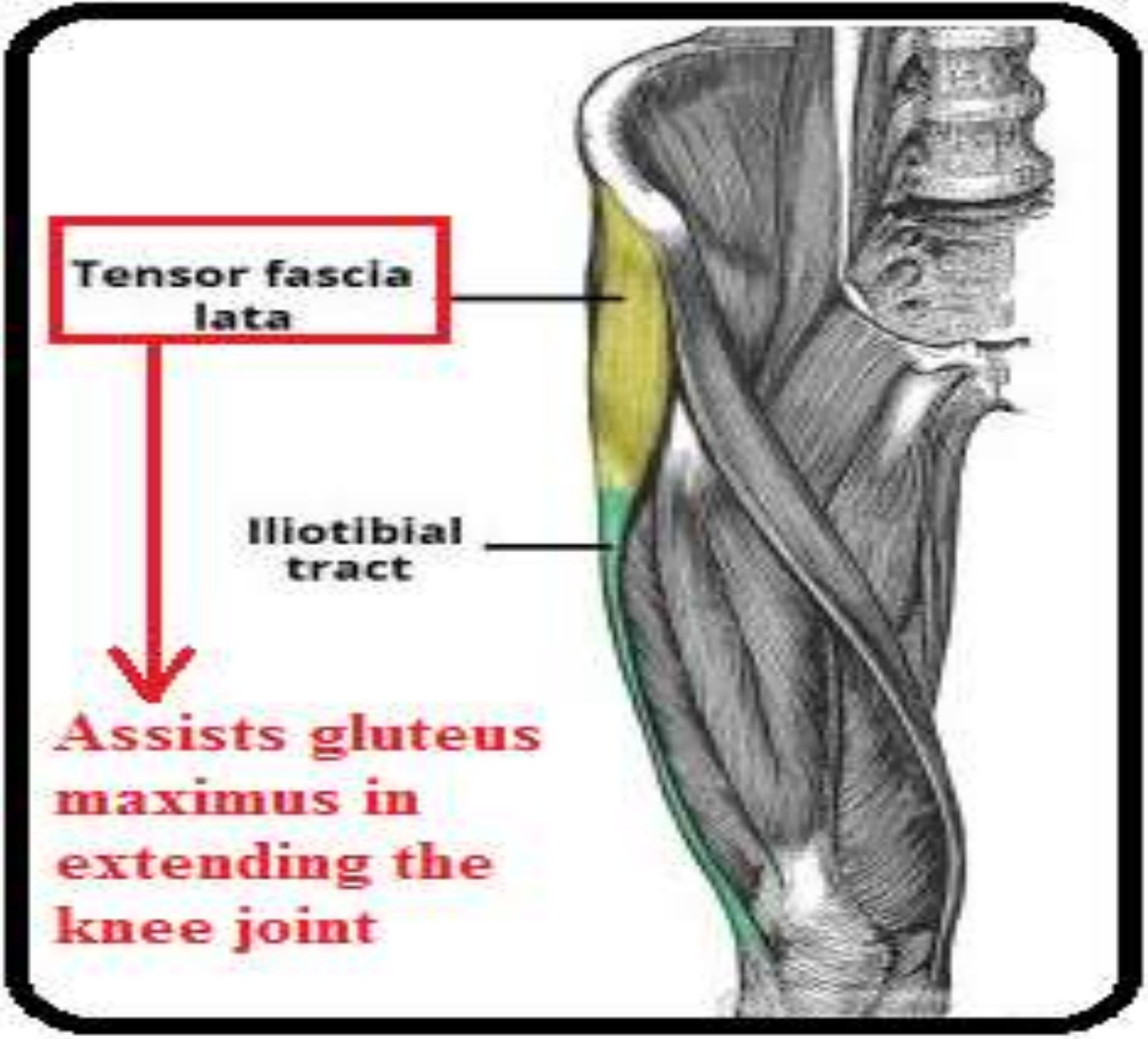
Gap between inguinal ligament and pelvic bone:
- Psoas major, iliacus, pectineus muscles
- Femoral artery
- Femoral vein
- Lymphatics
- Femoral branch of genitofemoral nerve
- Lateral cutaneous nerve of thigh
- Femoral nerve

Gateways to the lower limb.

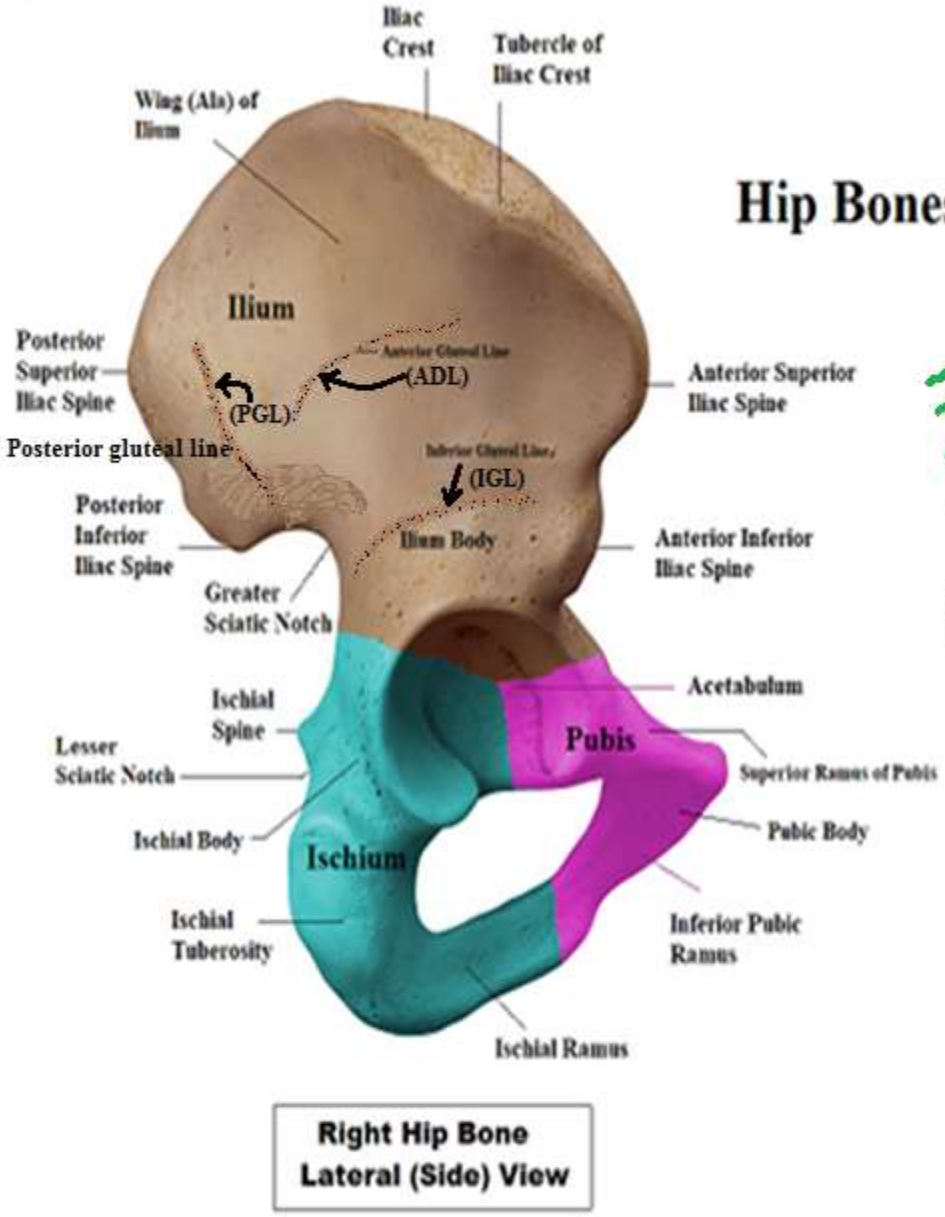


Bones and joints of the lower limb.

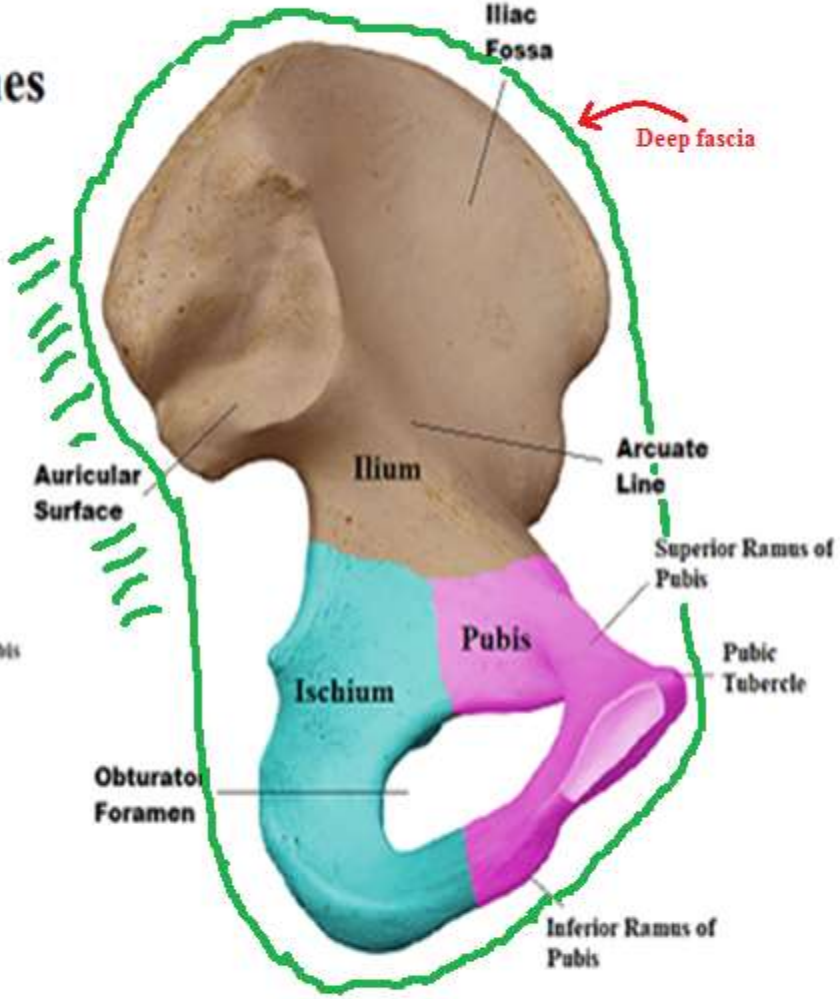

Inguinal ligament
Fascia lata
Ovoid hiatus
Great saphenous vein


Tensor fascia lata
Iliotibial tract
Assists gluteus maximus in extending the knee joint

Hip Bones



Right Hip Bone
Lateral (Side) View



Left Hip Bone
(Medial View)

Fascia Lata

Is a tough fibrous sheath that envelops the whole of the thigh like a sleeve.

THE FASCIA LATA IS ATTACHMENT

1. **ABOVE AND BEHIND:** To the back of the sacrum and coccyx.

1. **LATERALLY:** To the Iliac crest; In the gluteal region, It splits to enclose

A. **and tensor fascia lata.**

B. **the gluteus maximus muscle**

3. In front, to the inguinal ligament, and to the superior ramus of the pubis;

4. Medially, to the inferior ramus of the pubis and the ischium, and to the lower border of the sacrotuberous ligament.

5. Below

a. The condyles of the femur and tibia,
b. And the head of the fibula and continue as deep fascia of leg.

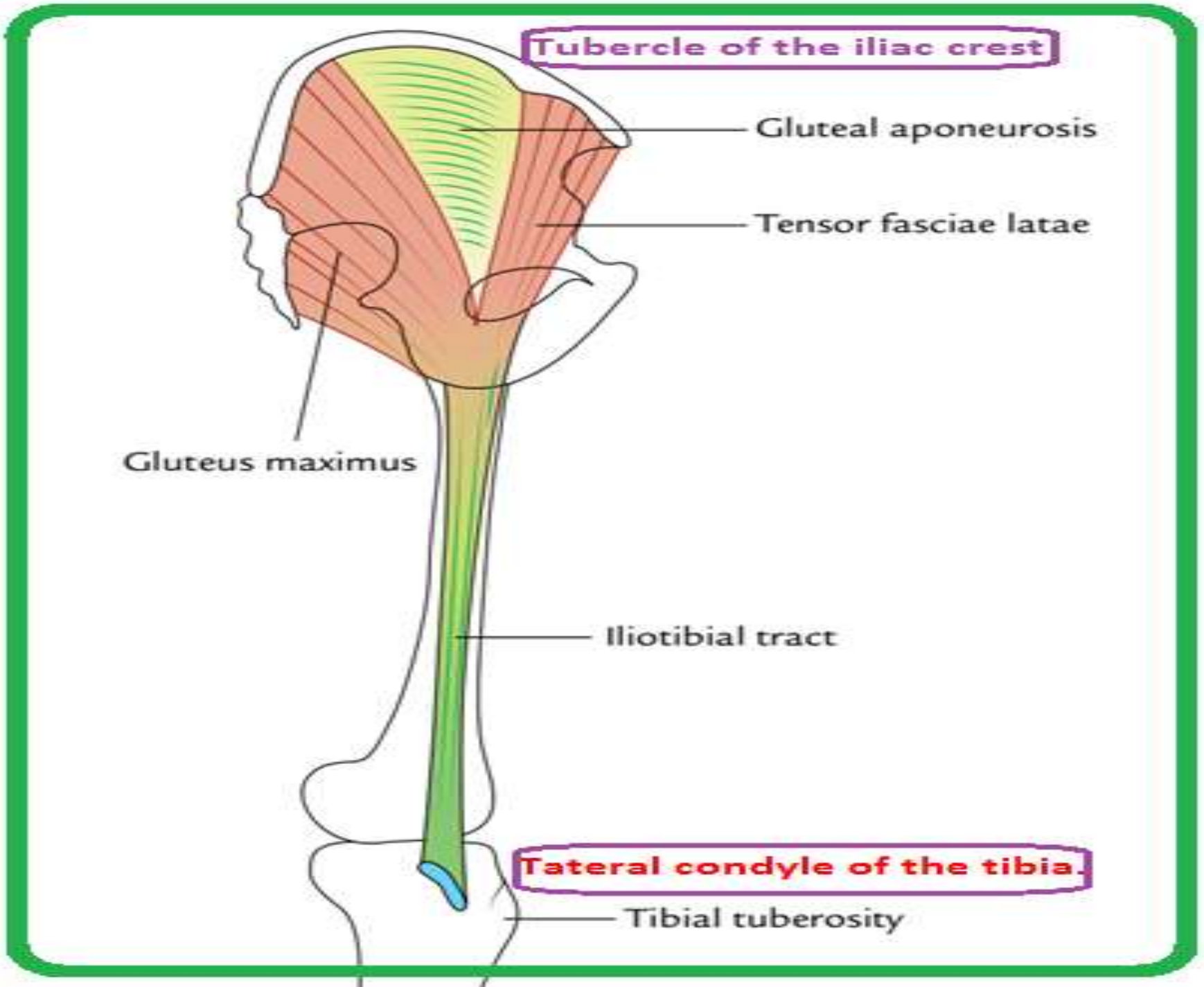
The fascia lata form a thick band laterally on the thigh, called

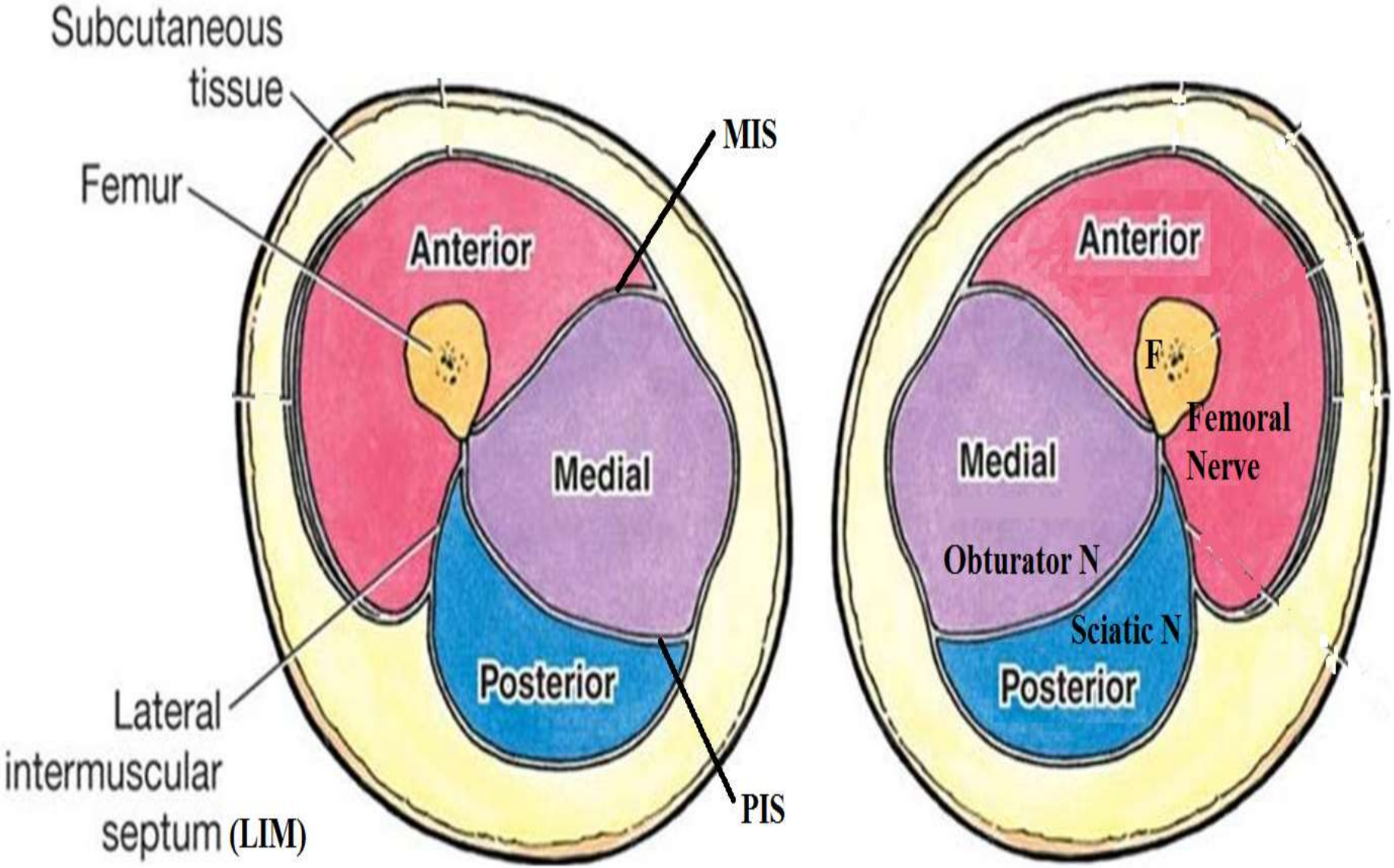
1. **ILIOTIBIAL TRACT.** Attached

a. Above to the **tubercle of the iliac crest**

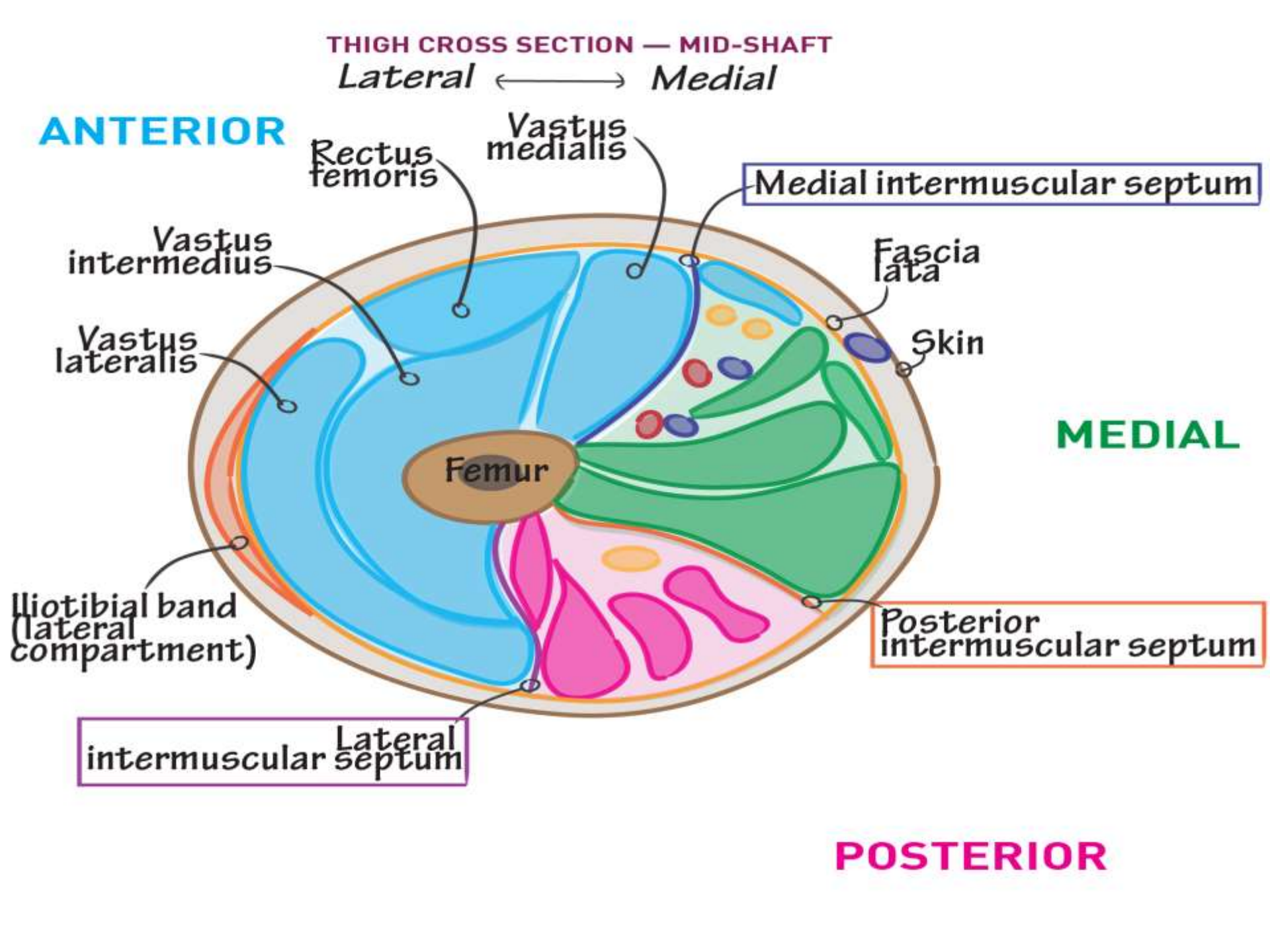
b. Below to the **lateral condyle of the tibia.**

c. **The iliotibial tract receives the insertion of the gluteus maximus & tensor fasciae latae**


Tubercle of the iliac crest
Gluteal aponeurosis
Tensor fasciae latae
Gluteus maximus
Iliotibial tract
Tateral condyle of the tibia
Tibial tuberosity



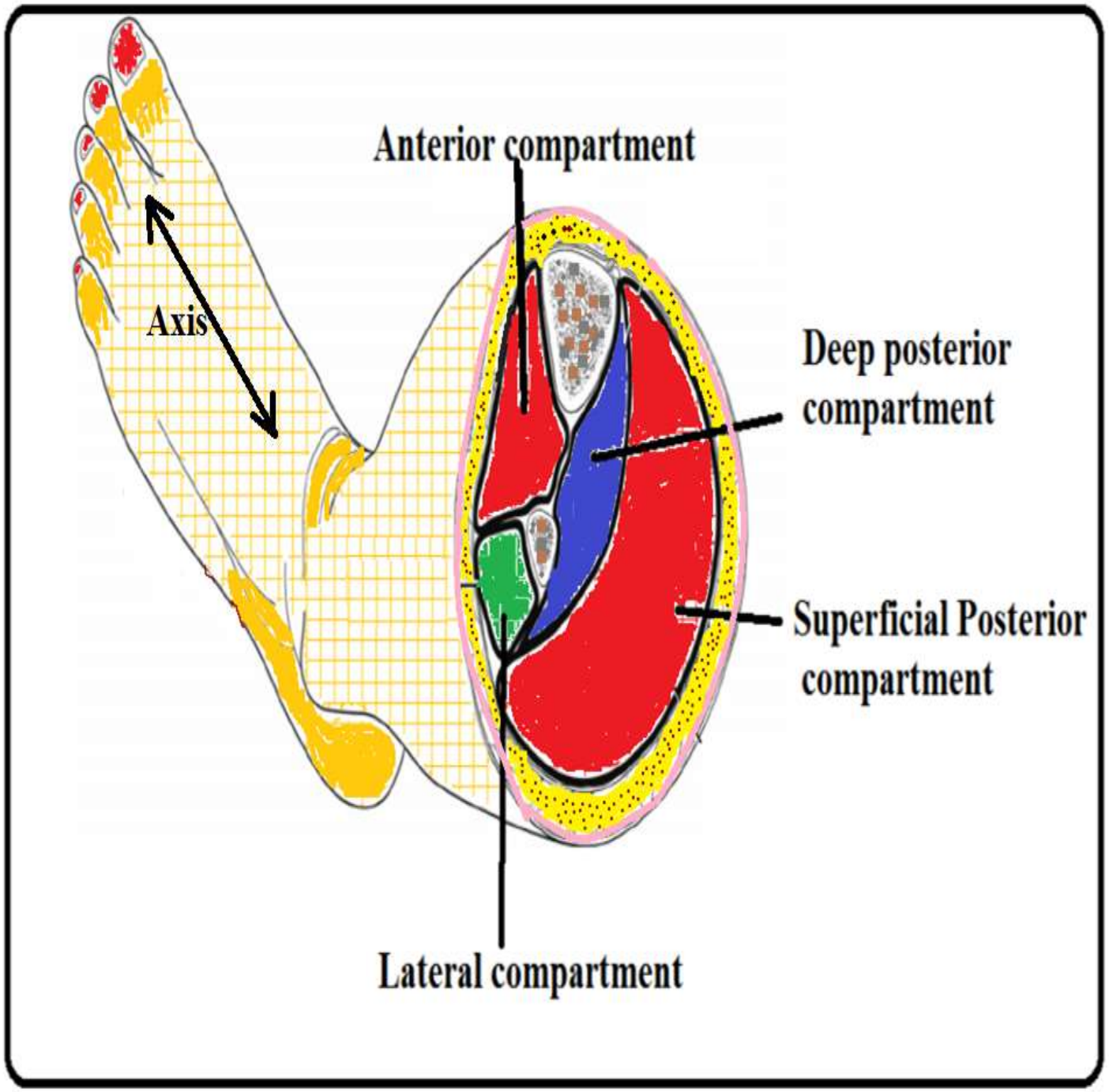
Inferior view of transverse section of thigl


THIGH CROSS SECTION — MID-SHAFT
Lateral ⟷ Medial
ANTERIOR
Rectus femoris
Vastus medialis
Medial intermuscular septum
Vastus intermedius
Fascia lata
Vastus lateralis
Skin
MEDIAL
Femur
Iliotibial band (lateral compartment)
Posterior intermuscular septum
Lateral intermuscular septum
POSTERIOR

Deep fascia of leg is a continuation of the fascia lata.

Where it also sends seta to bones to form compartments

.



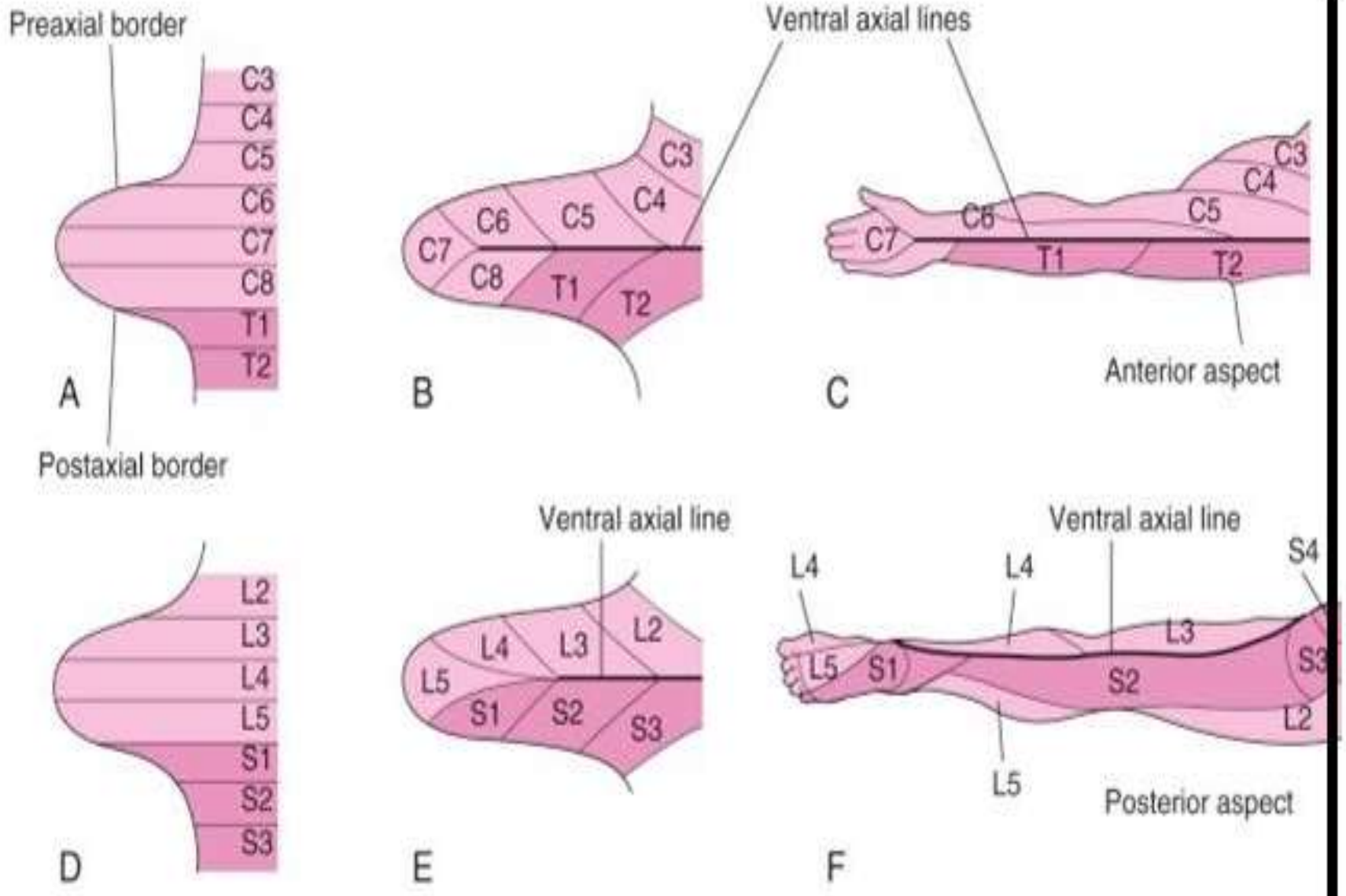
Clinical significance

1. **It has great functional regarding compartment formation.**

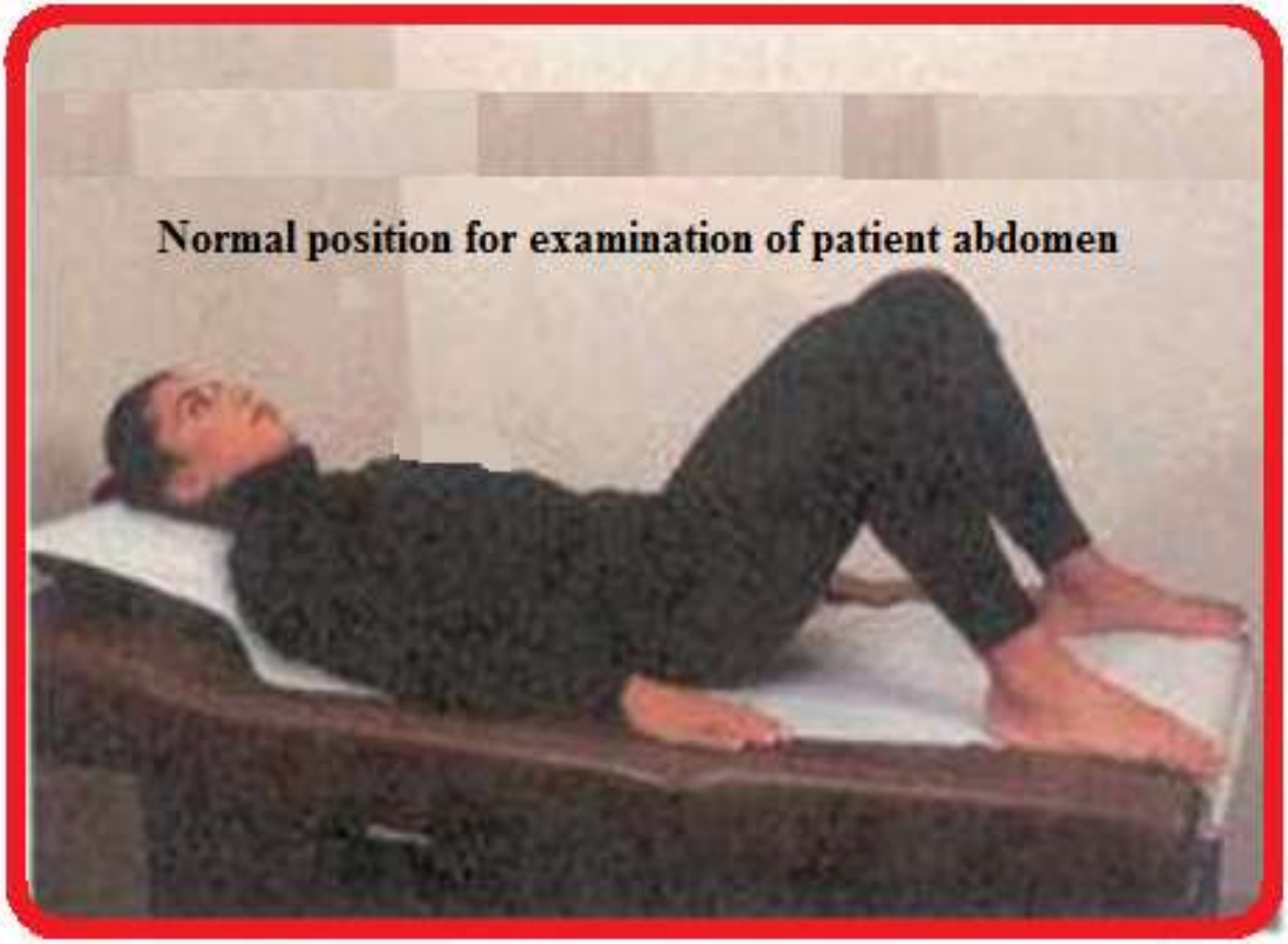
2. **Compartment syndrome.**

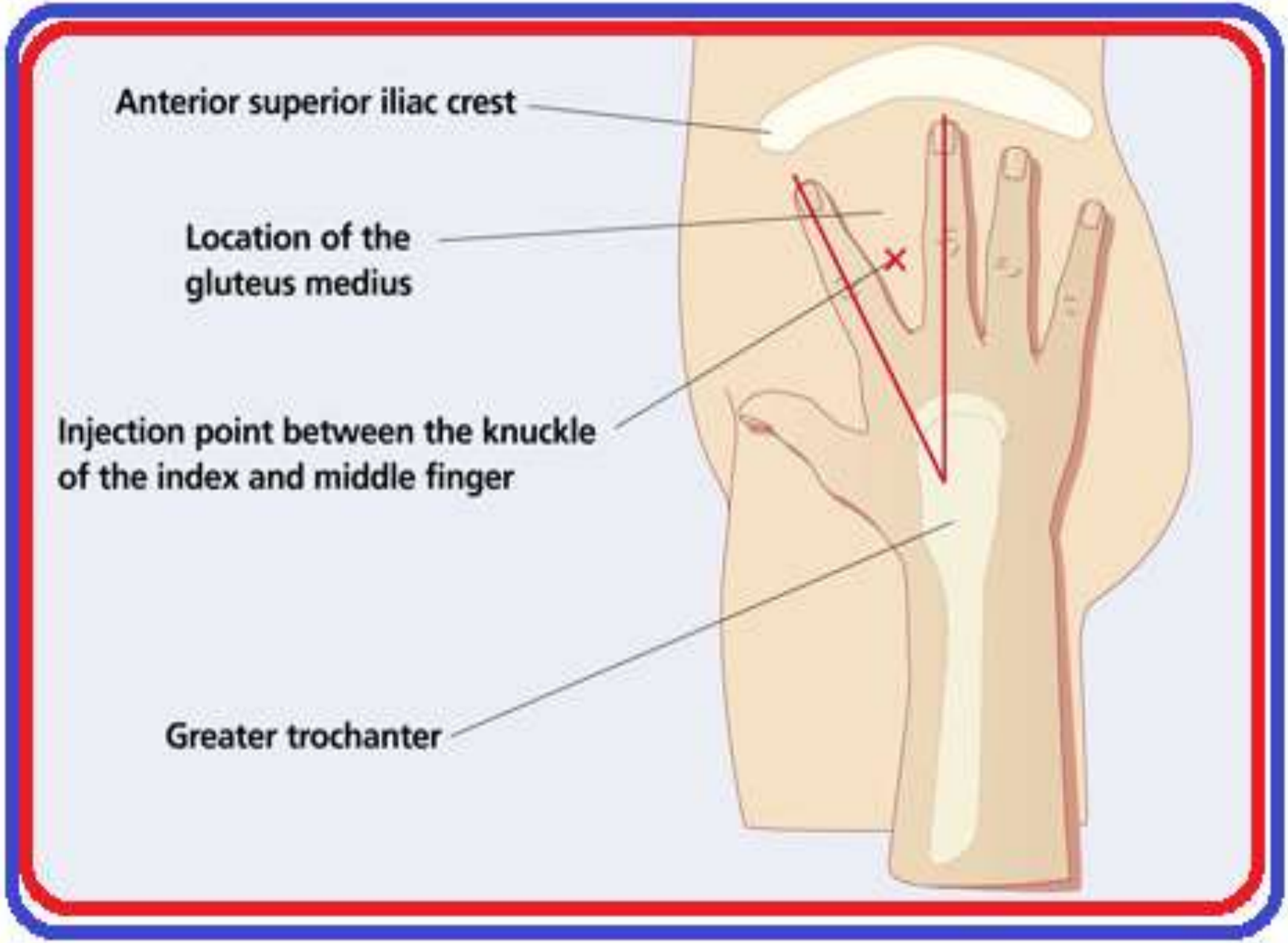
3. **Can be used as a grafting**

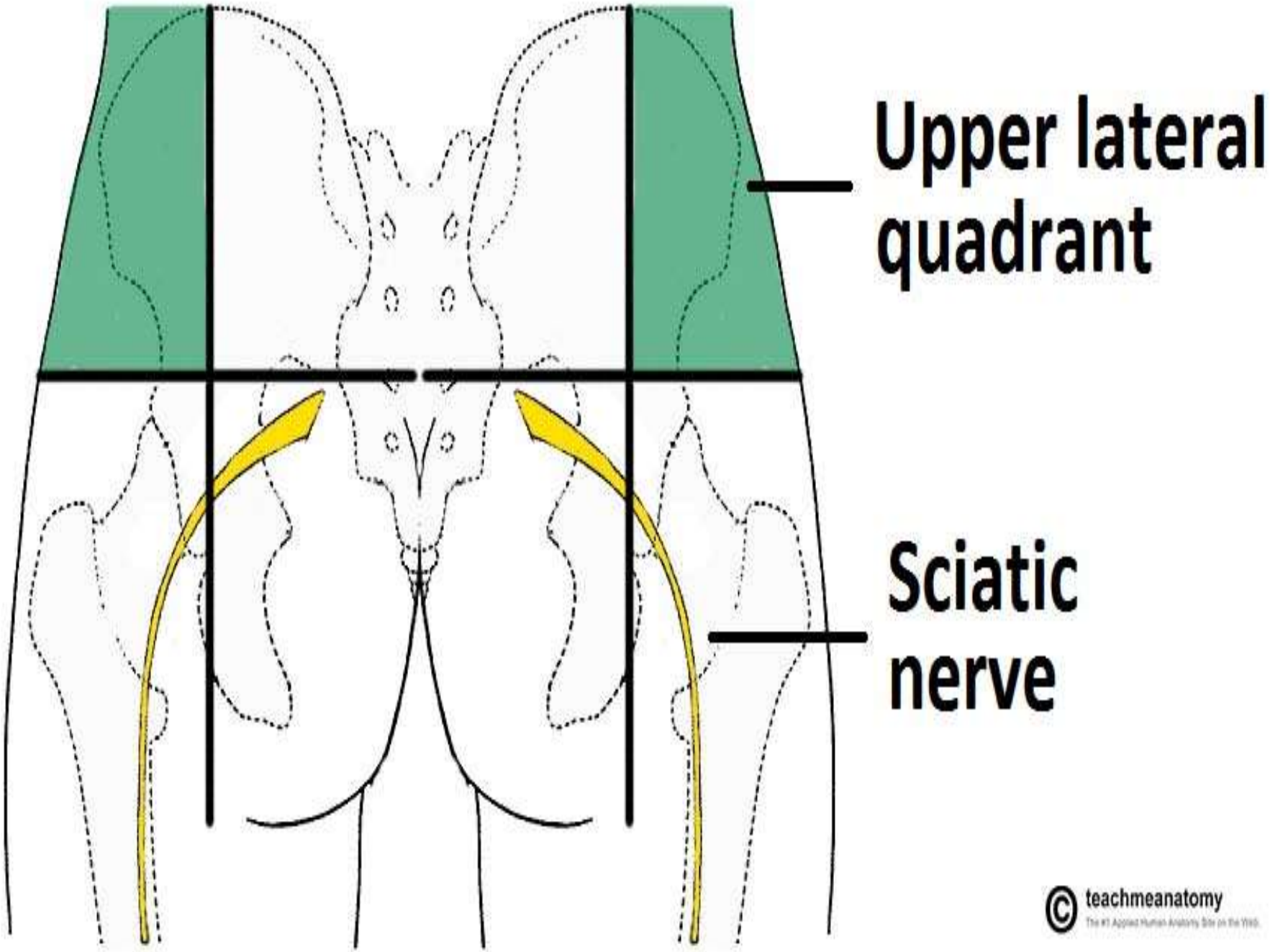
4. **The fascia lata is attached to the INGUINAL LIGAMENT. To relax the abdomen fully for palpation by an examining physician, the patient is asked to draw the legs up.**

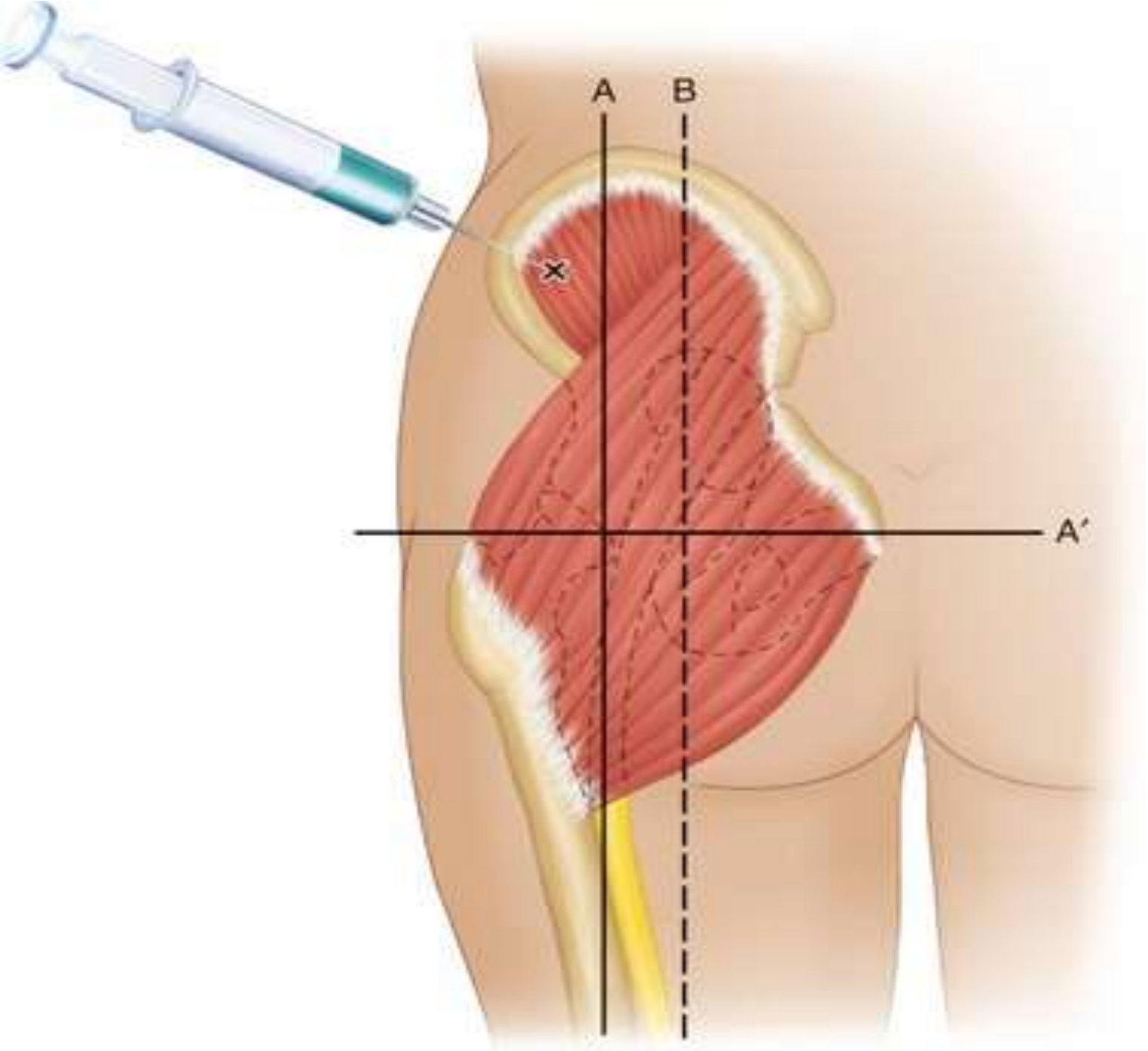


Dermatomal pattern of the upper and lower limbs.


Normal position for examination of patient abdomen


Anterior superior iliac crest
Location of the gluteus medius
Injection point between the knuckle of the index and middle finger
Greater trochanter


Upper lateral quadrant
Sciatic nerve
© teachmeanatomy



Thanks