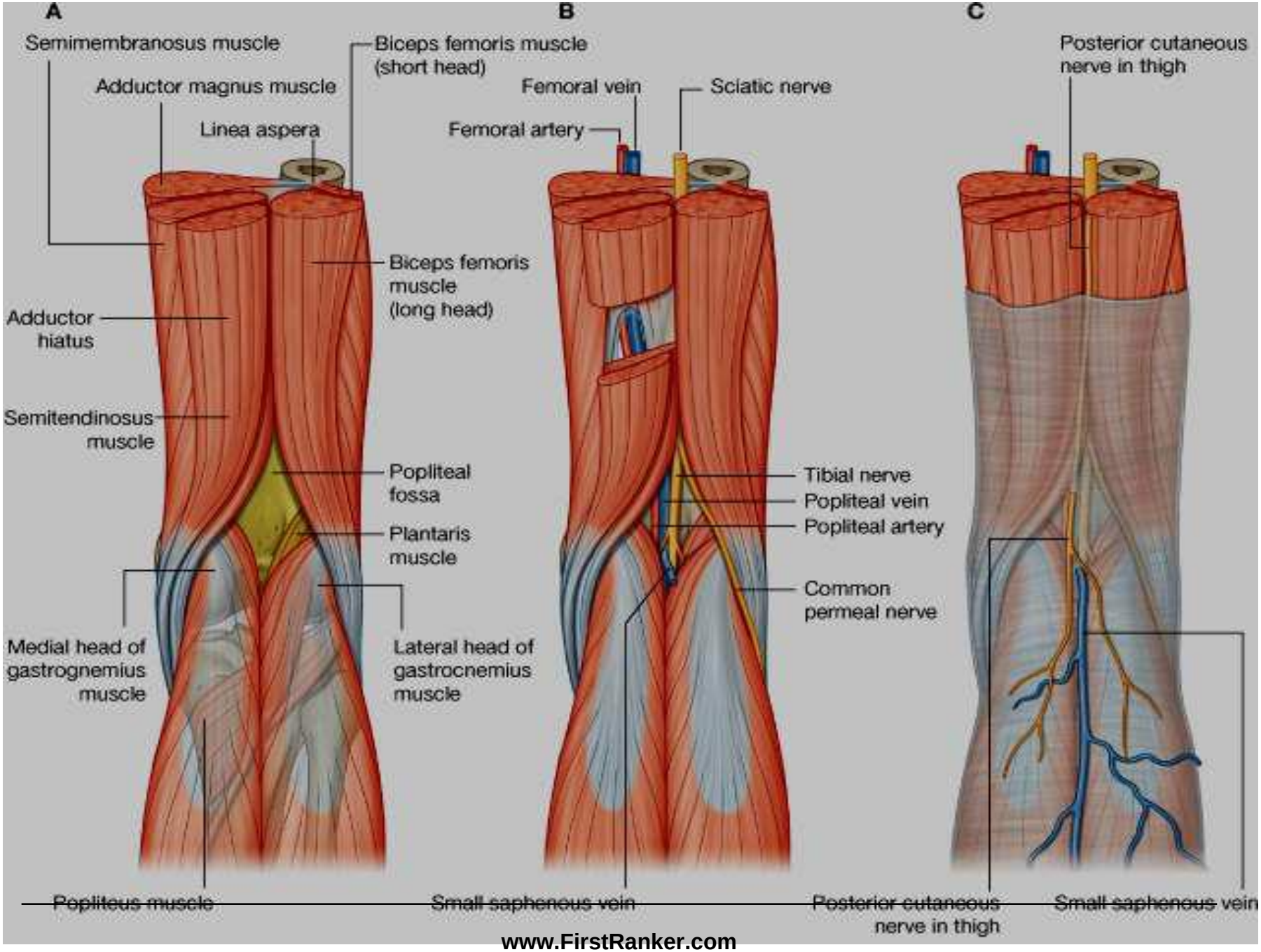
POPLITEAL FOSSA

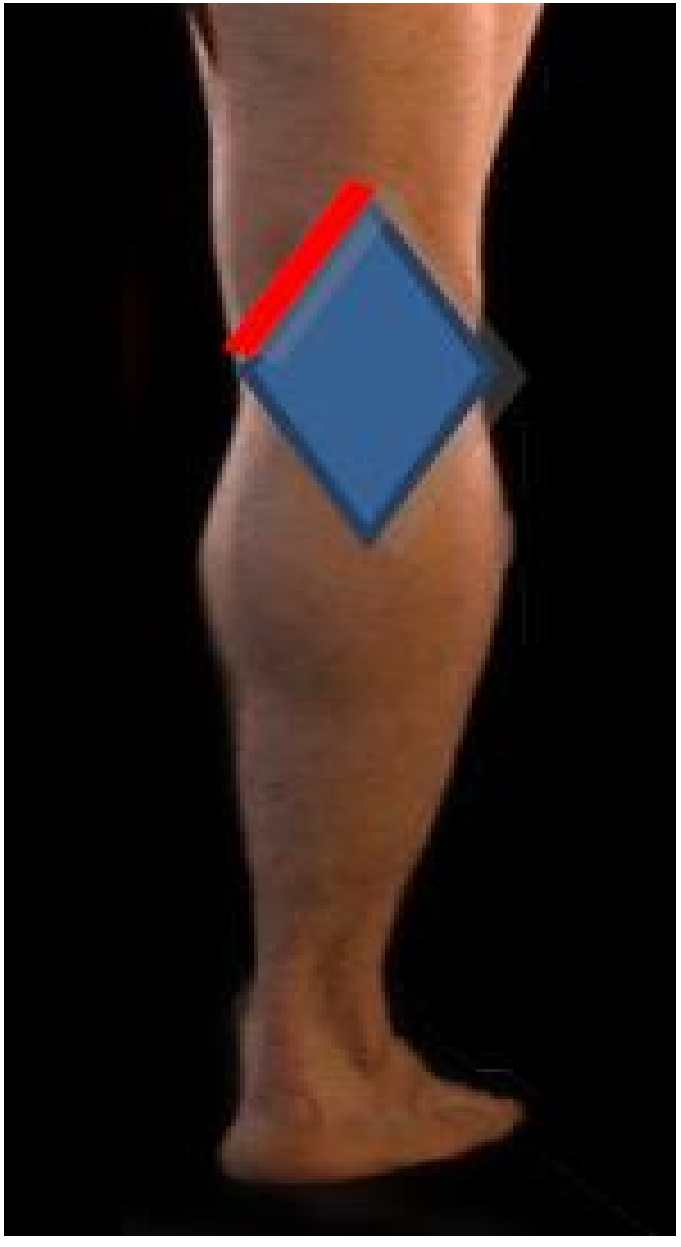
The Popliteal Fossa is a diamond-shaped intermuscular area found on the posterior aspect of the knee joint

- BOUNDARIES
- CONTENTS
- APPLIED ANATOMY



Upper Medial Boundary Comprises two muscles

- Semimembranosus
- Semitendinosus



Boundaries of the Popliteal Fossa

Upper Medial Boundary

- Semimembranosus

Posterior view, right thigh and knee

Boundaries of the Popliteal Fossa

Upper Medial Boundary

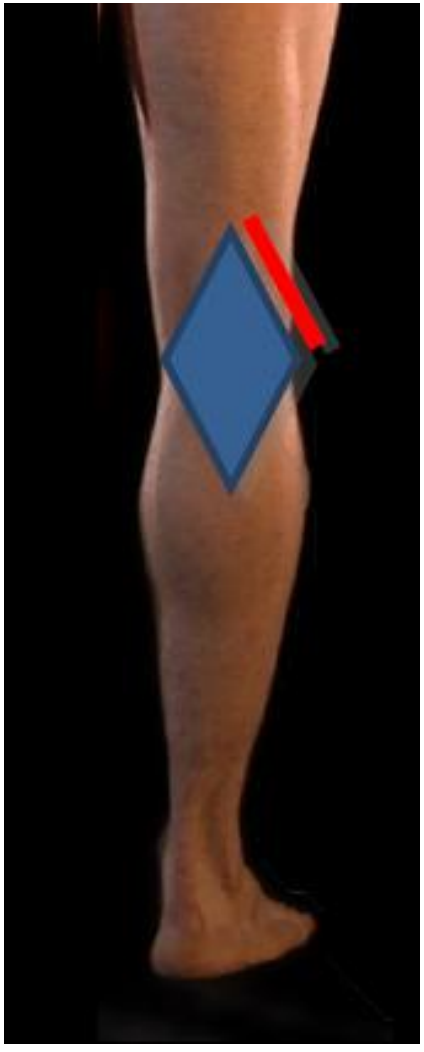
- Semitendinosus

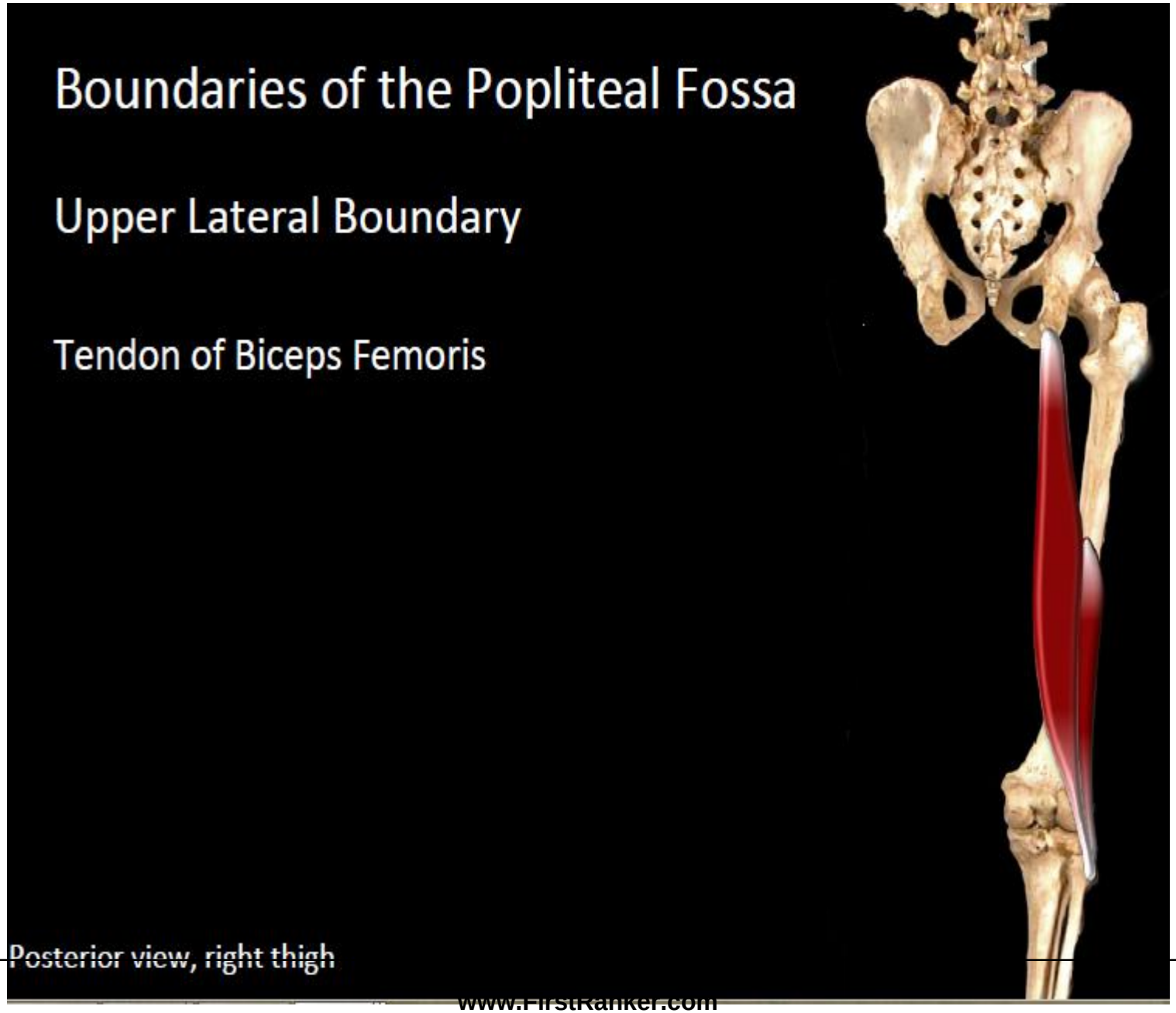
Posterior view, right thigh and knee

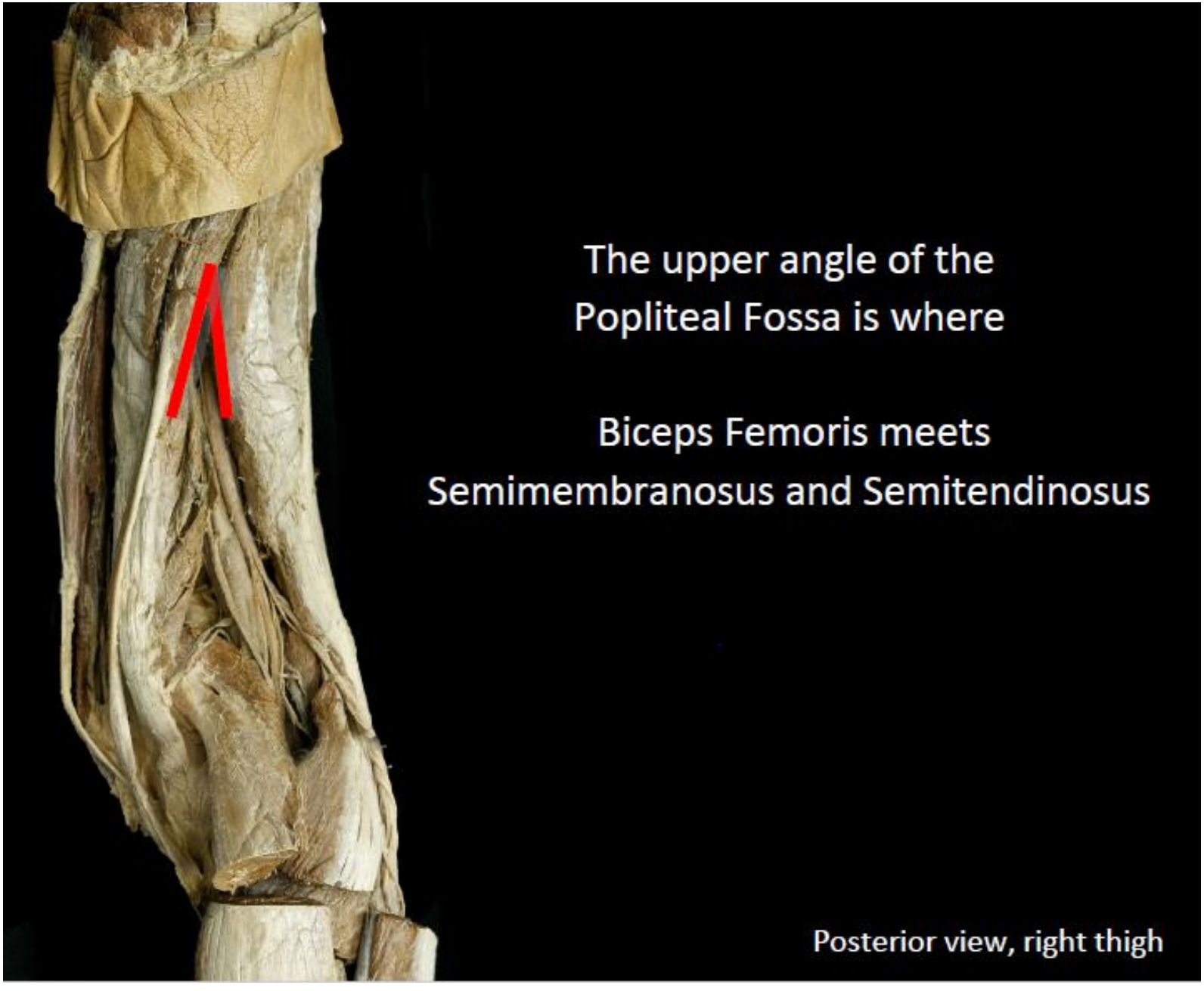
Boundaries of the Popliteal Fossa

Upper Lateral Boundary

Tendon of Biceps Femoris



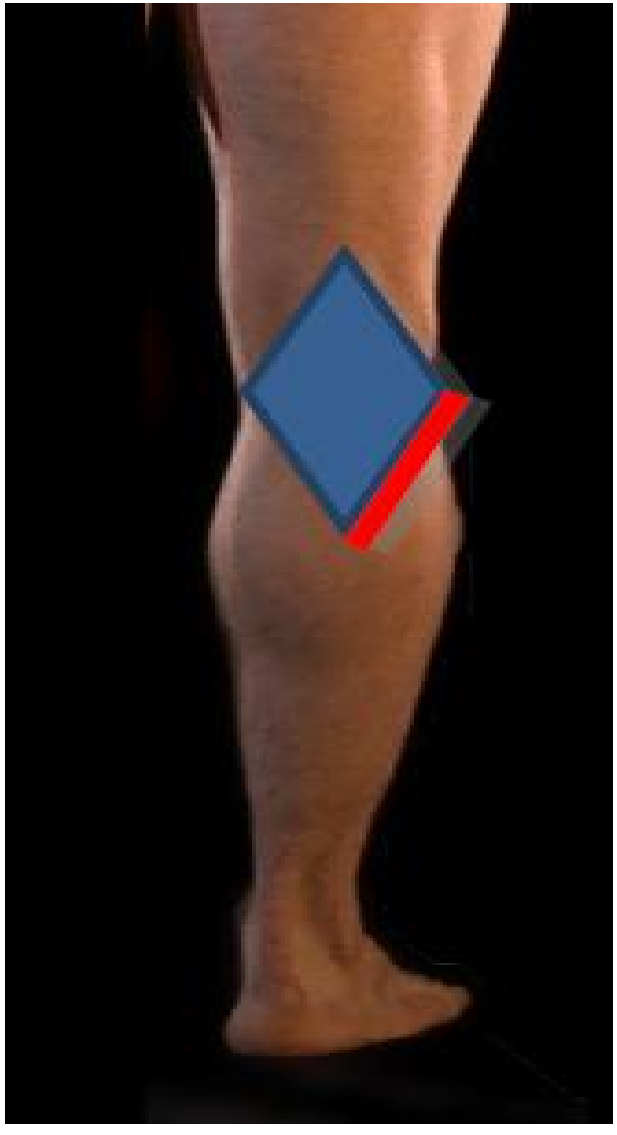


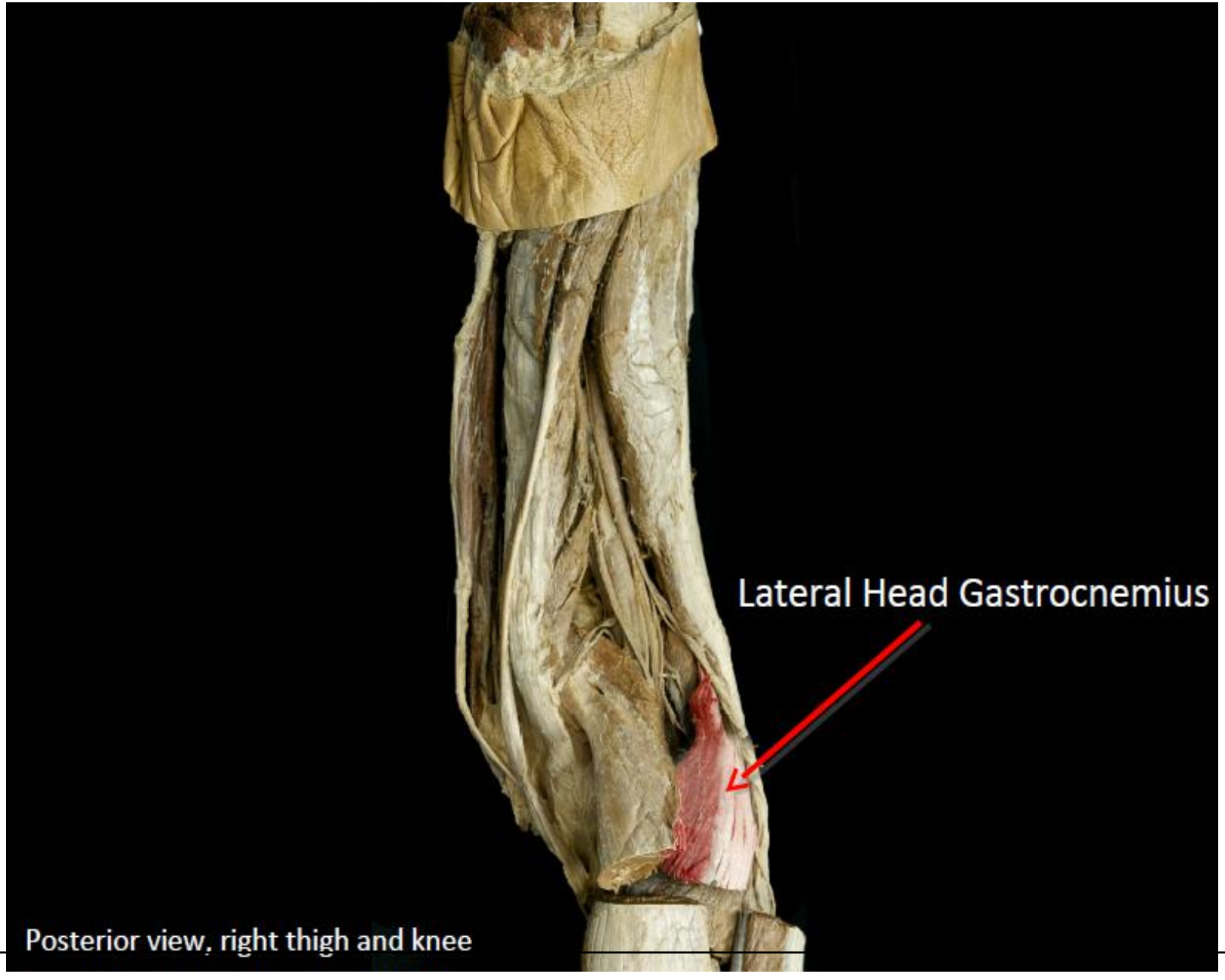


Boundaries of the Popliteal Fossa

Lower Lateral Boundary

Lateral Head of Gastrocnemius

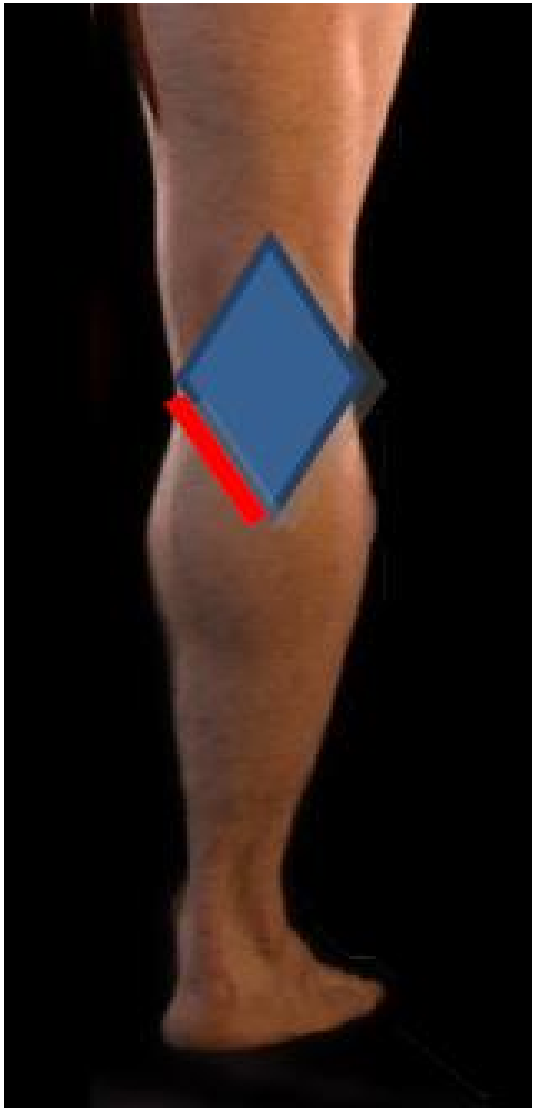


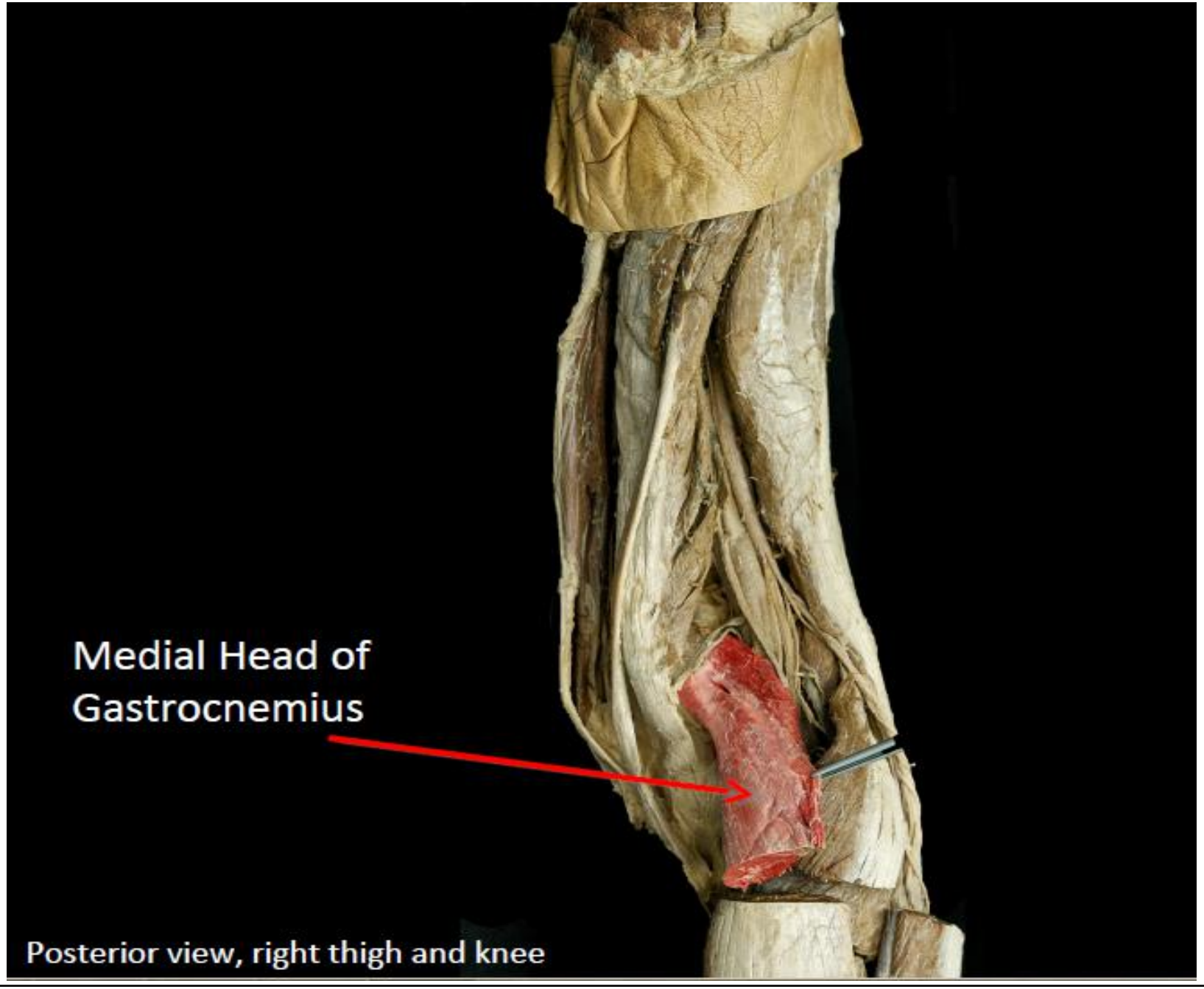


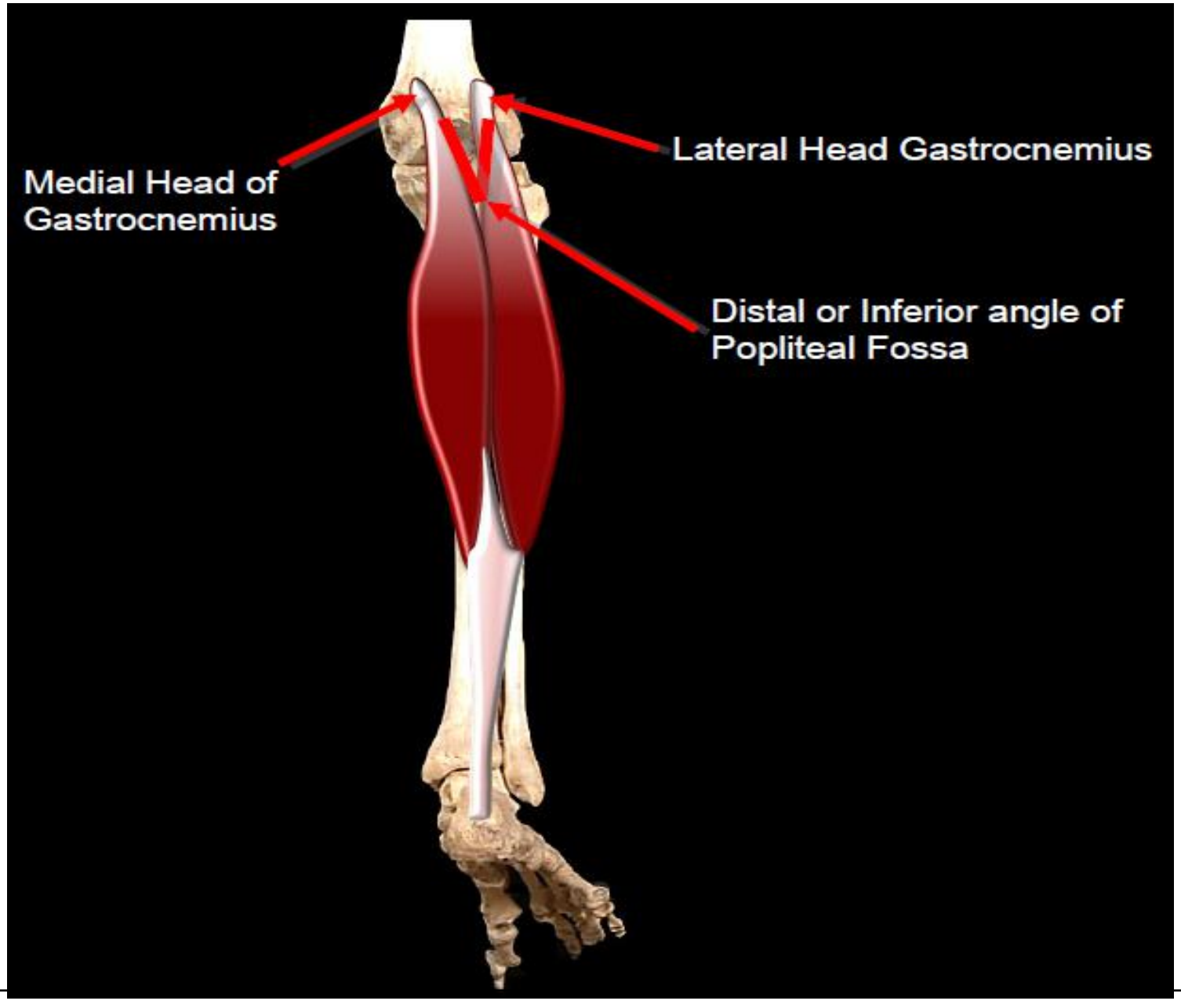
Boundaries of the Popliteal Fossa

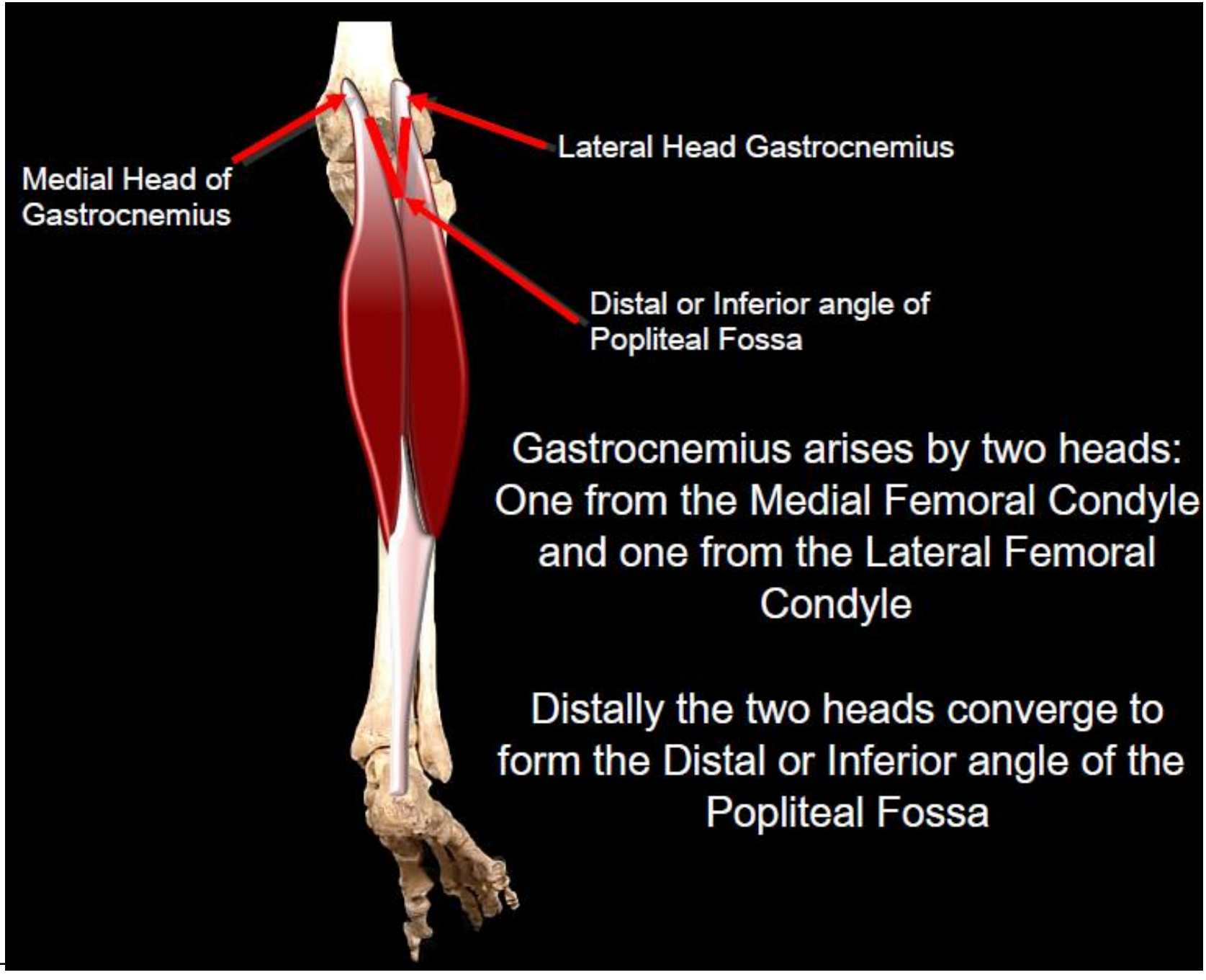
Lower Medial Boundary

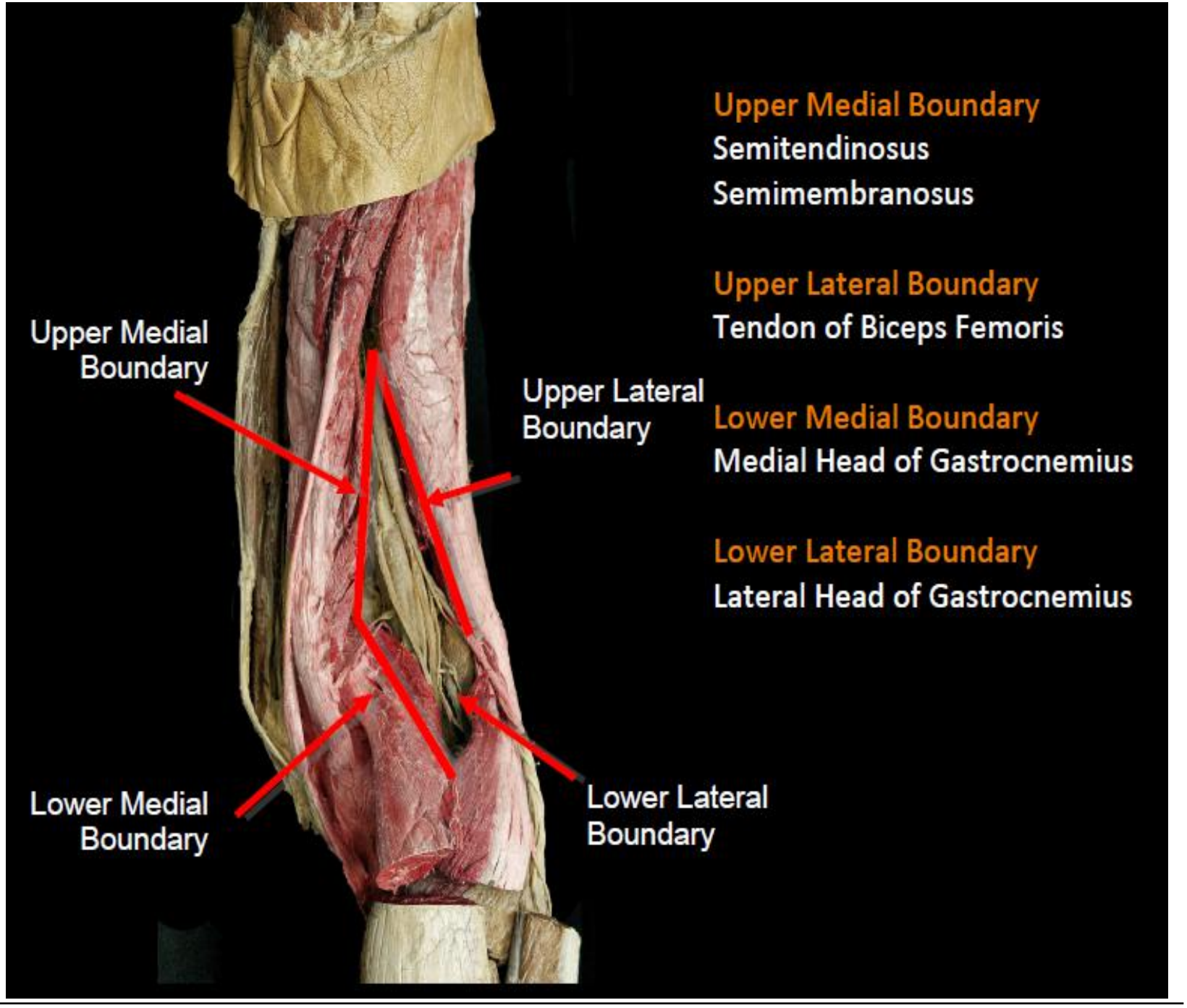
Medial Head of Gastrocnemius

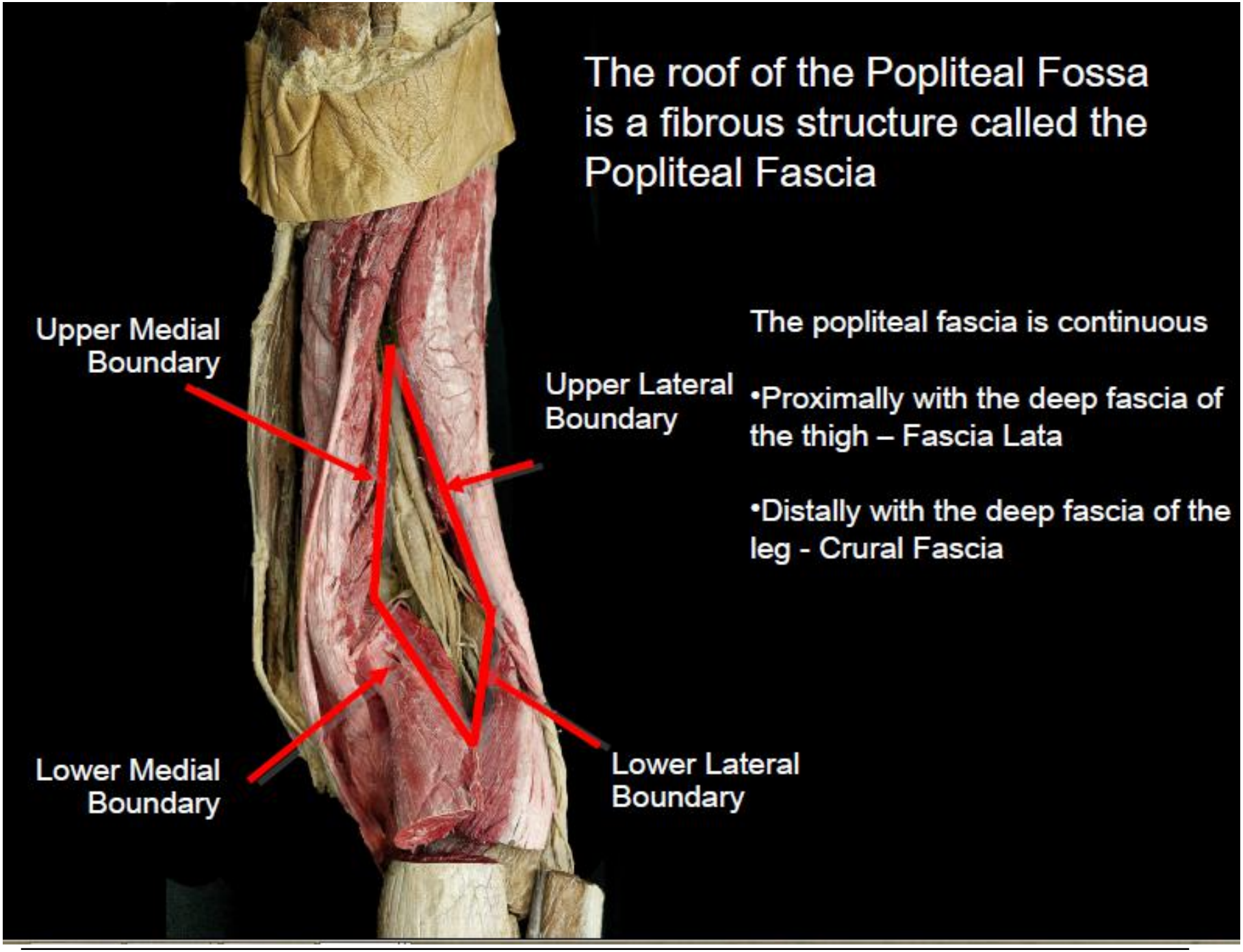








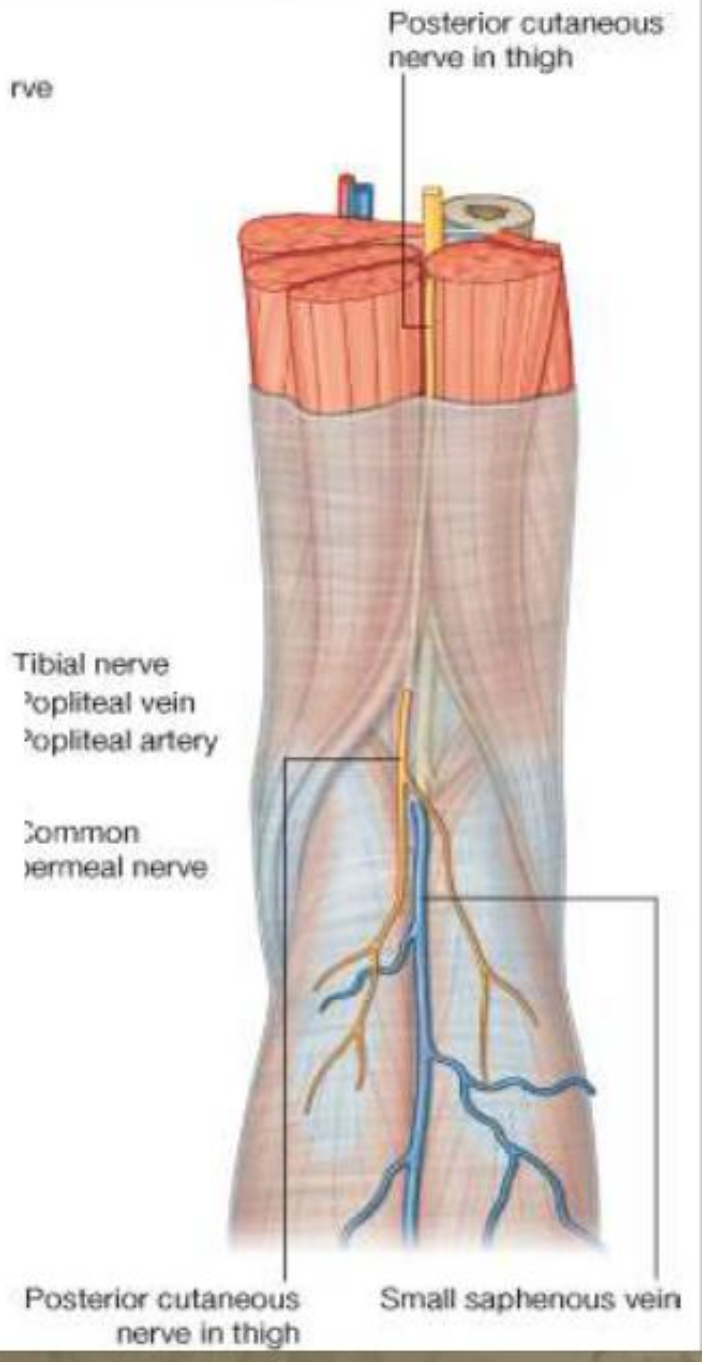




ROOF

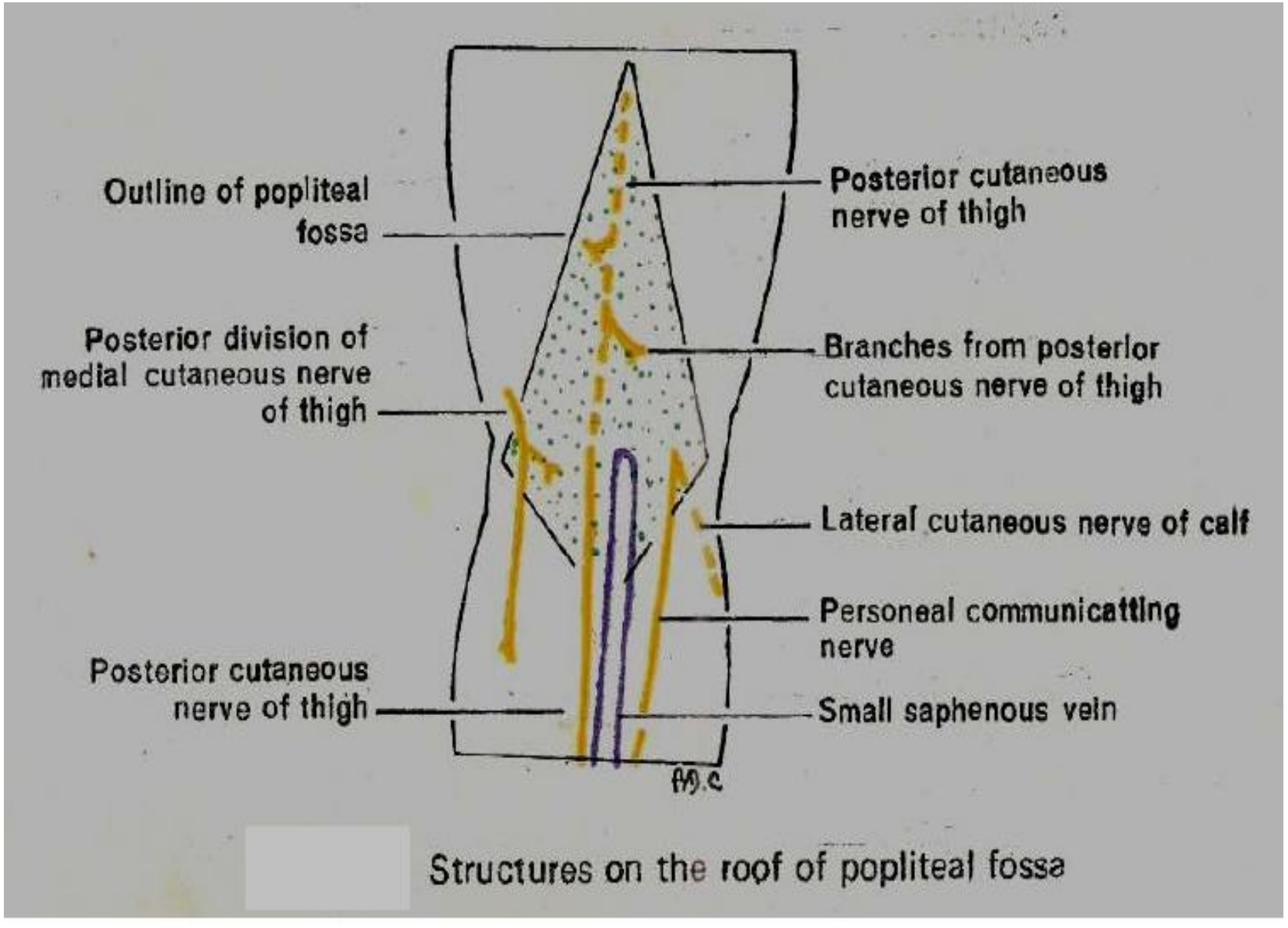
Roof :

- Skin,
- Superficial fascia,
- Popliteal fascia , pierced by :
  - Short Saphenous vein,
  - Post cutaneous nerve of thigh



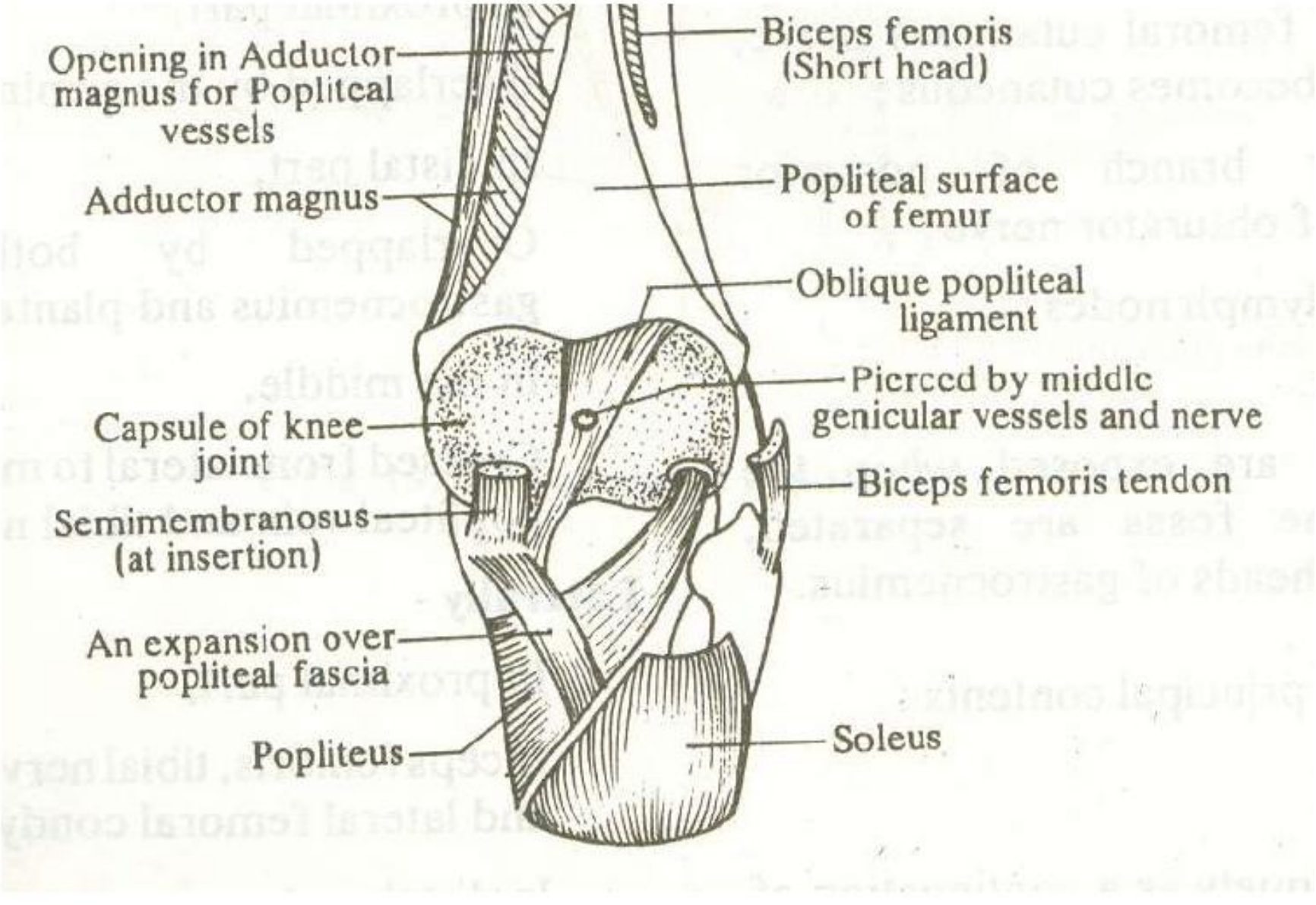
SF contains:-

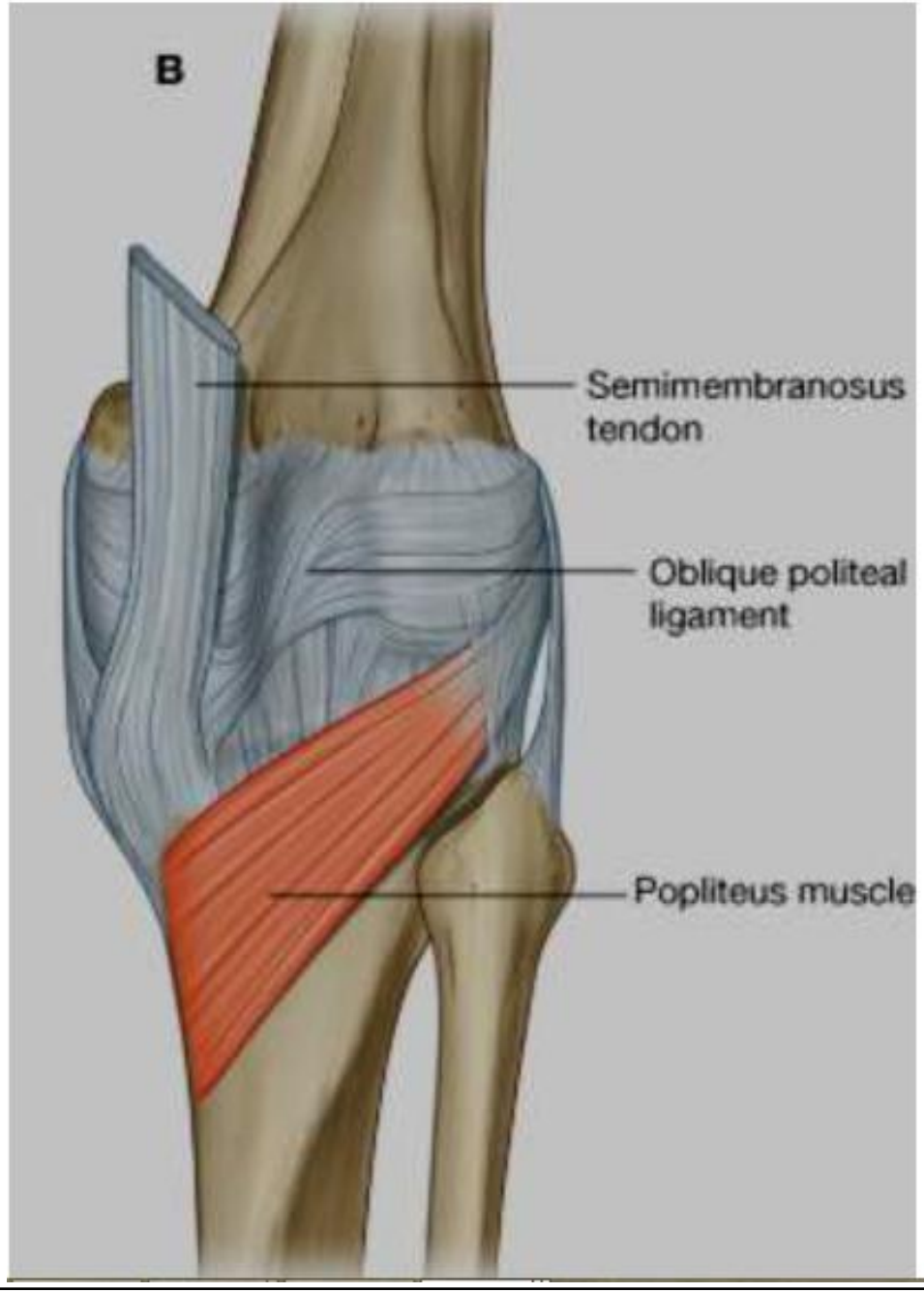
- Short saphenous vein
- Post cut nerve of thigh
- Post div of medial cut nv of thigh
- Sural communicating nv



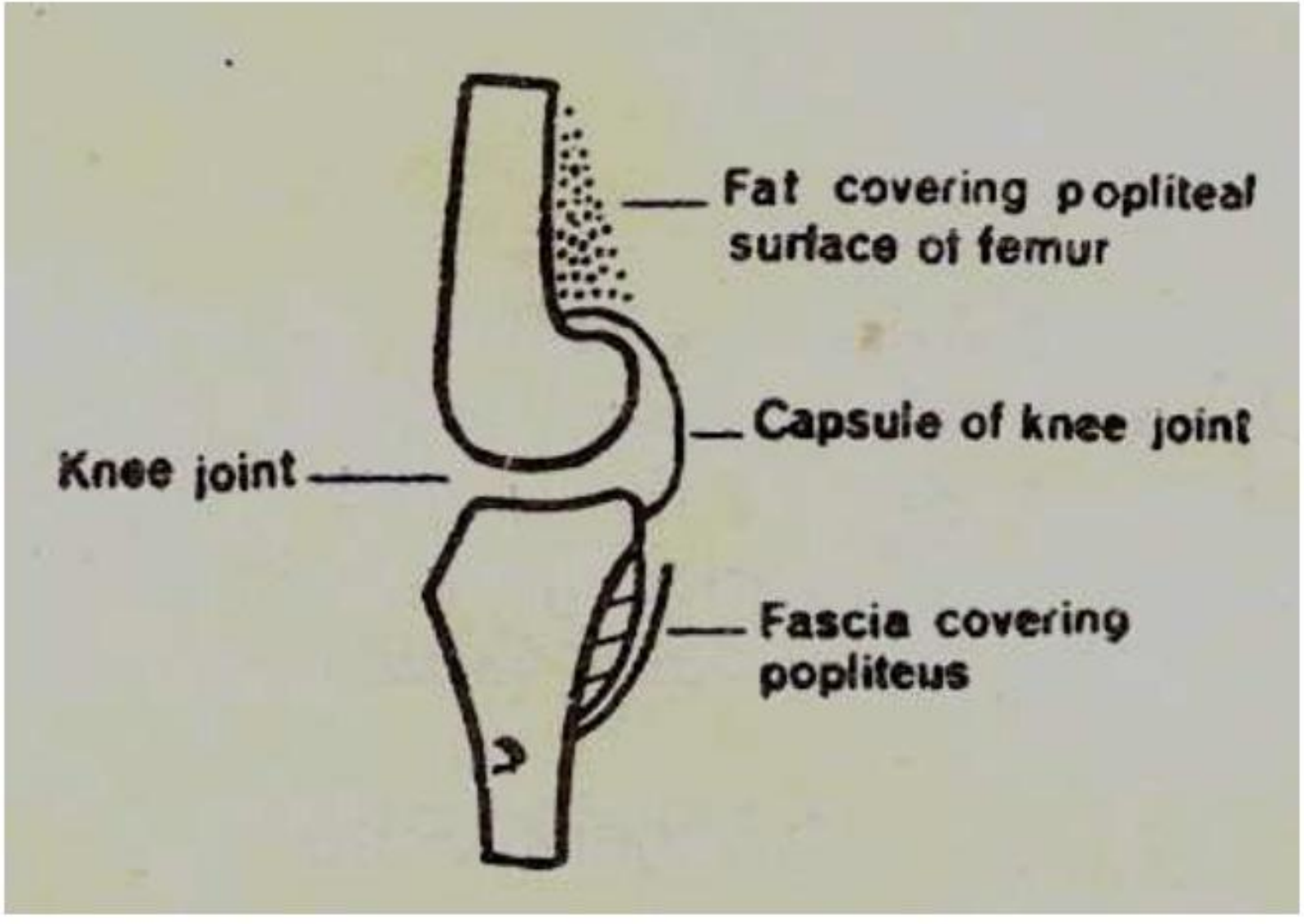
Structures in roof of Popliteal Fossa

FLOOR



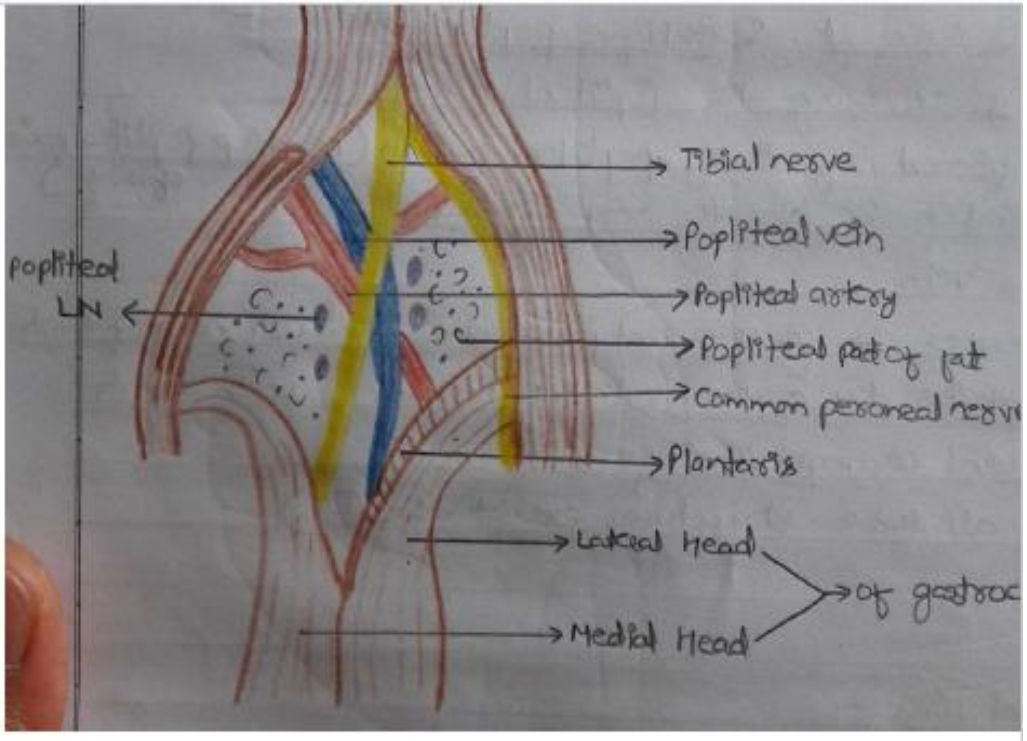


Floor of Popliteal Fossa – surface view



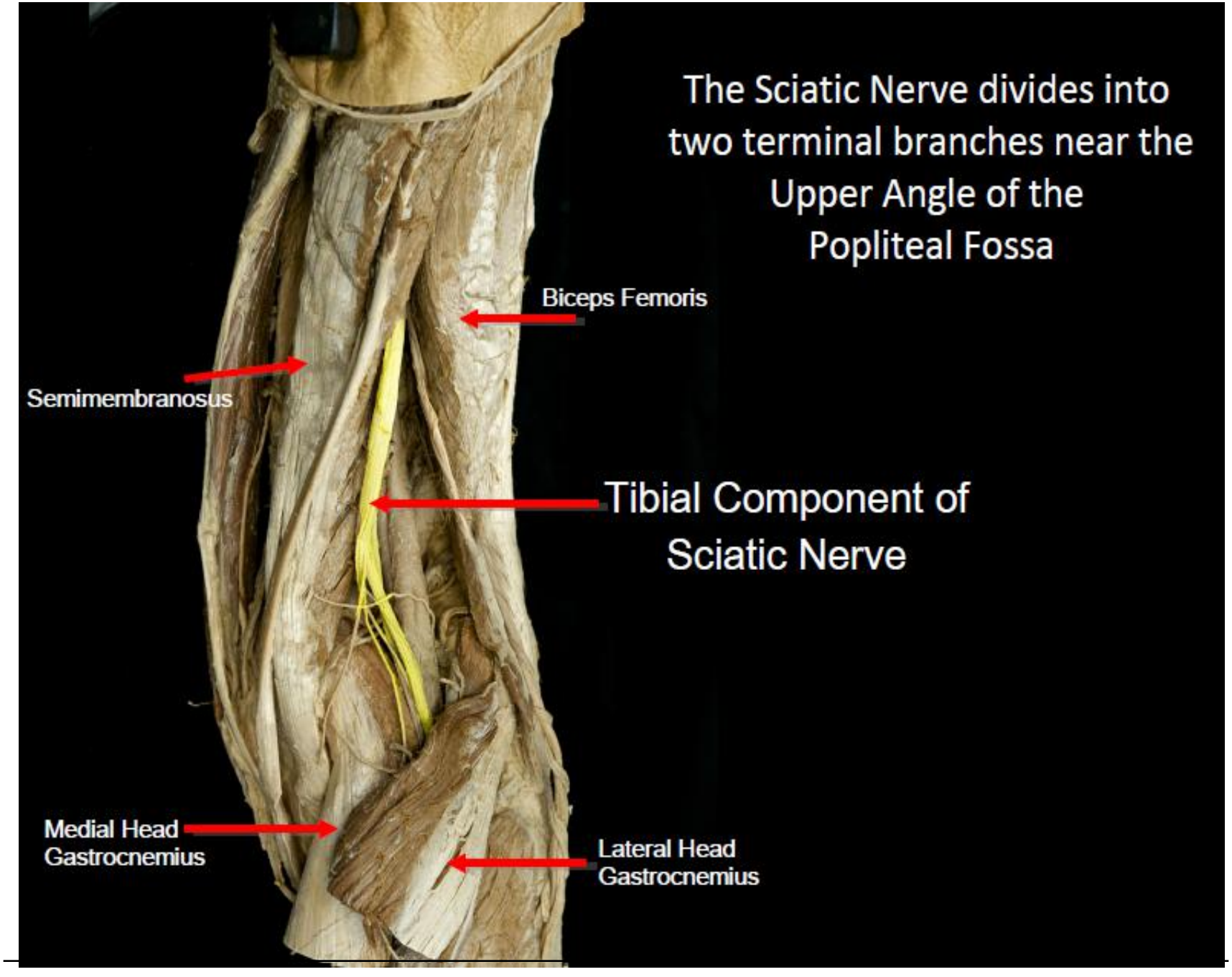
Floor of Popliteal Fossa as seen in sagittal section

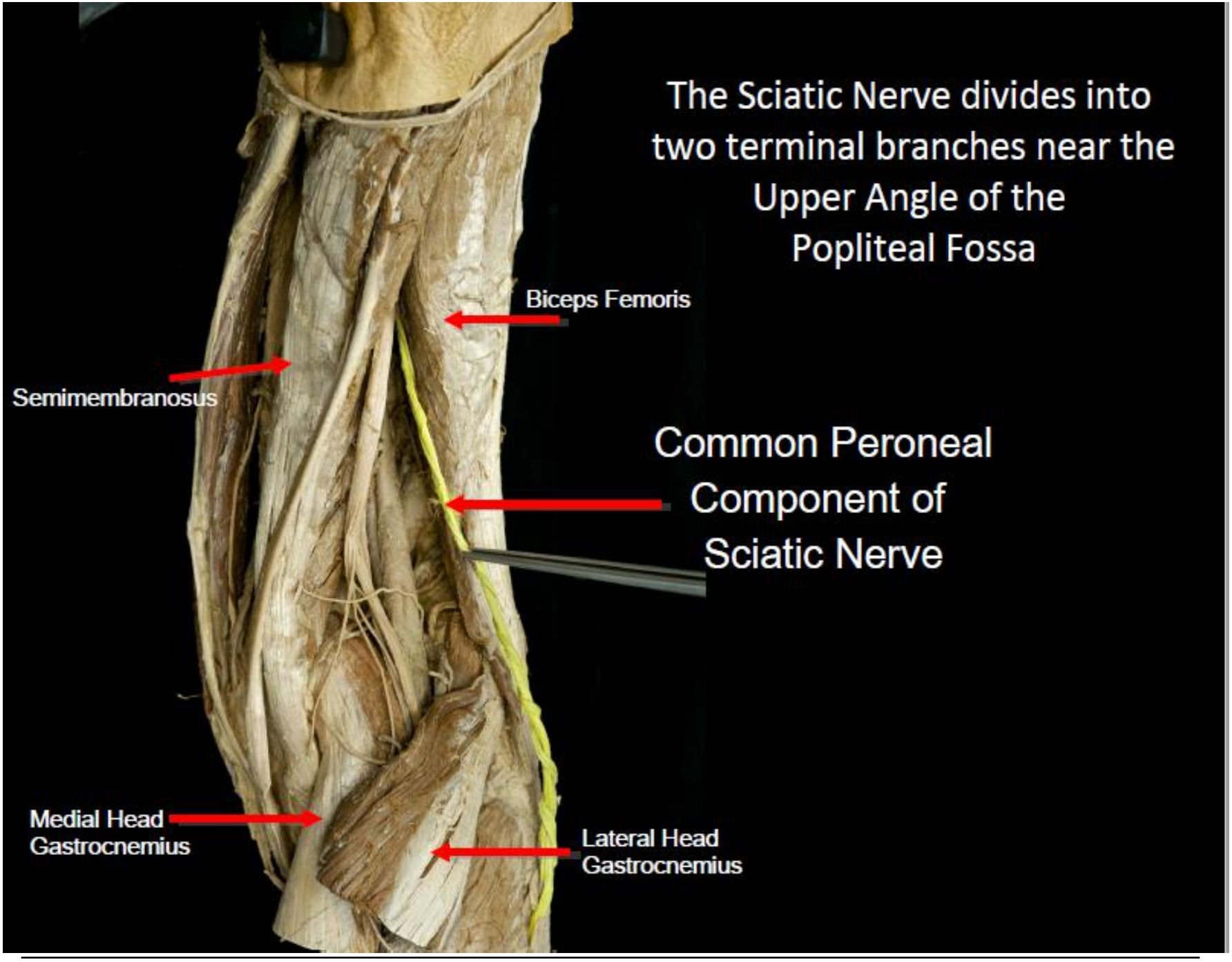
POPLITEAL FOSSA

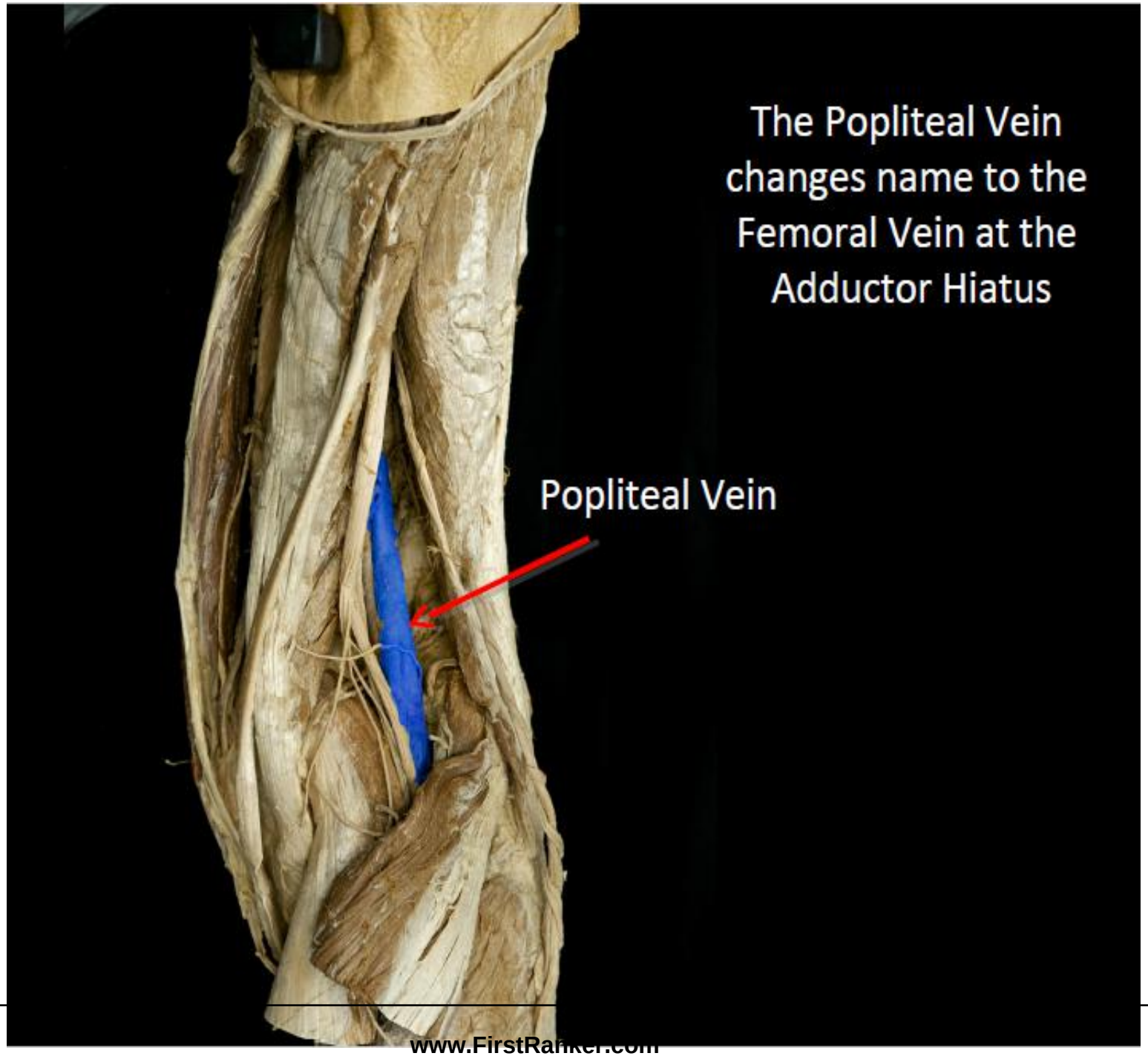


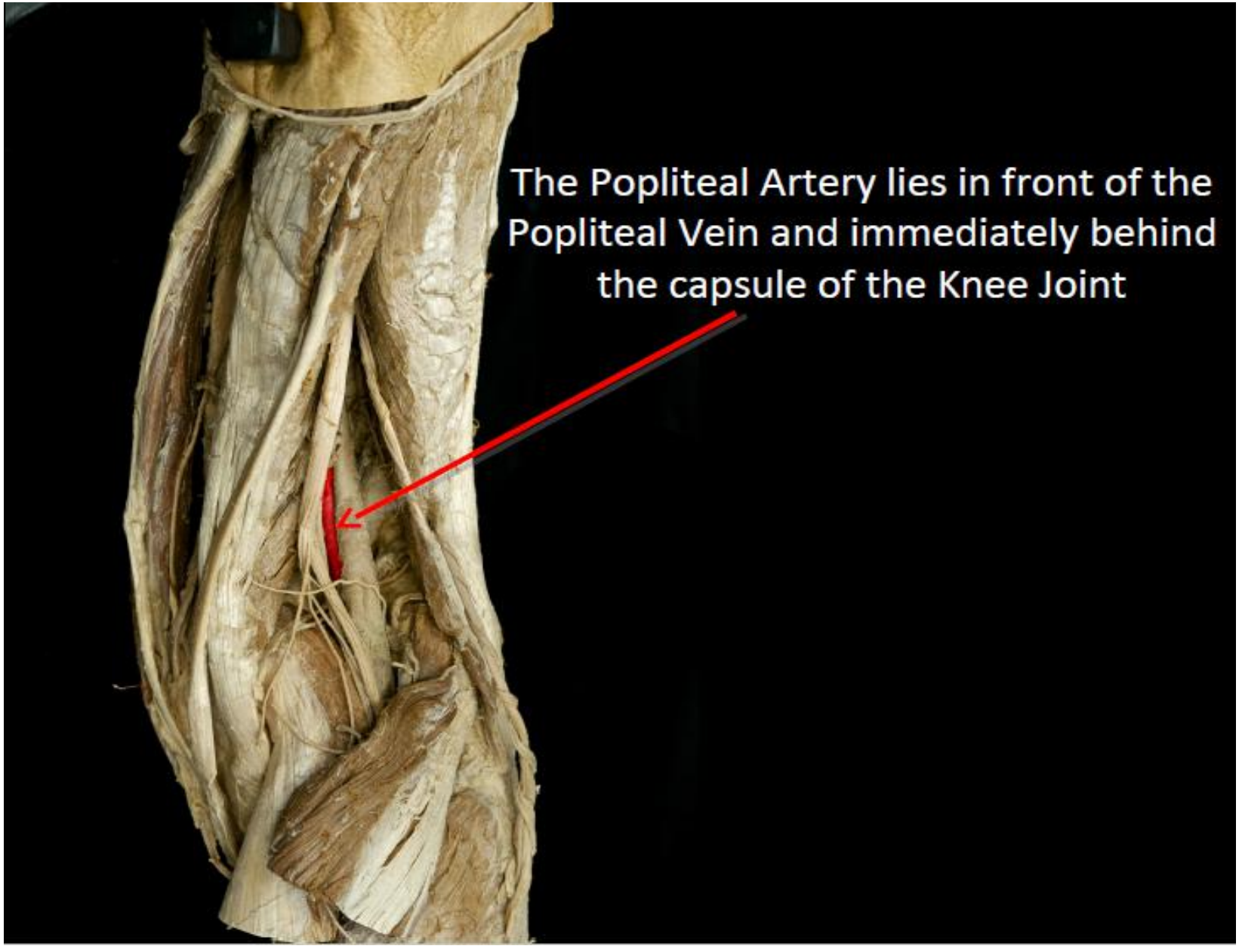
Contents :

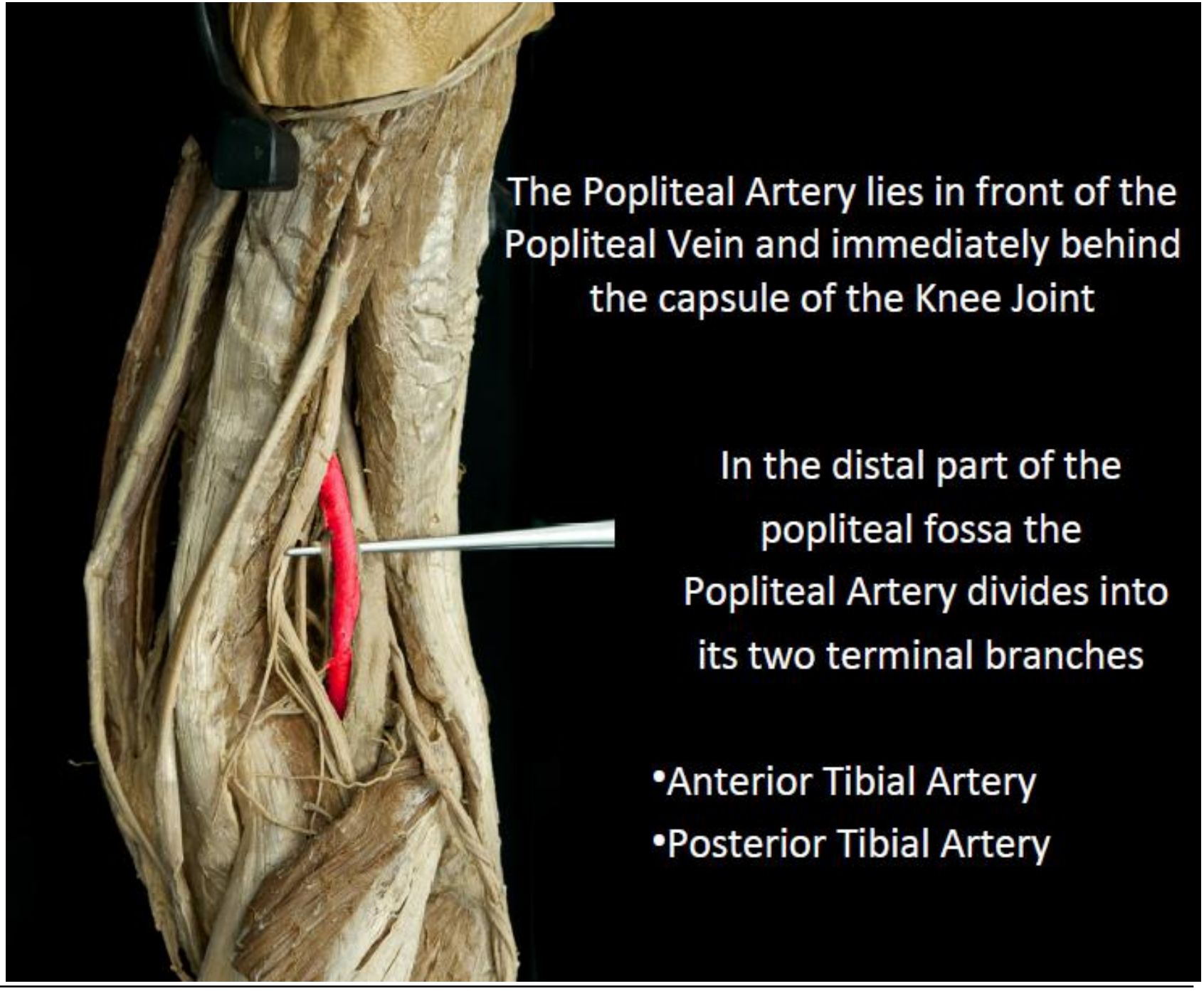
- Popliteal vessels
- Tibial nerve
- Comn peroneal nerve
- Popliteal Lymph nodes
- Fat
- Termination of Short Saph Vn
- Genicular Br of Post Divn of Obturator nerve
- Post cut nerve of thigh (before it becomes cutaneous)
- Sural communicating nerve

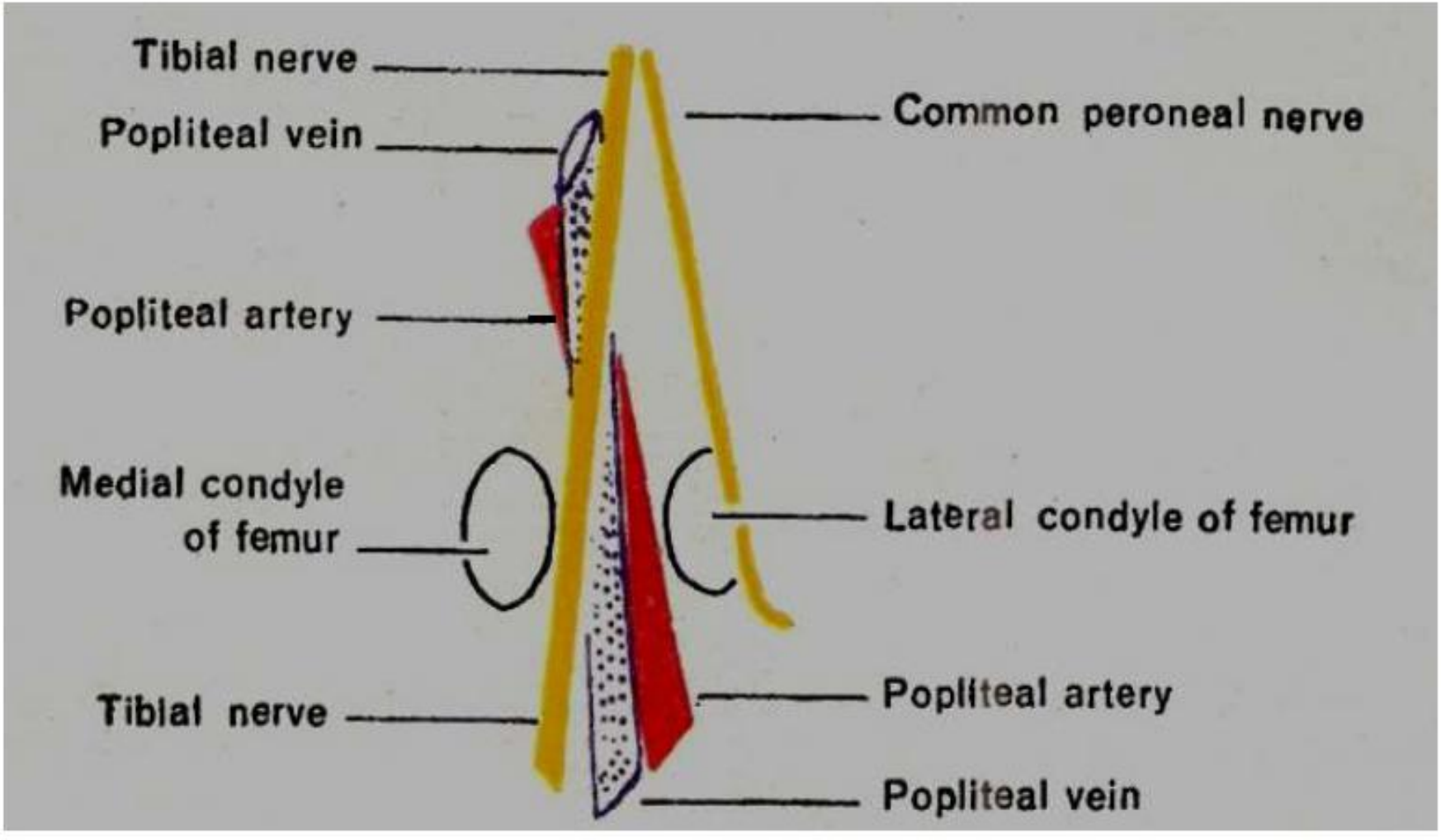






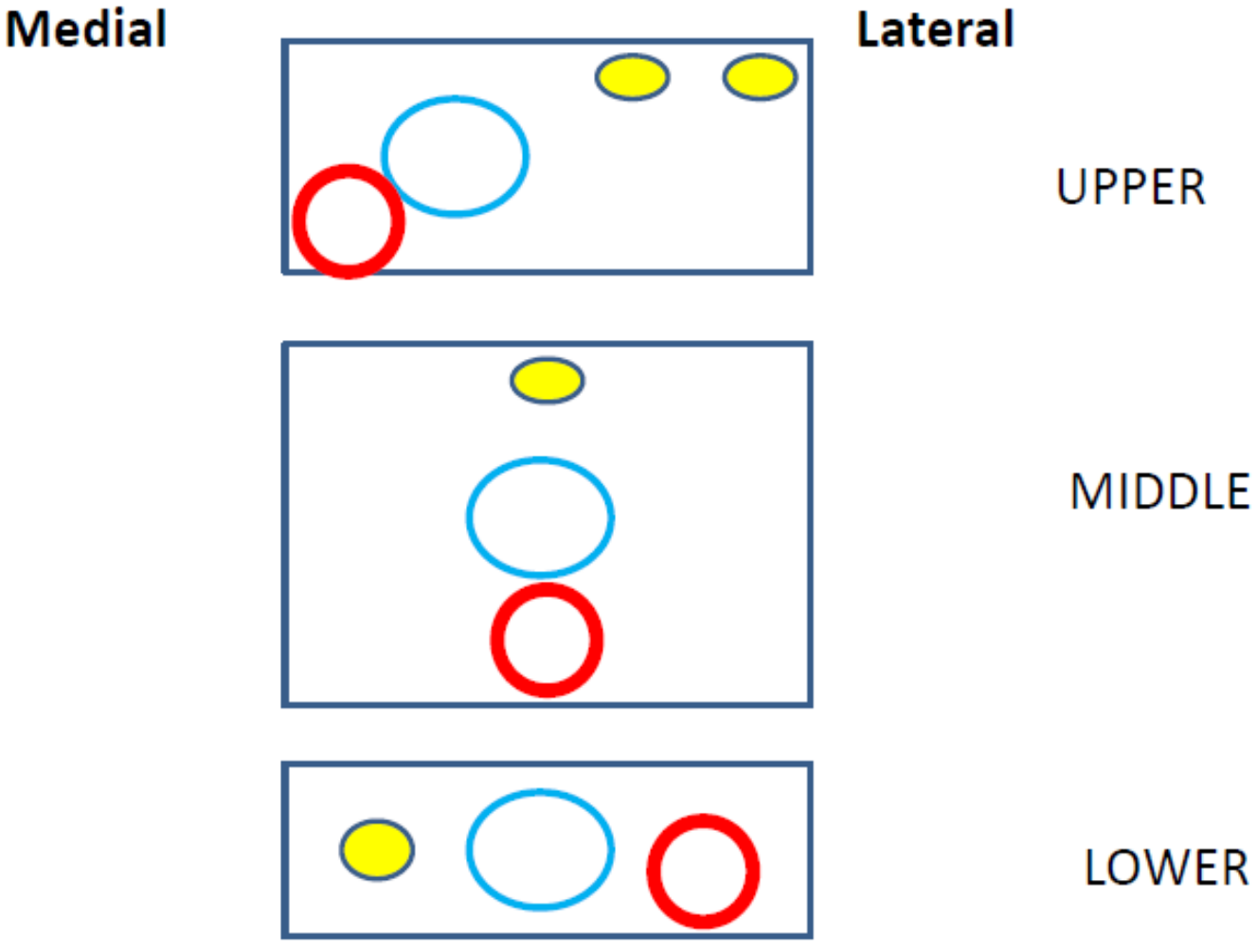






Contents of Popliteal Fossa

POPLITEAL VESSELS & TIBIAL NERVE



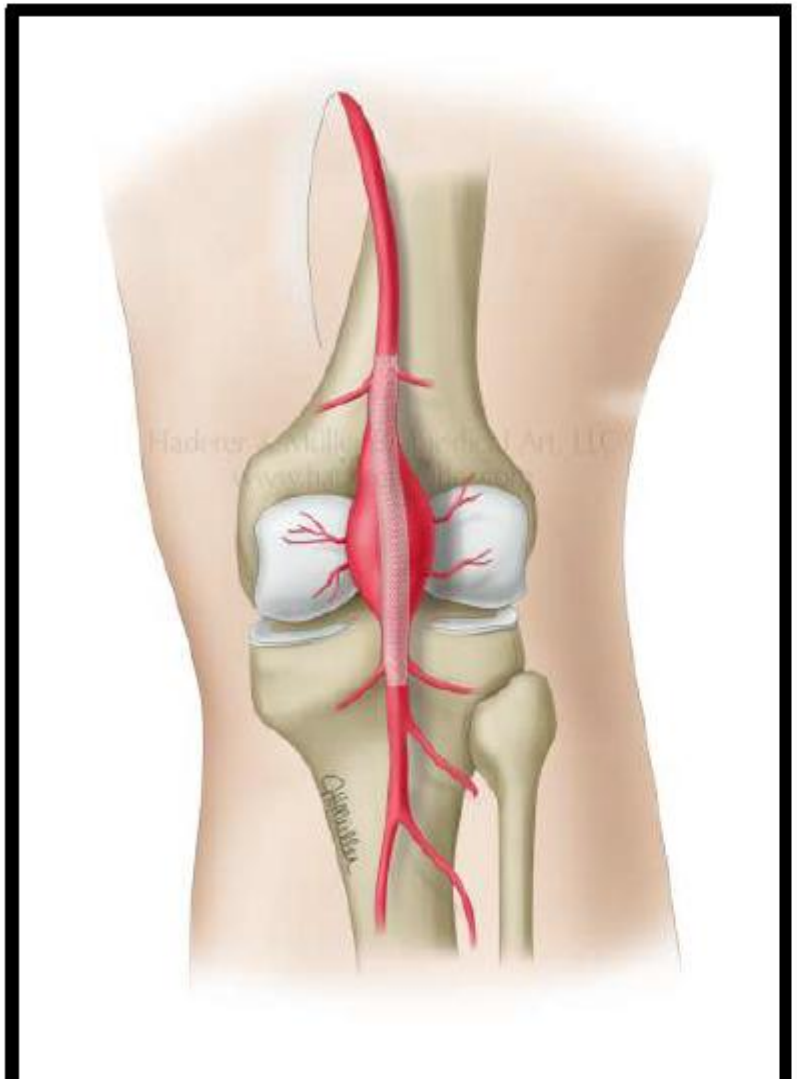
POPLITEAL FOSSA : Contents

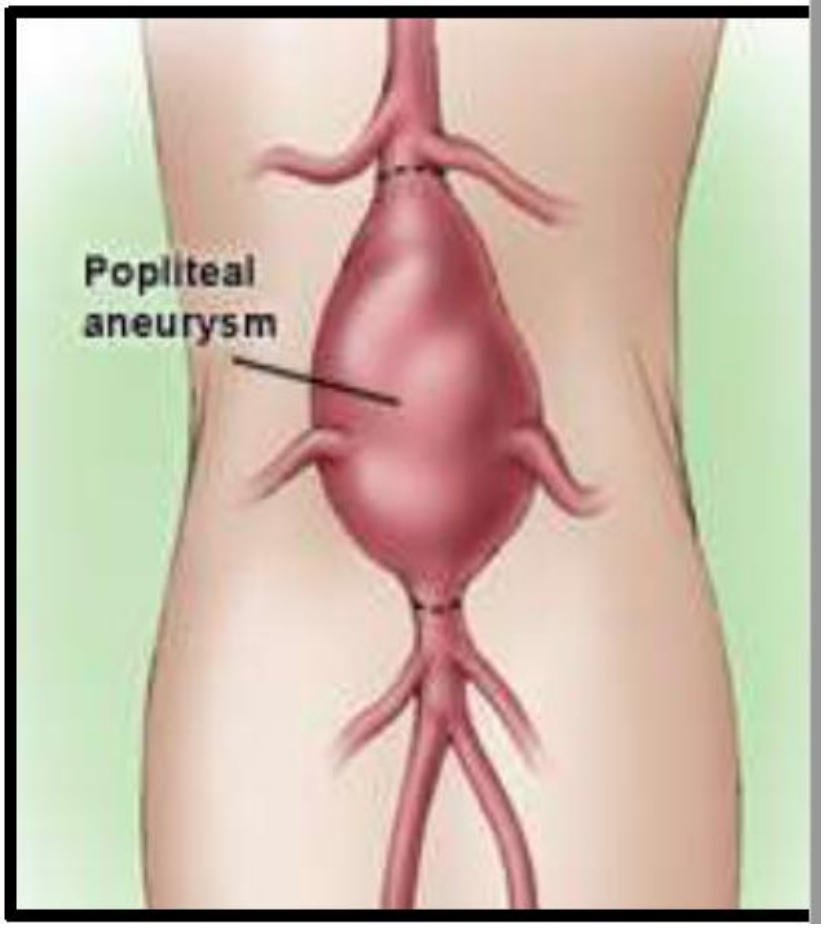
Popliteal Nodes :

- 6 in no
- **Afferents** : Superficial lymphatics acc SS Vein, (Postero lateral aspect of leg & foot)
- From Knee joint
- Deep lymphatics acc Tibial vessels.

- **Efferents** : Acc Femoral vessels to Deep Inguinal nodes

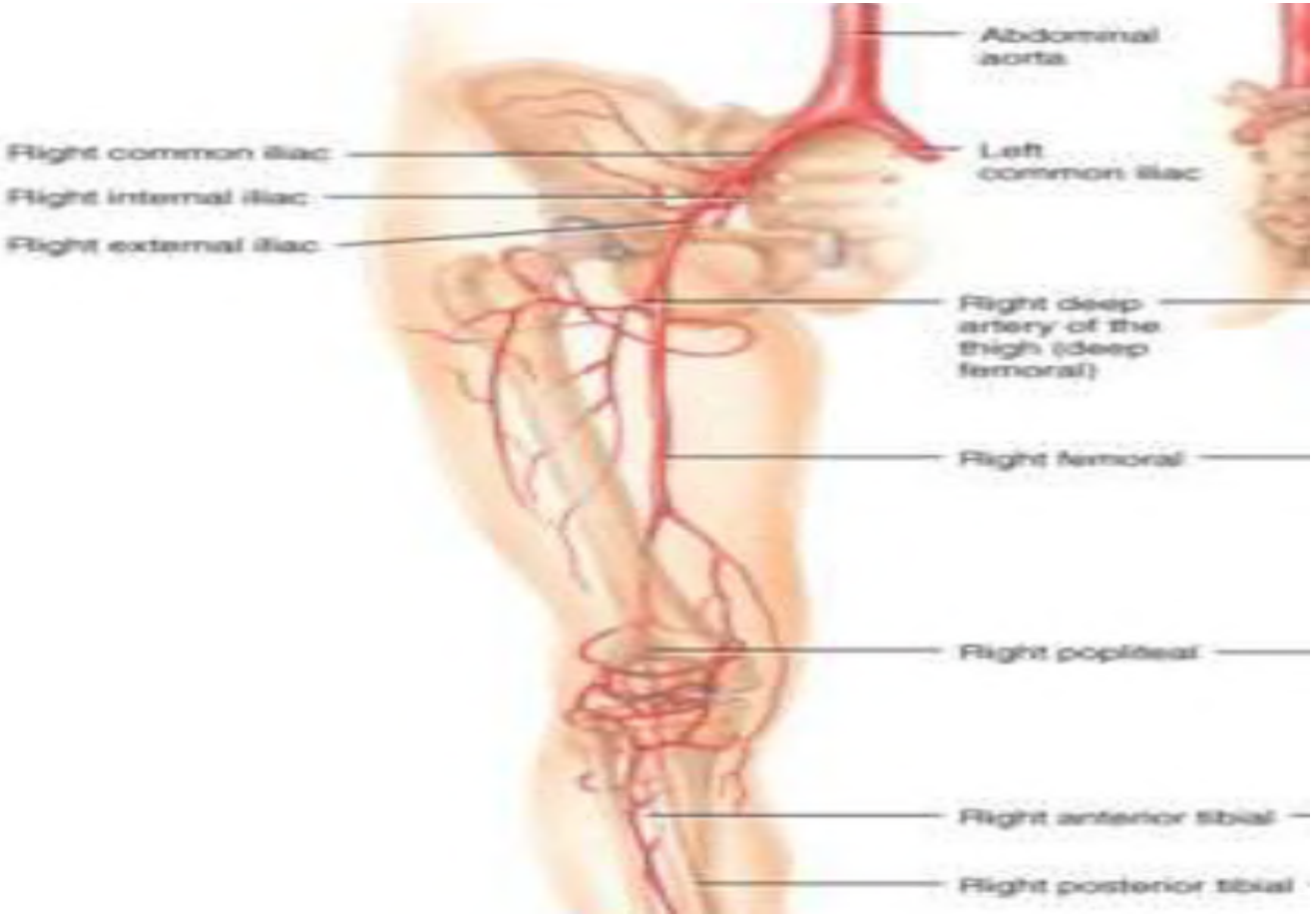
Popliteal Aneurysm





ARTERIES OF THIGH

FEMORAL ARTERY



External iliac artery become femoral artery when it passes under the inguinal ligament & into the thigh

– ~~femoral artery becomes popliteal artery behind the knee~~

FEMORAL ARTERY

- It is the main artery of the **lower limb.**

- It enters the **femoral triangle behind the inguinal ligament at the midinguinal point.**

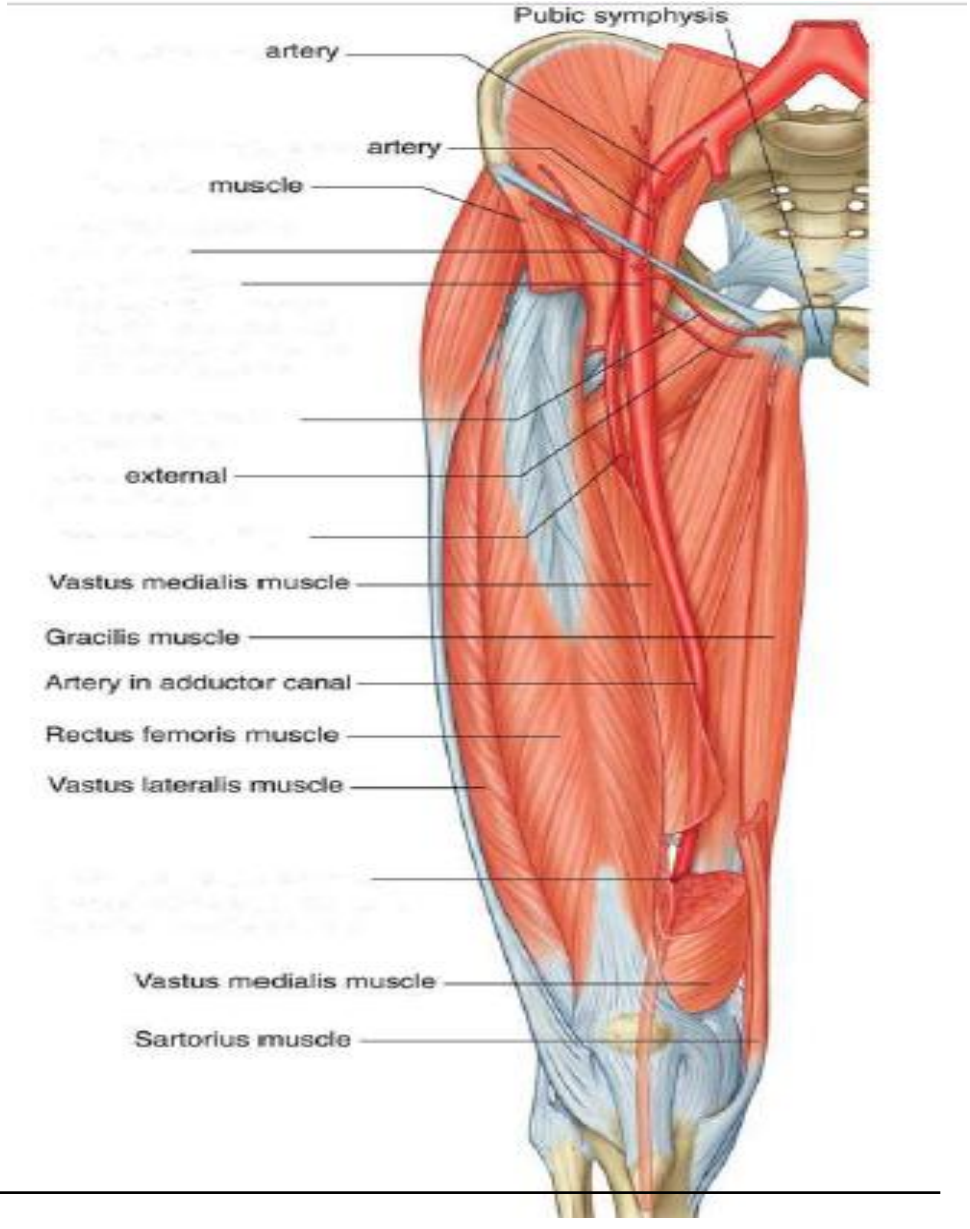
- It runs downward and medially successively via the **femoral triangle and adductor canal.**

- At the lower end of the **adductor canal , it leaves** the thigh via the adductor hiatus to go into the **popliteal fossa where it continues as** the **popliteal artery.**

SURFACE MARKING

- **Femoral artery is represented** by the upper two-thirds of a line joining the midinguinal point to the adductor tubercle.

The thigh is slightly flexed, abducted and laterally rotated



RELATIONS OF THE FEMORAL ARTERY IN THE FEMORAL TRIANGLE

1. The main anterior relations are the skin, **superficial fascia, deep fascia and the anterior wall of the femoralsheath.**

2. Posteriorly, the artery rests, from above downwards on

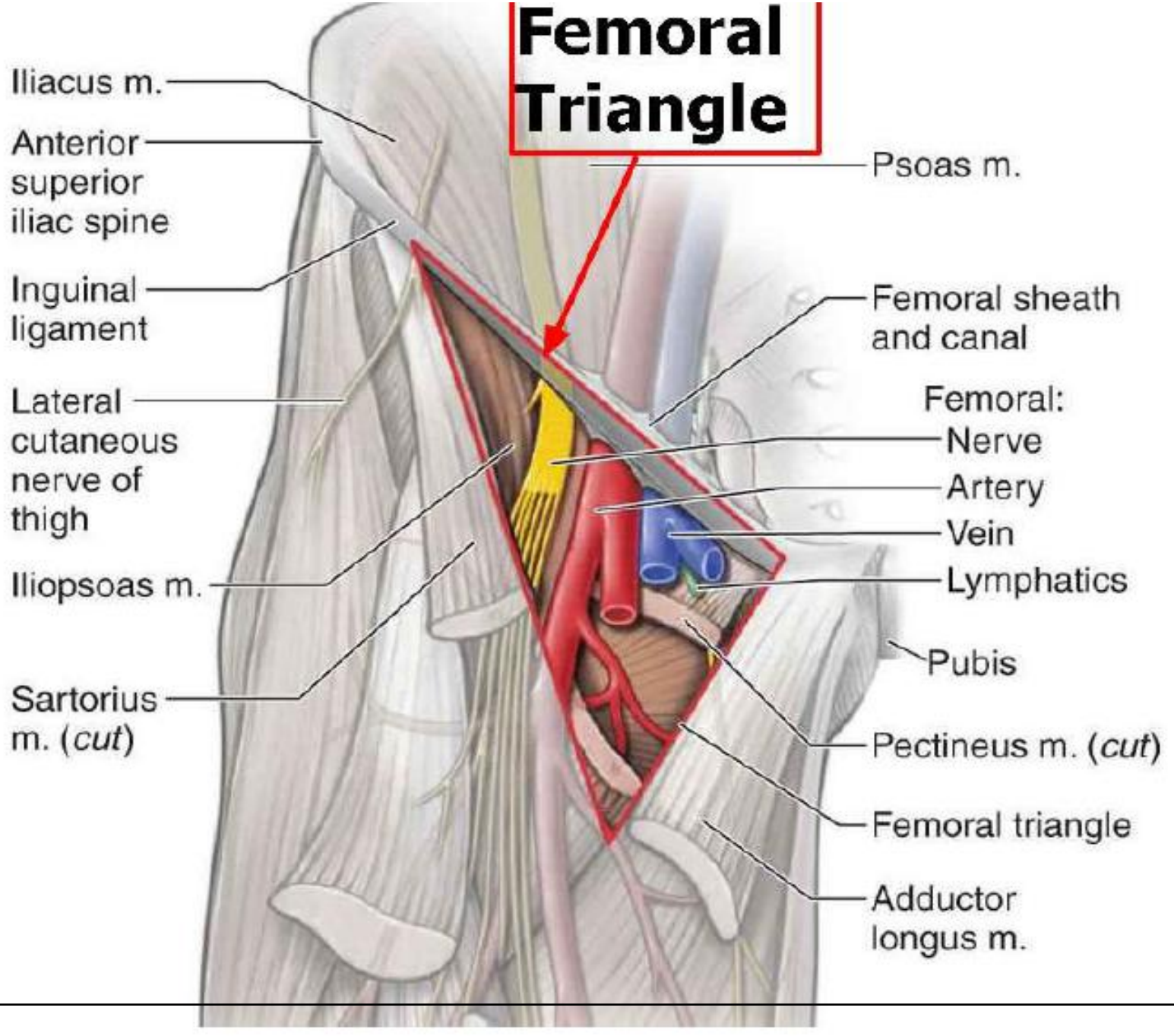
– **Psoas major,**

– **Pectineus ,**

- **The profunda artery comes behind the femoral artery as it lies on the pectineus.**
- **The nerve to Pectineus passes (from the femoral nerve) mediallybehind the artery.**

– **Adductor longus.**

- The posterior wall of the femoral sheath Intervenes between these structures and the artery.



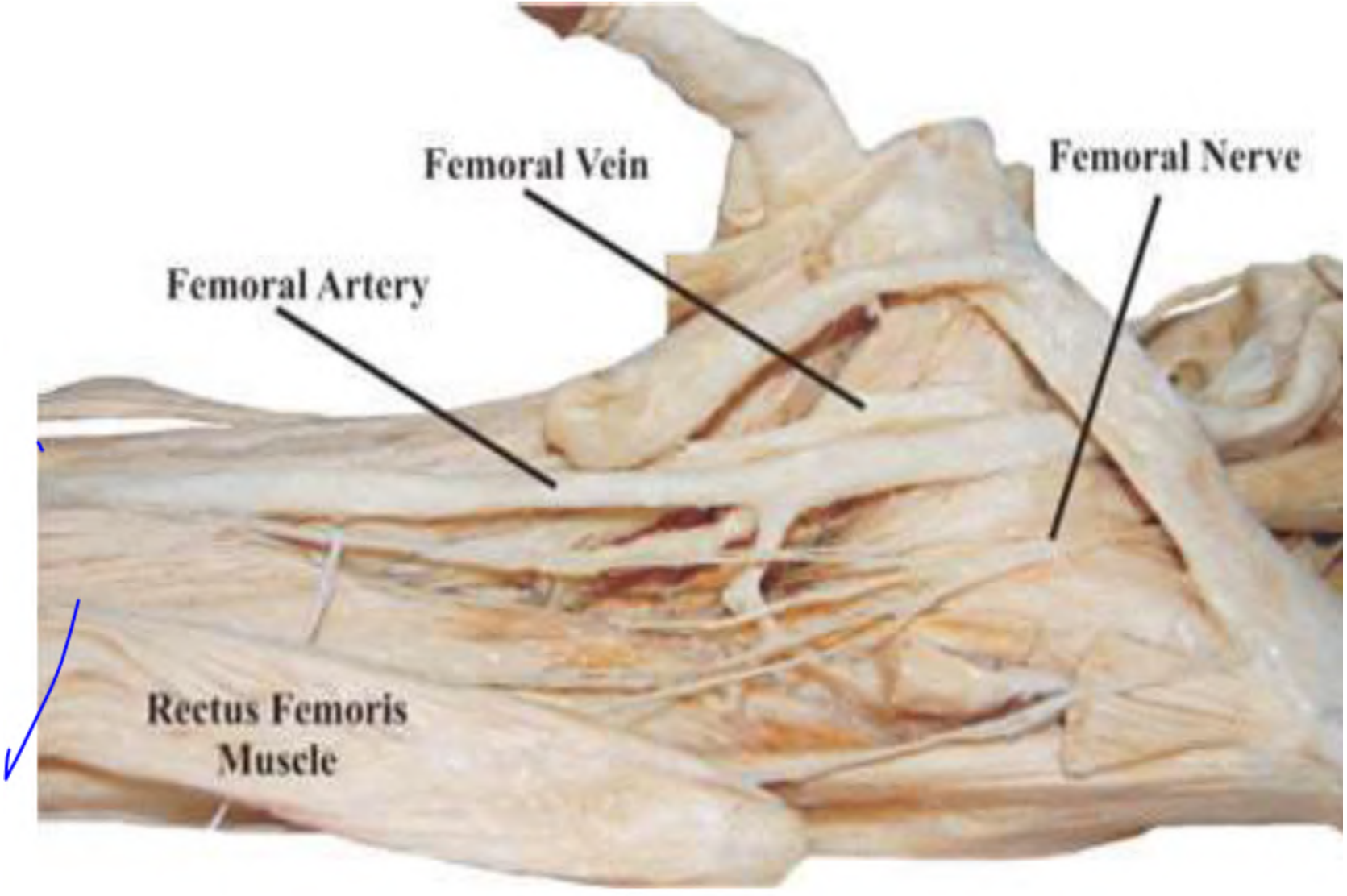
RELATIONS OF THE FEMORAL ARTERY IN THE FEMORAL TRIANGLE

3. The femoral artery & the femoral vein.

• The femoral artery is accompanied by the **femoral vein Just below the inguinal ligament. The vein is** medial to the artery.

• However, the femoral vein gradually crosses to the lateral side posterior to the artery.

• Femoral vein is directly behind the artery at the apex of the femoral triangle, and lateral to the lower end of the artery.



RELATIONS OF THE FEMORAL ARTERY IN THE FEMORAL TRIANGLE

4. The **femoral nerve is lateral to upper part of** the artery.
– Lower down the artery is related to the branches of the nerve, some of which cross it.

- The branch to the **pectineus crosses behind the upper part of** the artery.
- The medial cutaneous nerve of the thigh crosses the artery from lateral to medial side near the apex of the femoral triangle.
- The saphenous branch crosses the artery within the adductor canal.
- The nerve to the **vastus medialis is lateral to the artery in the** adductor canal.

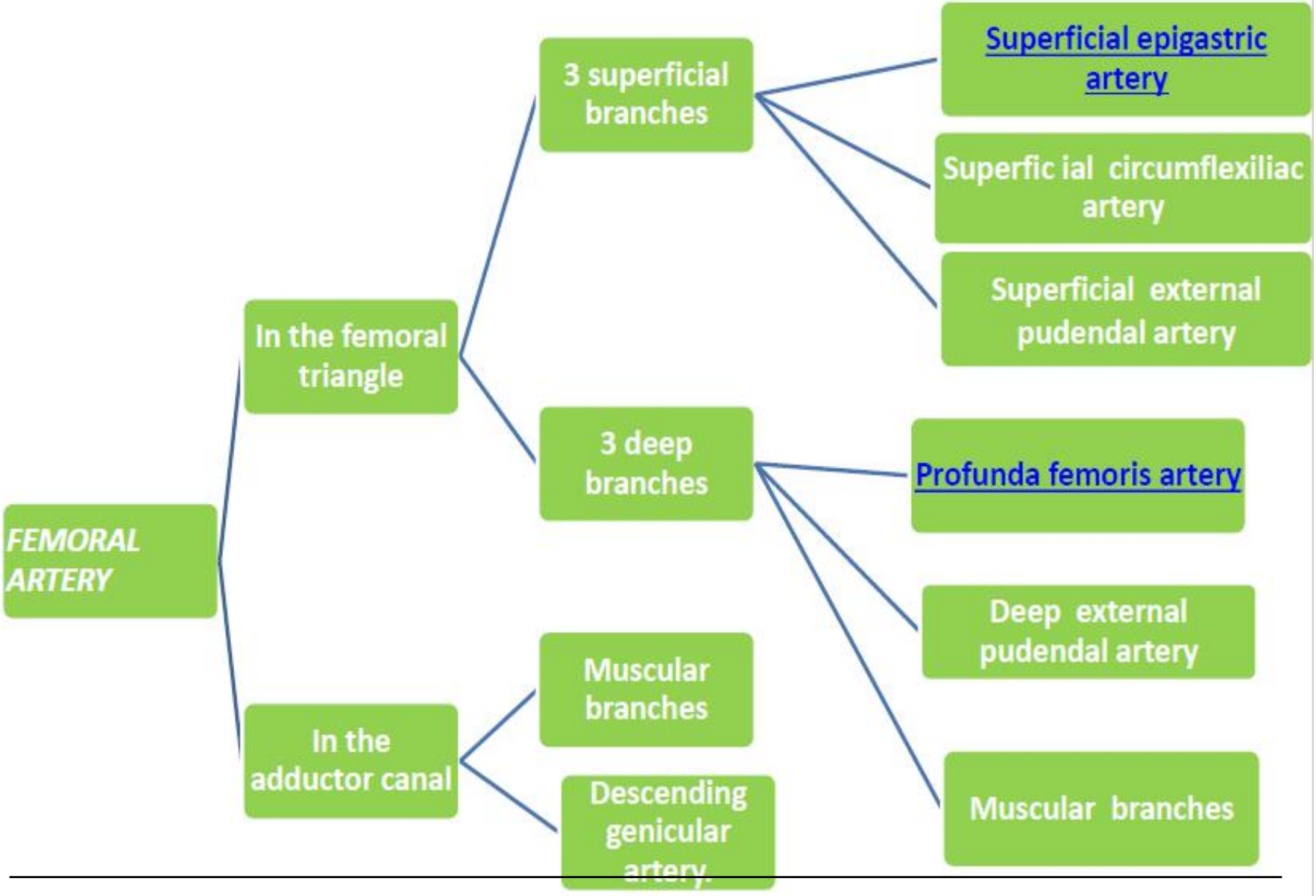
RELATIONS OF THE FEMORAL ARTERY IN THE FEMORAL TRIANGLE

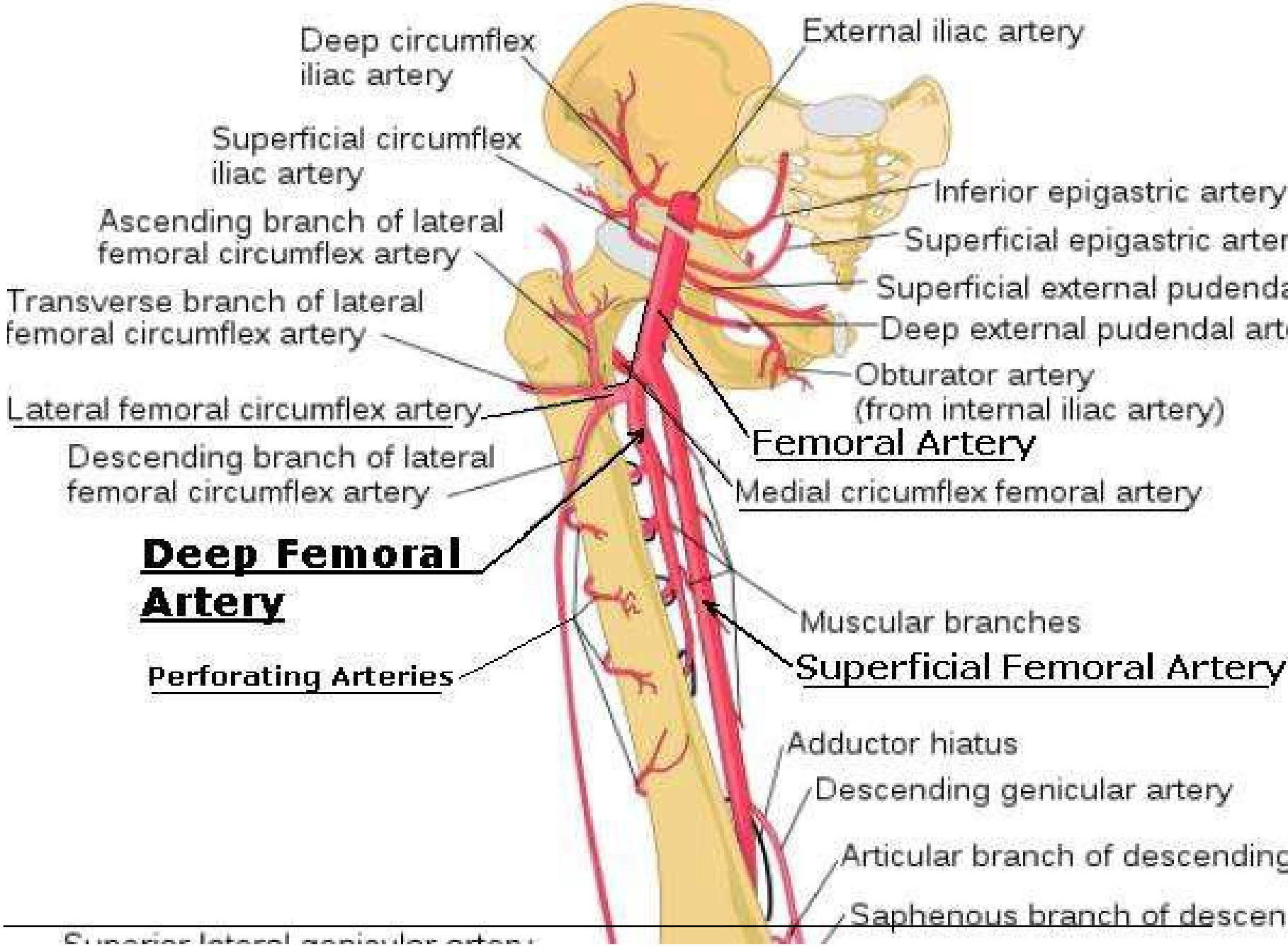
5. The femoral branch of the **genitofemoral nerve is** also lateral to the upper part of the femoral artery, within the femoral sheath, but lower down it passes to the front of the artery.

6. The **profunda femoris artery a branch of the** femoral artery itself, and its companion vein, lie behind the upper part of the femoral artery, where it lies on the pectineus.

– Lower down, however, the femoral and profunda arteries are separated by the adductor longus

BRANCHES OF FEMORAL ARTERY





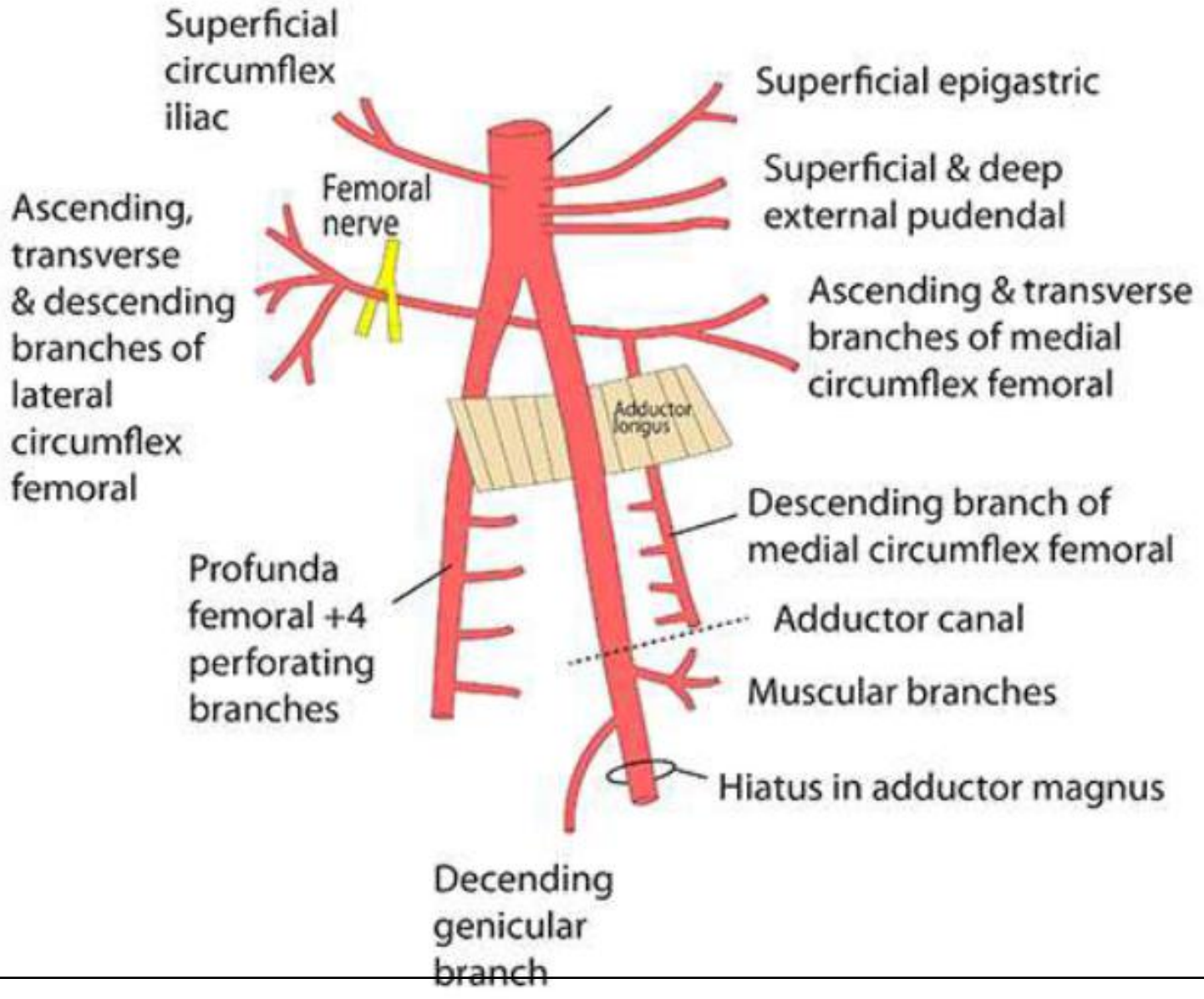
BRANCHES OF FEMORAL ARTERY

- **In the femoral triangle**:
  - 3 superficial branches:
    - Superficial epigastric artery,
      - Anastomose with the branches of inferior epigastric artery.
    - Superficial external pudendal artery.
      - Passes laterally parallel to inguinal ligament.
    - Superficial circumflex iliac artery.
      - Passes medially in front of femoral vein & then crossses the spermatic cord.
  - 3 deep branches:
    - Profunda femoris artery,
    - Deep external pudendal artery,
    - Muscular branches.

BRANCHES OF FEMORAL ARTERY

- 3 deep branches:
  - Profunda femoris artery.
    - ***FEMORAL ARTERY &*** profunda femoris artery straddles the adductor longus.
  - Deep external pudendal artery:
    - It originates just 4cm below the inguinal ligament passes medially behind or in front of femoral vein in front of pectineus and adductor longus. It pierces deep fasica to supply the **scrotum** or labium majus.
  - Muscular branches.

RIGHT FEMORAL ARTERY



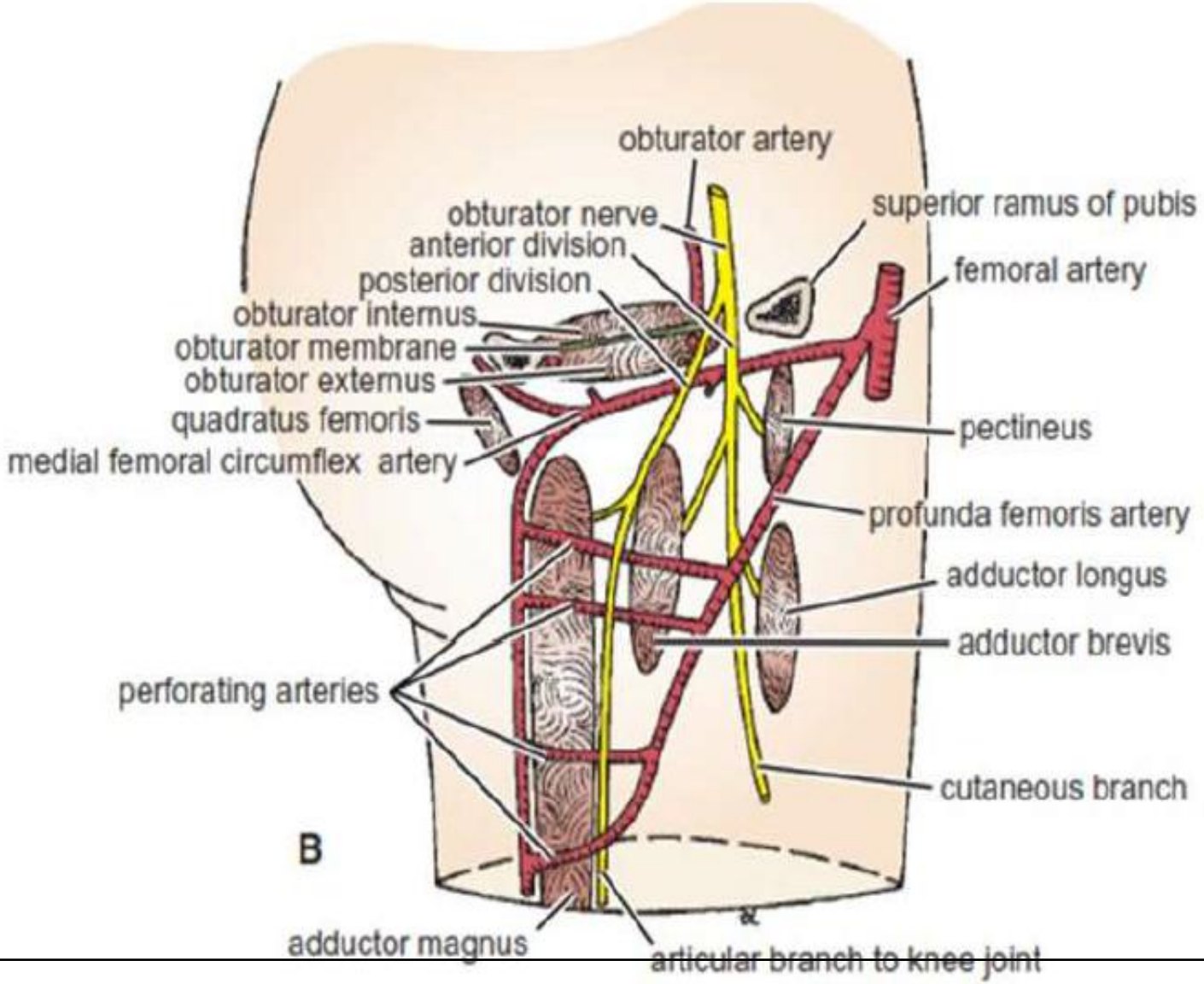
BRANCHES OF FEMORAL ARTERY

- **In the adductor canal**:
  - Muscular branches.
  - Descending genicular artery.
    - –The descending genicular artery leaves the canal by descending inside the substance of vastus medialis.
    - –It splits into articular and saphenous branches. The saphenous branch, also named saphenous artery, accompanies the **saphenous nerve** as it arises via the roof of adductor canal.

PROFUNDA FEMORIS ARTERY

- This is the largest branch of the femoral artery. It is the chief artery of supply to all the three compartments of the thigh.
- It arises from the lateral side of the femoral artery about 4 cm below the inguinal ligament. The origin lies in front of the **iliacus**. As the artery descends, it passes posterior to the femoral vessels.
- It leaves the femoral triangle by passing deep to the adductor longus. Continuing downwards, it passes first between the adductor longus and the **adductor brevis**, and then between the adductor longus and the adductor magnus. Its terminal part pierces the adductor magnus to end by becoming fourth perforating artery.

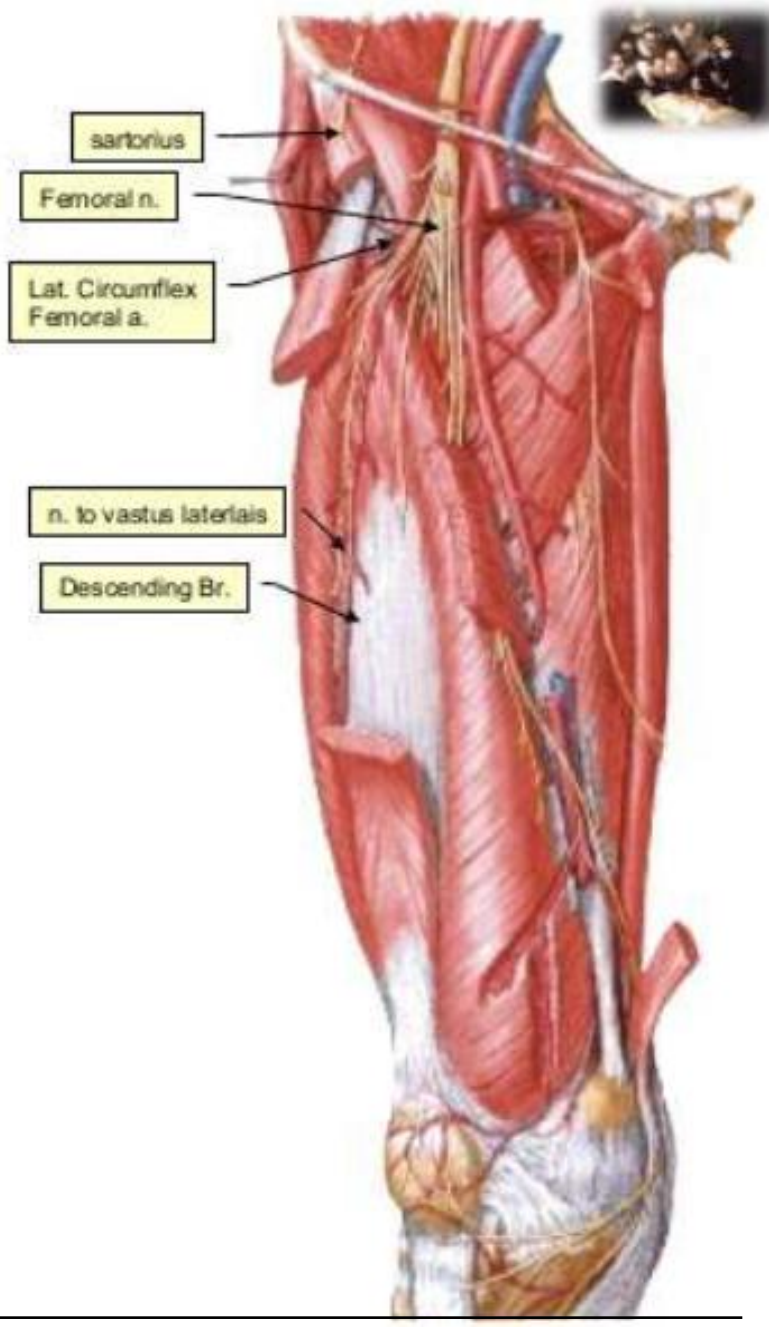
Profunda femoris & its branches



Profunda femoris artery

- **Lateral circumflex artery:**
  - Passes laterally between the branches of the femoral nerve.
  - Leaves the femoral triangle beneath sartorius.
  - Breaks up into three branches: ascending, transverse, and descending. The descending branch slopes downward accompanied by the nerve to vastus lateralis.
- **Medial circumflex artery:**
  - Passes posteriorly.
  - Leaves the femoral triangle between psoas major and iliacus.
  - Breaks into ascending and transverse branches.

- **3 or four perforating arteries**

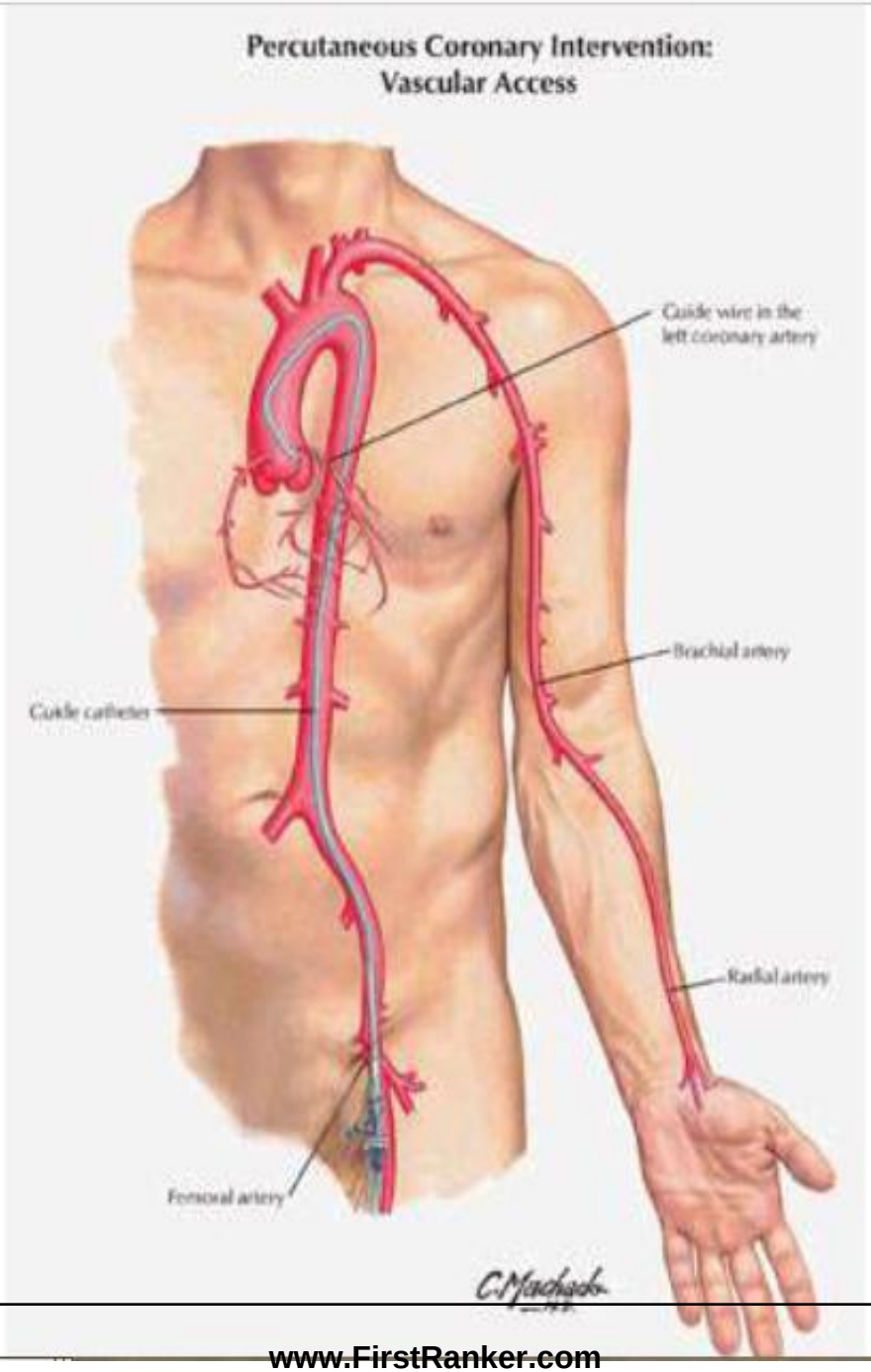


The profunda femoris artery

- The profunda femoris artery gives off the medial and lateral circumflex femoral arteries, and four perforating arteries.
- The **medial circumflex femoral artery** leaves the femoral triangle by passing posteriorly, between the pectineus and the psoas major muscles.
- The **lateral circumflex femoral artery** runs laterally between the anterior and posterior divisions of the femoral nerve, passes behind the **sartorius** and the rectus femoris, and divides into ascending, transverse and descending branches.
- **Perforating branches** – Consists of three or four arteries that perforate the adductor magnus, contributing to the supply of the muscles in the medial and posterior thigh.

CLINICAL SIGNIFICANCE

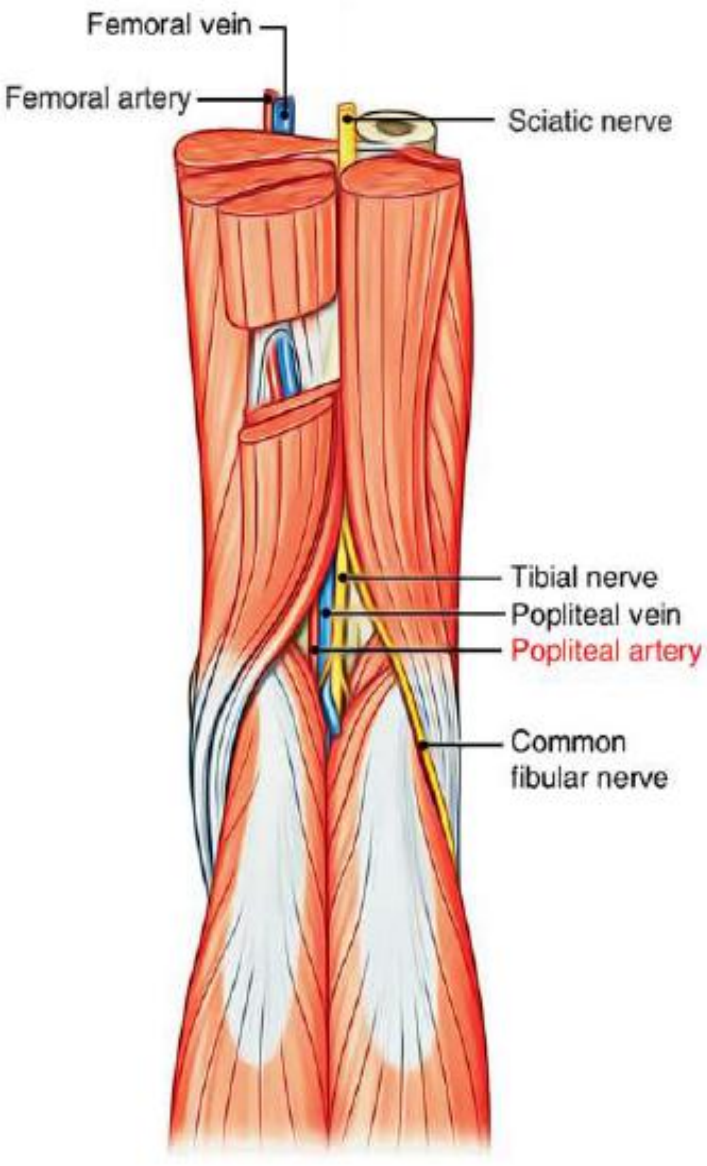
- **COMPRESSION, PALPATION AND CANNULATION OF FEMORAL ARTERY**
- The femoral artery can be compressed against the femoral head at the midinguinal point to control the bleeding in the distal part of the limb.
- The pulsations of the femoral artery are felt by the clinicians in the femoral triangle just below the midinguinal stage.
- Since the femoral artery is very superficial in the femoral triangle, it's the preferable artery for cannulation and injecting dye to do processes like angiography. It's also the favored vessel for performing the coronary angiography and angioplasty.



POPLITEAL ARTERY

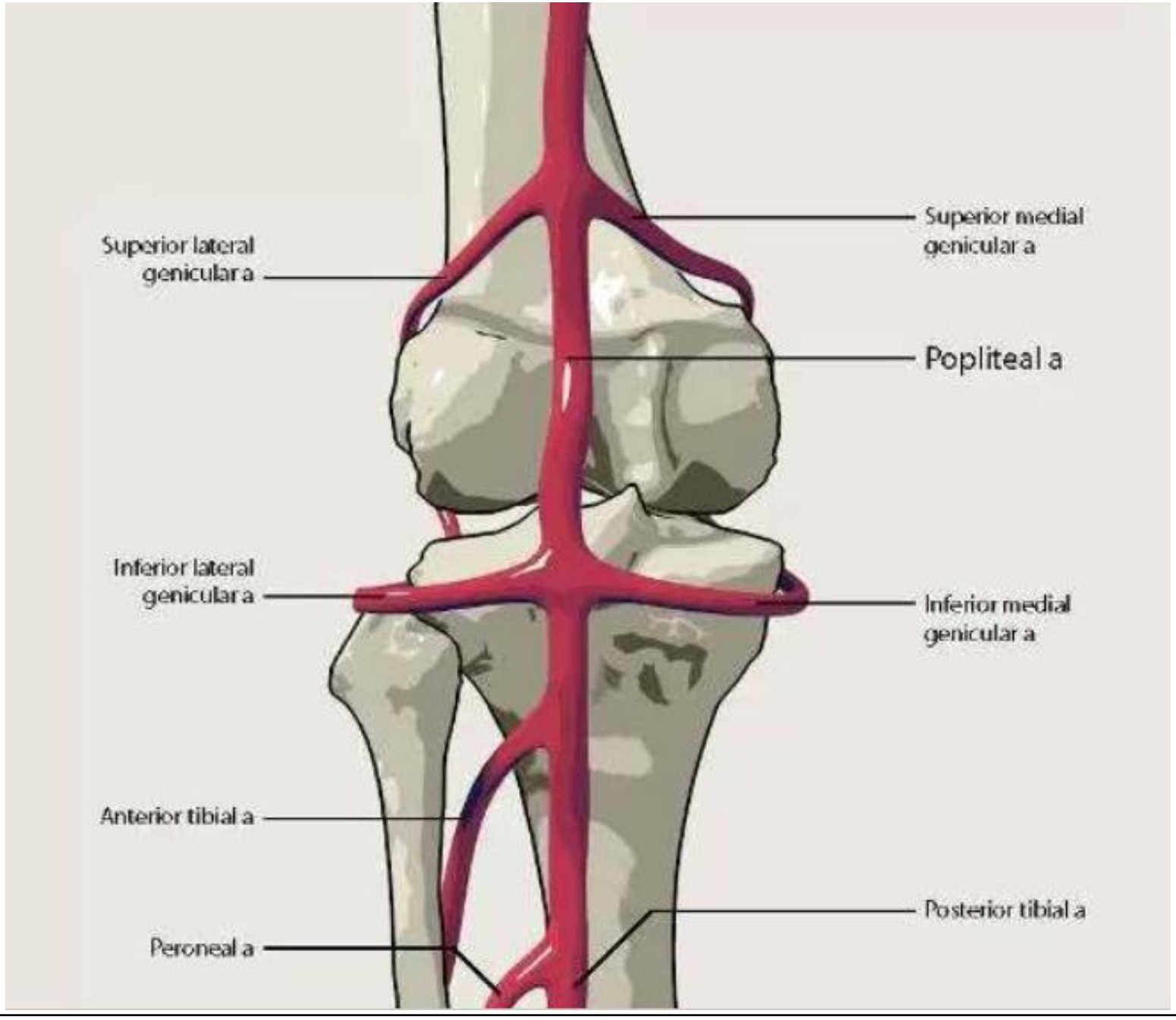
Popliteal artery

- It is the extension of femoral artery.
- The starting point is adductor hiatus.
- It gets divided into anterior and posterior tibial arteries when it comes across the floor of popliteal fossa by the medial to lateral side to reach the border of the popliteus.



Popliteal artery

- The **popliteal artery** descends down the posterior thigh, giving off genicular branches that supply the knee joint.
- It moves through the popliteal fossa, exiting sandwiched between the gastrocnemius and popliteus muscles.
- At the lower border of the **popliteus**, the popliteal artery terminates by dividing into the anterior tibial artery and the **tibioperoneal trunk.**
- The tibioperoneal trunk then divides into the **posterior tibial** and **peroneal arteries.**



BRANCHES OF POPLITEAL ARTERY

- All these are split into 3 groups-
  1. Cutaneous ,
  2. Muscular ,
  3. Articular (genicular).

1. **Cutaneous branches:** They pierce the roof and supply the overlying skin.

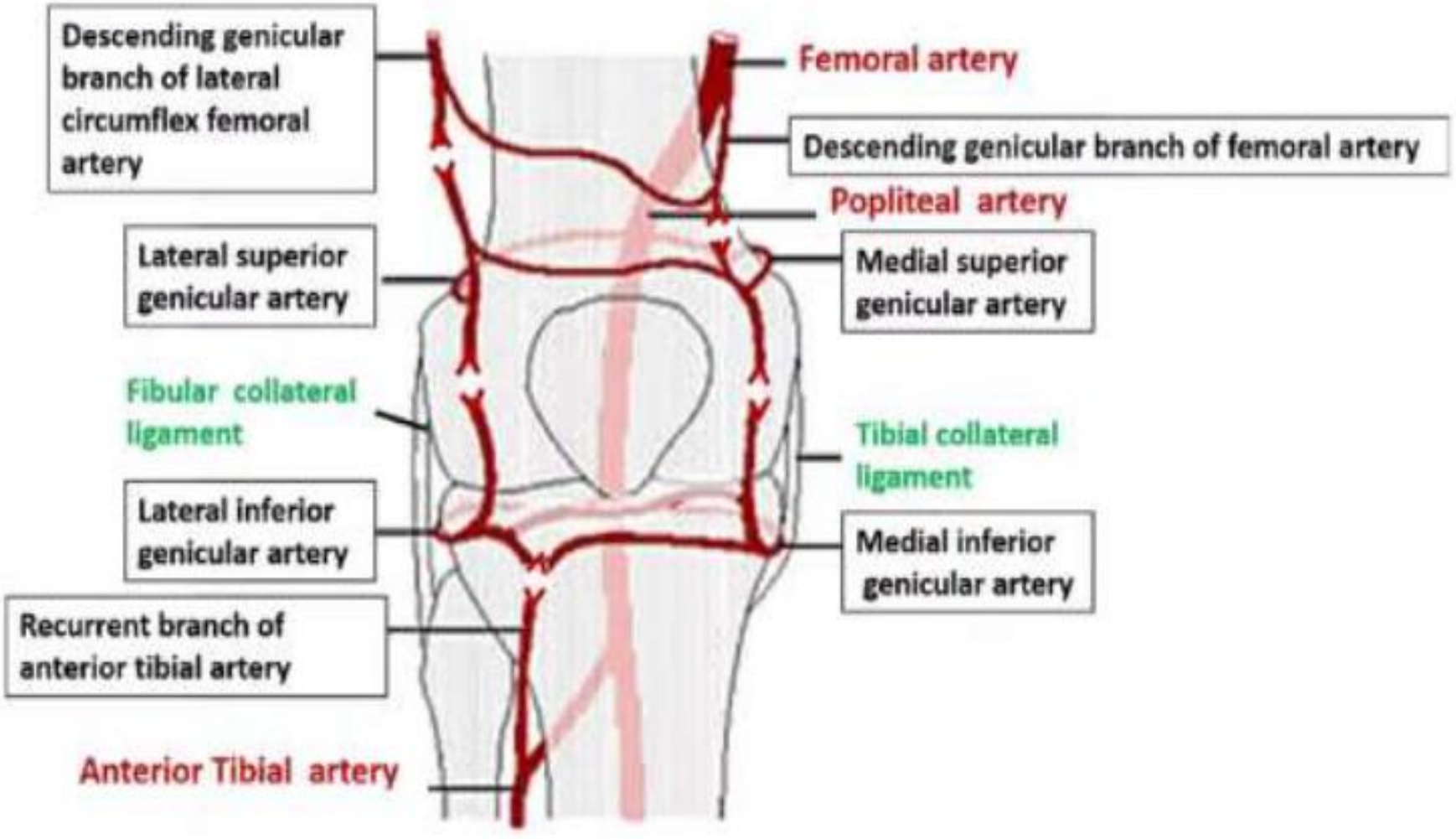
BRANCHES OF POPLITEAL ARTERY

2. Muscular branches:

- They're large and several in number.
- The upper branches (2 or 3 in number) supply **adductor magnus** and **hamstring** muscles.
- One or two of them anastomose with the fourth perforating artery.
- The lower muscular branches supply the **triceps surae** muscles (i.e., 2 heads of **gastrocnemius** and soleus) and **plantaris**.

BRANCHES OF POPLITEAL ARTERY

3. **Genicular (articular) branches:** They're 5 in number and provide the knee joint.
   1). **Superior medial and lateral genicular arteries:** They wind around the corresponding side of the femur immediately above the corresponding femoral condyles and take part in the formation of genicular anastomosis.
   2). **Inferior medial and lateral genicular arteries:** They wind around the corresponding tibial condyles and pass deep to the corresponding collateral ligaments of the knee joint to take part in the formation of genicular anastomosis.
   3). **Middle genicular artery:** It pierces the oblique popliteal ligament of the knee to supply the cruciate ligaments and synovial membrane of the knee joints.



Clinical Relevance: Popliteal Aneurysm

- An **aneurysm** is a dilation of an artery, which is greater than 50% of the normal diameter. The popliteal fascia (the roof of the popliteal fossa) is **tough** and non-extensible, and so an aneurysm of the popliteal artery has consequences for the other contents of the popliteal fossa.
- The **tibial nerve** is particularly susceptible to compression from the popliteal artery. The major features of tibial nerve compression are:
- Weakened or absent plantarflexion
- Paraesthesia of the foot and posterolateral leg
- An aneurysm of the popliteal artery can be detected by an obvious palpable **pulsation** in the popliteal fossa. An arterial bruit may be heard on auscultation