MUSCULOSKELETAL SYSTEM

<LOWER LIMB VESSEL>

1

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• The entrance to the **anterior** compartment of the leg is through lingual lig. & superior ramus, & to the **posterior** compartment is through **greater** sciatic foramen.

• **Femoral** artery is a continuation from **external iliac artery** when pass below inguinal ligament.

• **Position:** Midway between ASIS and pubis symphysis.

• Enter through sheet like structure (femoral sheet).

• Cross femoral triangle (superficial structure) - most muscle here is posteriorly located.

• **Relation:**
  
  – Sartorius is lateral to FA.

  – Iliopsoas & adductor muscles (longus & brevis) is posterior to it (all muscle is posterior).

  – Femoral vein and nerve (from medial to lateral) → vein → artery → nerve.

• **after** pass femoral triangle its run **deep** to the sartorius m. within **adductor canal** (canal located between sartorius & adductor muscles).

• **Terminate** at adductor hiatus (opening in the tendon of adductor magnus m.) → opening between anterior & posterior compartment of the thigh to **popliteal fossa**) as **popliteal artery** and here it will become **posteriorly**.

• **Braches:**

  The first 4 branch didn’t have relation to lower limb they only supply the skin.

1-Superficial circumflex iliaca (ASIS) → supply inguinal region laterally.

2-Superficial epigastric a. (Lower abdominal wall) supply umbilical’s region.

3-Superficial external pudendal a. (genital skin) runs medially
4-Deep external pudendal (genital skin) runs medially.
5-Profunda femoris a. (deep femoral art.) (deep a. of thigh) (thigh region) largest branch of femoral artery, arise from lateral side just below Inguinal lig. .
6-Descending genicular a. (knee joint) small (genicular mean to knee joint).

**Profunda Femoris Artery**

- **Deep to the adductor longus & superficial to brevis** (b.w adductor longus & brevis)
  * Adductor longus is *superficial* to adductor brevis.
- At its origin give two branch that supply the *hip joint*:
  a) **Medial femoral circumflex a.** (posterior).
  b) **Lateral femoral circumflex a.** (anterior) {its descending branch give BS to knee joint}.

- 1-4 perforating a. (perforate adductor magnus m.)

- **Trochanteric anastomosis** (related to greater trochanter):
  Form by (2 descending branch from (one from each) Superior gluteal a. & Inferior gluteal a. ) & (2 ascending branch from Medial femoral circumflex a. & Lateral femoral circumflex a.)

- **Cruciate anastomosis** (they cross each other) posterior medially located:
  Form by 1 descending branch from Inferior gluteal a. & 3 ascending branch from Medial femoral circumflex a. & Lateral femoral circumflex a. & 1st perforating a. from profunda.
Popliteal Artery

- Cont. from femoral artery through popliteal fossa (pass in the mid of popliteal fossa that have diamond shape, and its set posteriorly).
- The deepest one of the neurovascular structure in the popliteal fossa.
- Nerve, artery and vein here become ant. & post. and PA the most anterior one of posterior compartment.

Branches:
- a) Muscular branches
- b) Articular (geniculate) branches:
  1. Superior medial
  4. Inferior medial
  2. Superior lateral
  5. Inferior lateral
  3. Middle
- c) Terminal branches at the lower border of popliteus m.:
  • Anterior tibial a.
  • Posterior tibial a.

Genicular Anastomosis Around Knee Joint:

Form by 8 descending branch from:

1. Femoral a. \(\rightarrow\) Descending geniculara.
2. Descending branch of lateral femoral circumflex a.
3. Popliteal a. (geniculare) \(\rightarrow\) Superior medial & lateral \(\rightarrow\) Middle \(\rightarrow\) Inferior medial & lateral.
4. Anterior tibial a. \(\rightarrow\) Anterior tibial recurrent a.
Anterior Tibial Artery

• Smaller than posterior tibial
• Begin at the lower border of the popliteus m.
• Traverse the interosseous membrane
• Companies the deep peroneal n.
• Inferiorly its becomes superficial & pass deep only to the extensor retinaculum, between tendons of extensor hallucis longus m. and extensor digitorum longus m.
• Branches:
  a) Muscular branches
  b) Anastomotic branches (knee (ant. Recurrent a.) & ankle joints)
  c) At ankle becomes dorsalis pedis a.

Dorsalis Pedis Artery

• Superficial
• Relations
  Deep to Inferior extensor retinaculum
  Deep to 1st tendon of extensor digitorum (hallucis) previs m. Only one.
  1st dorsal interosseous m.: at the first the artery run superior to the muscle then it become deep to it.
• Branches:
  a) Lateral tarsal a.
  b) Arcuate a.
    1) Deep to the extensors
    2) Metatarsal branches 2-5
c) 1st dorsal metatarsal a. (come directly from dorsalis pedis ar.)

- At planter side join the planter arch

**Posterior Tibial Artery:**

- Posterior compartment divide into superficial & deep & it located at deep of leg.
- Anterior to Transverse intermuscular septum
- Posterior to Tibialis posterior
- Inferiorly:
  - Run Superficially
  - Deep to the flexor retinaculum (at the medial side)
- Branches:
  1) Peroneal a. (fibular) more laterally & post.
     - Deep to the flexor hallucis longus m.
     - Branches (can become ant.):
       a) Muscular branches
       b) Nutrient a. to fibula
       c) Perforating branch (Traverse the interosseous membrane)
  2) Muscular branches
  3) Nutrient a. to tibia
  4) Anastomotic branches (ankle joint)
  5) Medial and lateral planter aa. (terminating branches)

Medial planter a.

- Smaller
- Deep to abductor hallucis m.
• Branches:
  a) Muscular branches
  b) Cutaneous branches
  c) Articular branches

Lateral planter a.
  – Deep to the abductor hallucis m. and flexor digitorum brevis m.
  – Continue as planter arch (termination)
    • Planter digital aa.
  – Branches:
    • Muscular branches
    • Cutaneous branches
    • Articular branches

-planter arch : formed by lateral planter art. Of post. Tibial art. & the end of dorsalis pedis from ant. Tibial art.

Veins of the Lower Limb

- Digital and communicating veins
- (Dorsal venous network (arch)
- Lateral
- Medial
- Small saphenous vein
- Great saphenous vein
- Popliteal vein
- Femoral vein

Venae comitantes of the anterior and posterior tibial arteries
Venae comitantes of deep branches of the femoral artery
The doctor said that the deep veins have the same course of the arteries

**Great Saphenous Vein**

- Medial side
- Relations:
  - Ant to Medial malleolus
  - Posterior to Knee
  - Accompanies the saphenous n.
- Connected to the small saphenous v. by anastomotic branches
- Connected with deep vv. by perforating branches
- Tributaries:
  - Superficial circumflex iliac v.
  - Superficial epigastric v.
  - Superficial external pudendal v.
  - Accessory v.
  - Numerous other subcutaneous vv.
- Great saphenous vein is used in coronary bypass surgery:
  1)Ankle vein cutdown (more easily but we must be caution from cutting nerve)
  - Anterior and superior to the medial malleolus
  - Phlebitis could happen
  2)Groin vein cutdown (more safely)
    - 4 cm inferior and lateral to the pubic tubercle
Small Saphenous Vein

- Lateral side

- Relations:
  - Post. Lateral malleolus
  - Accompanies the sural n.
  - Lateral to the calcaneal tendon
  - Between the heads of the gastrocnemius m.

- Tributaries
  - Small subcutaneous vv.
  - Communicating veins with deep vv.
  - Anastomotic branches with the great saphenous v

Venogram of Femoral Vein and its Tributaries

how do we know that it is vein no artery? Vein have valves.
-in the next slides(27,28,29) the doctor doesn’t add anything.