MEDICAL EDUCATION RESOURCE

Front of Thigh:Facts to Remember & Clinicoanatomical Problem

Facts to Remember

- The **femoral artery** is the main arterial supply of the front of the thigh.
- The **femoral vein** is the direct continuation of the popliteal vein and becomes the external iliac vein above the inguinal ligament.
- The **femoral nerve (L2–L4)** is the largest branch of the lumbar plexus and the main motor supply to the anterior compartment.
- The **iliopsoas** is the chief flexor of the thigh.
- The **quadriceps femoris** is the chief extensor of the knee.
- The **sartorius** is the longest muscle in the body and acts across both the hip and knee joints.
- The **rectus femoris** is the only part of quadriceps that flexes the thigh and extends the knee.
- The **femoral triangle** serves as an important landmark for palpation, pulse, and vascular procedures.
- The **adductor canal** (Hunter's canal) transmits the femoral artery, vein, and saphenous nerve from the femoral triangle to the popliteal fossa.

- The **vastus medialis** prevents lateral displacement of the patella during knee extension.
- The **psoas major** acts as a guide for locating the lumbar plexus during dissections.
- The **patellar reflex** assesses integrity of **L3–L4 spinal segments**.
- The **femoral ring** is a potential site for femoral hernia, more common in females.
- **Holden's line** limits spread of urine into the thigh in urethral injuries.

Clinicoanatomical Problem

A 45-year-old woman presents with a **pulsatile swelling in the upper medial thigh** and complains of **pain radiating down the limb**.

Questions to Consider:

1. What is the likely diagnosis?
   ? **Femoral artery aneurysm.**
2. Which structure might be compressing nearby nerves?
   ? The **femoral nerve**, resulting in anterior thigh pain and weakness of knee extension.
3. How can this be differentiated from a femoral hernia?
   ?
   - **Femoral artery aneurysm:** Pulsatile and has an audible bruit; lies **below and lateral to pubic tubercle**.
   - **Femoral hernia:** Non-pulsatile, reducible swelling that may show cough impulse.

4. What is the management implication?
   ? Requires **surgical repair or endovascular intervention**, with care to avoid injury to the femoral vein and nerve.

Clinicoanatomical Problems

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1. Femoral Artery Aneurysm

Clinical Presentation:
A middle-aged man reports a **pulsatile swelling in the upper thigh**, tender on pressure. There is a **bruit** on auscultation and **distal pulses are diminished**.

Anatomical Basis:

- The aneurysm occurs in the **femoral triangle**, where the artery lies **superficially** beneath the skin and fascia.
- The **femoral vein** lies medial, and **femoral nerve** lateral — both may be compressed, causing **venous congestion** or **anterior thigh pain**.

Key Diagnostic Sign:
Swelling lies **below the inguinal ligament** and **lateral to pubic tubercle**, distinguishing it from inguinal hernia.

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2. Femoral Hernia

Clinical Presentation:
A swelling appears **below and lateral to pubic tubercle**, more common in women, becomes prominent on coughing or straining.

Anatomical Basis:

- Herniation occurs through the **femoral ring**, the upper opening of the **femoral canal**.
- Boundaries of femoral ring:
    - *Anterior:* Inguinal ligament
    - *Posterior:* Pectineus and fascia
    - *Medial:* Lacunar ligament
    - *Lateral:* Femoral vein
- **Complication:** Strangulation due to rigid boundaries; can compress the **femoral vein**, leading to leg edema.

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3. Femoral Vein Cannulation

Clinical Context:
Used when peripheral veins are collapsed (e.g., shock).

Anatomical Point:

- Femoral vein lies **medial to femoral artery** just **below the inguinal ligament**.
- The needle is inserted **1.5 cm medial to femoral pulse**, directed upward.
- Incorrect placement risks puncturing the **femoral artery** or **femoral canal lymph nodes**.

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4. Psoas Abscess

Clinical Presentation:
Patient with **tuberculosis of lumbar vertebrae** presents with a **fluctuant swelling in the femoral triangle** and **pain on hip flexion**.

Anatomical Basis:

- Infection spreads along the **psoas sheath** into the **femoral triangle** beneath fascia lata.
- The **psoas major** inserts into the **lesser trochanter**, and contraction during walking aggravates pain.
- May be mistaken for enlarged lymph node or hernia.

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5. Iliopsoas Spasm

Clinical Presentation:
Patient keeps the hip **flexed and externally rotated**; attempts at extension cause severe pain. Seen in **tuberculous hip arthritis** or **retroperitoneal inflammation**.

Anatomical Basis:

- **Iliopsoas** acts as a strong hip flexor.
- Inflammation of the muscle or surrounding fascia triggers reflex contraction.
- Passive hip extension stretches the inflamed tendon, producing pain.

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6. Femoral Nerve Injury

Clinical Presentation:
Following pelvic surgery or deep wound in groin, patient presents with **loss of knee extension**, **absent patellar reflex**, and **sensory loss over anterior and medial thigh**.

Anatomical Basis:

- Femoral nerve (L2–L4) supplies **quadriceps femoris**, the main extensor of the knee.
- Damage causes paralysis of quadriceps ? leg buckles during walking.

- **Saphenous nerve** branch explains sensory loss over medial leg.

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7. Meralgia Paraesthetica

Clinical Presentation:
Burning pain, tingling, or numbness over **anterolateral thigh** without motor weakness.

Anatomical Basis:

- Caused by compression of **lateral cutaneous nerve of thigh (L2–L3)** under **inguinal ligament** near ASIS.
- Common in obesity, tight belts, pregnancy, or prolonged sitting.
- Pain worsens with hip extension, relieved by flexion.

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8. Varicose Veins

Clinical Presentation:
Tortuous, dilated veins on the **medial side of thigh and leg**, with heaviness and swelling.

Anatomical Basis:

- Due to **incompetence of valves** in the **great saphenous vein** or **perforators** connecting to deep veins.
- Blood reflux causes venous congestion.
- Located along the course of **femoral triangle and adductor canal**.

Special Test:
Trendelenburg's Test determines the site of valvular incompetence.

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9. Patellar Reflex Loss

Clinical Presentation:
Loss of knee jerk reflex when patellar ligament is tapped.

Anatomical Basis:

- Reflex arc involves **L3–L4 segments** of spinal cord through **femoral nerve** to **quadriceps**.
- Absence indicates lesion of **femoral nerve** or **L3–L4 root**.

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10. Iliotibial Band Syndrome

Clinical Presentation:
Runner complains of **pain on the lateral side of knee** after prolonged activity.

Anatomical Basis:

- Due to friction between the **iliotibial tract** and **lateral femoral condyle** during repetitive flexion and extension.
- Common overuse injury in athletes; relieved by stretching IT band and strengthening hip abductors.

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11. Quadriceps Contracture (Volkmann Type)

Clinical Presentation:
Child with history of **improper intramuscular injection** develops **restricted knee flexion**.

Anatomical Basis:

- Injection fibrosis leads to shortening of **vastus intermedius** or **rectus femoris**.
- Knee cannot flex beyond 30–40°, palpable taut band in front of thigh.

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12. Posture and Gravity Line

Clinical Insight:

- The **iliotibial tract** and **quadriceps** play key roles in maintaining the **upright posture** by stabilizing knee extension.
- Weakness causes **buckling of the knee** during walking or standing.

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13. Adductor Canal Block

Clinical Context:
Used in lower-limb surgeries to provide anesthesia to **saphenous nerve** and **branches of femoral nerve** to knee.

Anatomical Basis:

- Local anesthetic injected between **vastus medialis** and **adductor longus/magnus** in the canal.
- Provides analgesia for **knee and medial leg** without affecting motor function of quadriceps.

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14. Housemaid’s and Clergyman’s Knee

Clinical Presentation:
Painful swelling over **front of patella** or **below patellar ligament**.

Anatomical Basis:

- **Prepatellar bursitis (Housemaid’s knee):** due to kneeling on hard surfaces.
- **Infrapatellar bursitis (Clergyman’s knee):** deeper inflammation below patellar ligament.
- Involves **bursae of the front of thigh** continuous with knee structures.

15. Compartment Syndrome

Clinical Presentation:
Following thigh injury, patient complains of **severe pain, swelling, and reduced distal pulse**.

Anatomical Basis:

- Tight **fascia lata** forms an unyielding boundary around thigh muscles.
- Hemorrhage or edema within the **anterior compartment** compresses vessels and nerves.
- Untreated, leads to **ischemic necrosis** and permanent muscle damage.

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16. Weakness of Hip Flexion

Clinical Presentation:
Difficulty in climbing stairs or getting up from sitting position.

Anatomical Basis:

- Caused by paralysis of **iliopsoas** (L1–L3) or injury to **femoral nerve**.
- Seen in diabetes, psoas abscess, or after abdominal surgery.

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17. Surgical Importance of Femoral Triangle

Applications:

- Site for **femoral artery ligation** in popliteal aneurysm.
- **Cardiac catheterization** or **angiography** access route.
- **Femoral vein puncture** for central venous pressure monitoring.

- **Femoral nerve block** for lower limb surgeries.