MEDICAL EDUCATION RESOURCE

Bones: Clinicoanatomical Problem

Clinicoanatomical Problem

Problem 1 — Elderly female with hip pain after a minor fall

History: A 72-year-old woman slips in her bathroom and cannot stand. The limb is **shortened and externally rotated**.
Interpretation:

- The likely diagnosis is a **fracture of the neck of the femur**.
- Mechanism: osteoporosis weakens the neck, which lies inside the capsule.
  Anatomical correlation:
- The **retinacular arteries** (branches of the *medial circumflex femoral artery*) that supply the femoral head run along the neck.
- These vessels are torn in intracapsular fractures ? **avascular necrosis** of the head.
  Clinical takeaway:
- Intracapsular fractures heal poorly and need **hip replacement**, while extracapsular fractures heal faster.

Problem 2 — Young athlete with pain below the knee

History: A 15-year-old runner complains of a tender swelling just below the patella.
Interpretation: Osgood–Schlatter disease (osteochondritis of the tibial tuberosity).
Anatomical correlation:

- Occurs at the site of **patellar ligament attachment** on the tibial tuberosity.

- Repetitive pull of *quadriceps femoris* causes micro-fractures of the secondary ossification centre.
  Management: Rest, physiotherapy, and anti-inflammatory measures.

Problem 3 — Sudden inability to stand on toes after hearing a "snap"

History: A middle-aged man playing badminton feels a sharp pain at the back of the heel.
Interpretation: Rupture of the Achilles (tendo calcaneus) tendon.
Anatomical correlation:

- The *tendo calcaneus* inserts on the **posterior surface of the calcaneus**.

- Rupture leads to **loss of plantar flexion**, making it impossible to stand on toes.
  Management: Surgical repair or immobilization with foot plantar flexed.

Problem 4 — Numbness over dorsum of foot after leg injury

History: A patient struck on the **lateral side of the leg below the knee** develops **foot drop** and **loss of sensation** on dorsum of foot.
Interpretation: Common peroneal nerve injury at fibular neck.
Anatomical correlation:

- The nerve winds around the **neck of fibula**, making it superficial and prone to injury.

- Loss of *dorsiflexors* (tibialis anterior, EHL, EDL) ? *foot drop*.
  Management: Splinting and physiotherapy; surgical decompression if entrapment present.

Problem 5 — Heel pain on first step in the morning

History: A 45-year-old woman has sharp heel pain that eases after walking for some time.
Interpretation: Calcaneal spur with plantar fasciitis.
Anatomical correlation:

- Due to chronic traction of the **plantar aponeurosis** on the *medial process of the calcaneal tuberosity*.
- Bony outgrowth (spur) irritates plantar fascia and nerves.
  Management: Heel pads, physiotherapy, corticosteroid injection.

Problem 6 — Pain and swelling on medial side of midfoot

History: A long-distance runner presents with tenderness over the **navicular tuberosity**.
Interpretation: Accessory navicular bone inflammation (os tibiale externum).
Anatomical correlation:

- *Tibialis posterior* inserts on the navicular tuberosity.
- An accessory ossicle at this site can cause friction and pain due to footwear pressure.
  Management: Padding, orthotics, or surgical excision if symptomatic.

Problem 7 — "Bimalleolar" ankle fracture

History: A twisting injury causes pain, deformity, and swelling around ankle.
Interpretation: Pott's fracture.
Anatomical correlation:

- Caused by *forced eversion* of foot.
- *Deltoid ligament* pulls medial malleolus ? fracture.
- Body of talus pushes laterally ? fracture of *fibular shaft or lateral malleolus*.
  Clinical sign: Foot appears abducted and everted.

Problem 8 — Pain in lateral foot after long walk

History: Hiker feels pain near the cuboid region with no visible fracture on X-ray.
Interpretation: Cuboid syndrome (subluxation).
Anatomical correlation:

- Subluxation of cuboid at *calcaneocuboid joint* due to pull of *peroneus longus tendon* running through its groove.
- Produces lateral foot pain and altered gait.
  Treatment: Manual manipulation (“cuboid whip”), taping, rest.

Problem 9 — Young adult with swelling over anterior knee

History: 25-year-old worker kneeling long hours develops anterior knee swelling.
Interpretation: Prepatellar bursitis (“Housemaid’s knee”).
Anatomical correlation:

- The *prepatellar bursa* lies **between the patella and skin**.
- Repeated friction and trauma cause inflammation and fluid accumulation.
  Treatment: Rest, aspiration, antibiotics if infected.

Problem 10 — Child with limping gait and hip pain

History: 8-year-old boy with hip pain and limp; X-ray shows collapse of femoral head.
Interpretation: Perthes disease (avascular necrosis of femoral head).
Anatomical correlation:

- *Epiphyseal blood supply* to femoral head is poor in children.
- Thrombosis or trauma to *medial circumflex femoral artery* ? ischemic necrosis.
  Treatment: Rest, traction, orthosis, or surgery.

Problem 11 — Flatfoot with pain on prolonged standing

History: A shopkeeper complains of foot pain and fatigue after standing all day.
Interpretation: Collapse of medial longitudinal arch (flatfoot).
Anatomical correlation:

- Weakness of *spring ligament*, *tibialis posterior*, and *abductor hallucis*.
- The *head of talus* descends, pressing the *navicular bone* downward.
  Management: Footwear with medial arch support, exercises.

Problem 12 — Pain in forefoot while walking

History: Middle-aged woman feels burning pain below 2nd and 3rd metatarsal heads.
Interpretation: Metatarsalgia.
Anatomical correlation:

- Pressure over the *transverse arch* of foot causes irritation of digital nerves between metatarsal heads.
  Treatment: Soft insoles, metatarsal pads.

Problem 13 — Child with inward-turned foot

History: A 6-month-old baby has both feet turned inward since birth.
Interpretation: Congenital talipes equinovarus (clubfoot).
Anatomical correlation:

- *Talus* and *calcaneus* are medially rotated and inverted.
- Associated shortening of *tendo calcaneus* and *tibialis posterior*.
  Treatment: Gradual correction by Ponseti casting or surgery.

Problem 14 — Tender swelling over lateral malleolus after inversion injury

History: Twisting ankle during sports, pain on lateral side.
Interpretation: Sprain or fracture at base of 5th metatarsal (Jones fracture).
Anatomical correlation:

- Caused by traction of *peroneus brevis tendon* attached to styloid process of 5th metatarsal.
  Management: Immobilization or screw fixation.

Problem 15 — Difficulty in knee extension after patellar trauma

History: After a fall on knee, patient unable to straighten leg.
Interpretation: Transverse fracture of patella.
Anatomical correlation:

- Upper fragment pulled upward by *quadriceps*, lower by *patellar ligament*.

- Disruption causes *loss of active extension*.
  Treatment: Tension-band wiring or partial patellectomy.

These problems emphasize **anatomical reasoning behind clinical findings** — the essence of *clinicoanatomical correlation* in the study of bones of the lower limb.