

Clinicals of Lower Limb

Fractures of Pelvic Bones

Mechanisms of Injury

Causes

i) Direct trauma (e.g. road traffic accident )

ii) Indirect force

→ Fall on feet

→ Force transmitted upward

Common Sites of Fracture

- Pubic rami
- Acetabulum

- Sacroiliac joint region
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★ Exam Pearl: Fractures occur at structurally weak points

! Complications

Pelvic fracture → Soft tissue injury → Damage to →
Urinary bladder + Urethra !

★ Clinical Insight: Always suspect urinary injury in pelvic trauma



Neck-Shaft Angle of Femur

 Normal Values

Age	Angle
Child	~160°
Adult	~125°

 Abnormalities

 Coxa Valga

Feature	Description
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Angle	Increased
Cause	Congenital hip dislocation
Effect	Limited adduction

▼ Coxa Vara

Feature	Description
Angle	Decreased
Causes	Neck fracture, slipped epiphysis
Effect	Limited abduction

Flowchart: Angle Changes

- \uparrow angle \rightarrow Coxa valga \rightarrow \downarrow adduction
 - \downarrow angle \rightarrow Coxa vara \rightarrow \downarrow abduction
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 Exam Trick: Valga = "wide angle", Vara = "reduced angle"


Fracture of Neck of Femur


Subcapital Fracture


 Common In:

- Elderly
- Postmenopausal females (osteoporosis)

 Flowchart: Mechanism

Fall / trauma → Neck of femur fracture → Disruption of blood supply → Avascular necrosis 

 Complication: Avascular necrosis of femoral head (due to damage to retinacular arteries)

 Limb Changes

Fracture → Muscle pull (RF + adductors + hamstrings) →

Upward displacement → True shortening

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Lateral rotators dominate → External rotation of limb


★ Classic Clinical Sign: Shortened, externally rotated limb

💥 Intertrochanteric Fracture

🧩 Features

Feature	Description
Age group	Middle-aged / elderly
Cause	Trauma
Type	Extracapsular

 Blood Supply: Good blood supply preserved

 Exam Pearl: Lower risk of avascular necrosis compared to neck fractures

 Flowchart: Comparison

Neck fracture → Intracapsular → Poor blood supply → AVN risk !

Intertrochanteric fracture → Extracapsular → Good blood supply → Better healing

 Summary

Key Concepts

- Pelvic fractures → risk to bladder & urethra
- Neck-shaft angle:
 - ↑ → Coxa valga
 - ↓ → Coxa vara
- Neck fracture:
 - Elderly
 - AVN risk
 - Shortened, externally rotated limb
- Intertrochanteric fracture:
 - Better prognosis

Recall

Pelvic trauma → Think urinary injury

Neck fracture → Think AVN + shortening + external rotation

🌟 Fracture of Upper 1/3 of Femoral Shaft

(Just below lesser trochanter)

🧠 Mechanism of Deformity

▲ Proximal Fragment

- i. Abducted (gluteus medius & minimus)
 - ii. Laterally rotated (gluteus maximus + short lateral rotators)
 - iii. Flexed (iliopsoas attached to lesser trochanter)
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▼ Distal Fragment

- i. Pulled upward (hamstrings + quadriceps)
 - ii. Moves behind proximal fragment
 - iii. Adducted (adductors)
 - iv. Laterally rotated
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★ Exam Pearl: Combination deformity = flexion + abduction + lateral rotation (proximal fragment)

💥 Fracture of Middle 1/3 of Femoral Shaft

🧠 Key Deformity

Mid-shaft fracture → Strong muscle pull (quadriceps + hamstrings) → Distal fragment pulled upward → Overlap of fragments → Severe shortening of limb

★ Exam Pearl: Maximum shortening occurs in mid-shaft fractures


💥 Fracture of Distal End (Supracondylar)

🧠 Mechanism of Deformity

Distal femur fracture → Gastrocnemius pulls distal fragment → Fragment moves backward → Lies close to popliteal artery → Risk of vascular injury ⚠️

Clinical Importance

- Popliteal artery lies directly behind femur
 - High risk of:
 - Arterial injury
 - Limb ischemia
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 Exam Pearl: Always check distal pulses in supracondylar fractures

Additional Risk

- Slipped epiphysis can also injure popliteal artery
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Femoral vs Inguinal Hernia Comparison



Comparison Table

Feature	Inguinal Hernia	Femoral Hernia
Common in	Males 🧑	Females 🧑
Pathway	Inguinal canal	Femoral canal
Position	Above & medial to pubic tubercle	Below & lateral !
Strangulation	Less common	More common ⚠️
Treatment	Often conservative	Surgical



Flowchart: Key Differentiation

Groin swelling → Above & medial to pubic tubercle →

Inguinal hernia

Groin swelling → Below & lateral → Femoral hernia

Integrated Clinical Understanding

Fracture Patterns Summary

Upper shaft → Complex deformity (flexion + abduction + rotation)

Middle shaft → Maximum shortening

Distal shaft → Backward displacement → vascular risk

Final High-Yield Summary

- Muscle pull determines fracture deformity
 - Mid-shaft fractures → greatest overlap
 - Supracondylar fractures → popliteal artery injury risk
 - Femoral hernia:
 - Below & lateral
 - More dangerous (strangulation)
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Exam Rapid Recall

Femur fracture → Think muscle pull = deformity

Distal femur fracture → Think popliteal artery ⚠

Groin swelling → Use pubic tubercle relation

-> The End <-