Hip Fractures

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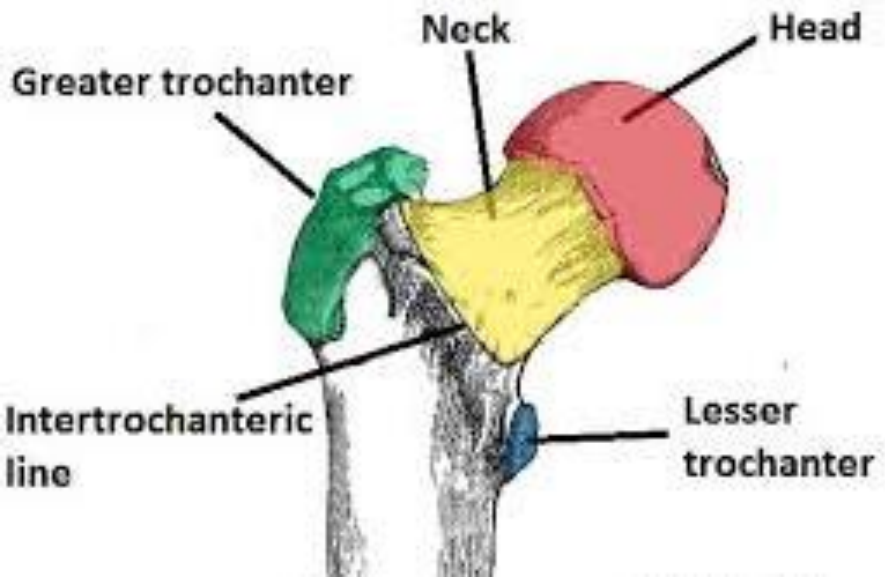
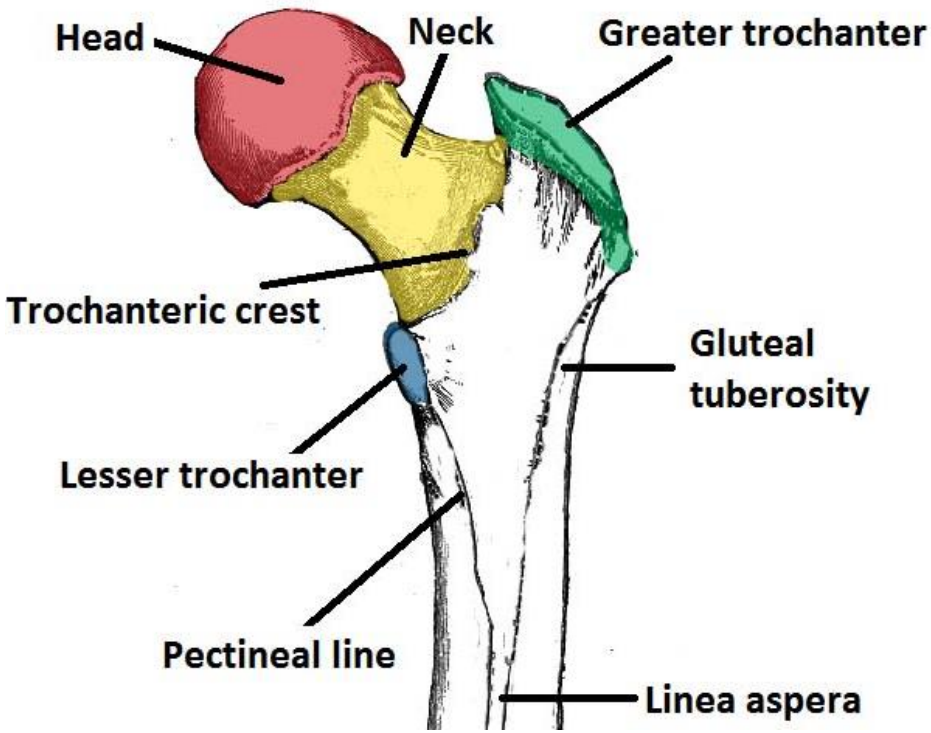
Learning Objectives

- Identify anatomy of the proximal femur
- Identify vascular supply of the proximal femur
- Clarify the mechanisms of injury
- Identify the signs & symptoms of PF fractures
- Classification of PF fractures
- Identify the principles of management


Neck
Head
Greater trochanter
Intertrochanteric line
Lesser trochanter

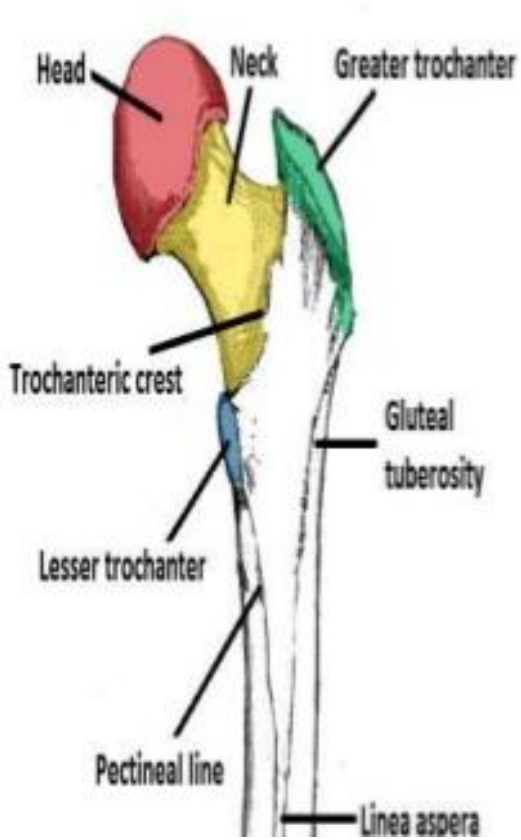

Head
Neck
Greater trochanter
Trochanteric crest
Gluteal tuberosity
Lesser trochanter
Pectineal line
Linea aspera

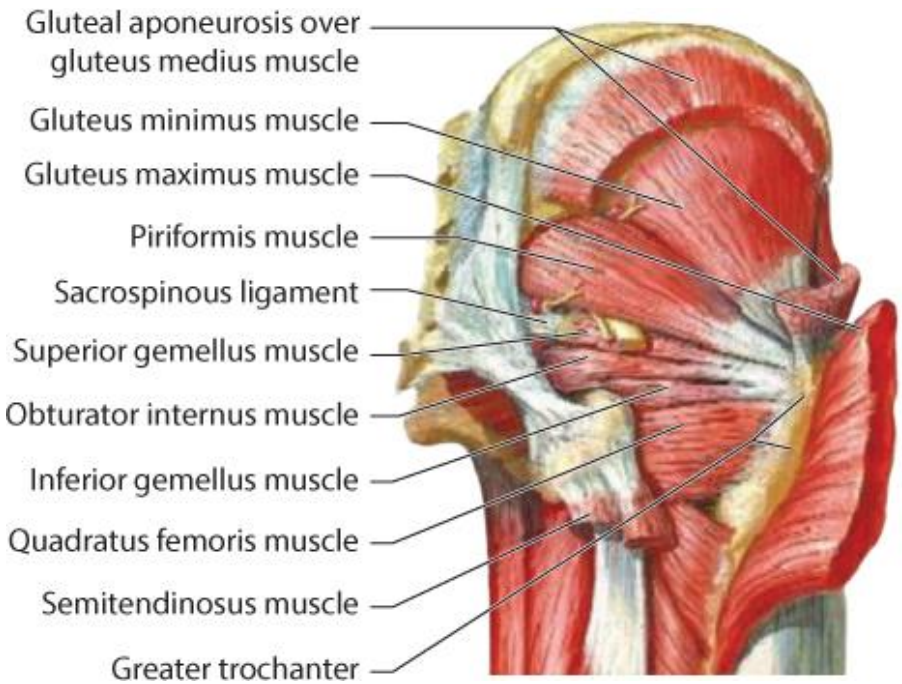
ANATOMY OF NECK OF FEMUR

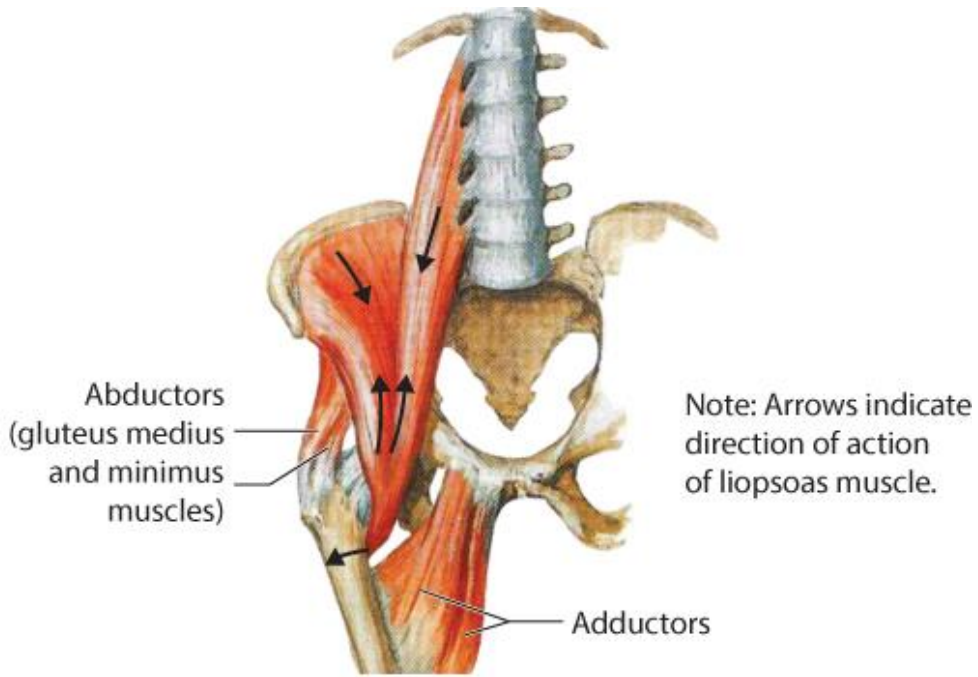
- Neck connects head with shaft and is about 3.7 cm long.
- It makes angle with the shaft 130+/- 7 degree(less in female due to their wider pelvis).

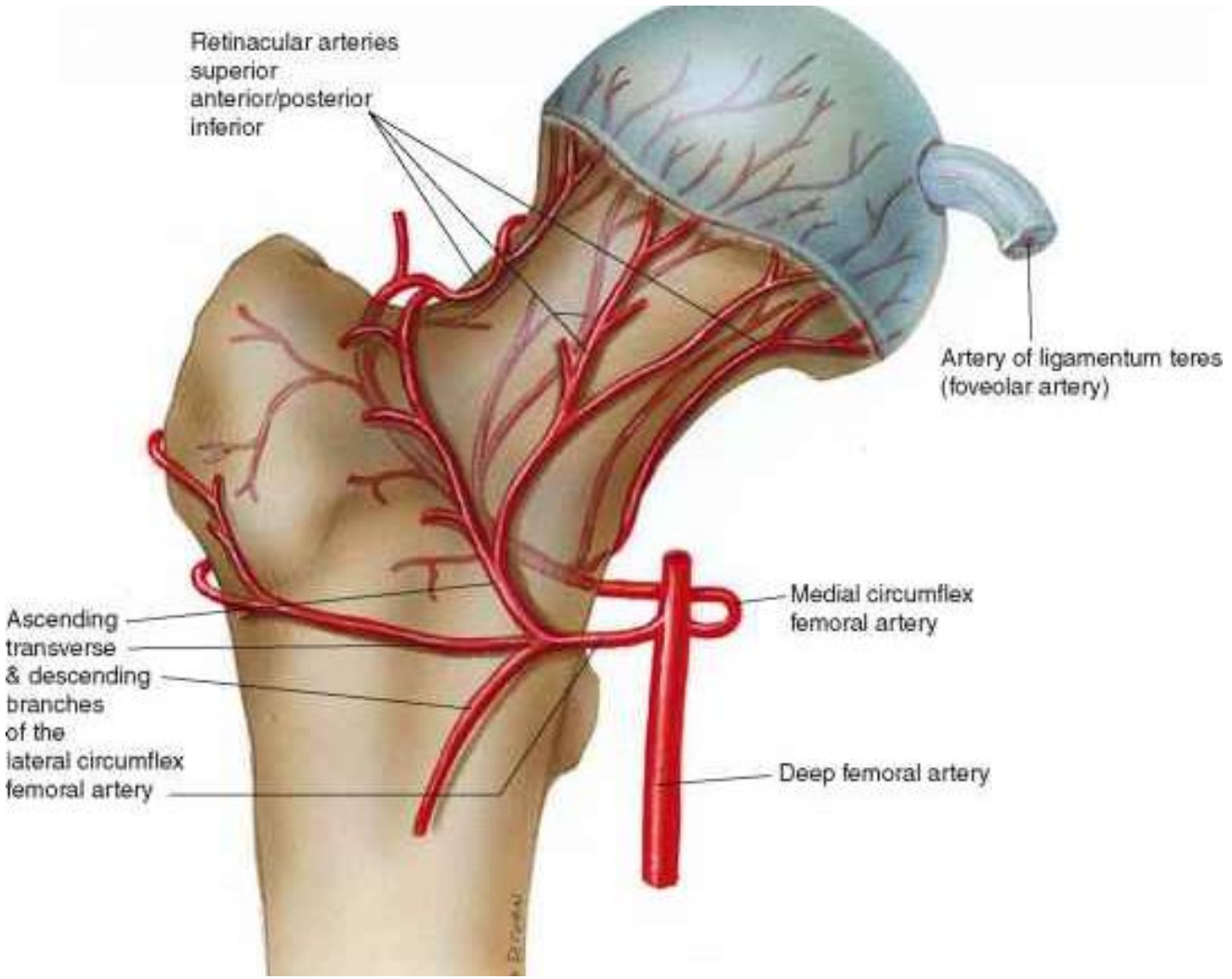
It facilitate movements of hip joint.

- It is strengthened by calcar femorale (bony thickening along its concavity).




Gluteal aponeurosis over gluteus medius muscle
Gluteus minimus muscle
Gluteus maximus muscle
Piriformis muscle
Sacrospinous ligament
Superior gemellus muscle
Obturator internus muscle
Inferior gemellus muscle
Quadratus femoris muscle
Semitendinosus muscle
Greater trochanter


Abductors (gluteus medius and minimus muscles)
Adductors
Note: Arrows indicate direction of action of liopsoas muscle.


Retinacular arteries
superior
anterior/posterior
inferior
Artery of ligamentum teres
(foveolar artery)
Medial circumflex
femoral artery
Ascending
transverse
& descending
branches
of the
lateral circumflex
femoral artery
Deep femoral artery

Blood supply

Crock described the arteries of the proximal end of the femur in three groups

(a) an extracapsular arterial ring located at the base of the femoral neck;

(b) ascending cervical branches of the extracapsular arterial ring on the surface of the femoral neck (known as retinacular arteries)

(c) the arteries of the ligamentum teres

Mechanism of Injury

- Old patients: result from low energy trauma in osteoporotic bones
- younger patients following high energy trauma like motor vehicle accidents.

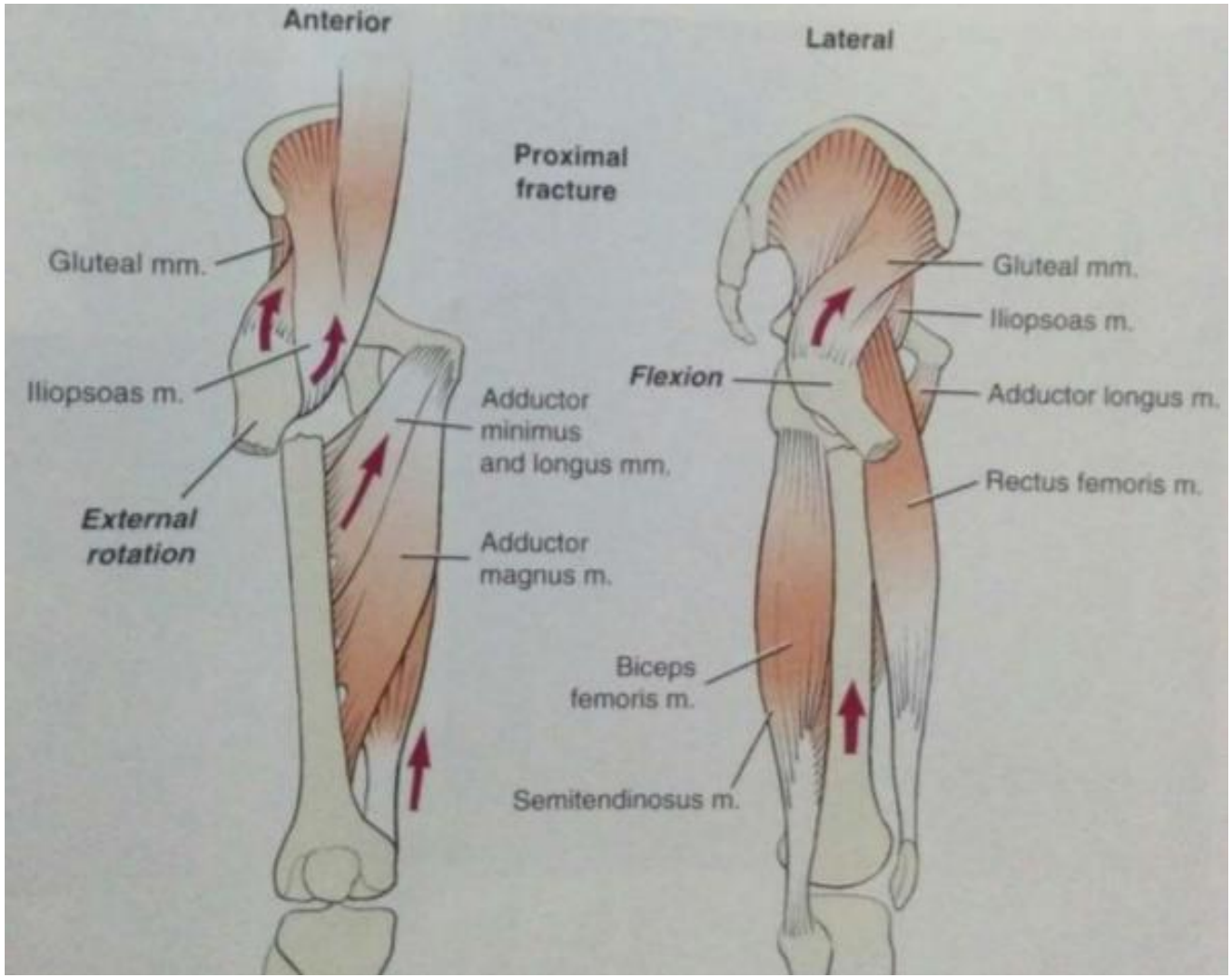
Presentation

- The clinical presentation of the proximal femur fractures can vary depending on the type, severity, and cause of the fracture.

Pain

- displaced fractures: Patients usually cannot stand or ambulate.
- Non-displaced or impacted fractures: patients with may be ambulatory and experience minimal pain.

- Patients with a displaced proximal femur fractures exhibit the classic presentation of a shortened and externally rotated extremity. There may be tenderness to palpation in the area of the greater trochanter. Ecchymosis may be present and should be noted.


Anterior
Lateral
Proximal fracture
Gluteal mm.
Iliopsoas m.
External rotation
Adductor minimus and longus mm.
Adductor magnus m.
Gluteal mm.
Iliopsoas m.
Flexion
Adductor longus m.
Rectus femoris m.
Biceps femoris m.
Semitendinosus m.

- Range-of-motion testing of the hip will be painful and ***should be avoided***.

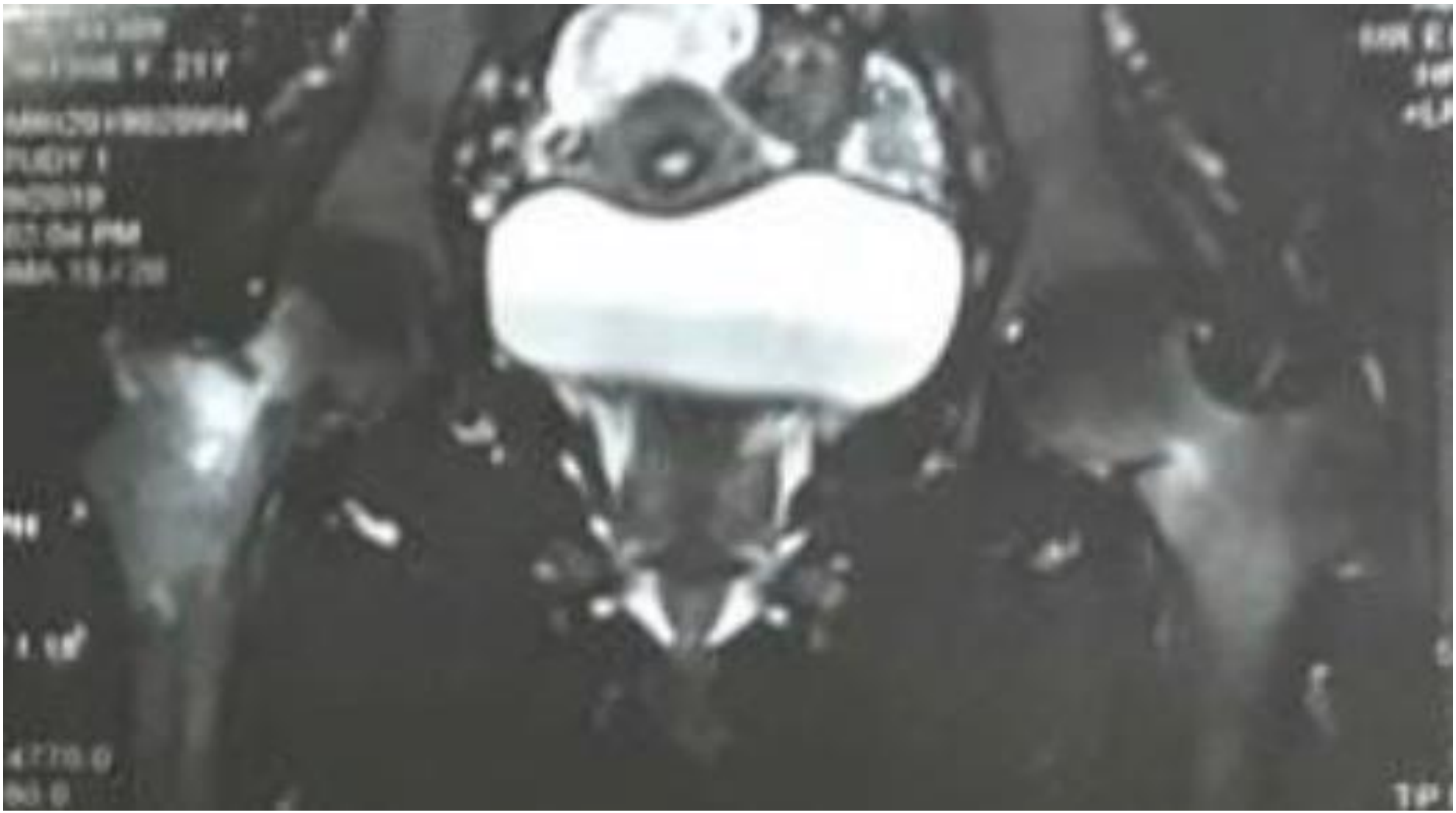
- Neurovascular injury is rare after hip fracture, careful evaluation is nevertheless mandatory.

Special Attention

- Thigh or groin pain without any history of trauma. These patients should be suspected to have with a ***stress fracture of the proximal femur***. They should be enquired about any recent changes in the type, duration, or frequency of physical activity.

- In patients in whom no significant history about activity or trauma is available, ***pathological fracture*** must be considered.

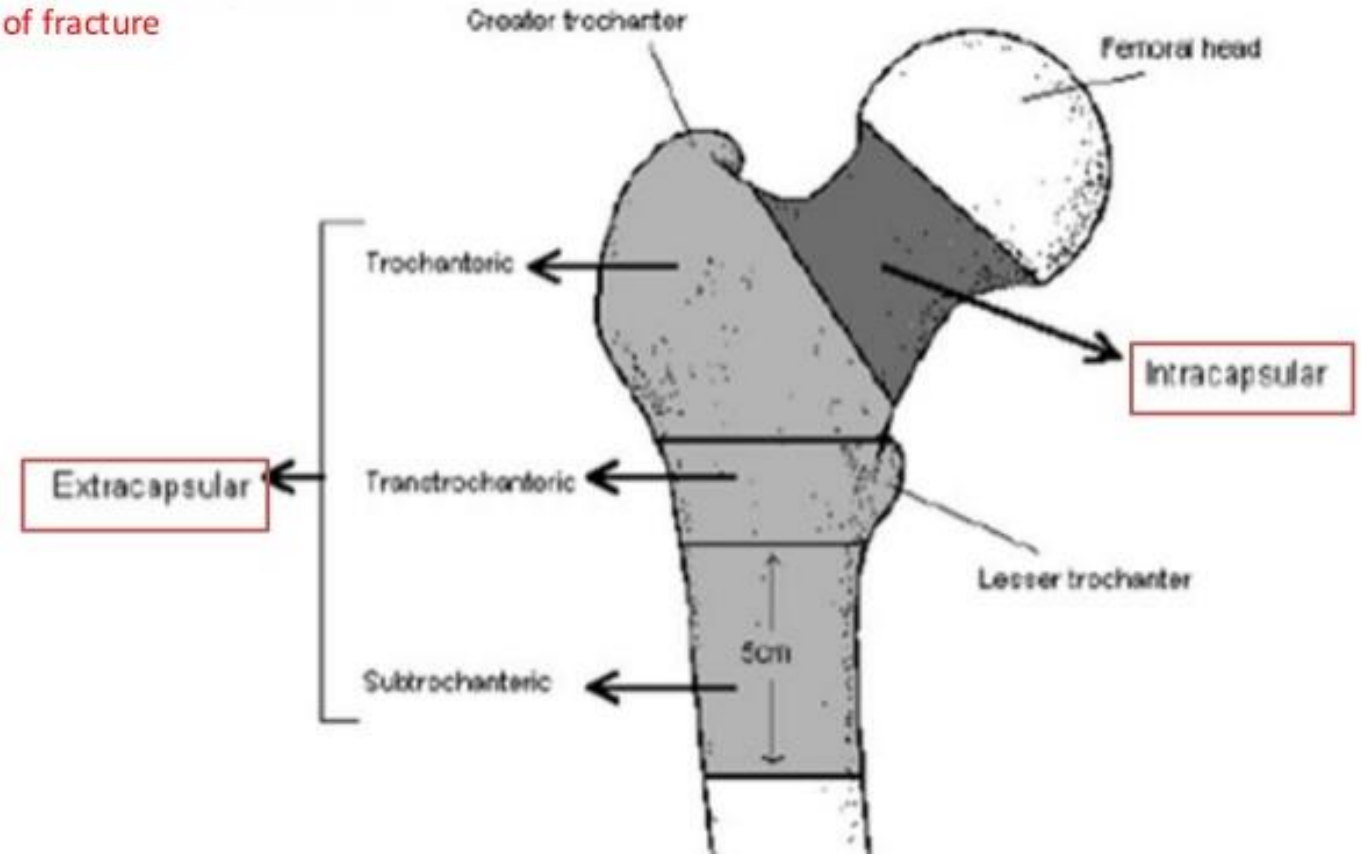
Diagnosis ?



Diagnosis ?

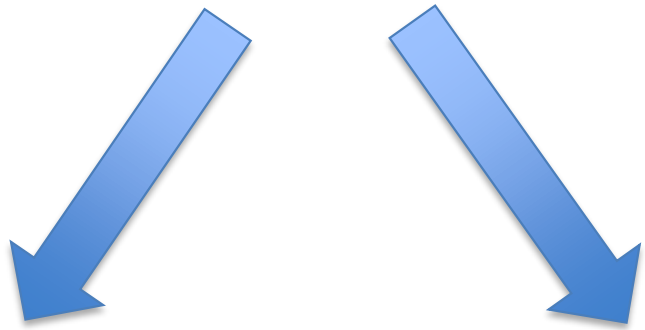
CLASSIFICATION of FEMUR FRACTURE

*based on area/location of fracture



Classification of Proximal Femur Fractures

- Proximal femur fractures are divided into groups based on their location with regard to the capsule.



Intracapsular Extracapsular

Intracapsular fractures

- within the lining of hip joint capsule, associated with injury to blood supply to head of femur. may result in avascular necrosis of femoral head.

Femoral head fractures **Femoral neck fractures**

Intracapsular fractures

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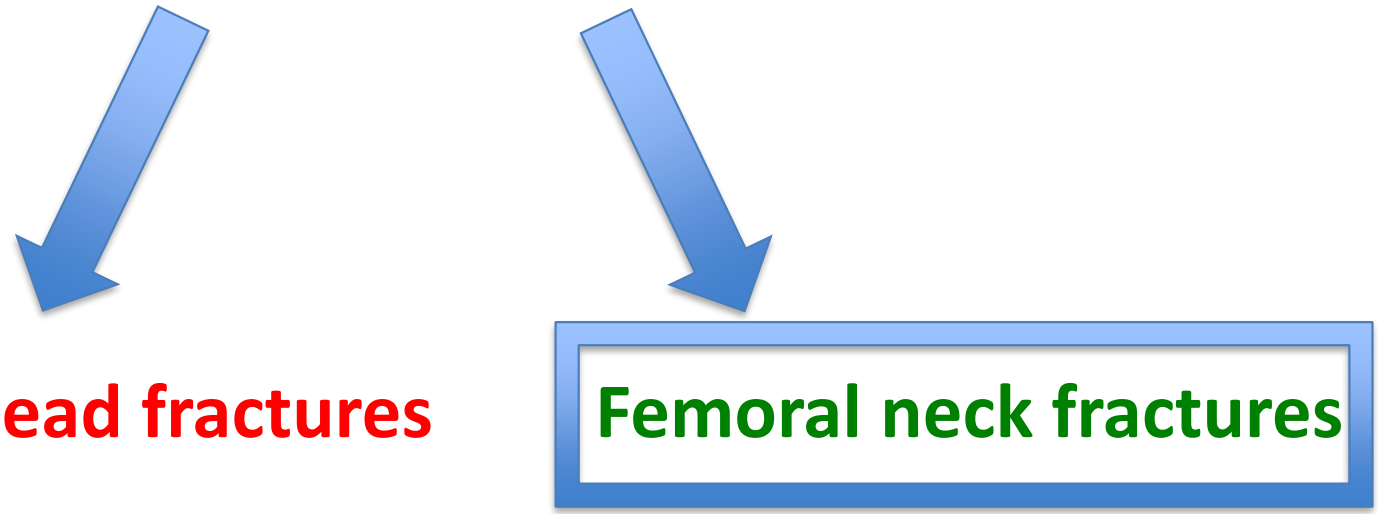


Femoral neck fractures

Depending on fracture location these are further classified as

Subcapital fracture – just below the head of femur

Transcervical fracture – through mid neck

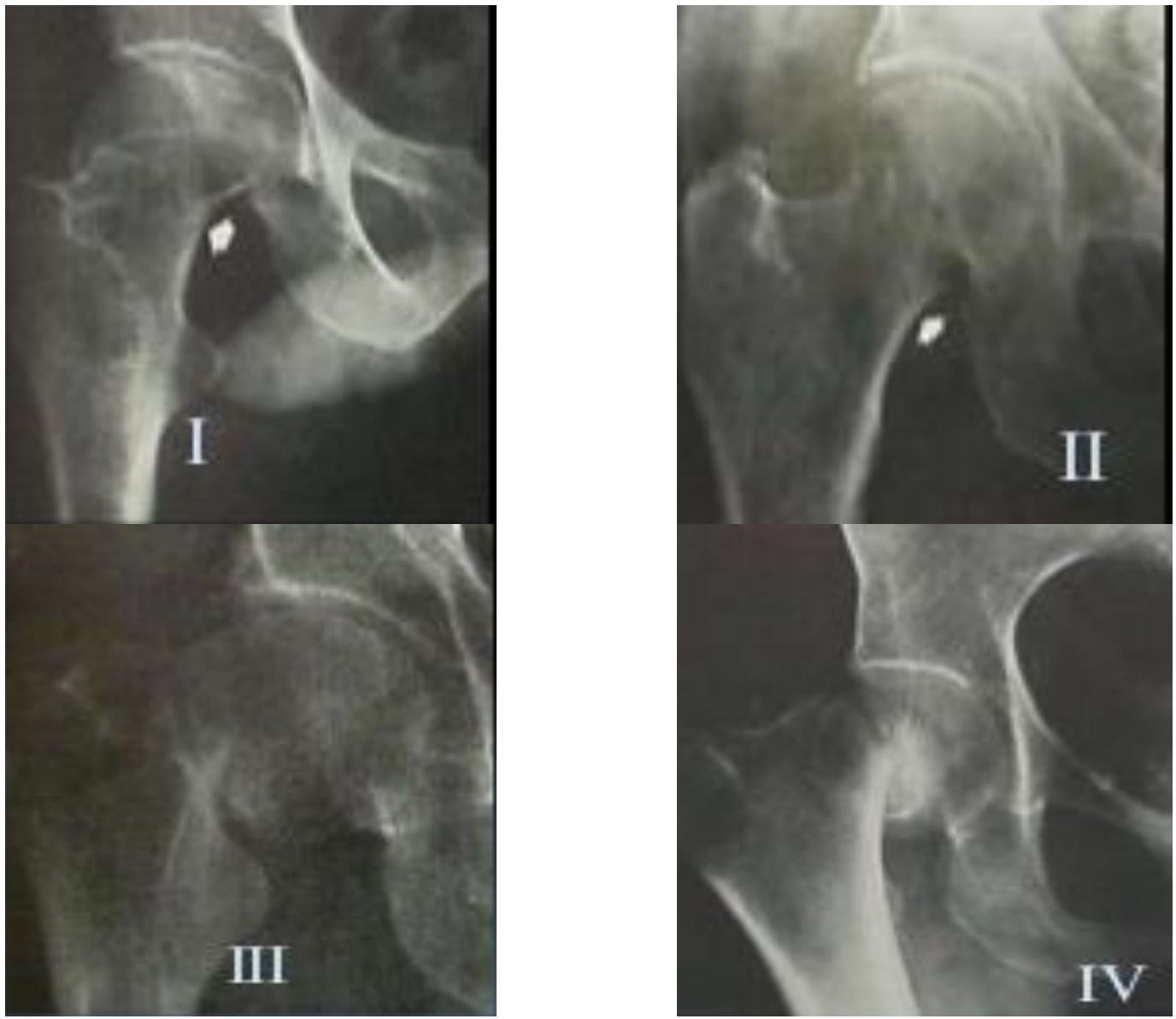
Basi-cervical fracture – through base of neck

Diagnosis ?

Diagnosis ?

Diagnosis ?

Garden’s classification



Extracapsular fractures

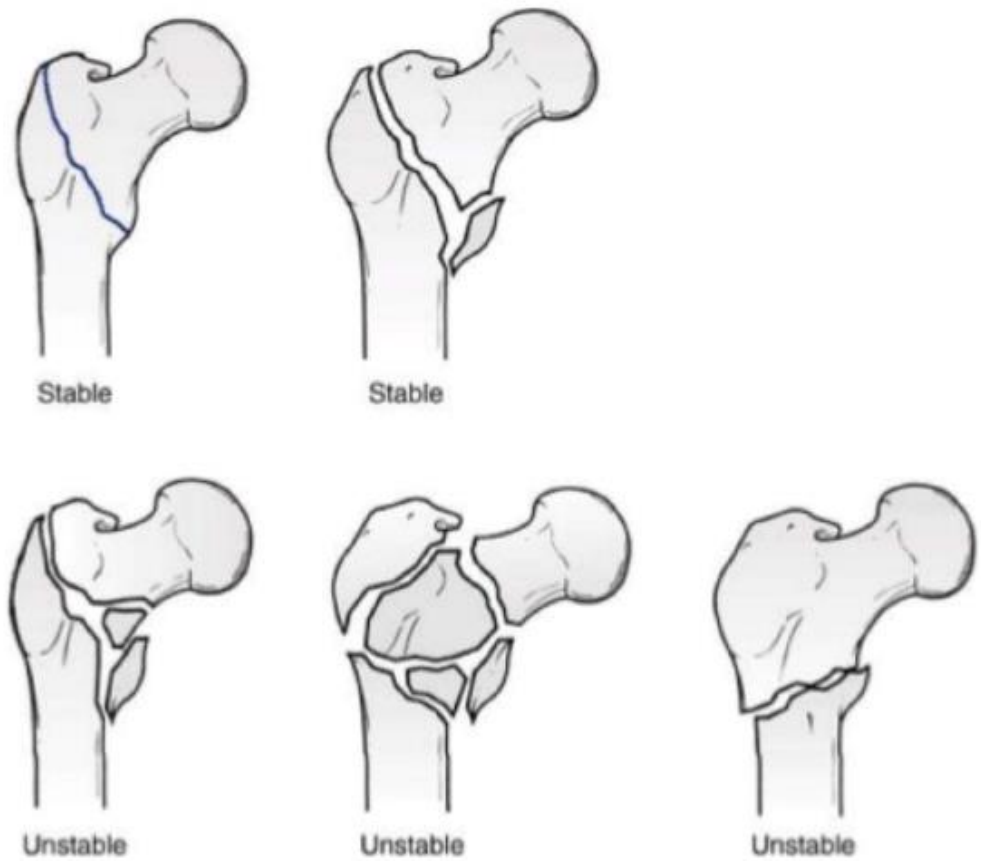
Outside the capsule , do not cause the same degree of vascular damage as intra-capsular fractures and therefore can be treated differently.

Intertrochanteric

Subtrochanteric

Intertrochanteric fracture classification

Evans Classification



Diagnosis ?

Diagnosis ?

Diagnosis ?

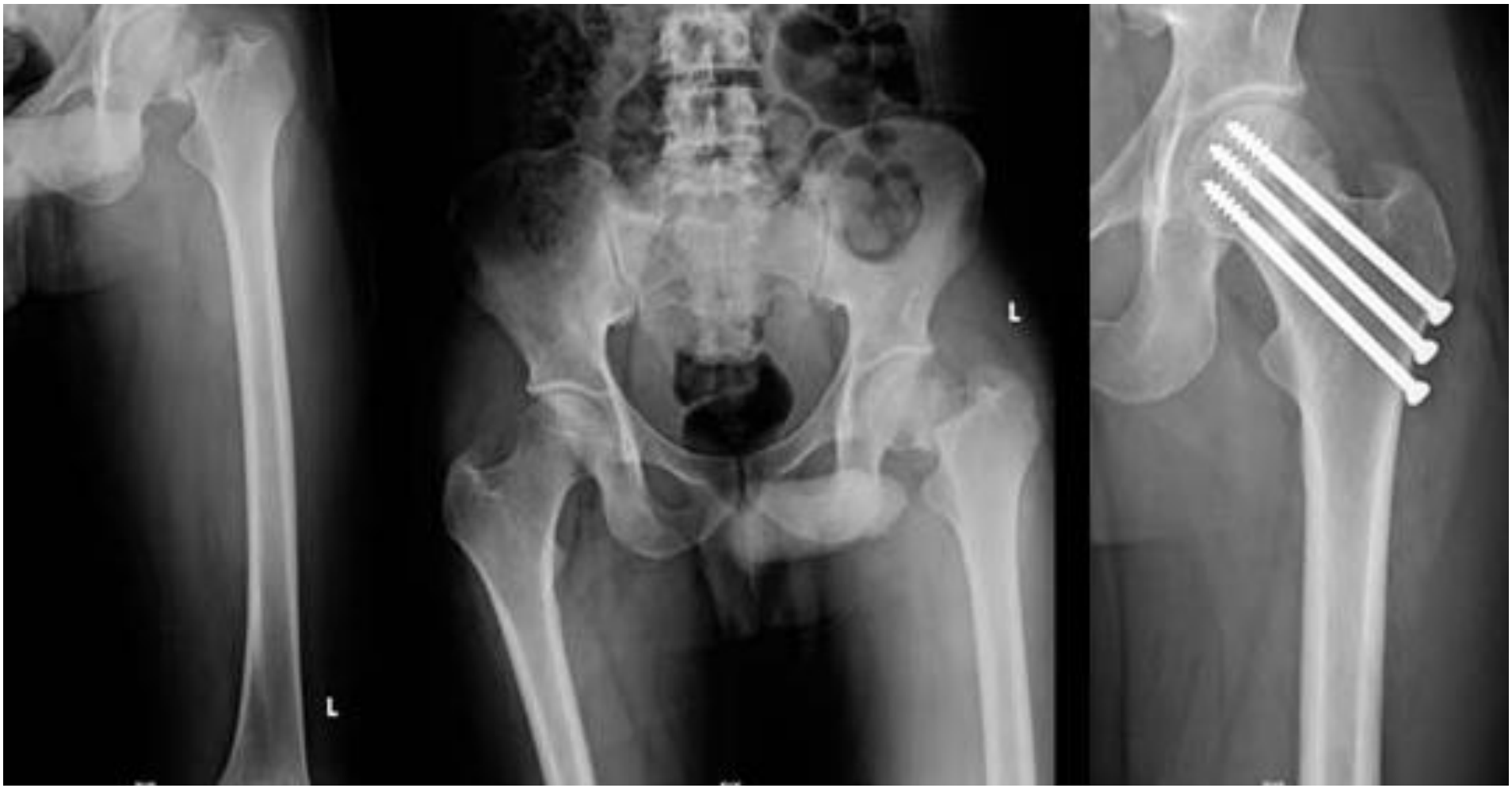
Diagnosis ?

Principles of Management

Femur neck fracture

FIX **OR** **REPLACE**

FN # 25-year-old



FN # 70-year-old

Monopolar PHR

Inter,/ subtrochanteric fractures

- Aim: Restore length, alignment & rotation

NO anatomical reduction

Without extensive soft tissue dissection, this fracture forms abundant callus in 6 weeks

Intertroch. Treatment DHS

Intertroch. Treatment IMN

Subtroch. Treatment

Complications

General

- DVT
- PE
- Pneumonia
- Bed sores

Lacal

- AVN
- Non / Mal-union
- Failure of fixation
- Posttraumatic arthrosis

?

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