JOINTS OF THE LOWER LIMB

HIP JOINT

1-Type: Synovial ball-and-socket joint

2-Articular surfaces:

a- head of femur
b- lunate surface of acetabulum

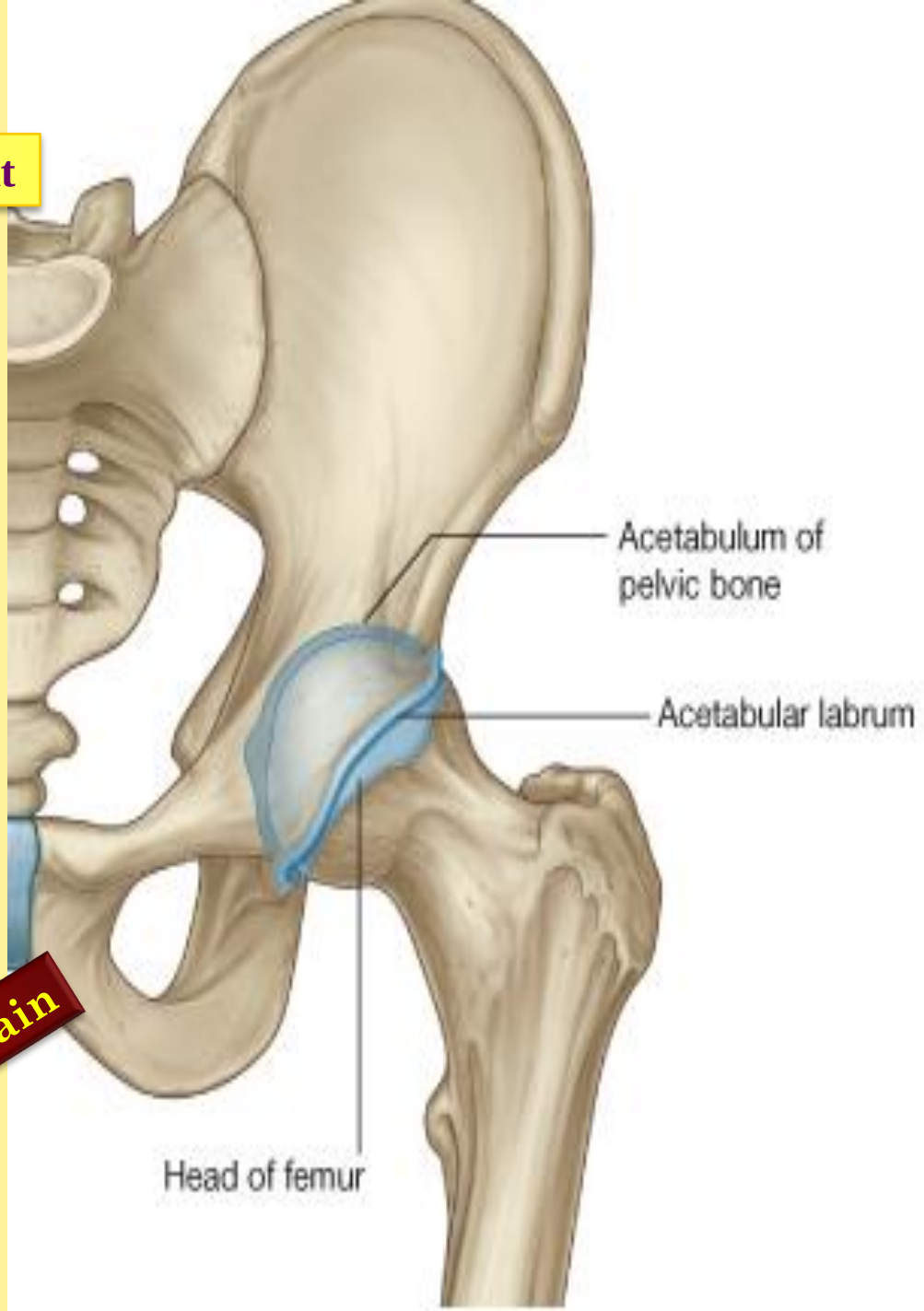
↓

Which is deepened by the fibrocartilaginous *labrum acetabulare*

3-Nerve Supply:

Femoral nerve
Obturator nerve
Sciatic nerve

Remember referred pain

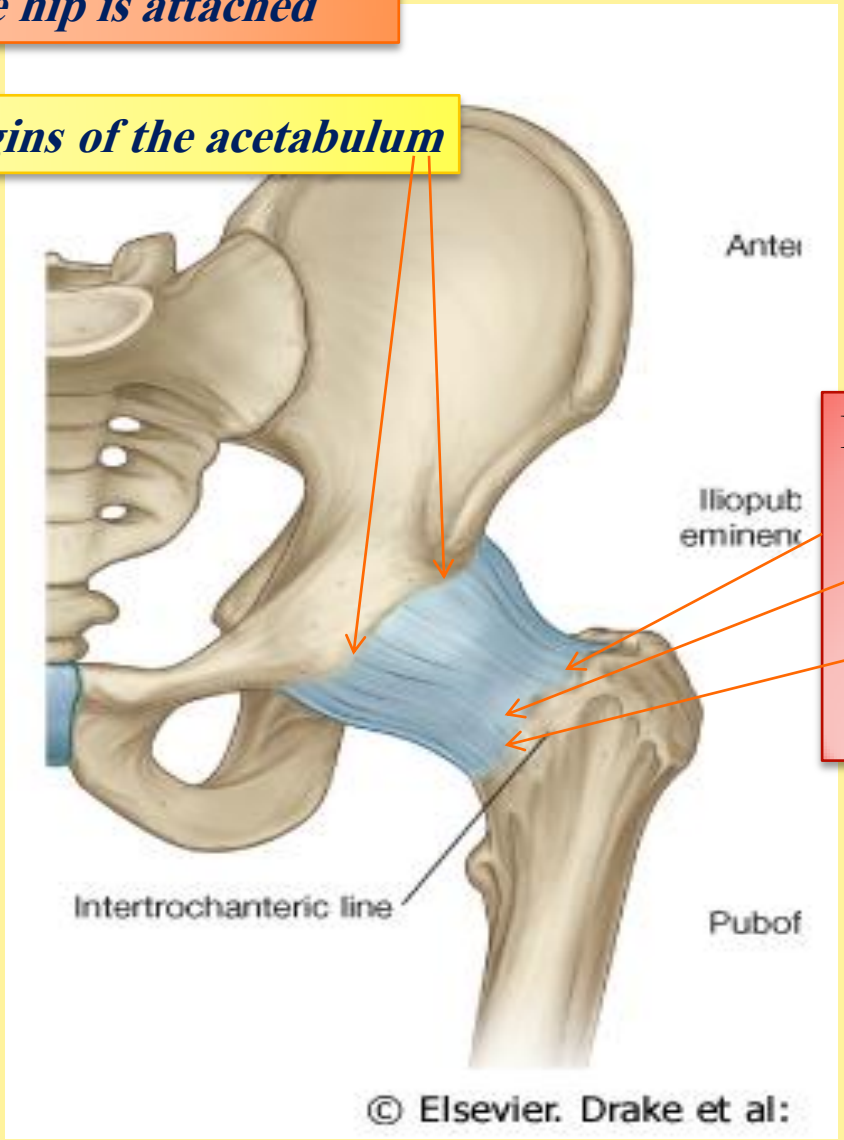


4-The *capsule of the hip is attached*

proximally to the margins of the acetabulum

Capsule

posteriorly, to the femoral neck about 0.5 in (12mm) from the trochanteric crest. From this distal attachment, capsular fibres are reflected on to the femoral neck as *retinacula and provide one pathway for the blood supply to the* femoral head



Distally, it is attached along the trochanteric line, the bases of the greater and lesser trochanters

5-The **synovial membrane of the hip joint**

lines the fibrous layer as well as any intracapsular bony surfaces not lined with articular cartilage

Thus, where the fibrous layer attaches to the femur, the synovial membrane reflects proximally along the femoral neck to the edge of

the femoral head. The **synovial folds (retinacula), which reflect superiorly along the femoral neck as longitudinal bands, contain subsynovial ret inacular arteries (branches of the medial and a few from the lateral femoral circumflex artery), which supply the head and neck of the**

femur

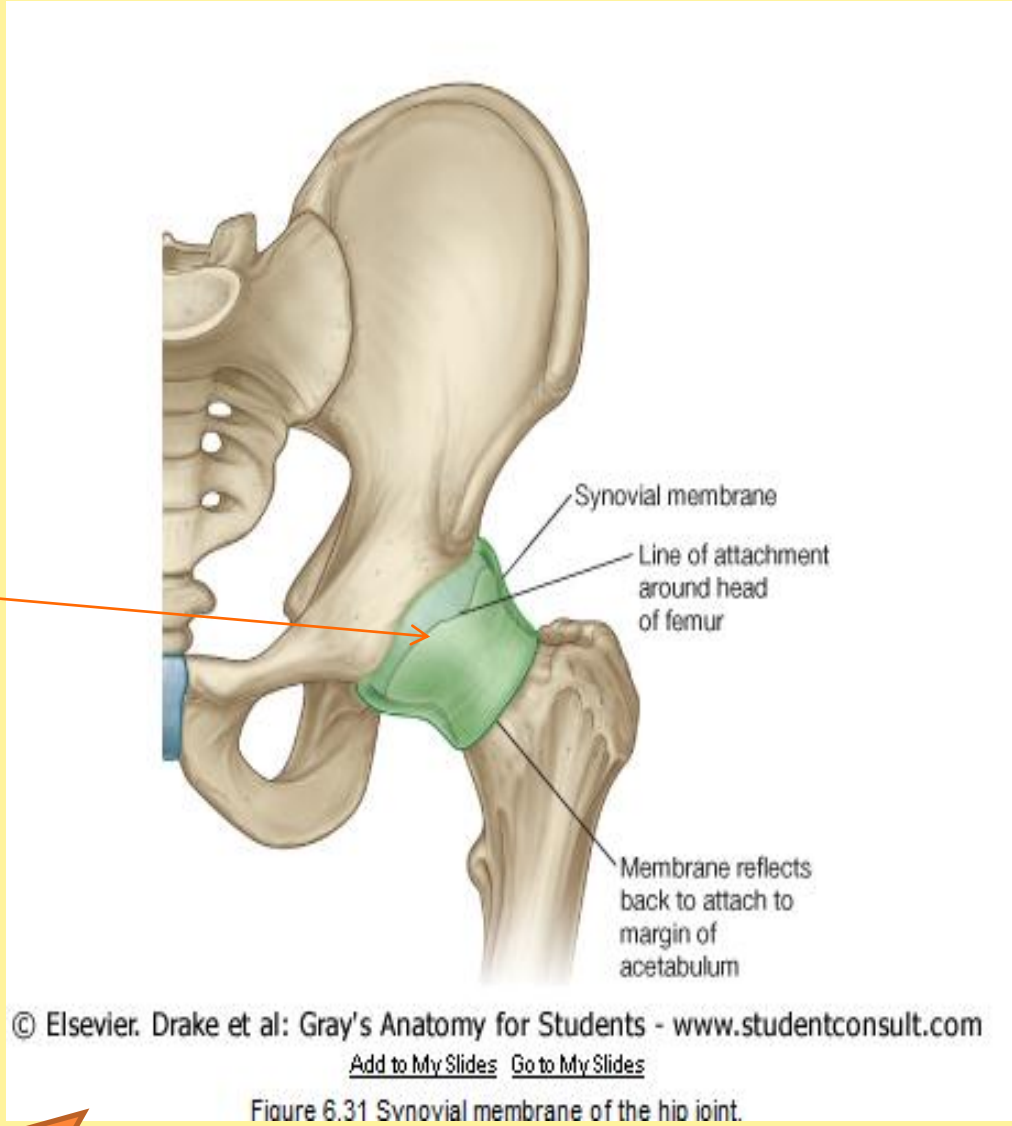
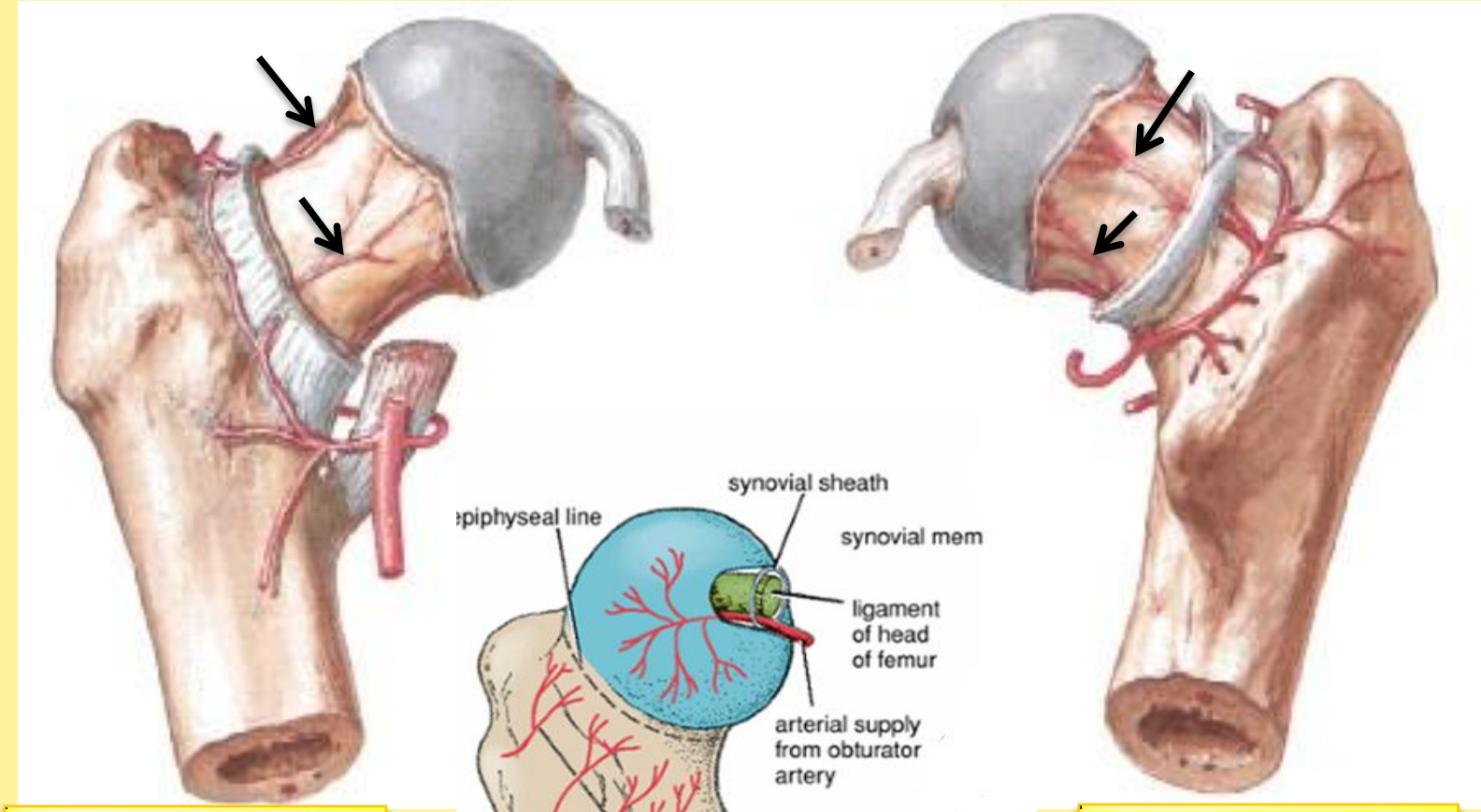


Figure 6.31 Synovial membrane of the hip joint.

important

6-Subsynovial retinacular arteries (branches of the medial and a few from the lateral femoral circumflex artery), which supply the head and neck of the femur

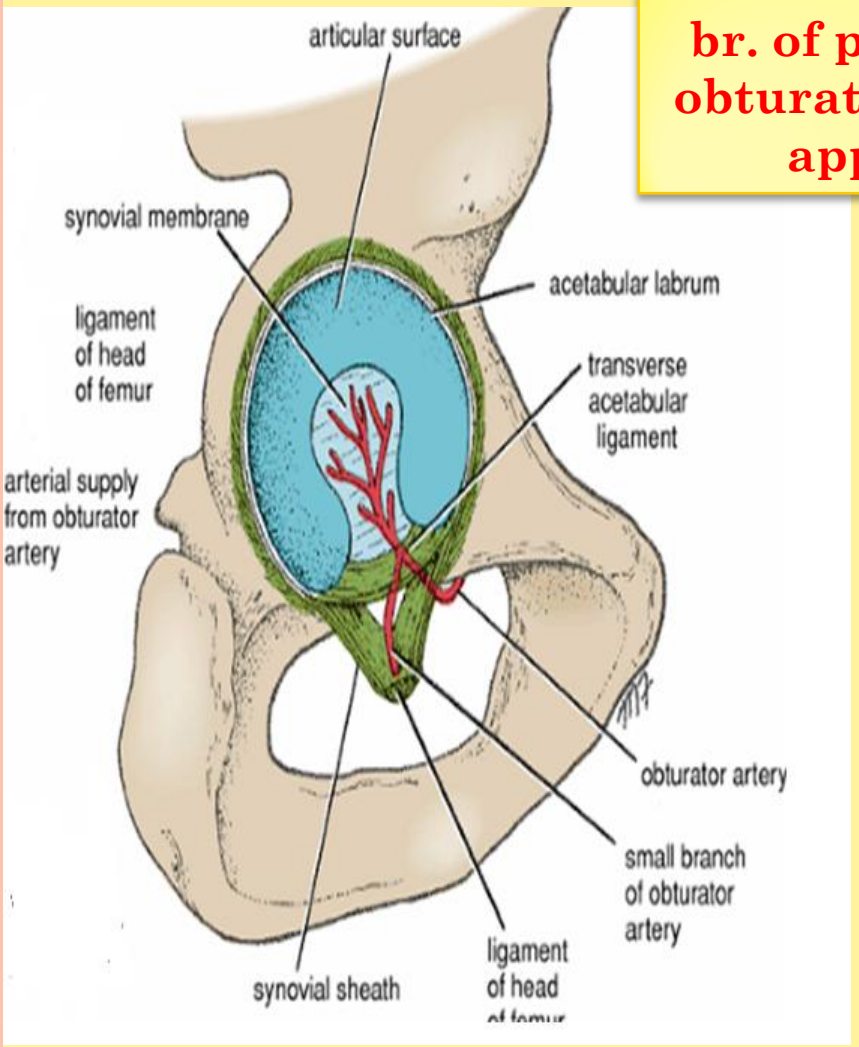


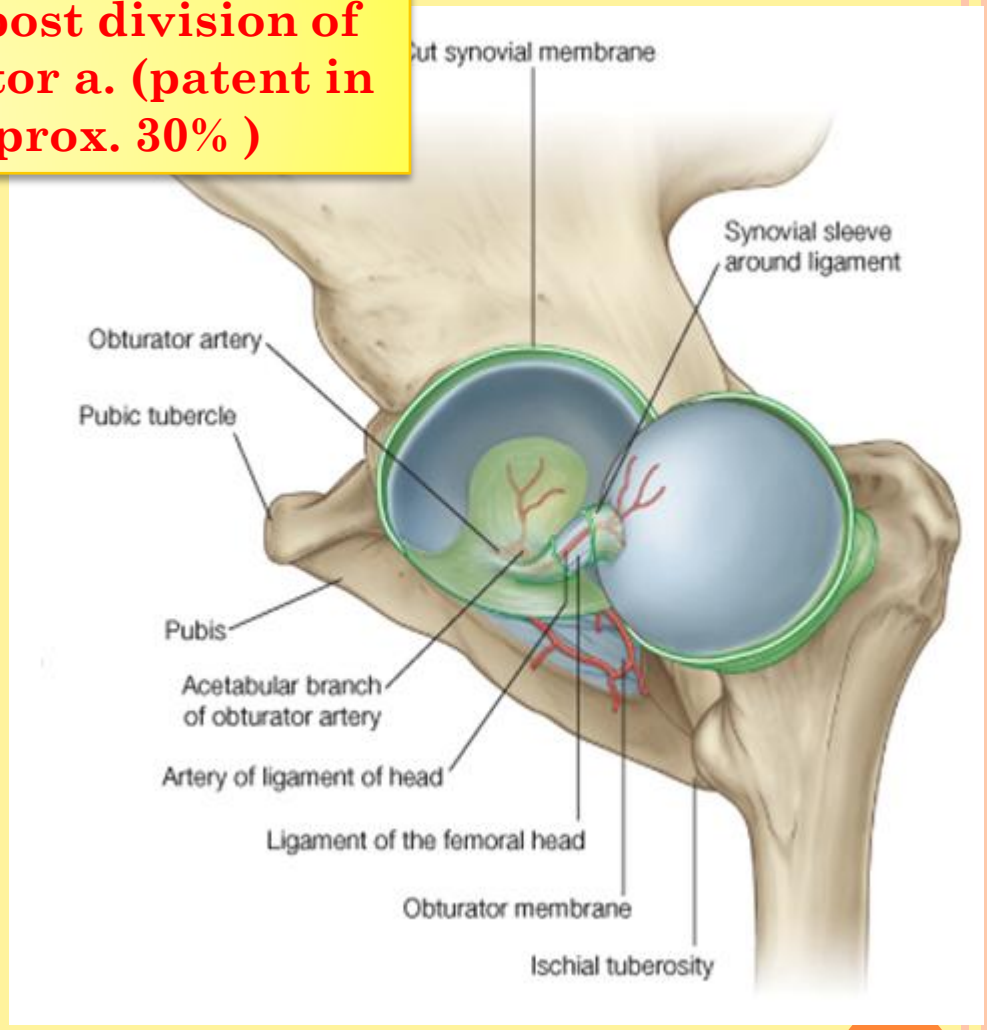
Anterior view

Posterior view

Blood supply of the head of the femur

-Acetabular (foveolar) br. of post division of obturator a. (patent in approx. 30%)

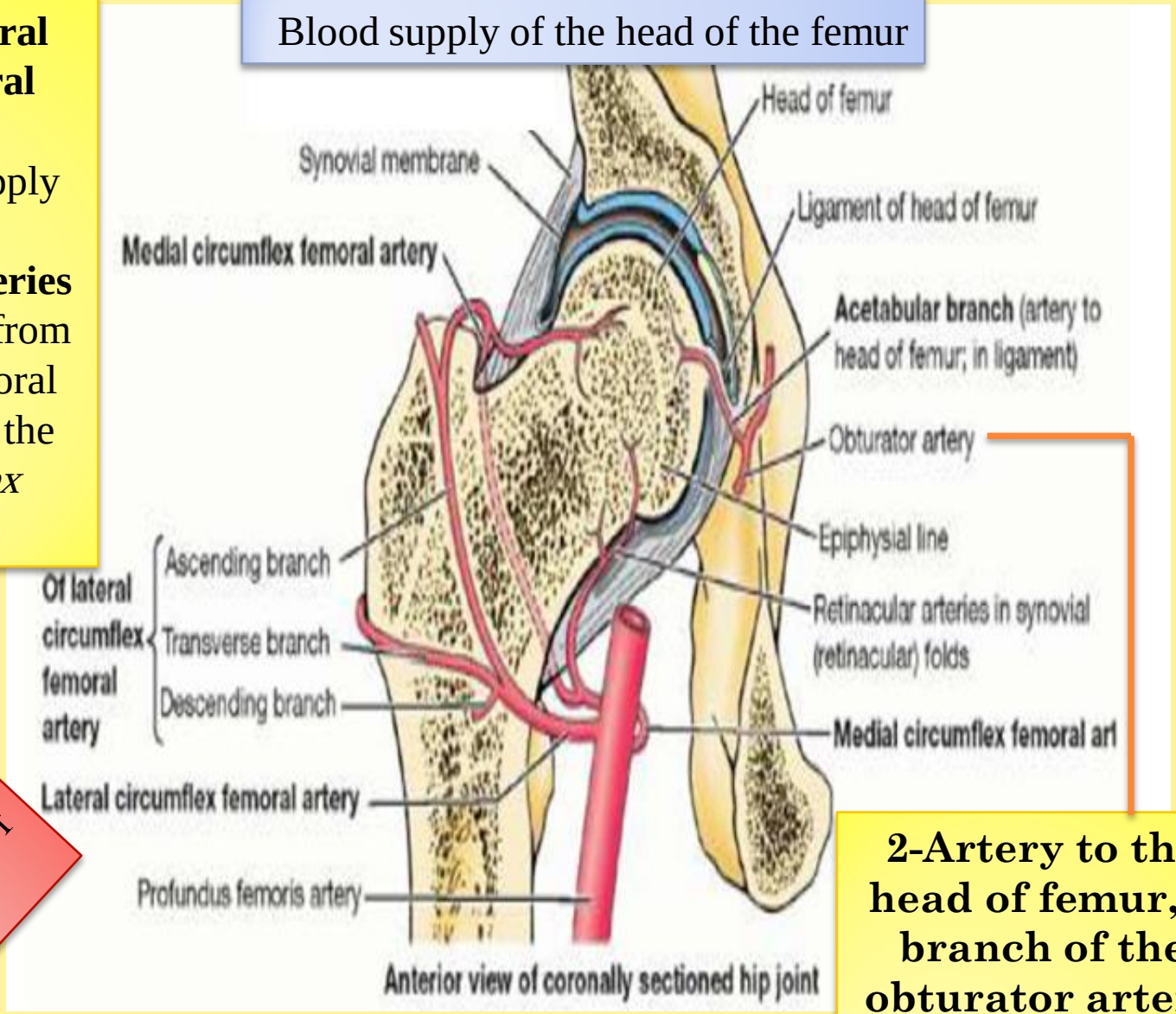




1-Medial and lateral circumflex femoral arteries

The main blood supply is from **the retinacular arteries** arising as branches from the circumflex femoral arteries (especially the *medial circumflex femoral artery).*

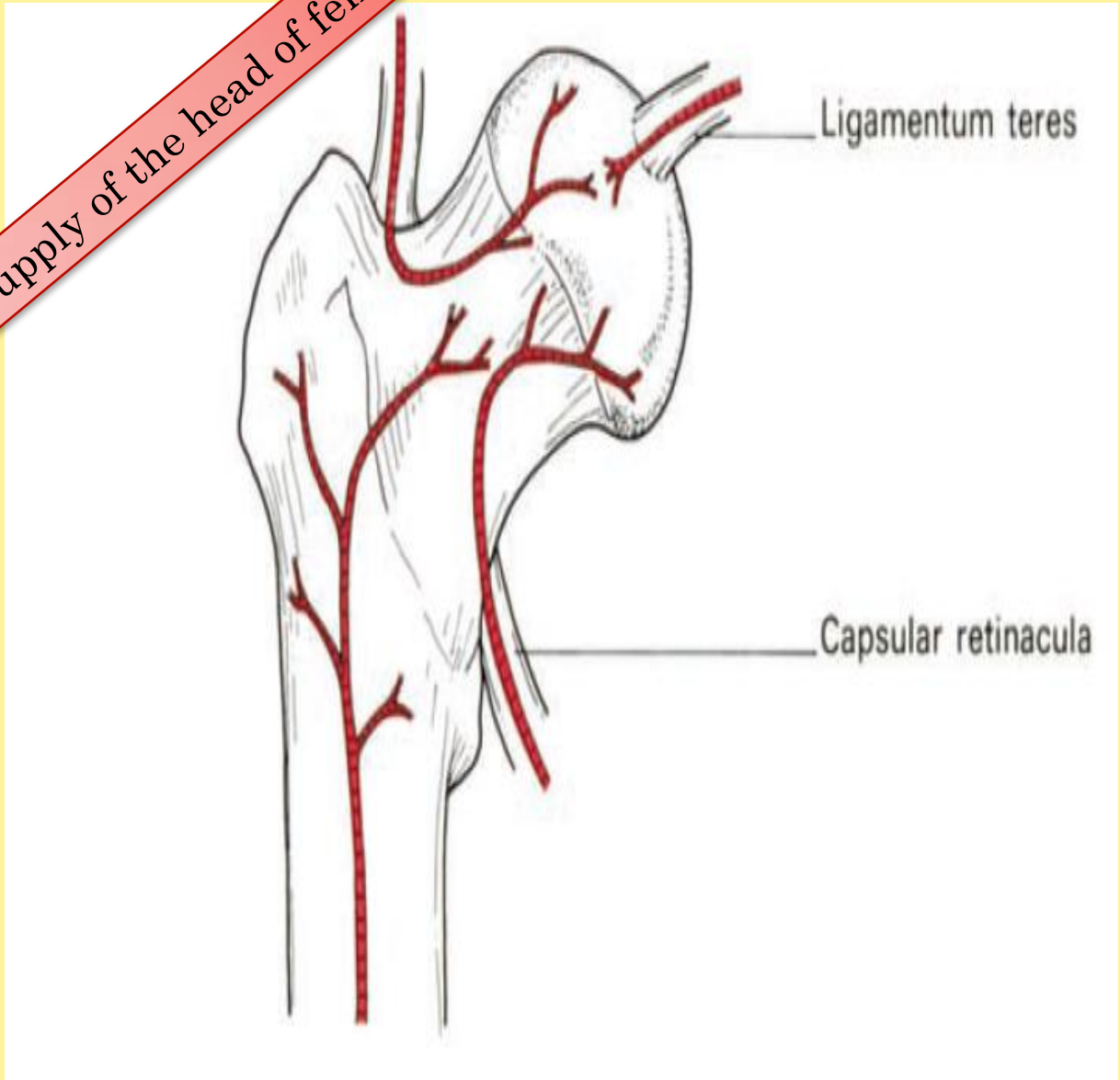
Blood supply of the head of the femur



2-Artery to the head of femur, a branch of the obturator artery that traverses the ligament of the head.

Blood supply of the head of the femur

Practice the blood supply of the head of femur



The upper end of the femur is a common site for fracture

in the elderly

The neck may break
1-immediately beneath the head

subcapital

2-near its midpoint

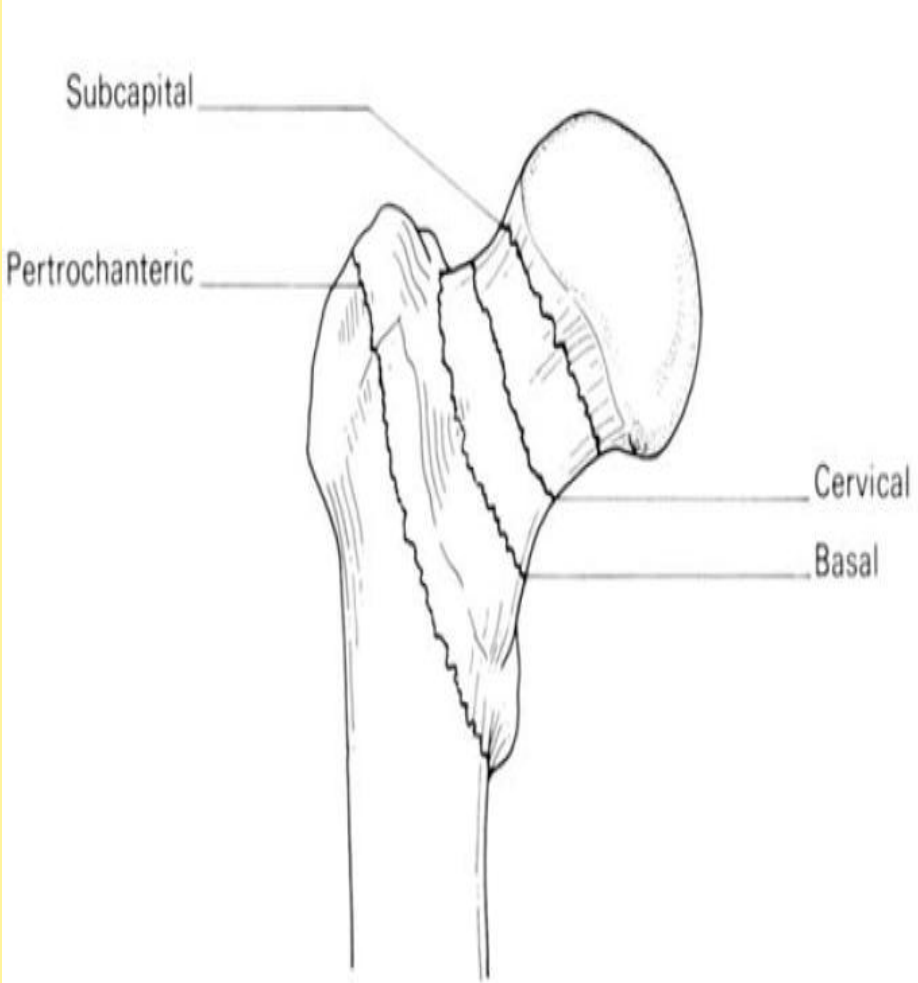
cervical

3-adjacent to the trochanters

basal

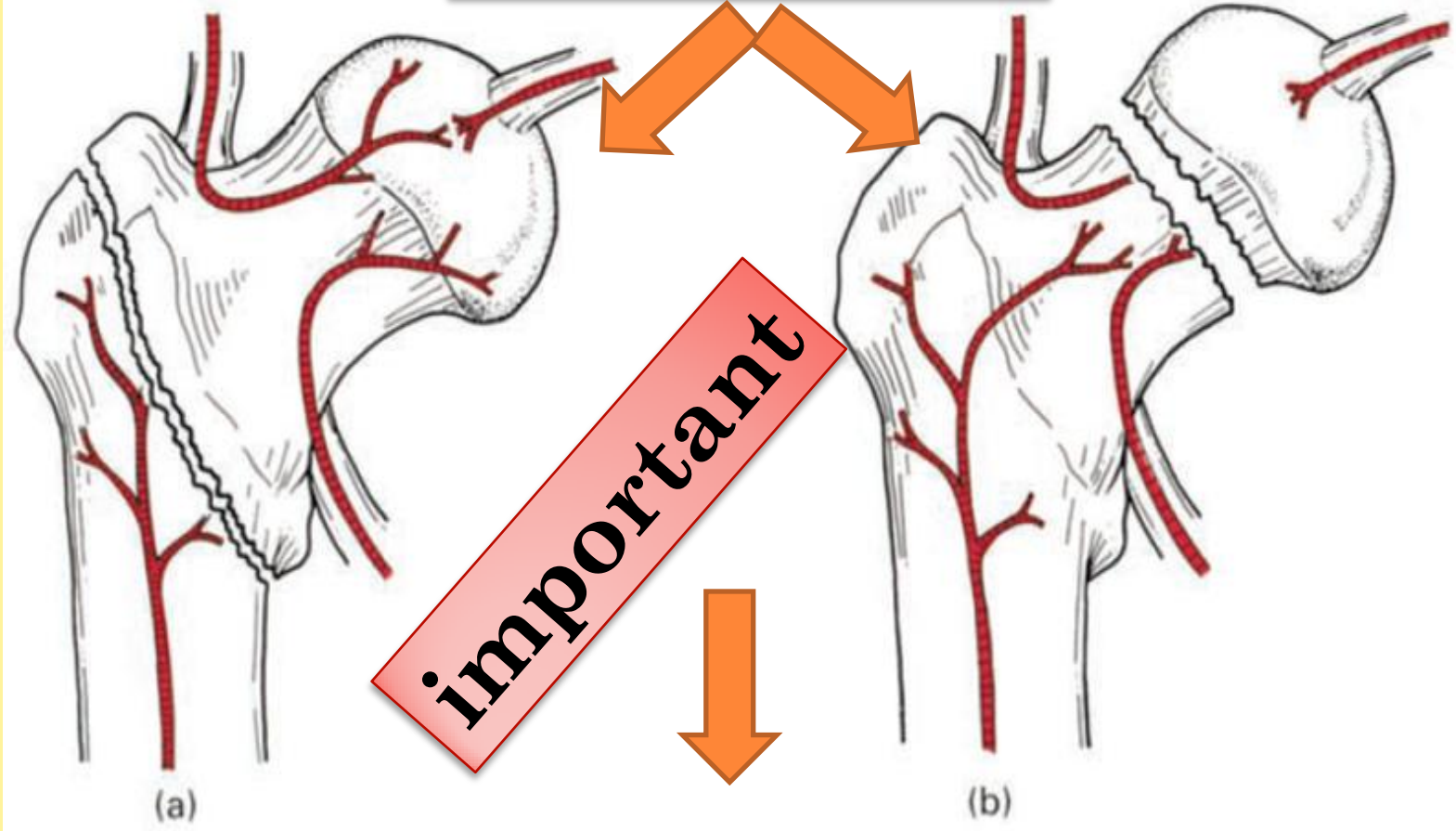
4-the fracture line
may pass between, along or just below the trochanters

pretrochanteic

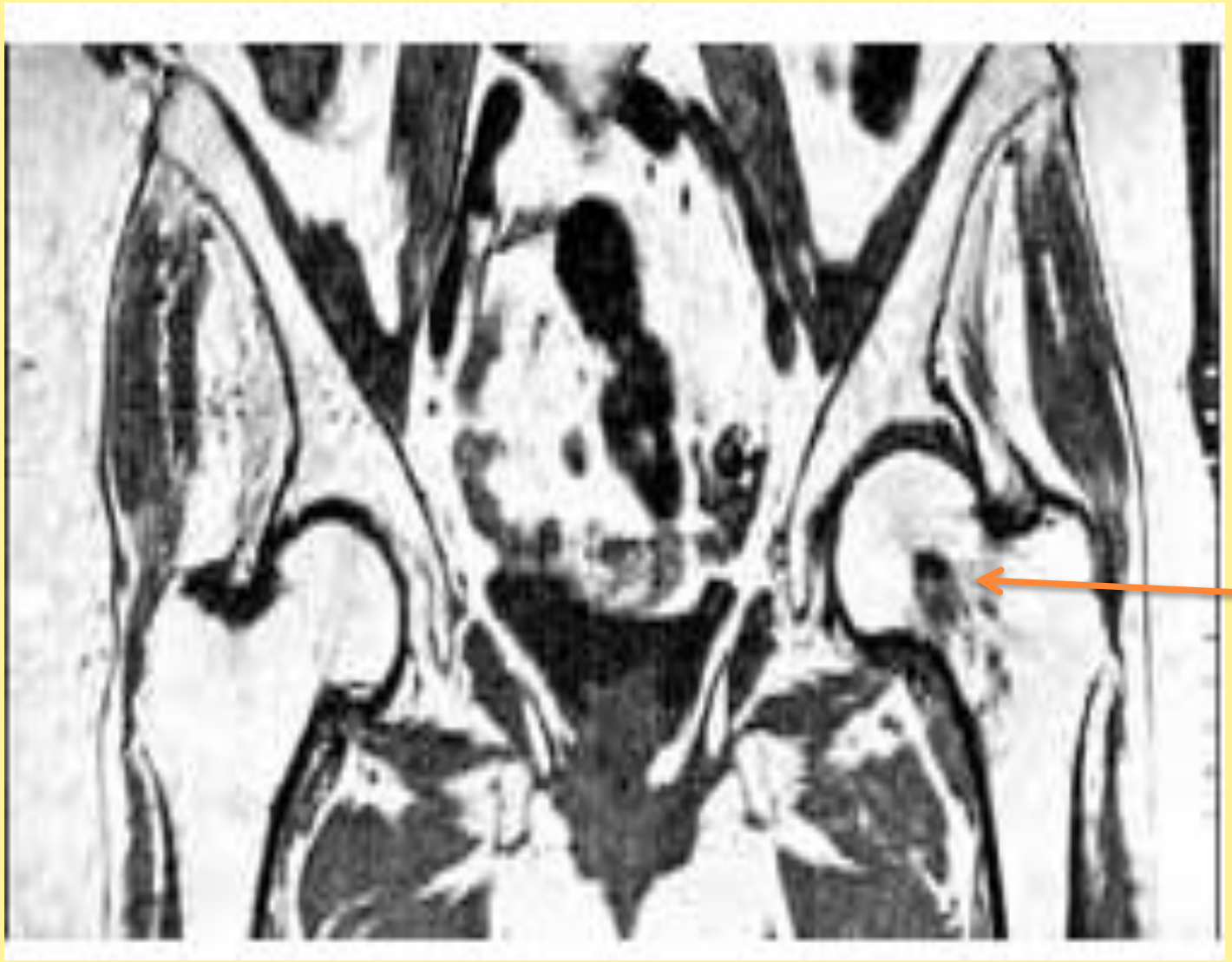


Neck fracture will result in

important



(a) A pertrochanteric fracture does not damage the retinacular blood supply—aseptic bone necrosis does not occur. (b) A subcapital fracture cuts off most of the retinacular supply to the head—aseptic bone necrosis is common. Note that the blood supply via the ligamentum teres is negligable in adult life.



For reading only

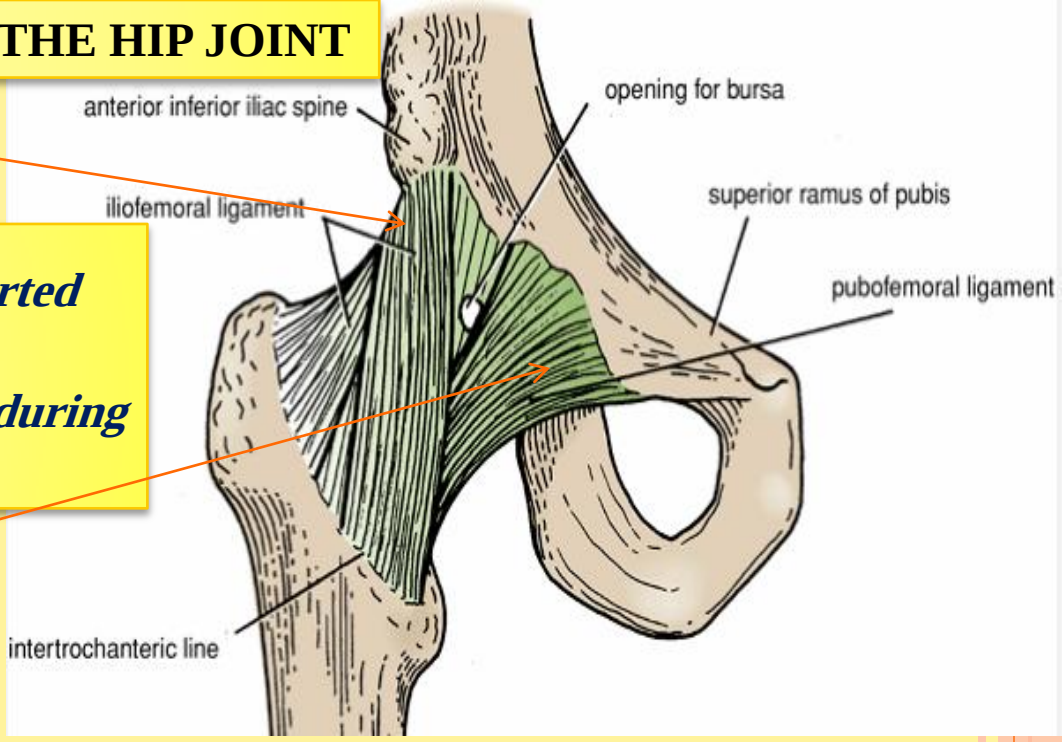
MRI revealing Left Femoral neck Fracture

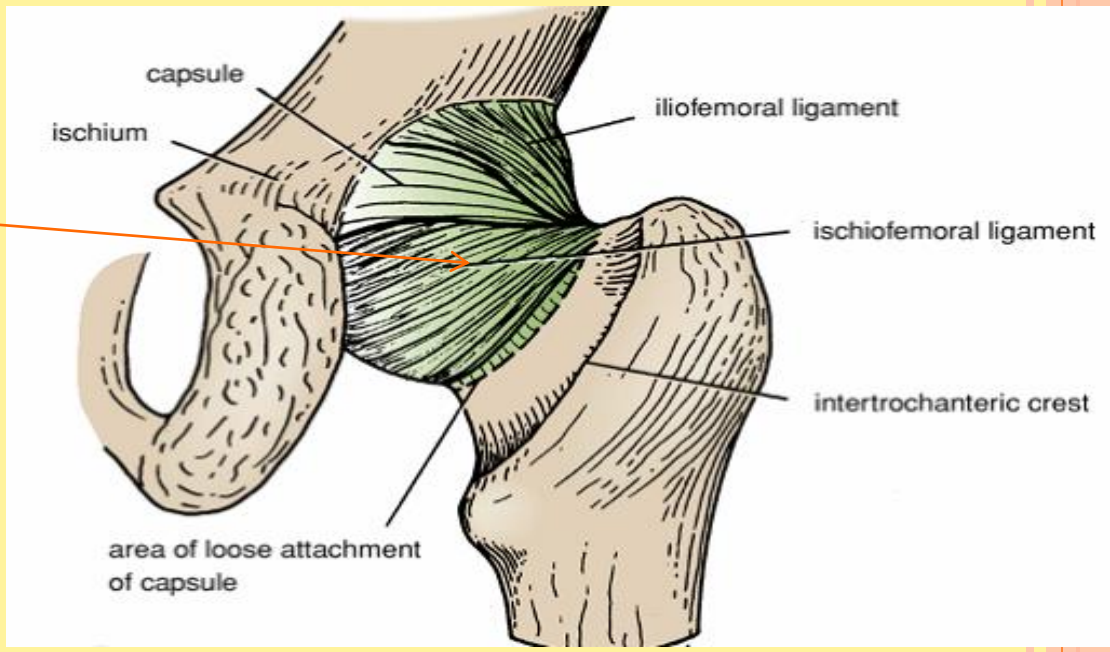
7-MAIN LIGAMENTS OF THE HIP JOINT

a-Iliofemoral: ***is a strong, inverted Y-shaped ligament. Prevents <u>hyperextension</u> of hip joint during standing***

b-Pubofemoral: ***limits extension and abduction***

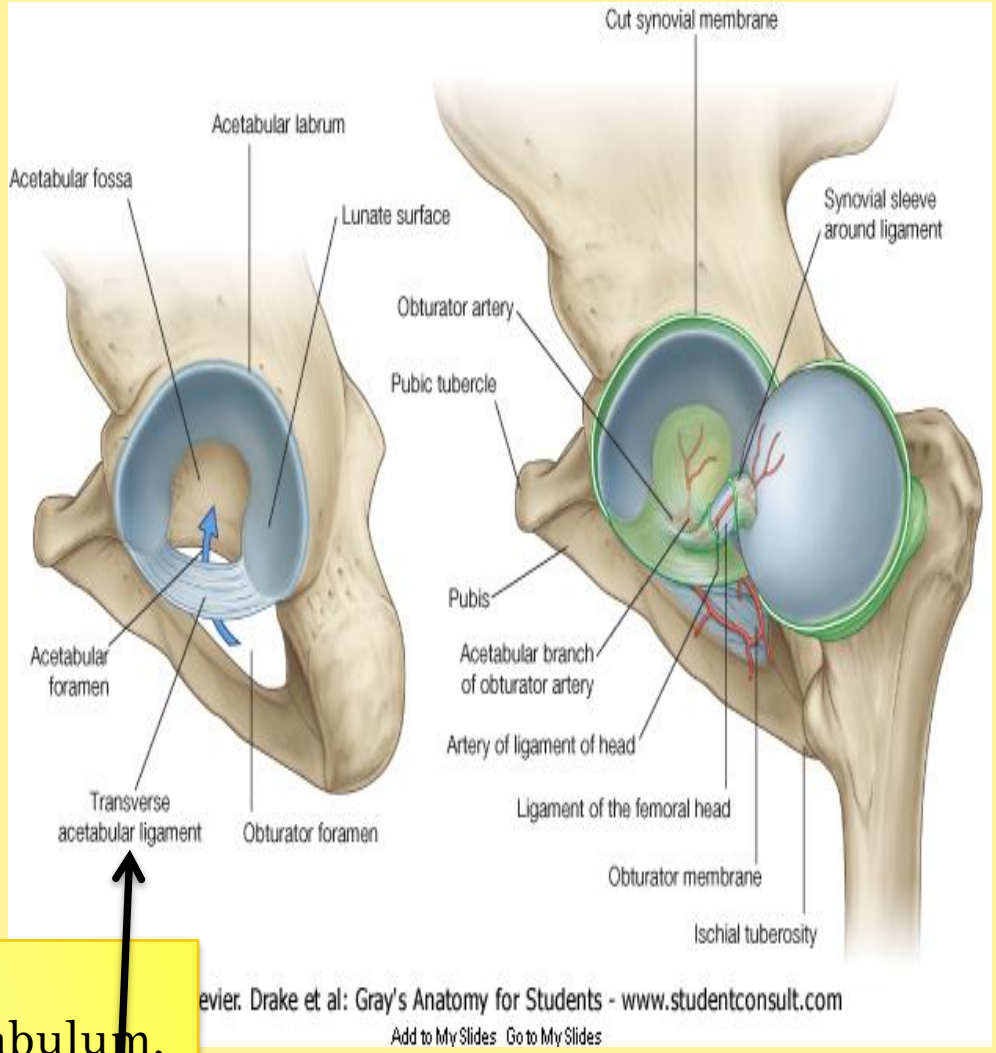
c-Ischiofemoral: ***limits extension***





D-The **ligament of head of femur *ligamentum teres* primarily a synovial fold conducting a blood vessel, is weak and of little importance in strengthening** the hip joint

Its wide end attaches to the margins of the acetabular notch and the *transverse acetabular ligament; its narrow end* attaches to the femur at the *fovea for the ligament of the head of femur. Usually, the ligament contains a small artery to the head of the femur.*



The non-articular lower part of the acetabulum, the *acetabular notch, is closed off* below by the ***E-transverse acetabular ligament***

Blood Supply to the Femoral Head and Neck Fractures
Anatomic knowledge of the blood supply to the femoral head explains why avascular necrosis of the head can occur after fractures of the neck of the femur. In the young, the epiphysis of the head is supplied by a small branch of the obturator artery, which passes to the head along the ligament of the femoral head. The upper part of the neck of the femur receives a profuse blood supply from the medial femoral circumflex artery. These branches pierce the capsule and ascend the neck deep to the synovial membrane. As long as the epiphyseal cartilage remains, no communication occurs between the two sources of blood. In the adult, after the epiphyseal cartilage disappears, an anastomosis between the two sources of blood supply is established. Fractures of the femoral neck interfere with or completely interrupt the blood supply from the root of the femoral neck to the femoral head. The scant blood flow along the small artery that accompanies the round ligament may be insufficient to sustain the viability of the femoral head, and ischemic necrosis gradually takes place.

8 - Movements

- Flexion is performed by ***the iliopsoas, rectus femoris, and sartorius***
- Extension is performed by ***the gluteus maximus and the hamstring muscles.***
- Abduction is performed by ***the gluteus medius and minimus***, assisted by the sartorius, tensor fasciae latae, and piriformis.
- Adduction is performed by ***the adductor longus and brevis and the adductor fibers of the adductor magnus***. These muscles are assisted by the pectineus and the gracilis.
- Lateral rotation is performed by the short lateral rotator muscles and assisted by the gluteus maximus.
- Medial rotation is performed by **the anterior fibers of the gluteus medius and gluteus minimus and the tensor fasciae latae.**

Flexion is limited by the hamstring muscle group. Extension is limited by the ligamentous thickening of the capsule; abduction, by the adductor group of muscles; adduction, by the tensor muscle and fascia of the abductor muscles; and rotation, by the fibrous capsular

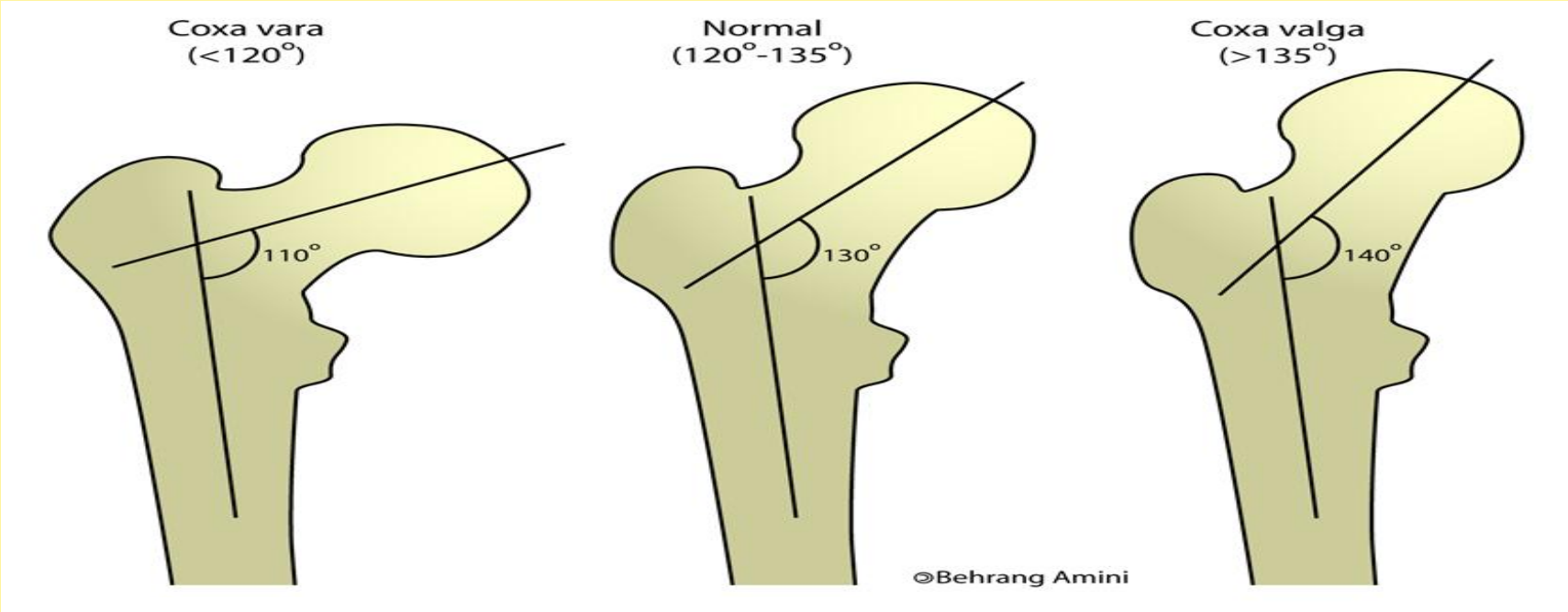
9- Angle of Inclination

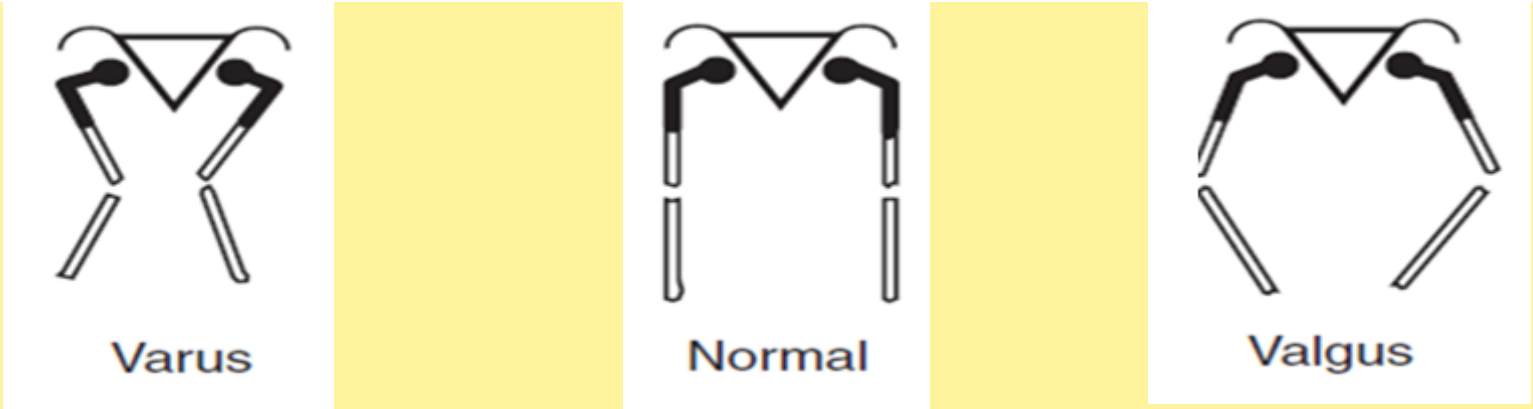
it is the angle between the neck and shaft of the femur

Approx. 125°

typically ranges from 115 to 140 degrees

is about 160 ° in the young child and about 125° in the adult

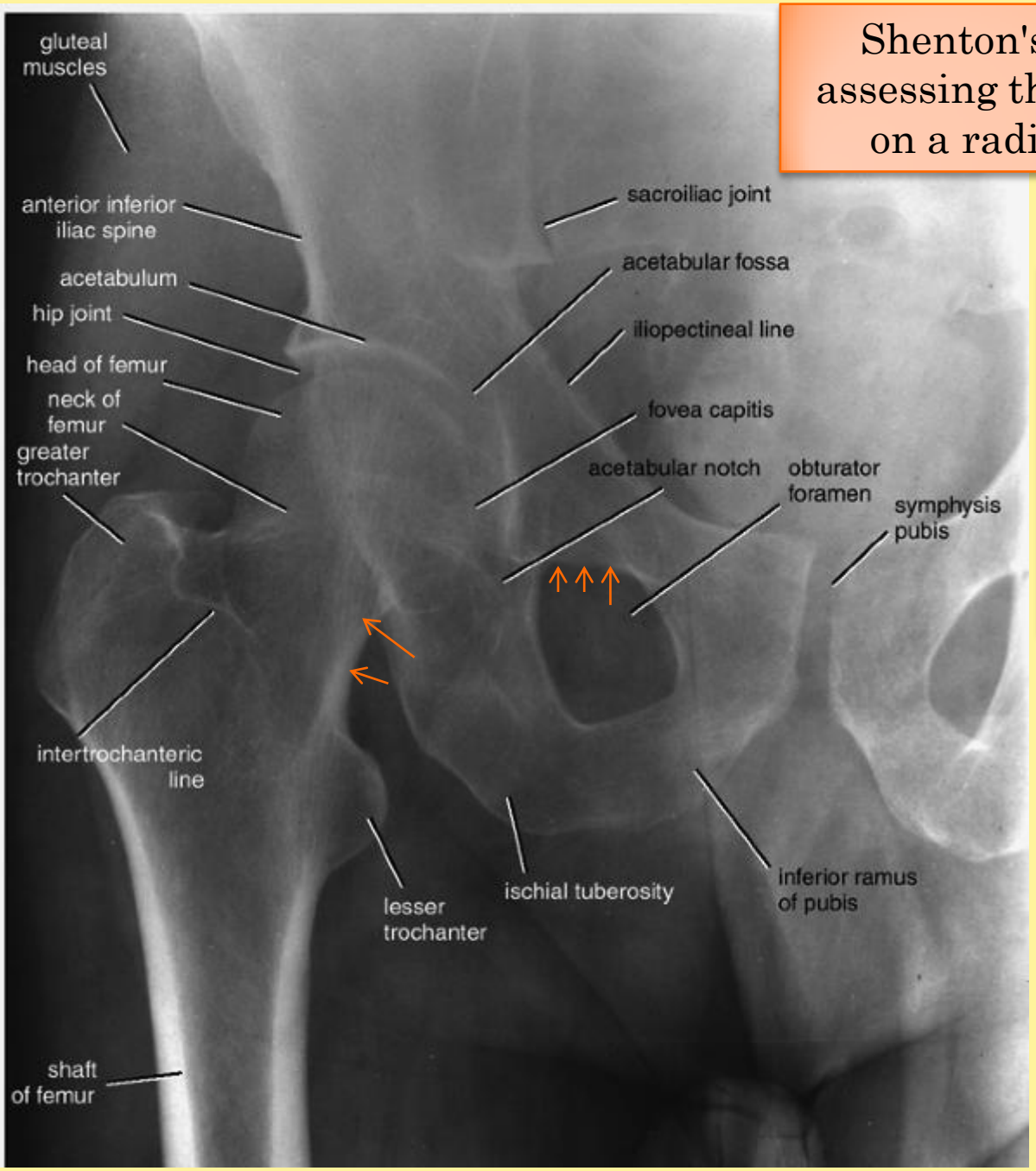




it occurs in fractures of the neck of the femur and in slipping of the femoral epiphysis. In this condition, abduction of the hip joint is limited

<u>for example</u>, in cases of congenital dislocation of the hip. In this condition, adduction of the hip joint is limited

Shenton's line is a useful means of assessing the angle of the femoral neck on a radiograph of the hip region



Note that the inferior margin of the neck of the femur should form a continuous curve with the upper margin of the obturator foramen (Shenton's line)

10-There is a pattern of hip injuries;

In children may sustain greenstick fractures of the femoral neck

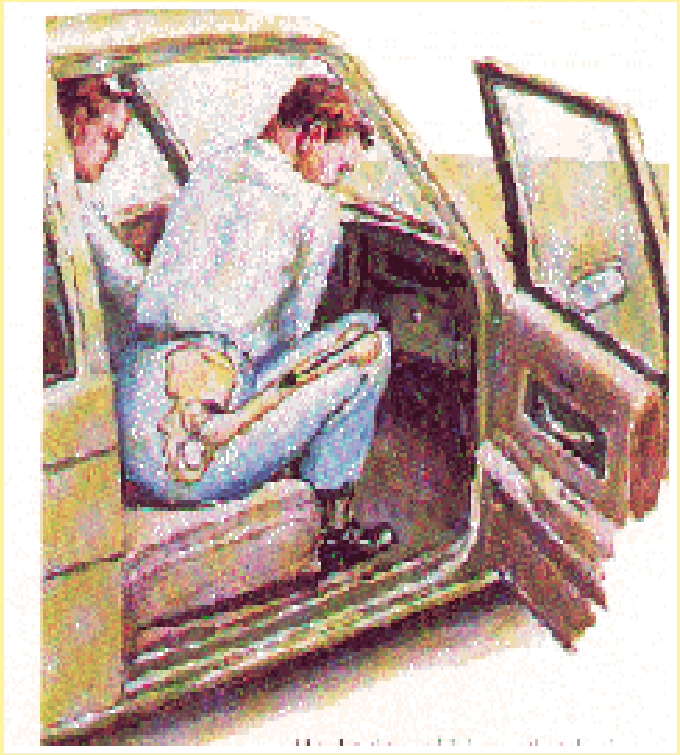
schoolboys may displace the epiphysis of the femoral head

in adult life the hip dislocates

in old age fracture of the neck of the femur again becomes the usual lesion

Dislocation of the hip

The hip is usually dislocated backwards and this is produced by a force applied along the femoral shaft with the hip in the flexed position (e.g. the knee striking against the opposite seat or in car accedent



The sciatic nerve, is in a close posterior relation with the hip joint therefore, it is in a danger of damage in these injuries