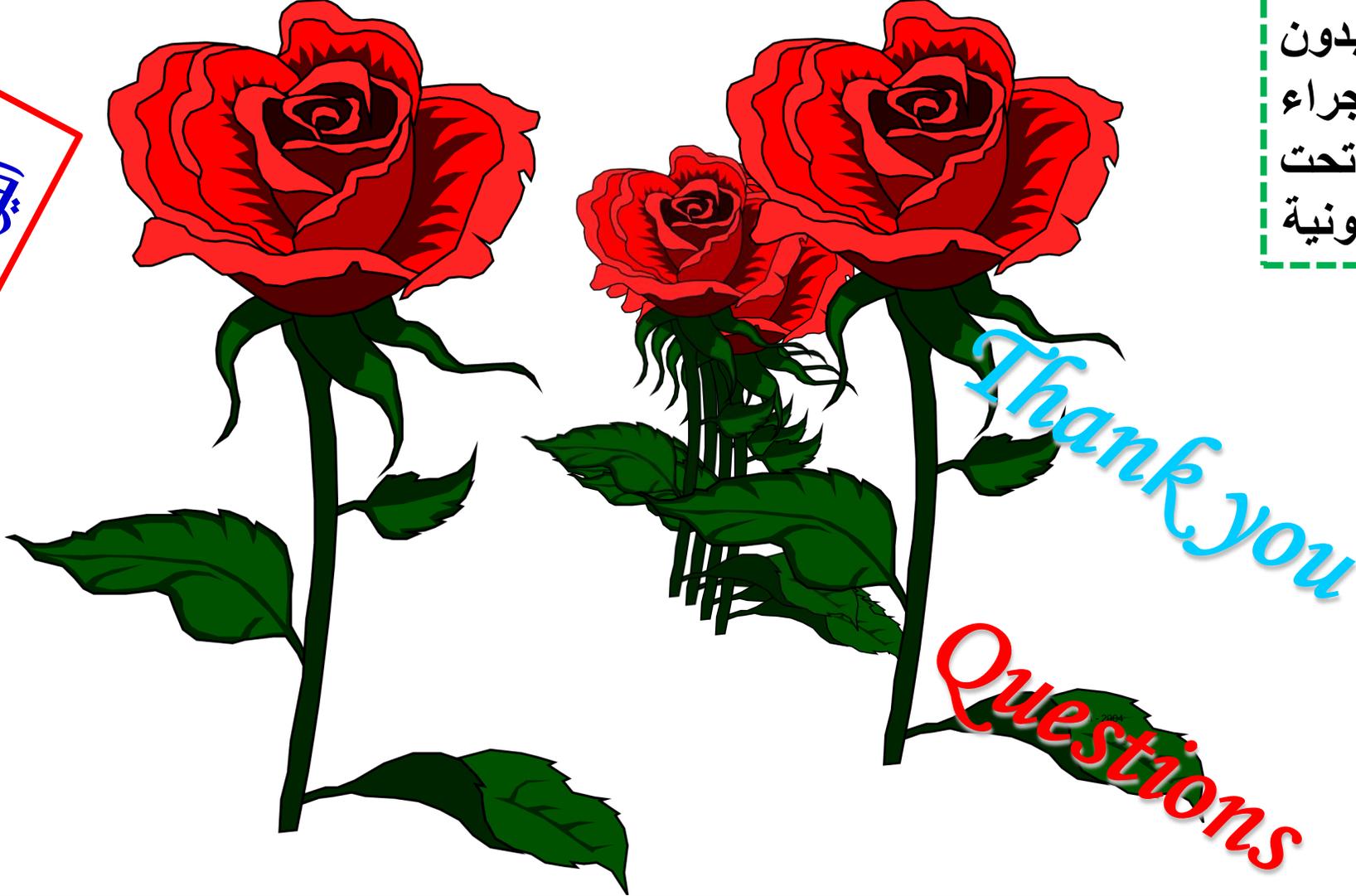


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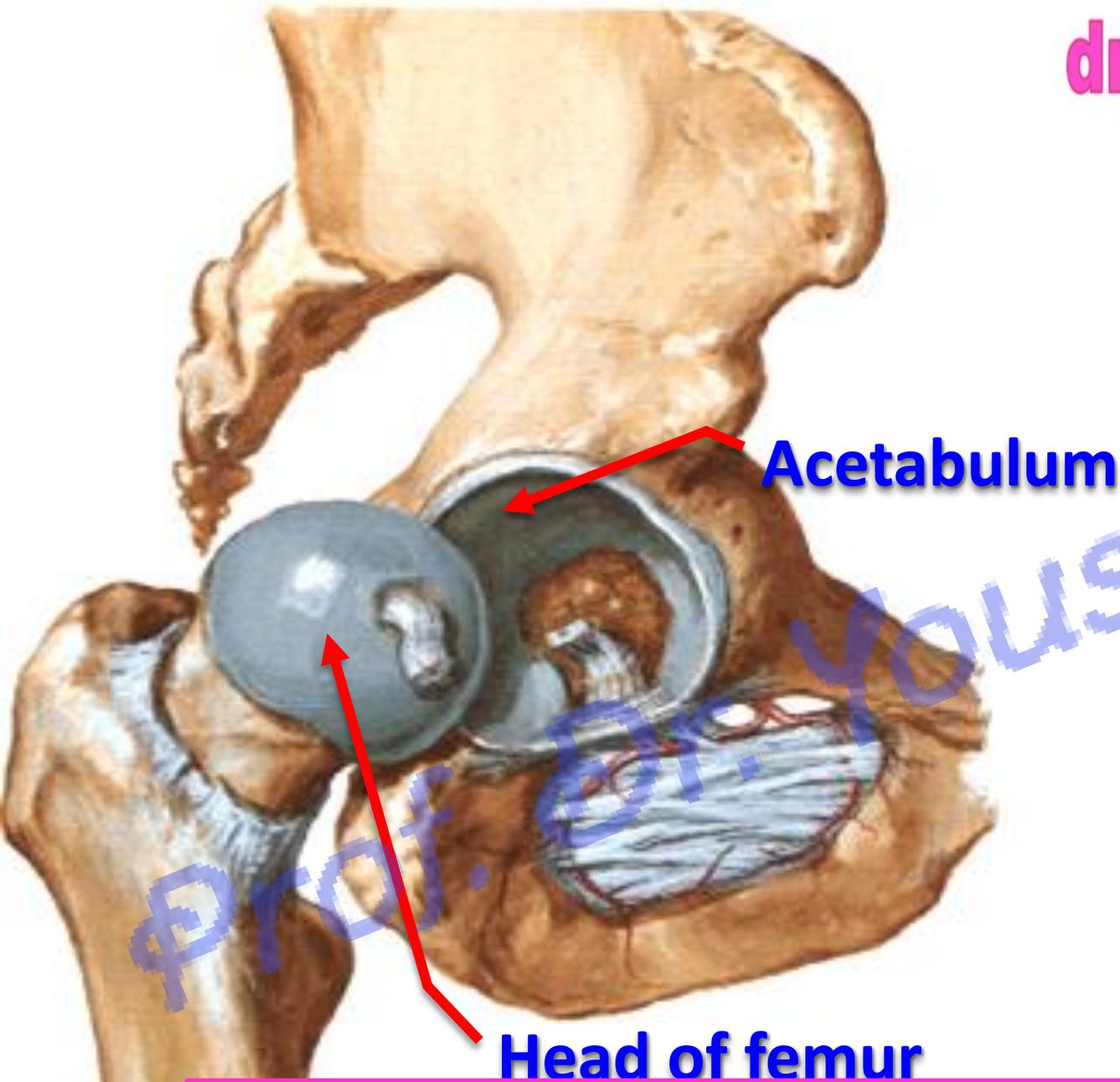


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# Hip Joint

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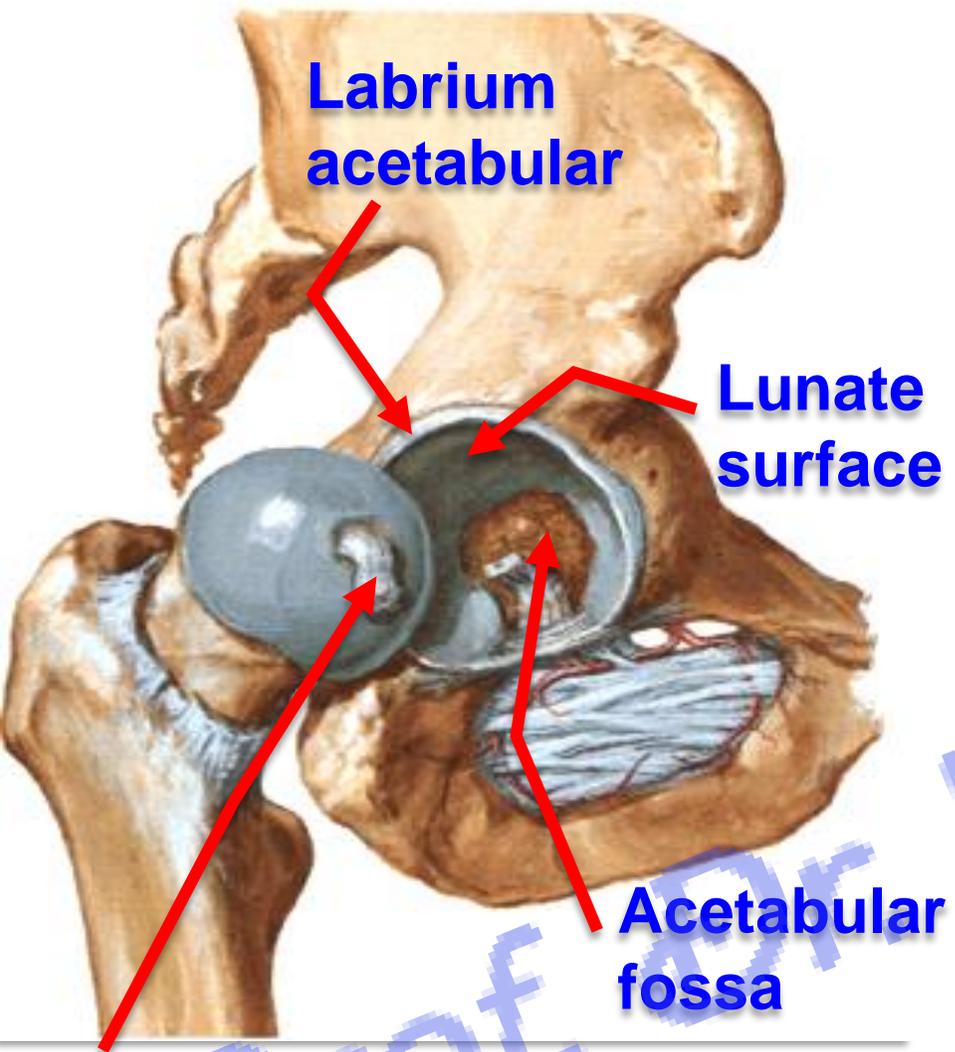
• **Hip Joint**

**1- Type:** Synovial joint, and polyaxial (ball and socket).

**2- Articular surfaces:**

a- Head of the femur.

b- Lunate surface of the acetabulum of hip bone.



**Ligament of  
Head of femur**

- **Acetabulum of hip bone**

- This is a **cup-shaped depression** on the lateral side of the hip bone.
  - The inferior margin of the acetabulum shows **acetabular notch**.
  - Its floor shows
    - A- C-shaped **articular** strip called the **lunate surface**.
    - B- **Non-articular** area called the **acetabular fossa**.
- Labrum Acetabular**; ring of fibrocartilage fixed to margin of acetabulum to increase depth of the cavity.

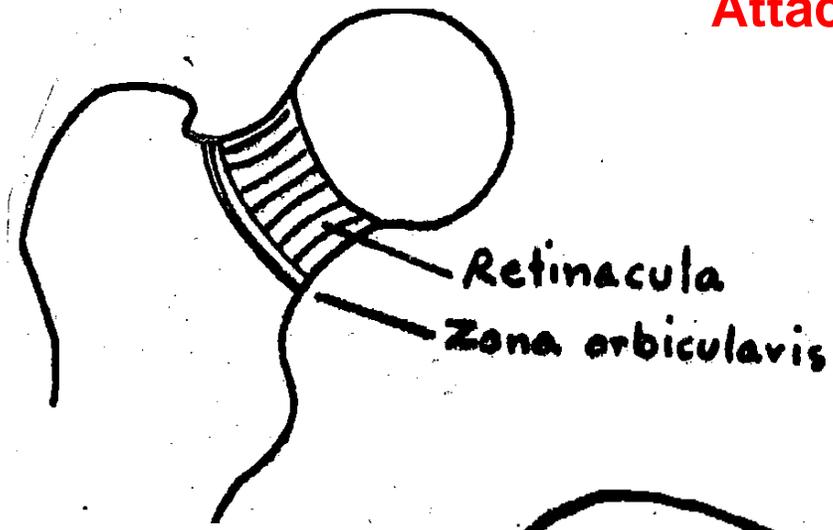
- **Head of the femur**

- It forms more than half (about two-thirds) of a sphere.
- There is a small depression called fovea that gives attachment to the ligament of the head of the femur.

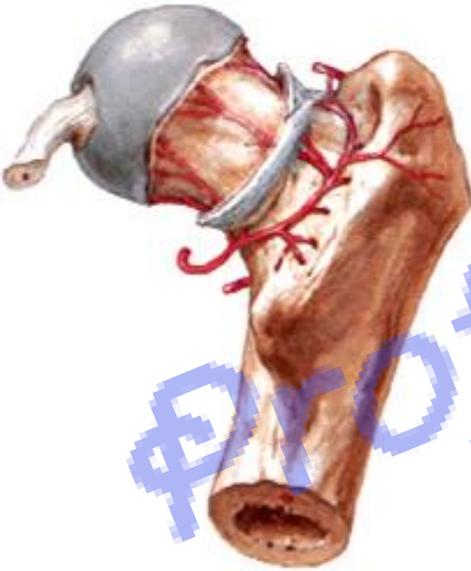
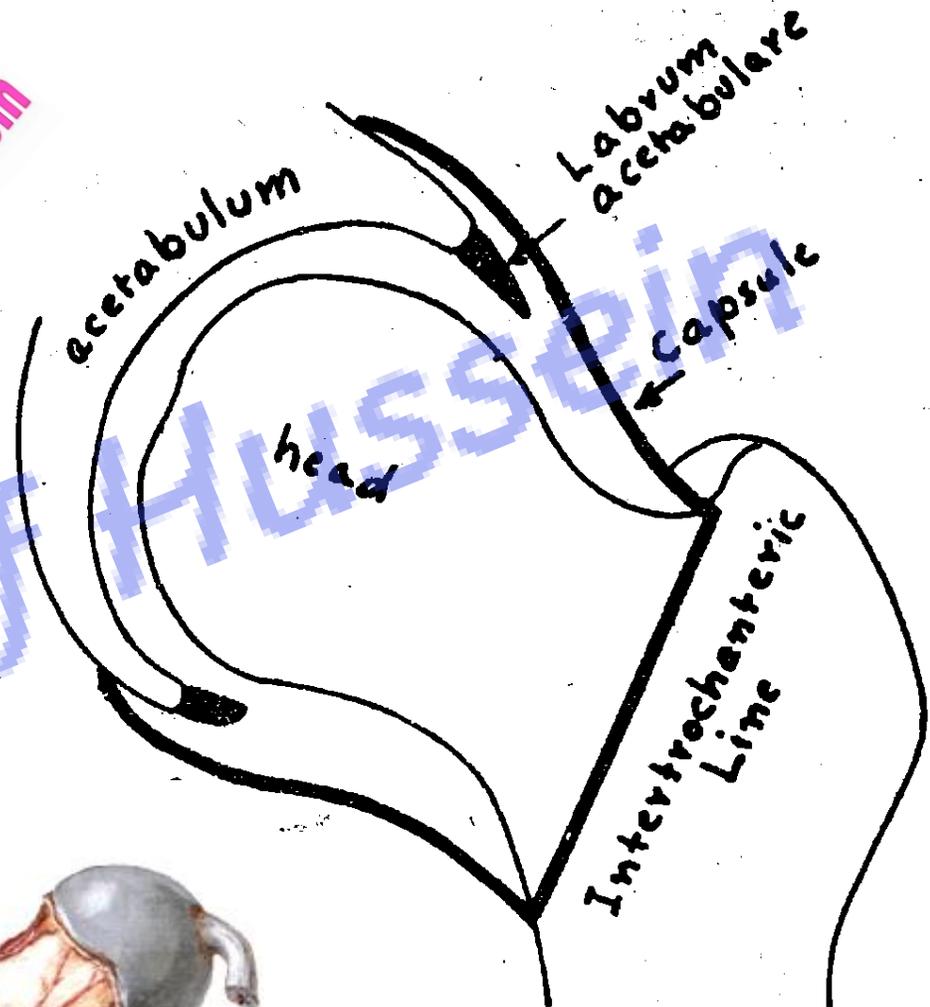
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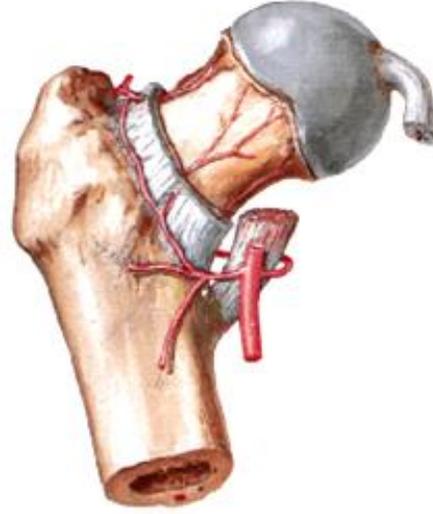
# Attachment of capsule



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Post. view



Ant. view

- **Attachment of the Capsule**

1- **Hip bone**: to the margin of the acetabulum **outside the labrum acetabular**.

2- **Femur**:

a- **Anteriorly**, to the intertrochanteric line.

b- **Posteriorly**, to the neck of the femur **one cm medial** to intertrochanteric crest.

- Accordingly, the **neck** is partly intracapsular and partly extracapsular.
- The fibers of the capsule are arranged **longitudinally parallel** to the neck of the femur
- Some of the deep fibers of the capsule are arranged **circularly** around the neck forming the **zona orbicularis**.
- Many of the fibers of the capsule are reflected medially to cover the **intracapsular** part of the neck called **retinacula of the neck**. They keep the bony fragments close together in cases of fractures of the neck of the femur.
- **Synovial membrane** covers all non-articular surfaces inside the capsule

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# Ligaments of Hip Joint

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- **Iliofemoral ligament:**

- It is the **strongest** ligament of the body.

\*\* **Site; anterior** to the capsule.

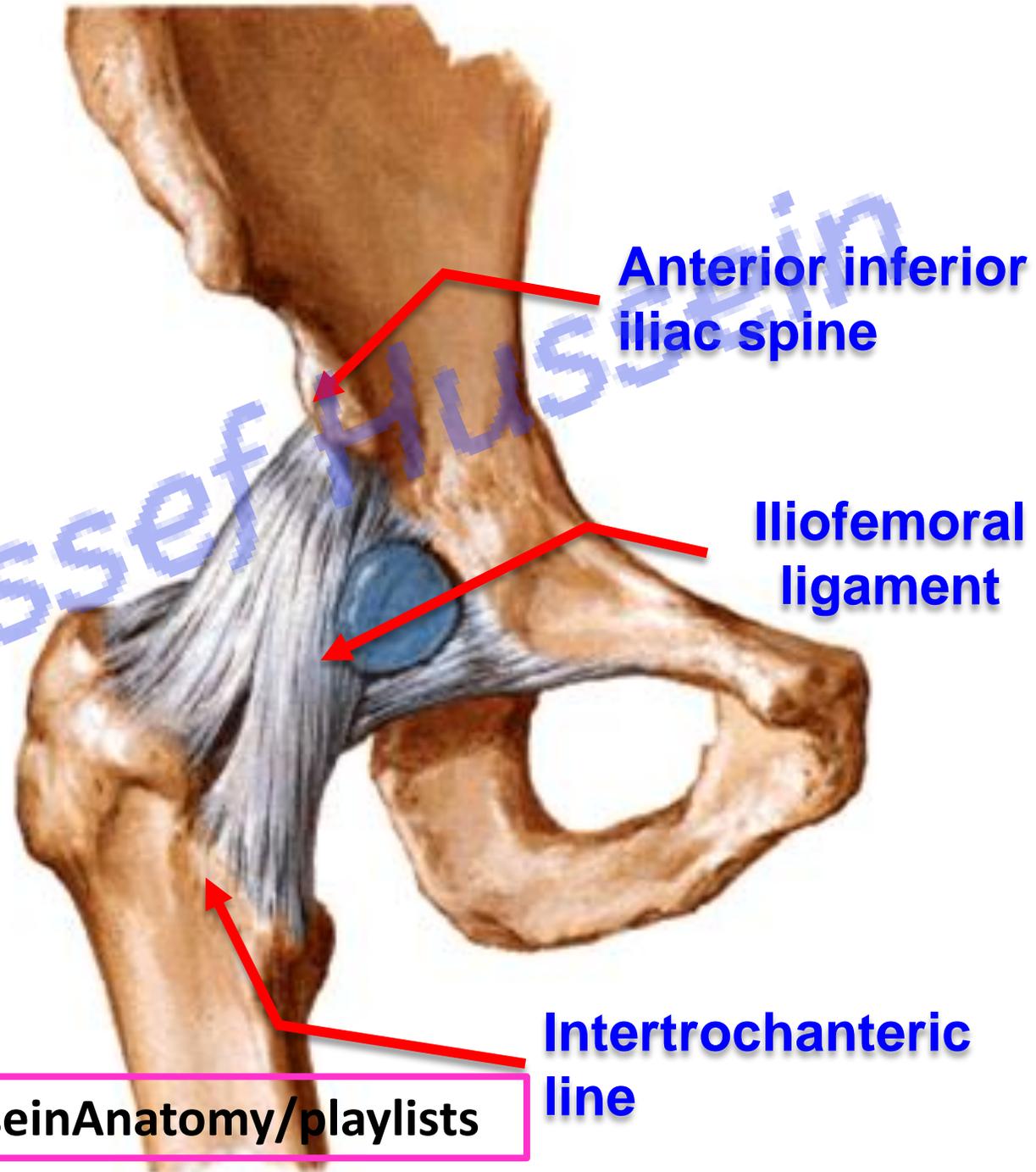
\*\* **Shape;** Y- shaped.

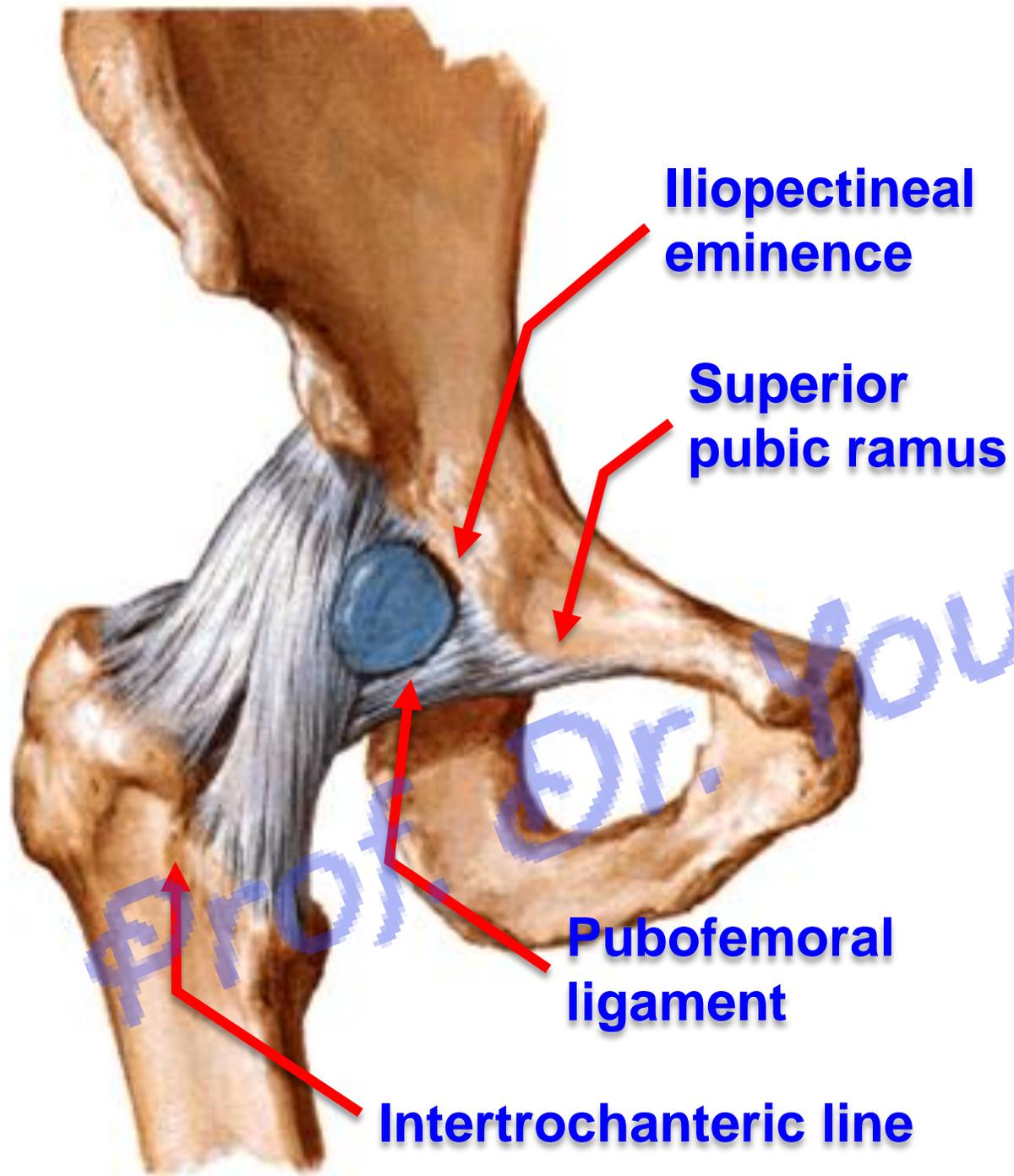
\*\* **Attachment;**

1- Apex attached to the lower part of **anterior inferior iliac spine**.

2- Two bands are attached to the **intertrochanteric line**.

\*\* **Functions,** Prevents hyperextension of the hip joint.

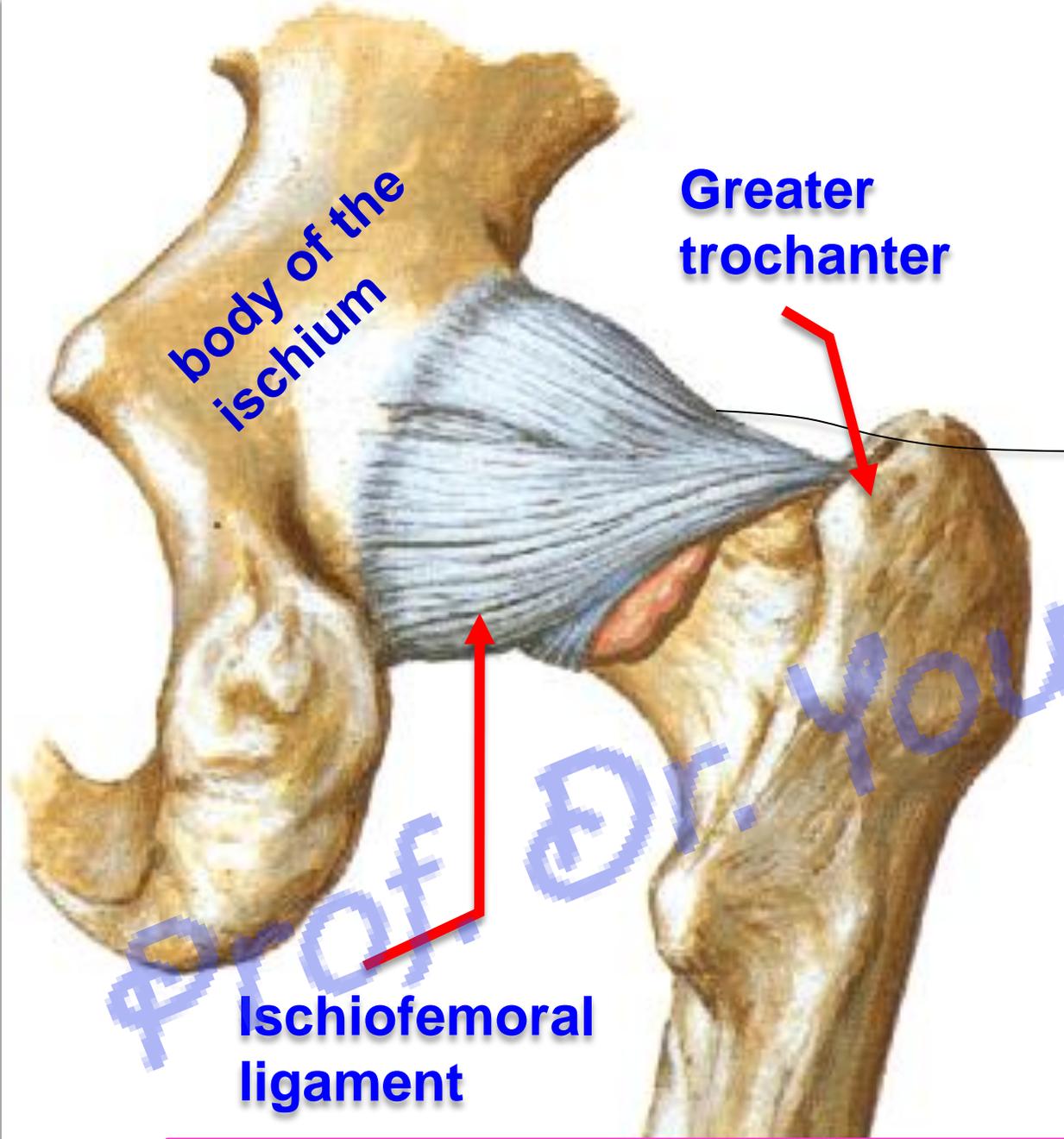




## **Pubofemoral ligament:**

- \*\* Site, medial** to capsule.
- \*\* Shape:** triangular
- \*\* Attachment;**
  - 1- Hip, iliopectineal eminence and superior pubic ramus.**
  - 2- Femur, intertrochanteric line.**
- \*\* Function,** Prevents over abduction of the hip joint.

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- **Ischiofemoral ligament:**

- \*\* **Site;** on the **back** of the capsule.

- \*\* **Shape:** spiral ligament

- \*\* **Attachment,**

- 1- Hip,** the body of the **ischium.**

- 2- Femur,** to the greater trochanter.

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- **Transverse acetabular ligament:**

- **Attachments**, margins of acetabular notch.
- It converts the notch into foramen for passage of nerve & vessel to the joint.

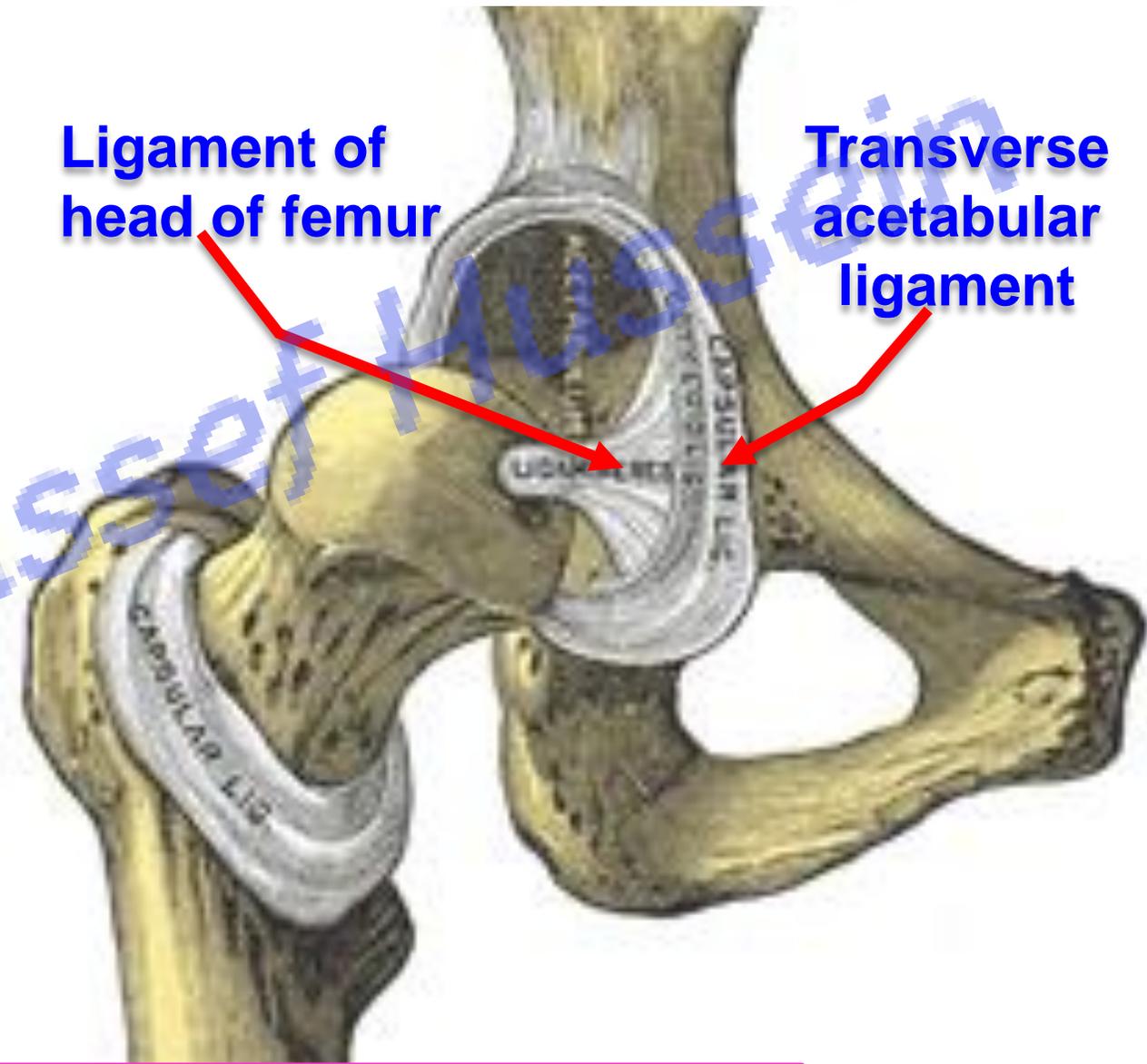
- **Ligament of head of the femur:**  
(ligamentum teres)

- **Shape**, It is a triangular ligament and covered by a synovial membrane.

- \*\* **Attachment;**

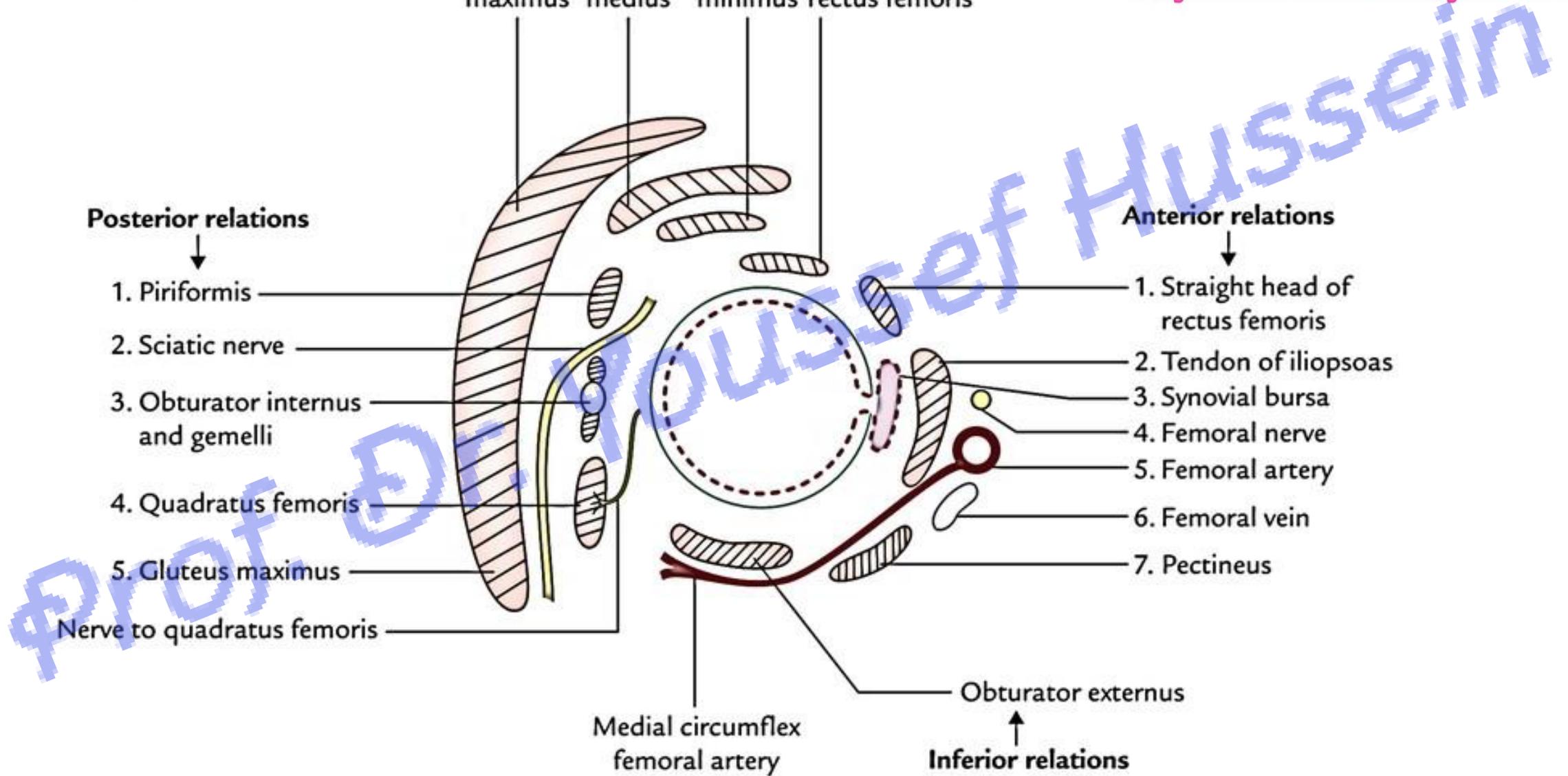
- **Apex:** to fovea of head of the femur.
- **Base** to transverse acetabular ligament.

- \*\* **Functions;** carries blood supply to head of the femur.



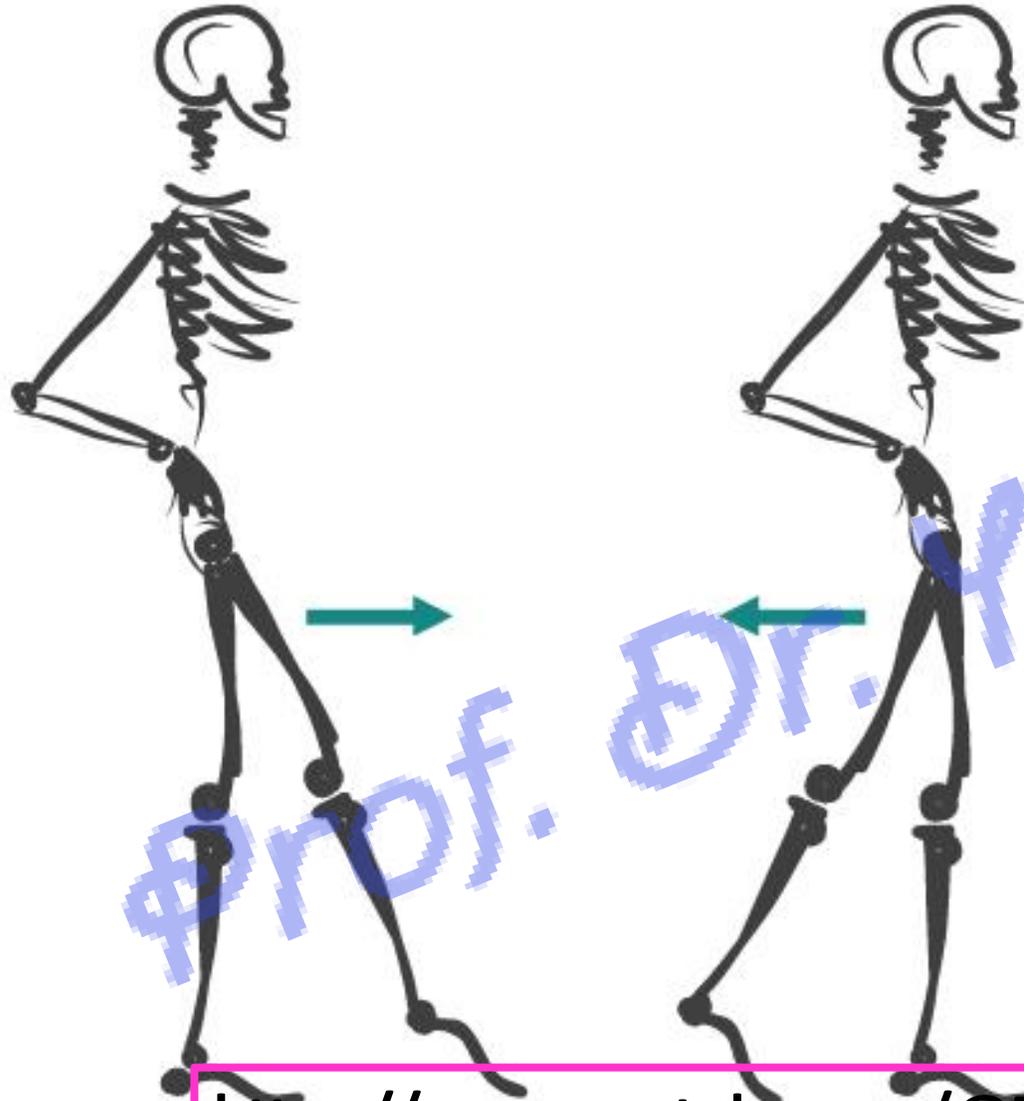
# Relations of hip joint

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FLEXION

EXTENSION



### ❖ Movements of the hip joint

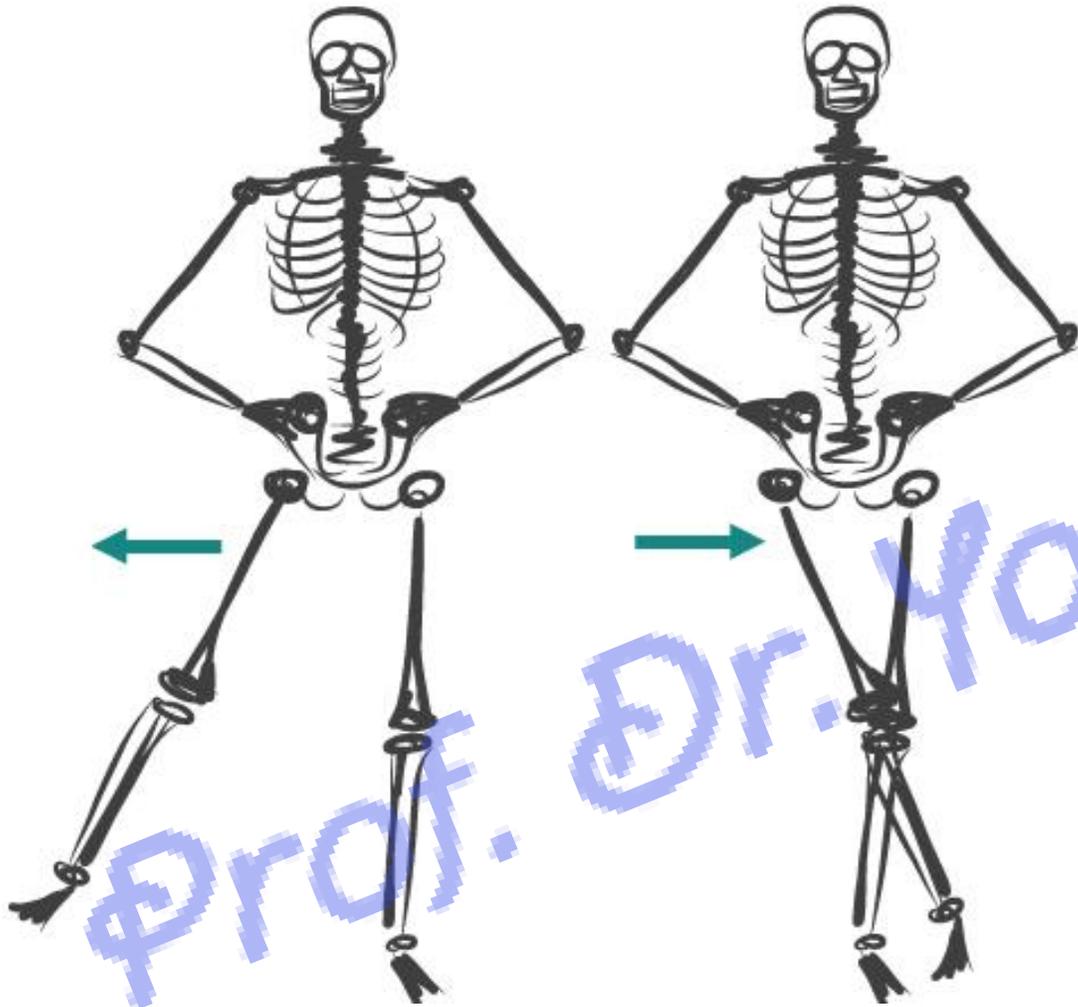
- **Flexion:** mainly by psoas major and iliacus.
  - helped by sartorius, rectus femoris and pectineus.
- **Extension:** mainly by gluteus maximus.
  - helped by the hamstrings.
- **Flexion and extension occur around a transverse axis.**

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ABDUCTION

ADDUCTION



### ❖ Movements of the hip joint

- **Adduction:** mainly by adductor longus, brevis and magnus.
- helped by pectineus and gracilis.
- **Abduction:** mainly by glutei medius and minimus.
- helped by tensor fasciae latae and sartorius.
- Abduction and adduction occurs around **anteroposterior axis**

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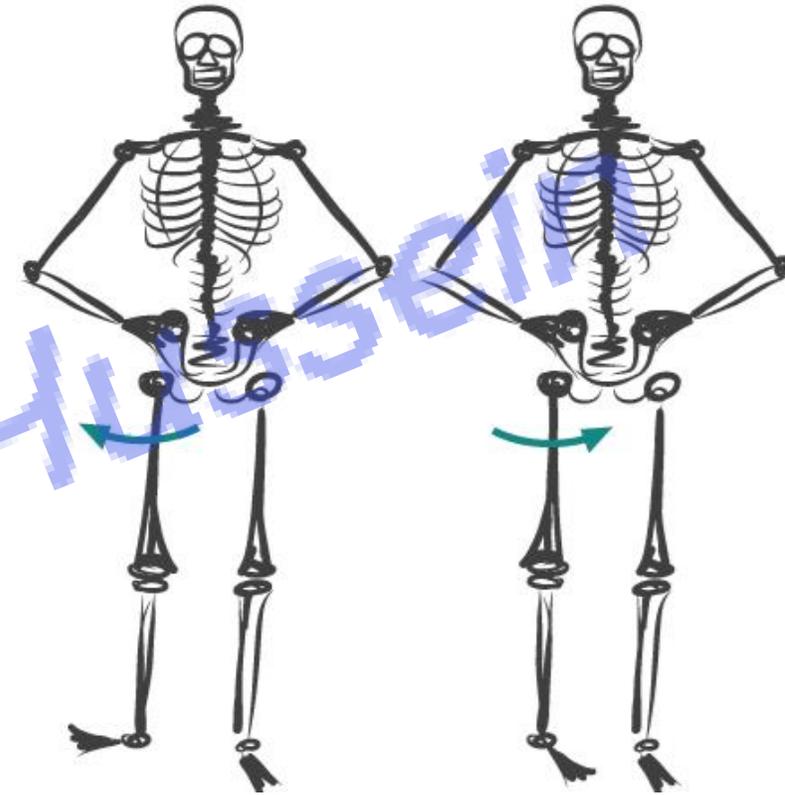
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## ❖ Movements of the hip joint

- **Medial rotation:** mainly by of the glutei medius and minimus.
  - helped by tensor fasciae latae.
- **Lateral rotation:** by
  - 1) Piriformis.
  - 2) Obturator internus.
  - 3) 2 Gemilli,
  - 4) Quadratus femoris.
  - 5) Obturator externus.
- **Circumduction;** combination of flexion, abduction, extension and adduction done in succession.

Lateral rotation

Medial rotation



- The rotation of thigh occurs around a vertical axis passes from head of femur to medial condyle of the femur.

## ❖ Blood supply

- Arterial supply (anastomoses around the neck of the femur)
  - 1- **A**scending branch of the medial circumflex femoral artery.
  - 2- **A**scending branch of the lateral circumflex femoral artery.
  - 3- **A**cetabular branch of the obturator artery.
  - 4- Superior **gluteal** artery.
  - 5- Inferior **gluteal** artery.

## ❖ Nerve supply of the hip joint

- 1- Femoral nerve (Nerve to rectus femoris).
- 2 - Obturator nerve (anterior branch).
- 3- Nerve to quadratus femoris (sacral plexus).

- **Nelaton's line**

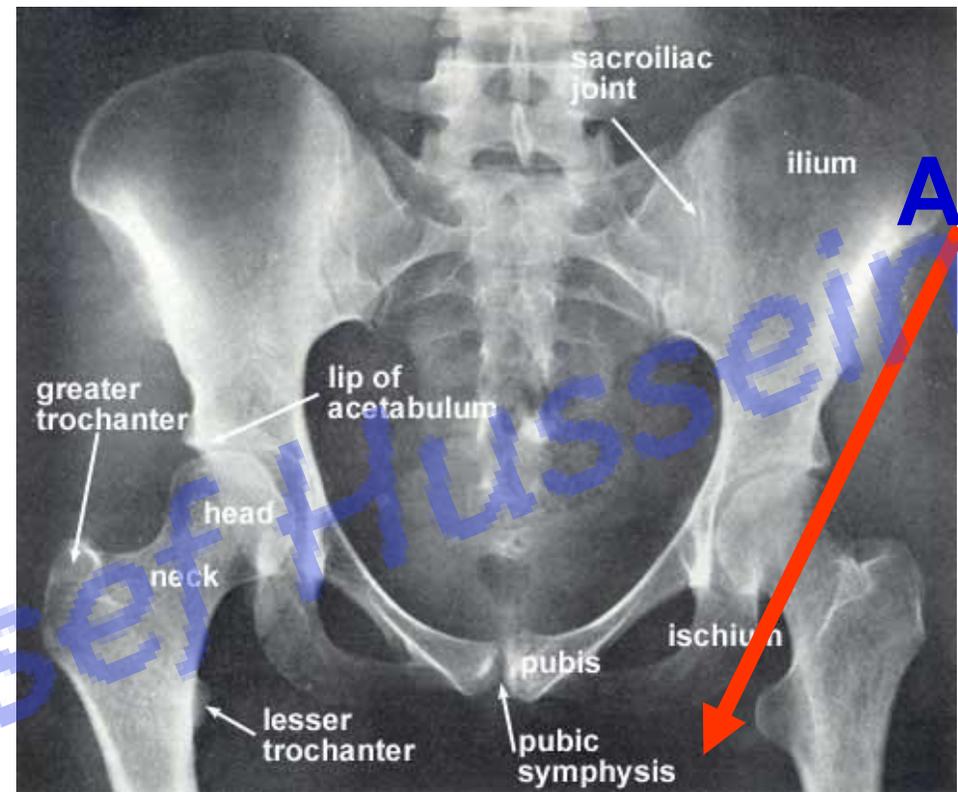
- a line drawn from the **anterior superior iliac spine** to the **ischial tuberosity**. This line normally passes on the top of the greater trochanter.

- **Dislocation of the hip joint**, the top of the greater trochanter is raised above the line.

- **Stability of the hip joint**

- It is very strong and stable joint due to the following factors:

- 1- The depth of acetabulum to accommodate greater part of head of the femur.
- 2- The strong ligaments around the joint.
- 3- The strong muscles around the joint.



**ASIS**

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Abduction by  
gluteus medius  
and minimus

Flexion by  
iliacus and psoas major

Spasm of thigh  
muscles

Pull of  
adductors

(a)

(b)

## Fracture of the upper part of femur

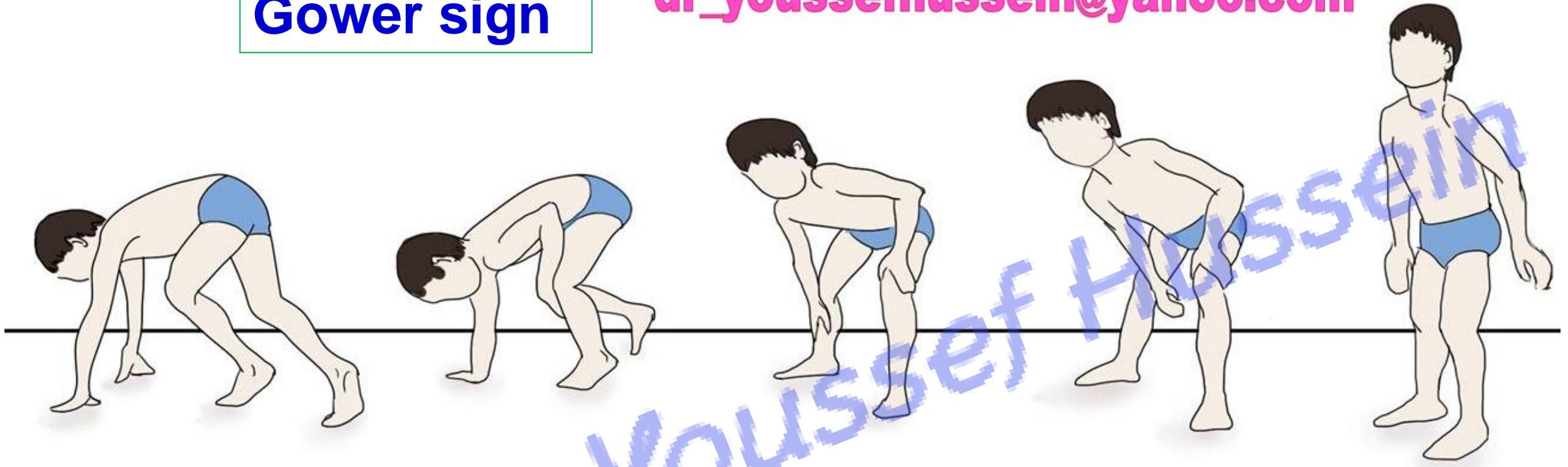
- **Proximal segment:**
- Flexion and lateral rotation by iliopsoas
- Abduction by gluteus medius, minimus
- **Distal segment is pulled medially by the adductor muscles.**

### • Neck of the femur

- It is long and oblique position allows the lower limb to swing easily clear of the pelvis.
- **If fractured**, the shaft is free and rotate laterally around its own axis.
- **Types:** Intracapsular and extracapsular

## Gower sign

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- Injury of inferior gluteal nerve: Paralysis of the gluteus maximus muscle leading to difficult in climbing up stairs and rising from the floor is squatting position.

- **Gower's sign**, in Paralysis of the muscle the patient Cannot stand without support, he rises slowly supporting his hand on his leg then on his thigh. He climbs on himself

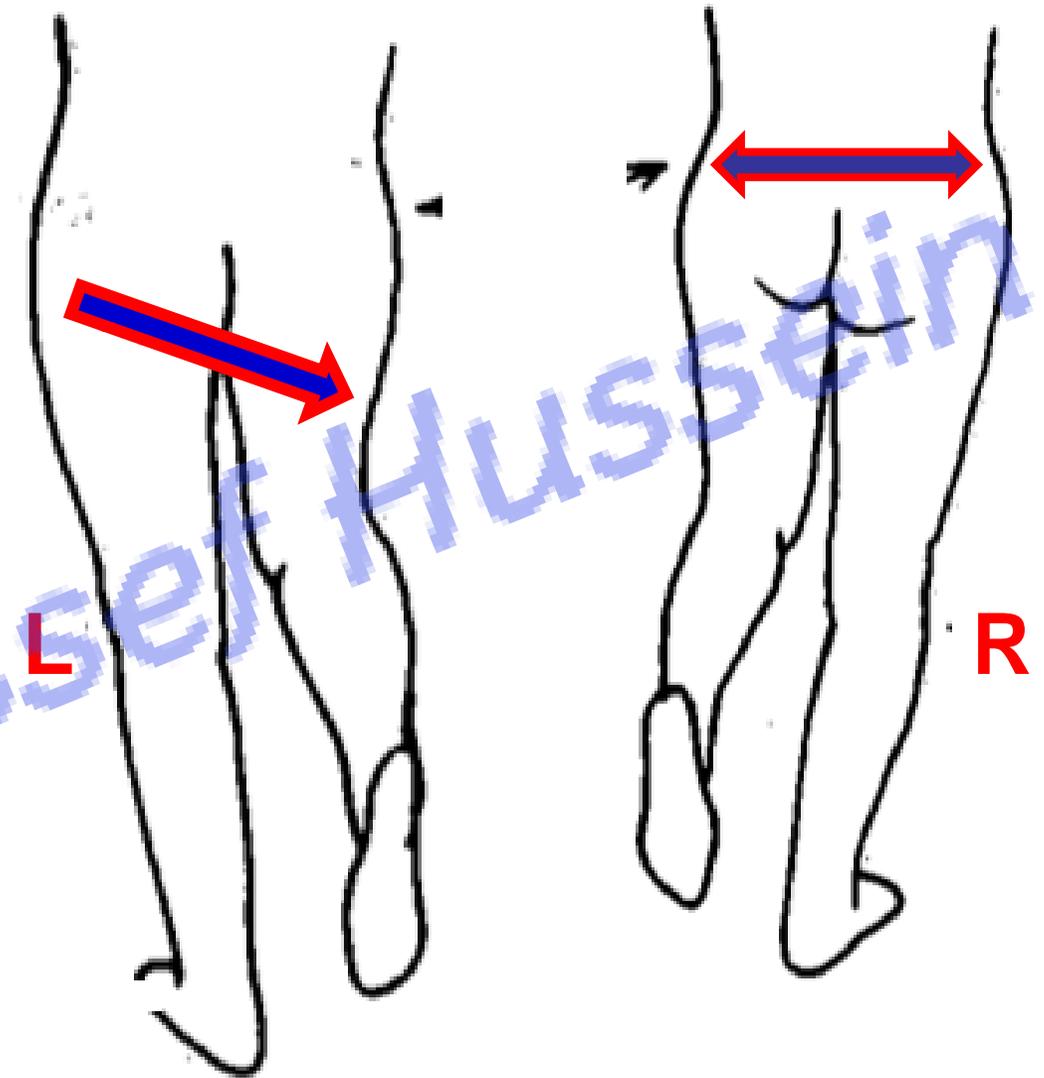
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## ❖ Trendelenburg's sign

- **Paralysis of left superior gluteal nerve**
- When standing on **normal right lower limb**: right glutei medius and minimus contracted to **prevent tilting** of the pelvis to the affected left side
- When standing on the **affected left limb**: pelvis **tilting to the normal right** side due to loss of actions of left glutei medius and minimus

## **Paralysis of glutei medius and minimus:**

- 1) **One side** paralysis leads to **lurching gait**.
- 2) **Both sides** paralysis lead to **waddling gait** (from side to side like the duck).

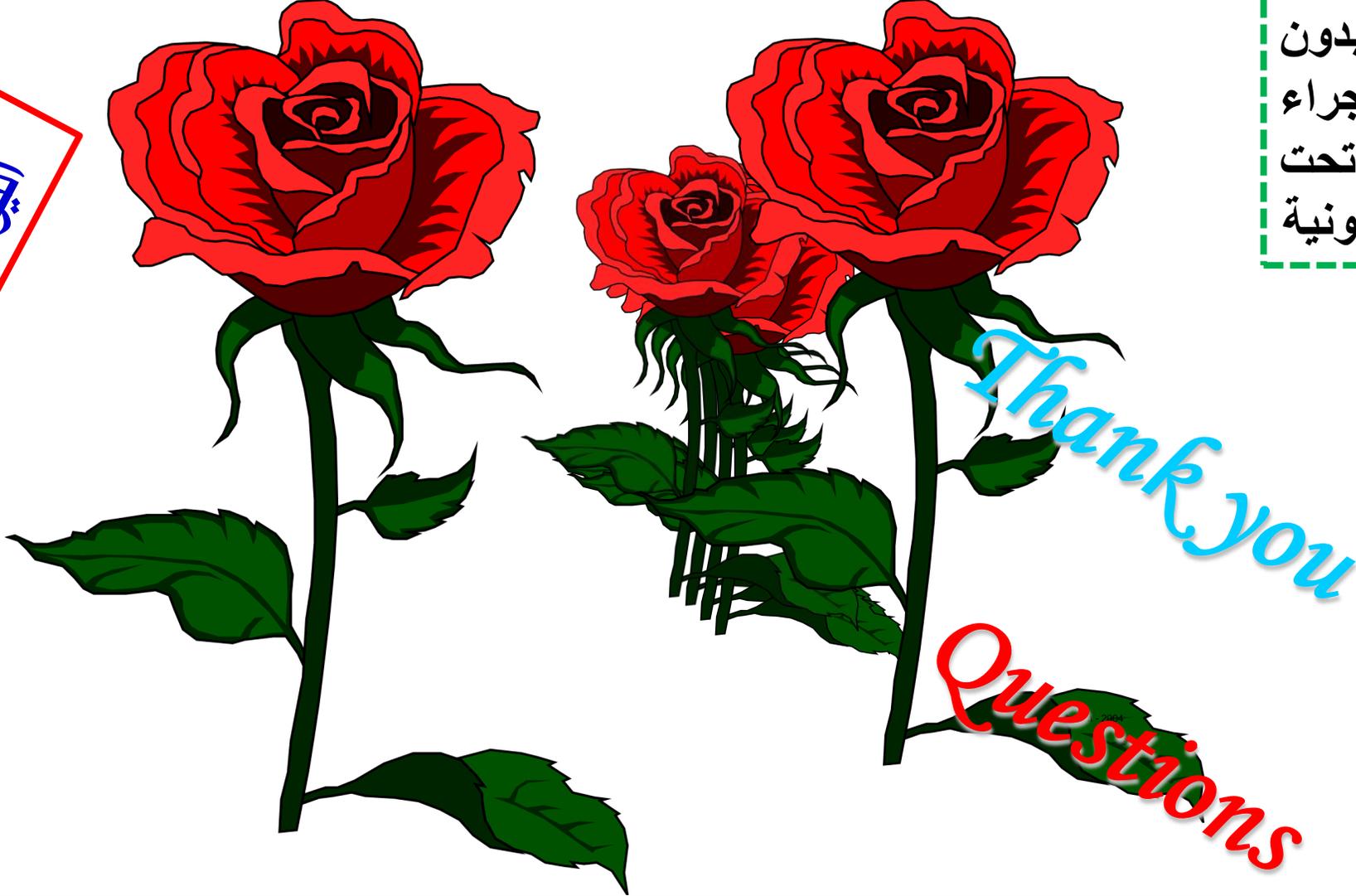


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