



# Imaging the Musculoskeletal System

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# OBJECTIVES

The main focus and objective of this lecture is to help student to be competent in looking at MSK images and interpreting findings, by learning:

- Normal radiological anatomic landmarks
- System of analyzing findings

BONE DENSITY  
BONE TEXTURE  
DISTORTION /  
DISPLACEMENT  
OF NORMAL  
STRUCTURES

“Where to look & What to look for”

IMPORTANT SITES

- Recognize features of certain disease entity







# **IMAGING OF MUSCULOSKELETAL SYSTEM**

PLAIN FILM

Corner Stone

COMPUTED TOMOGRAPHY

MAGNETIC RESONANCE IMAGING

ULTRASOUND

ANGIOGRAPHY

NUCLEAR MEDICINE

Useful in complex skeletal trauma

Useful in bone, joint, soft tissue





# **IMAGING OF MUSCULOSKELETAL SYSTEM**

- Tendons/ligaments/muscles.
- Detect fluid collections around joints or within muscles.
- Soft tissue masses and cysts.

ULTRASOUND

ANGIOGRAPHY

NUCLEAR MEDICINE

bone scan is very sensitive  
but is relatively non-specific

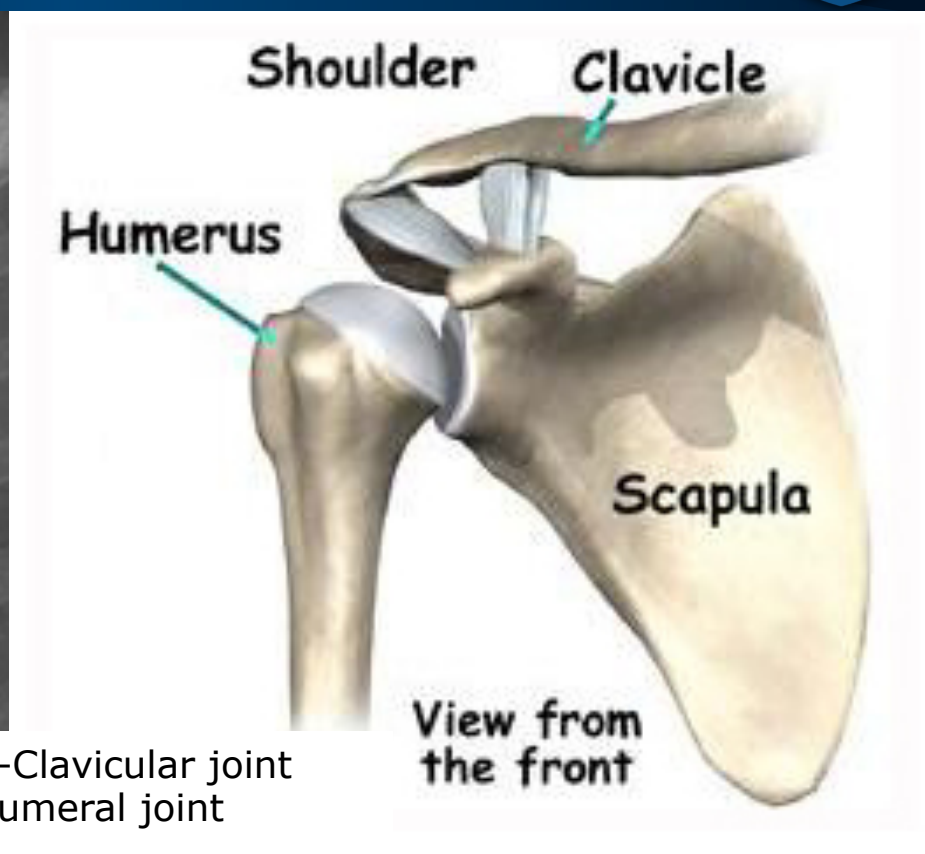
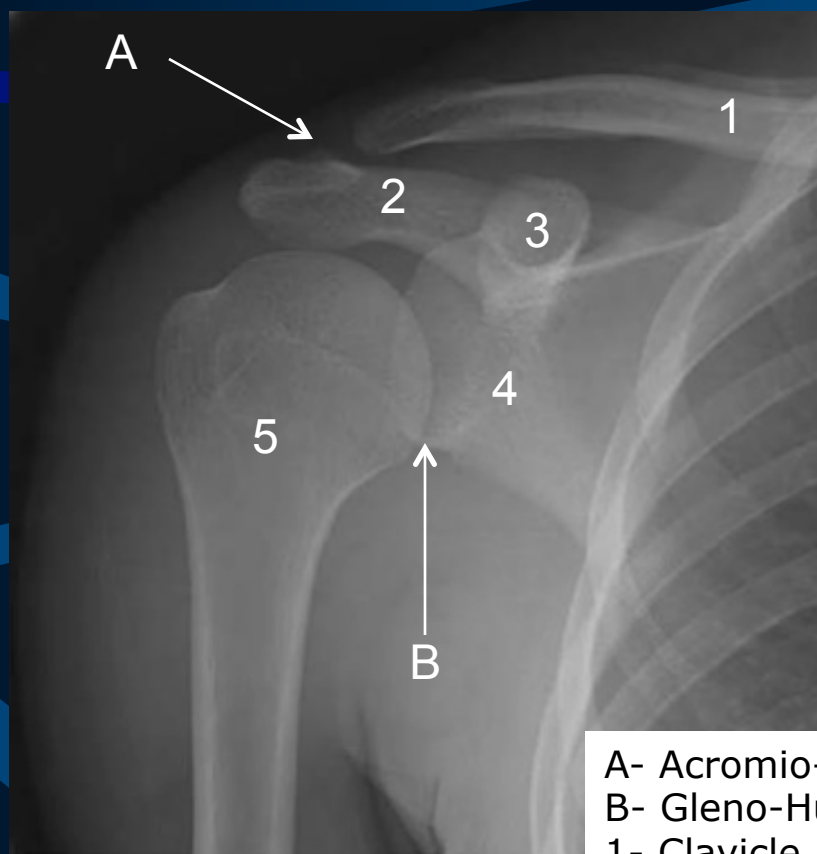




# *MUSCULOSKELETAL RADIOLOGICAL ANATOMY*

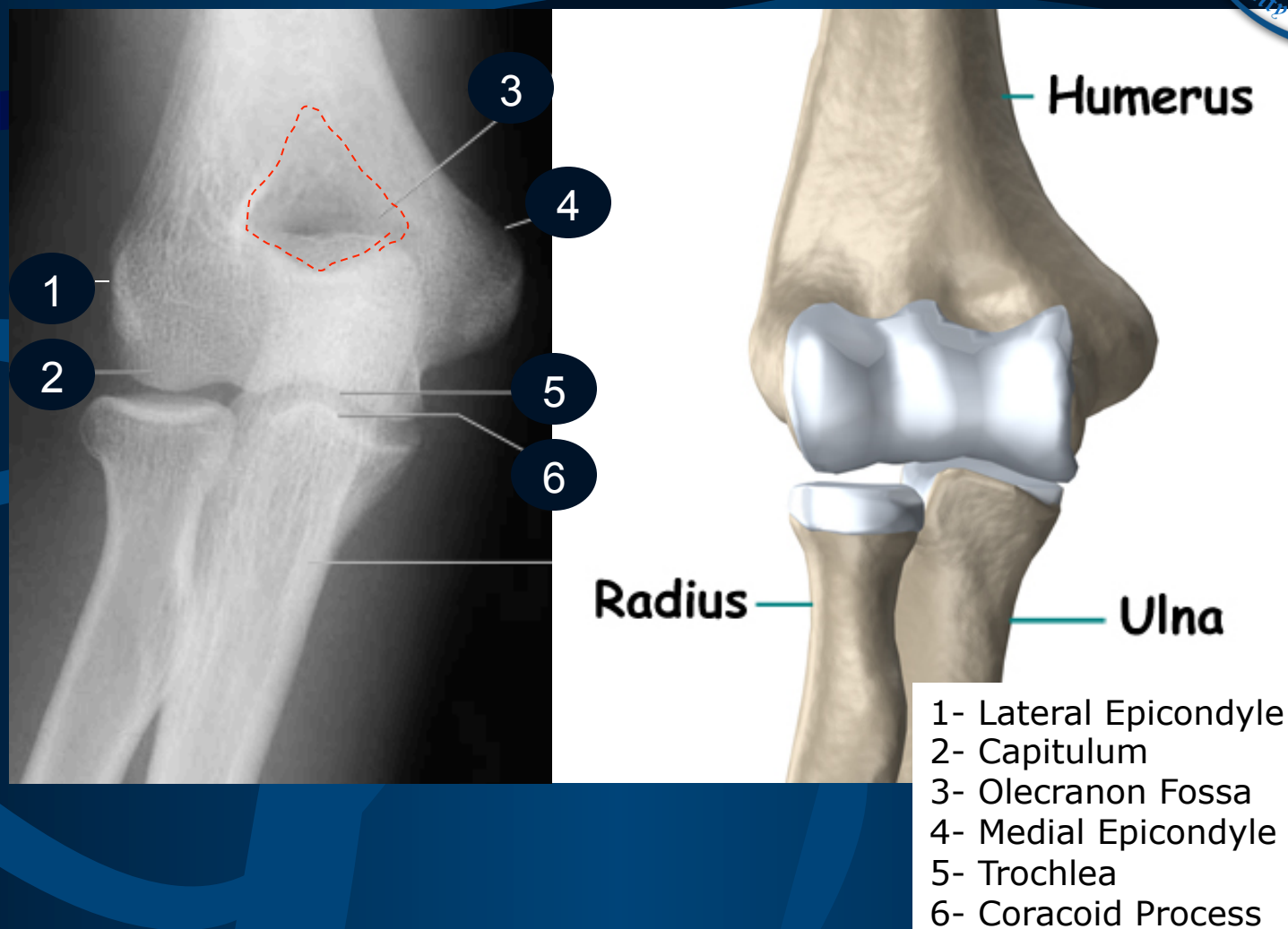


## Musculoskeletal Radiological Anatomy

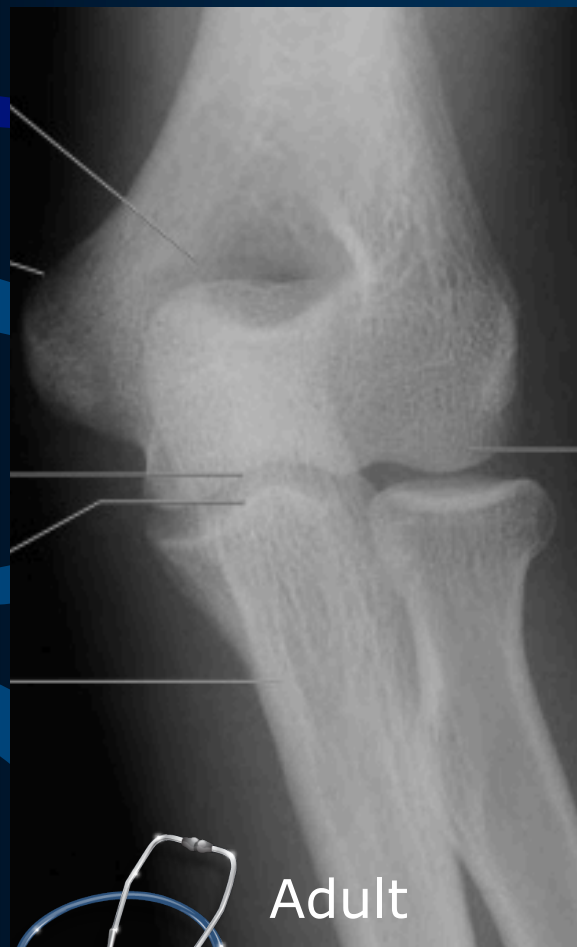


- A- Acromio-Clavicular joint
- B- Gleno-Humeral joint
- 1- Clavicle
- 2- Acromiom process
- 3- Coracoid process
- 4- Glenoid process
- 5- Humerus

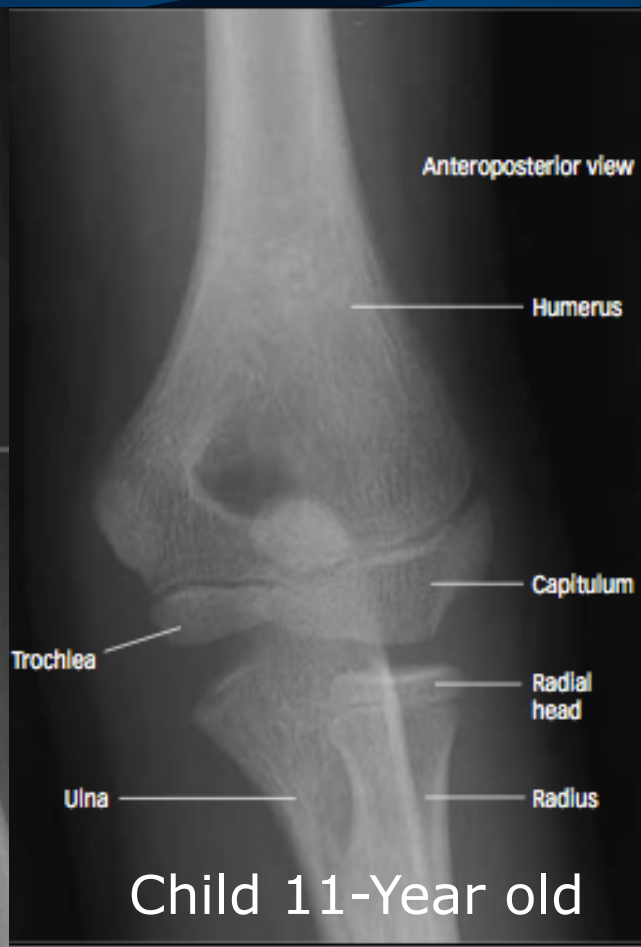
## Musculoskeletal Radiological Anatomy



## **Musculoskeletal Radiological Anatomy**



Adult



Child 11-Year old

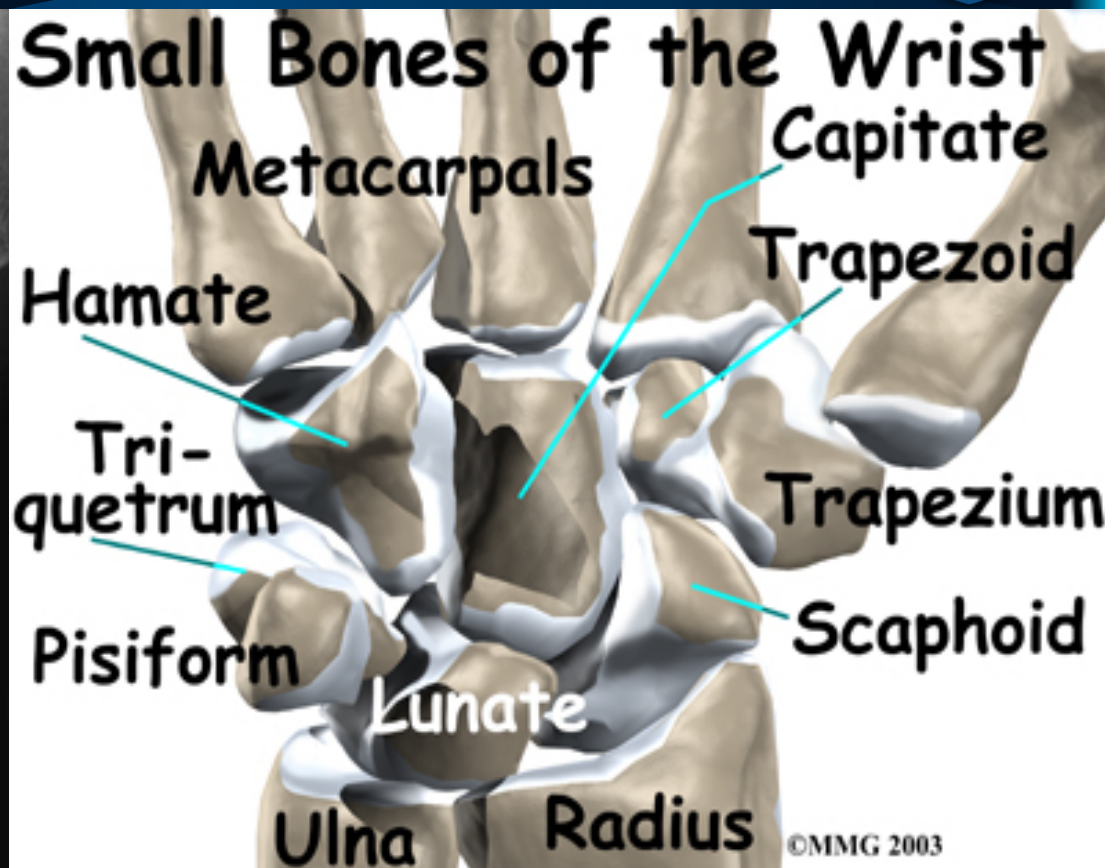


Child 5-Year old

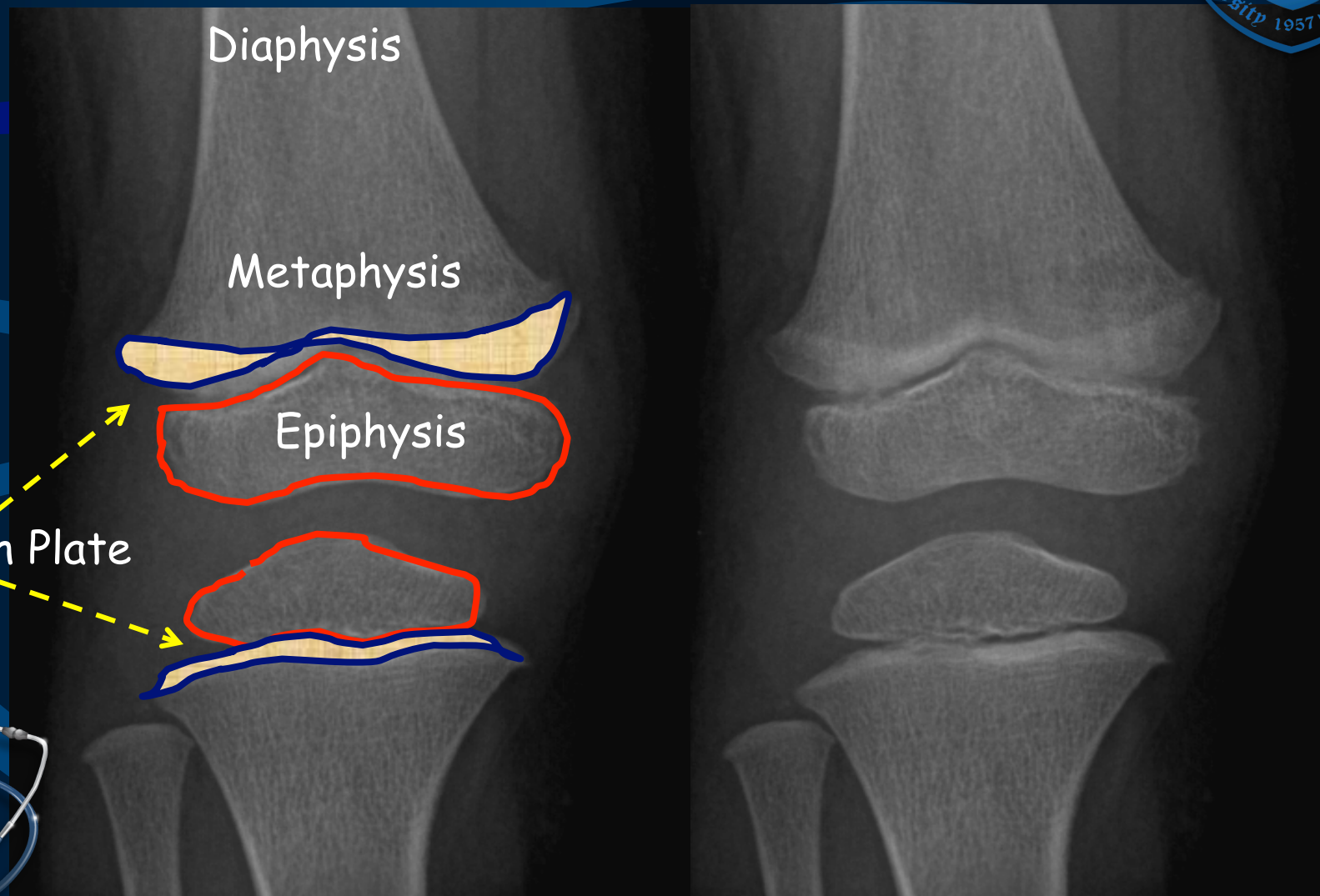




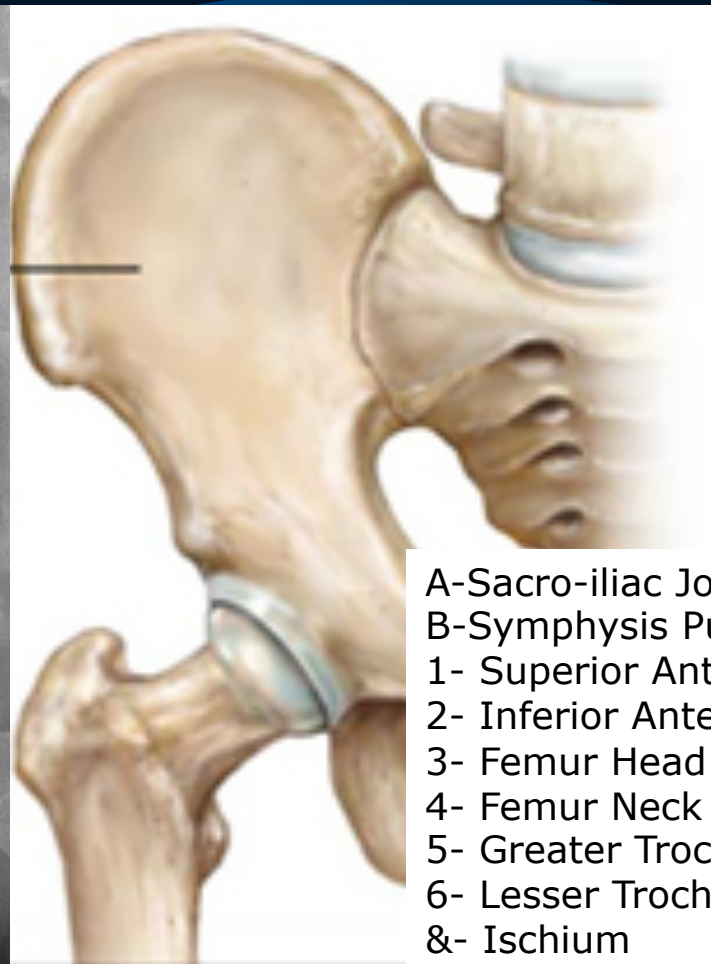
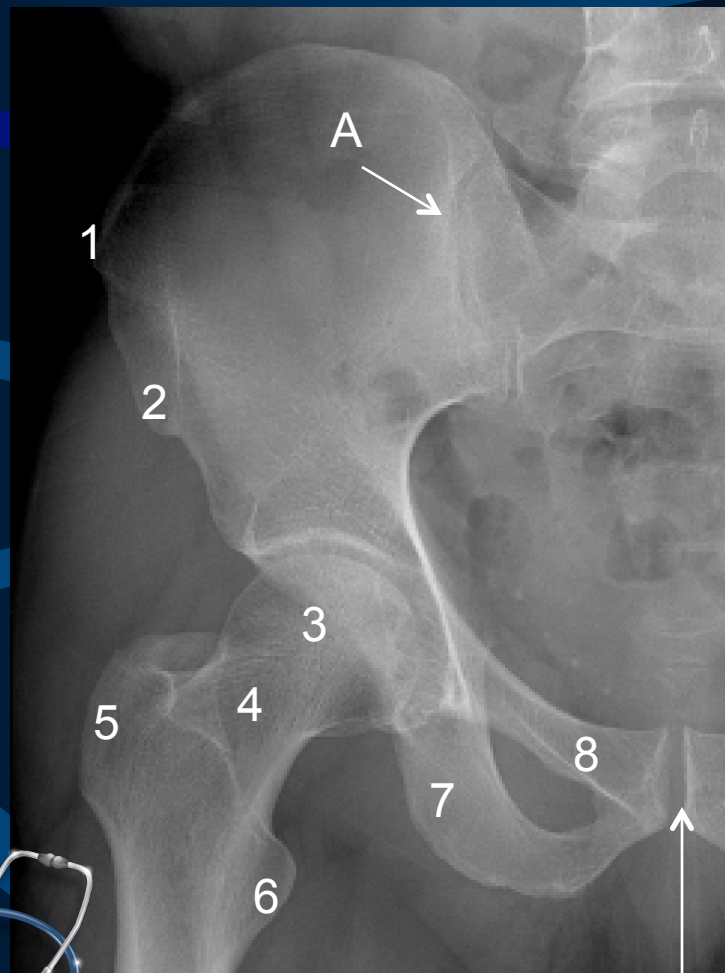
## Musculoskeletal Radiological Anatomy



## Musculoskeletal Radiological Anatomy



## Musculoskeletal Radiological Anatomy



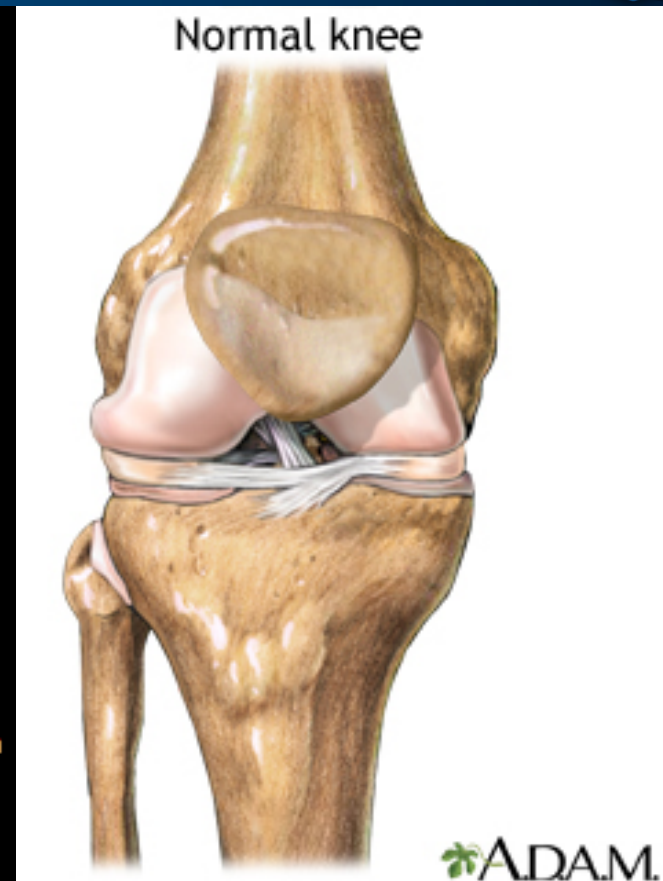
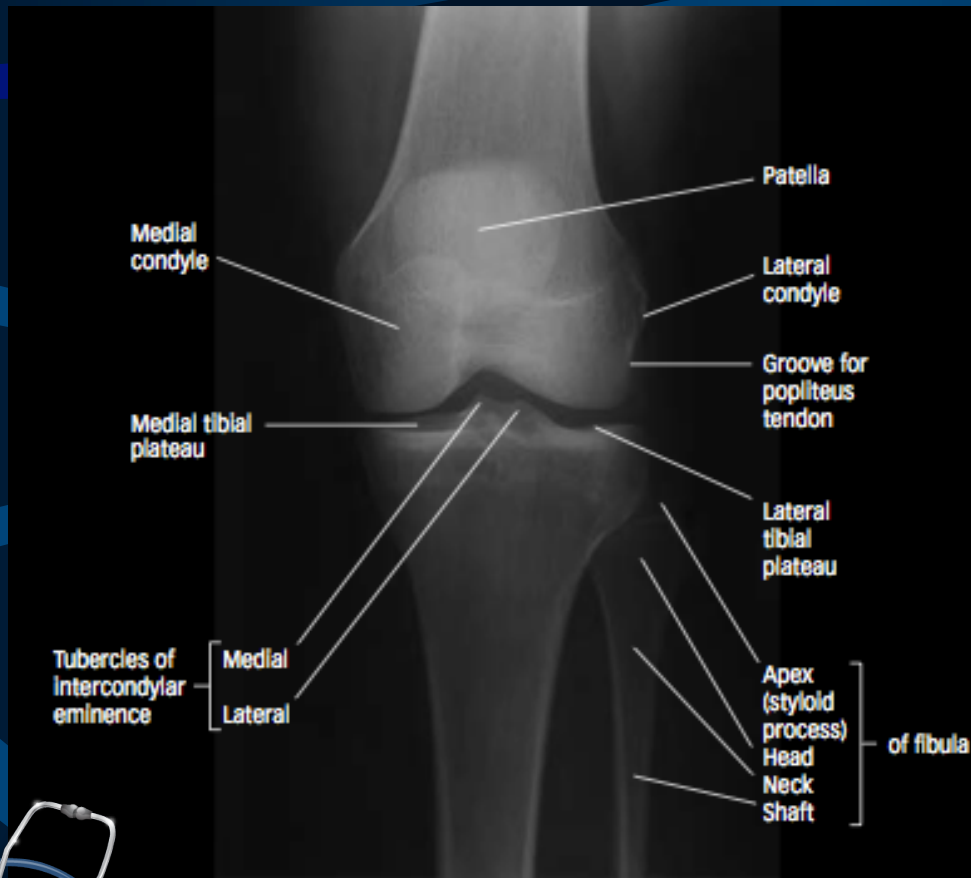
- A-Sacro-iliac Joint
- B-Symphysis Pubis
- 1- Superior Anterior Iliac Spine
- 2- Inferior Anterior Iliac Spine
- 3- Femur Head
- 4- Femur Neck
- 5- Greater Trochanter
- 6- Lesser Trochanter
- 7- Ischium
- 8- Superior Pubic Ramus



B



## Musculoskeletal Radiological Anatomy





# INTERPRETATION

Normal

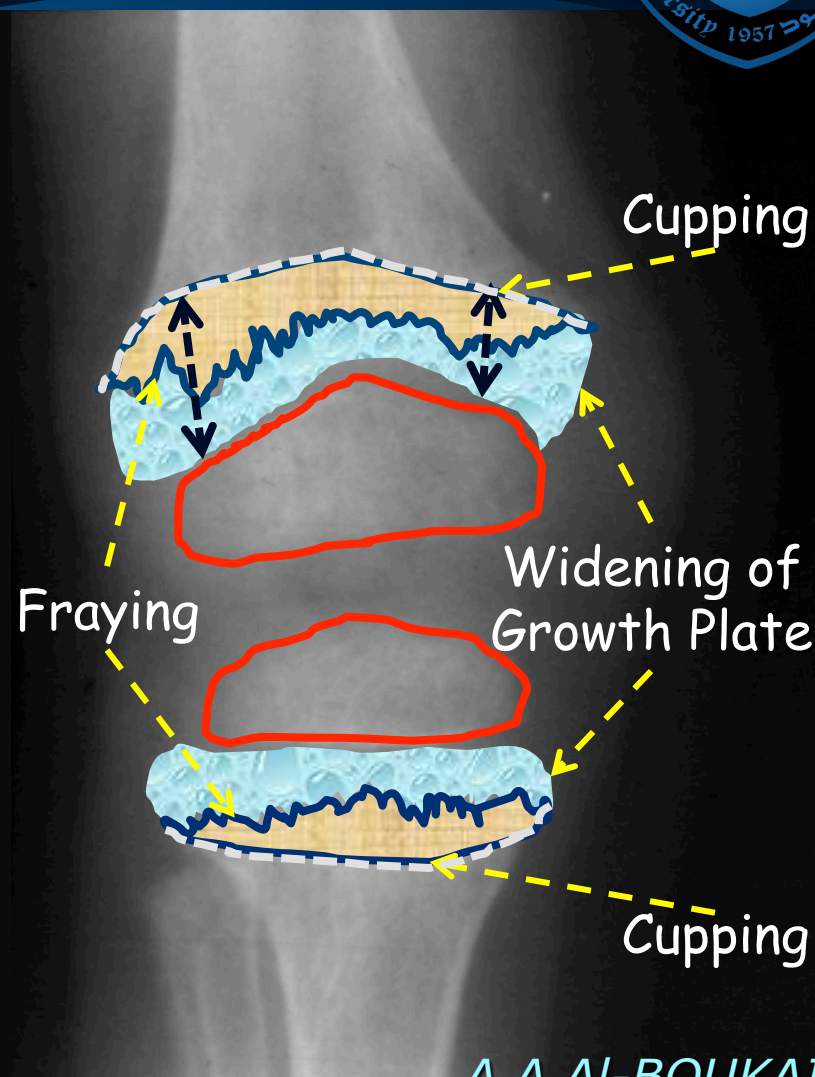
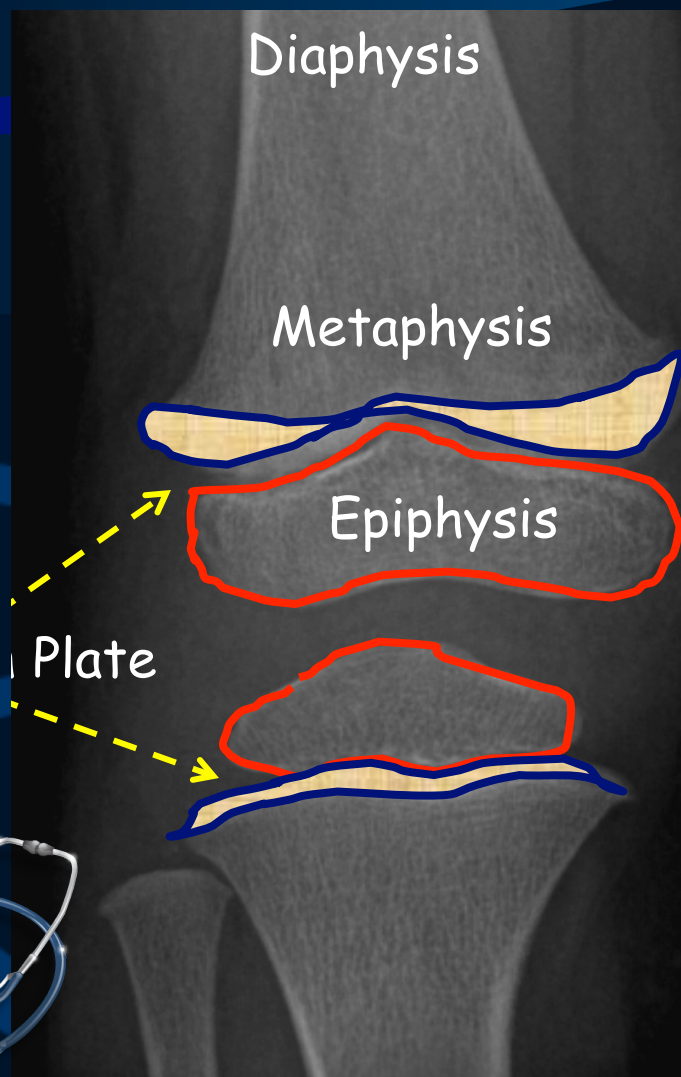
Rickets



# INTERPRETATION

Normal

Rickets





# OBJECTIVES

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"Where to look & What to look for" A A Al-BOUKAI-15



# *MUSCULOSKELETAL PATHOLOGY*

*Congenital*

*Arthritis*

*Metabolic*

*Trauma*

*Infectious*

*Hematological*

*Neoplastic*





# *MUSCULOSKELETAL RADIOLOGICAL TRAUMA*





# *TERMINOLOGY IN BONE TRAUMA*

DISLOCATION *vs.* SUBLAXATION

CLOSED *vs.* OPENED FRACTURES

GREENSTICK *vs.* TORUS FRACTURES

PHYSEAL INJURIES

STRESS FRACTURES

PATHOLOGICAL FRACTURES





# ***BASIC PRINCIPLES IN RADIOLOGY OF BONE TRAUMA***

- Two perpendicular views.
- Radiograph should include the joint nearest to the trauma.
- The paired bone concept.
- The weakest link concept (Adult vs. Children).
- Comparison films.





# ***BASIC PRINCIPLES IN RADIOLOGY OF BONE TRAUMA***

The weakest link

- The soft tissue structures (muscles/ ligaments/ tendons) in **Adults**
- The physeal plate (growth plate) in **Children**



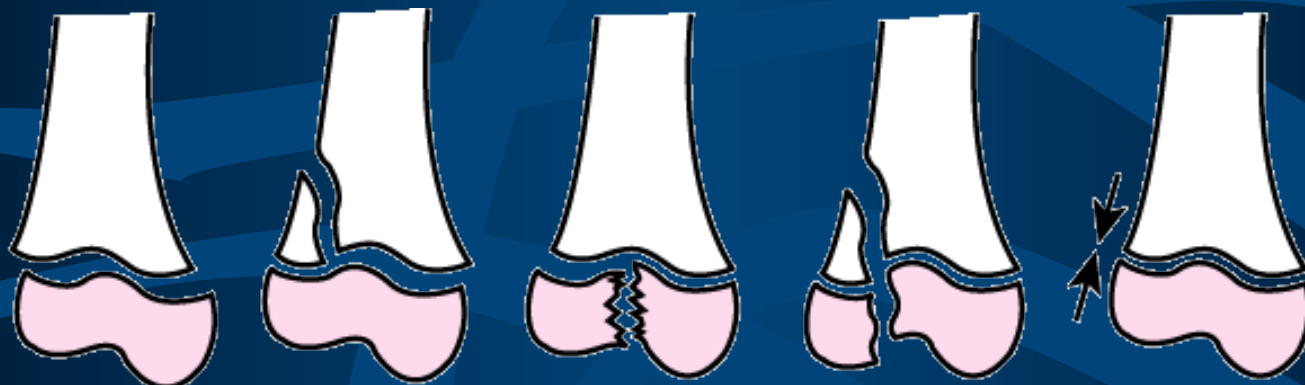








# SALTER-HARRIS INJURIES



I

II

III

VI

V





Salter-Harris 1

Normal



Traumatic Osteolysis of epiphyseal plate  
Salter-Harris injury Type1

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Salter-Harris 1

Normal



Traumatic Osteolysis of epiphyseal plate  
Salter-Harris injury Type1

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# 11years old boy with swelling of wrist pain



Growth plate injury ( Salter-Harris injury type II )

## 9years old boy with pain



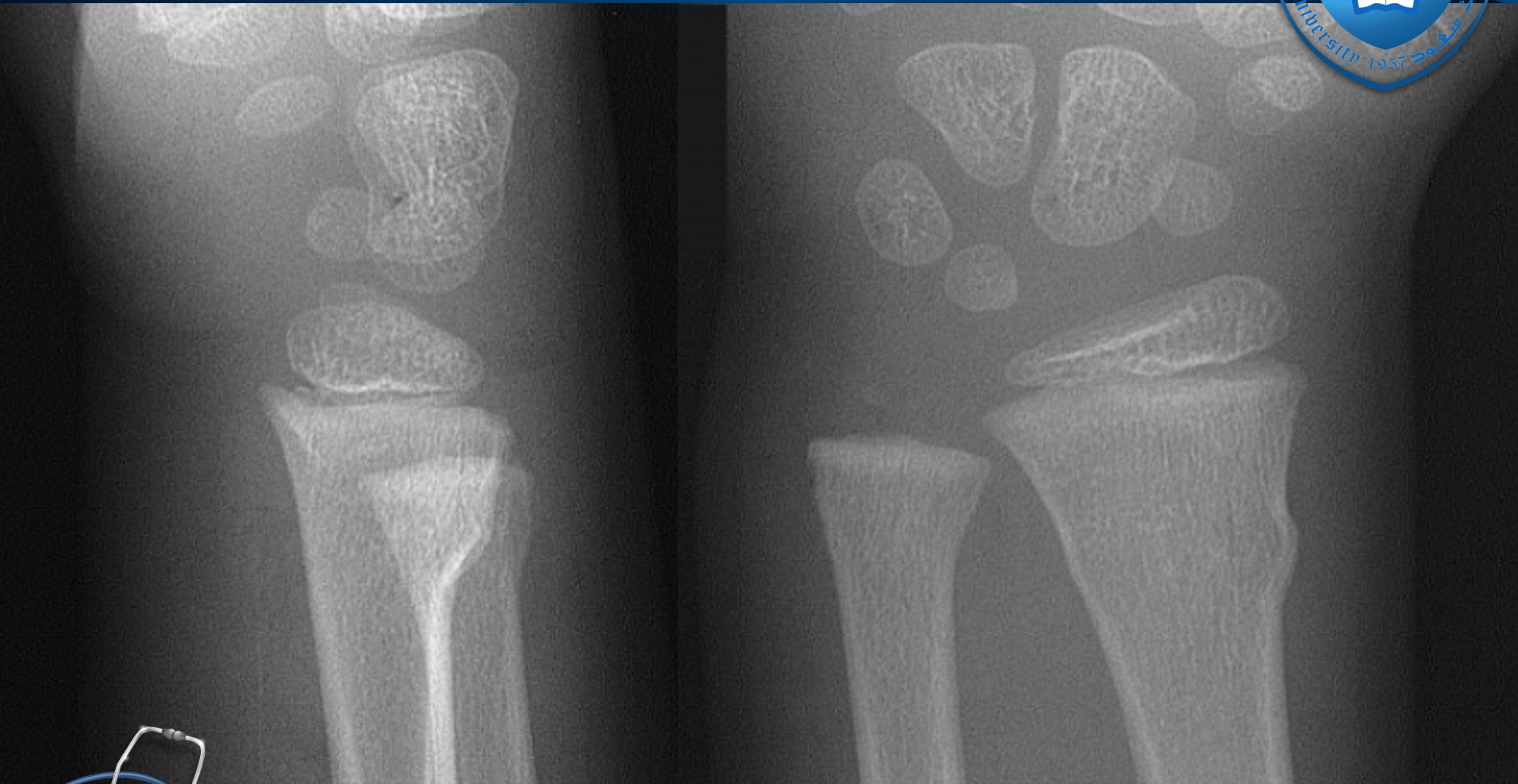
RT



Salter-Harris injury Type V

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Torus Fracture



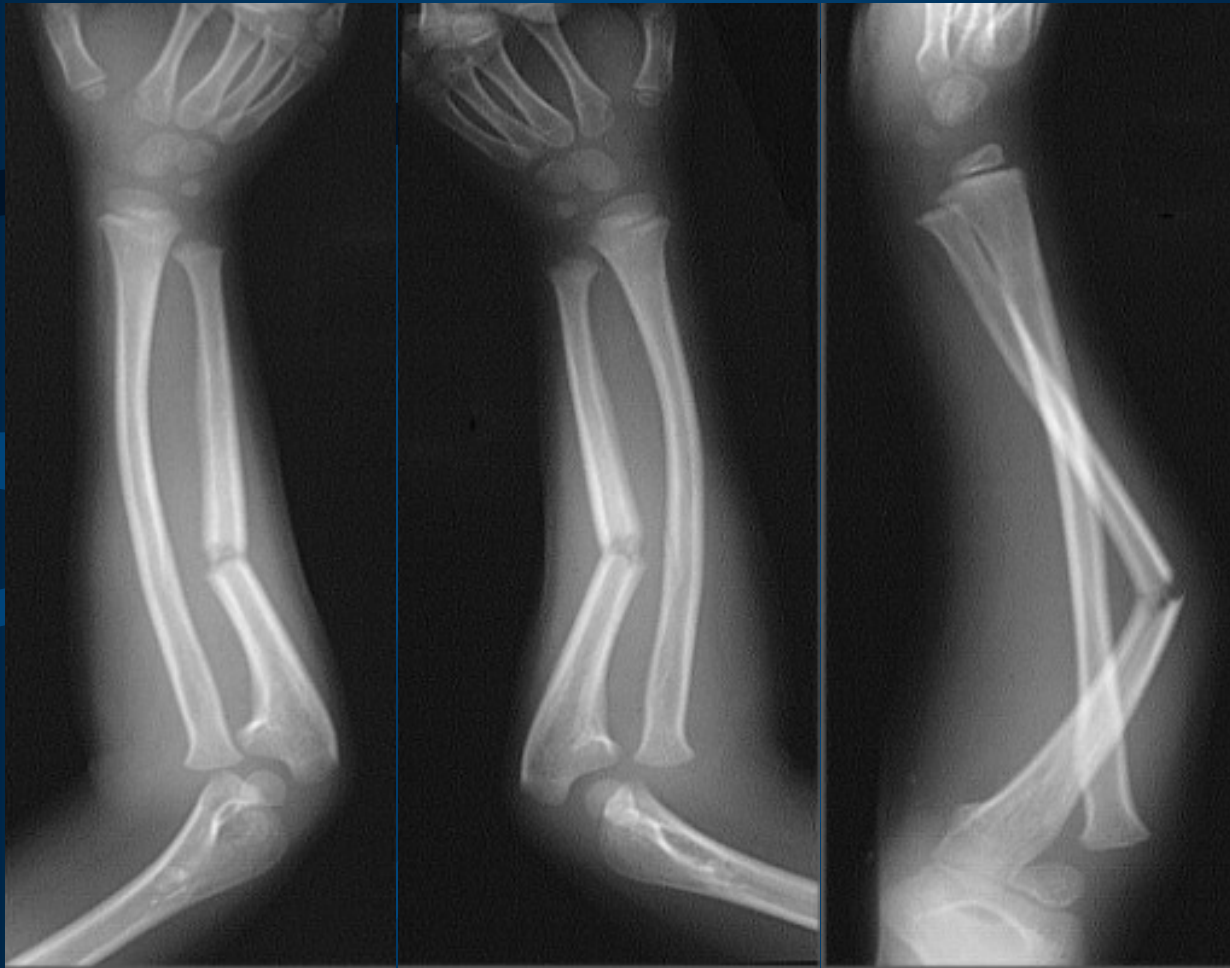


Greenstick fracture





**Bowing Fracture**



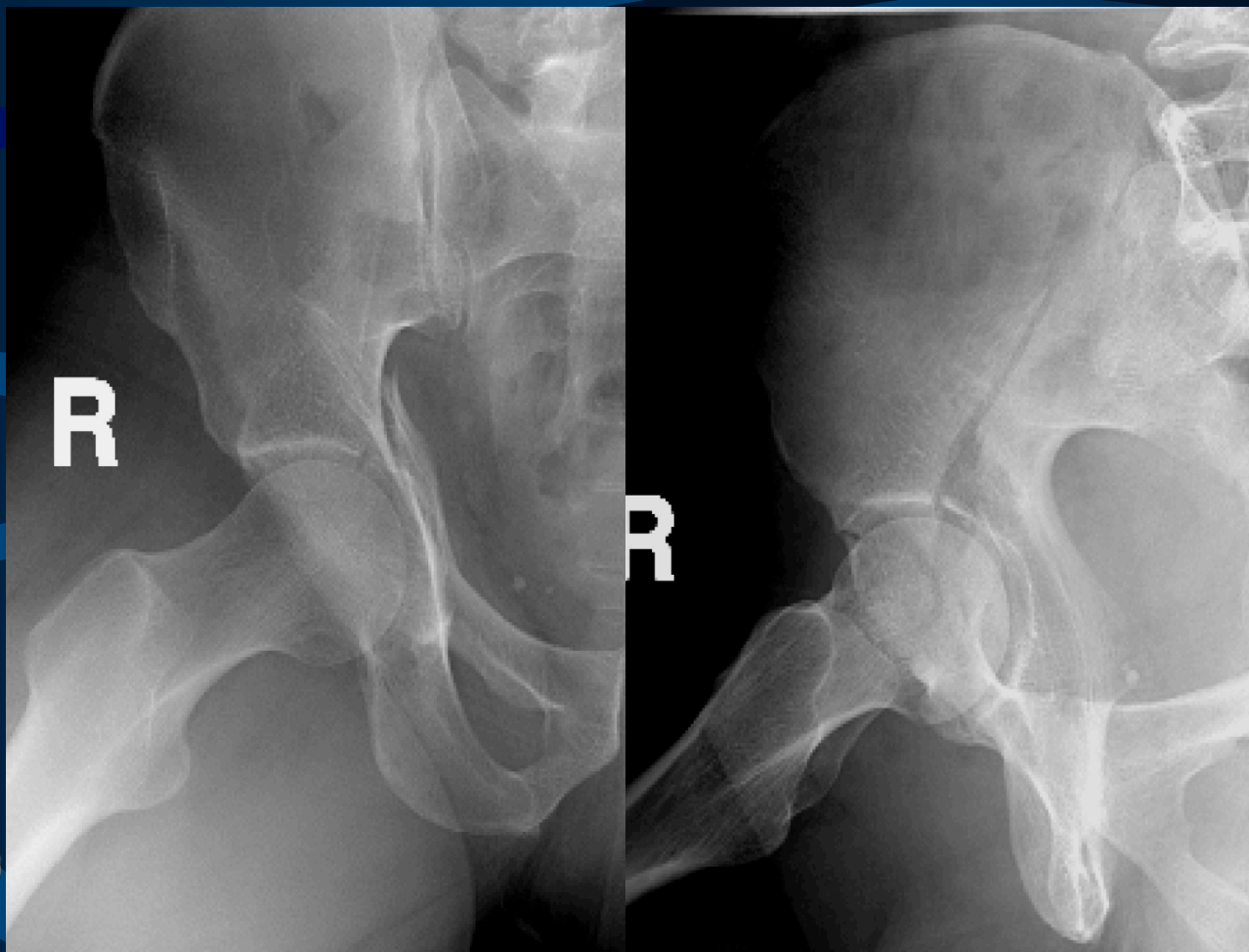
55 years old patient limping with hip pain



Supra-acetabular fracture

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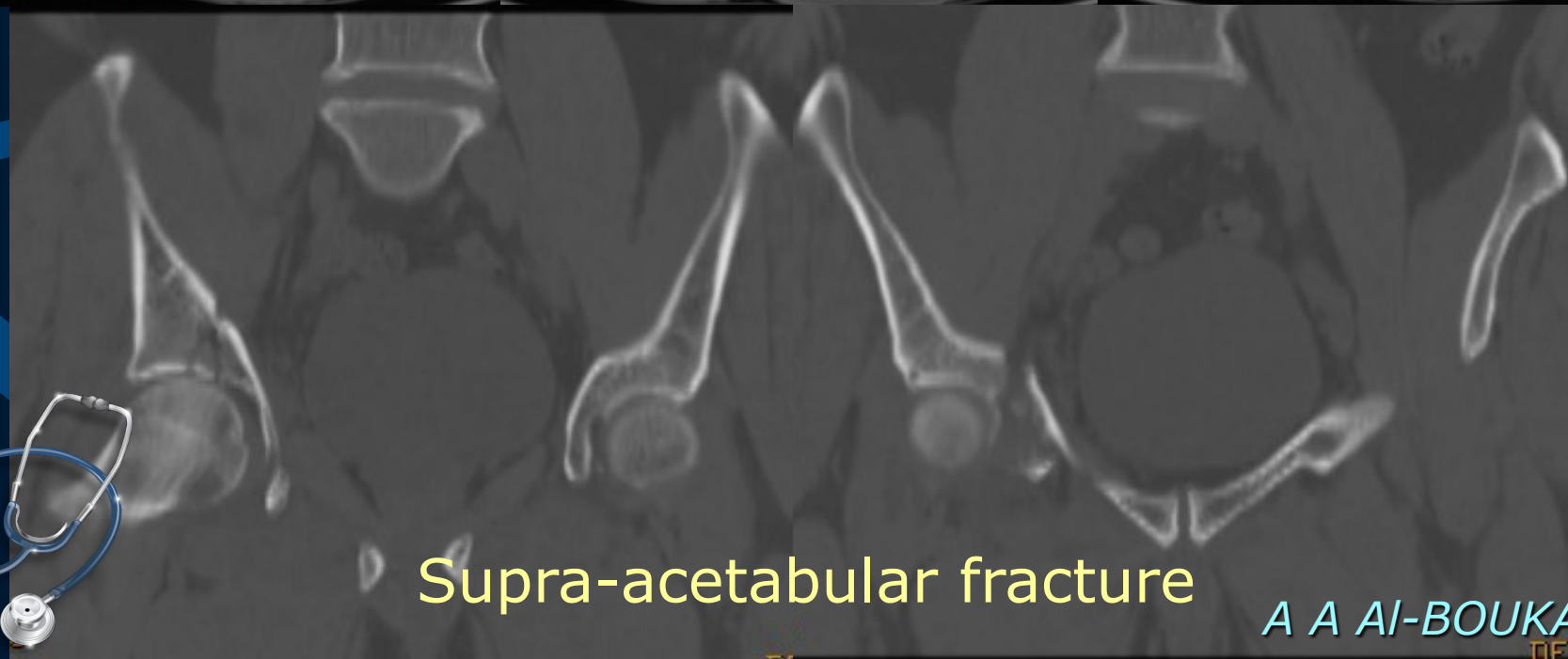
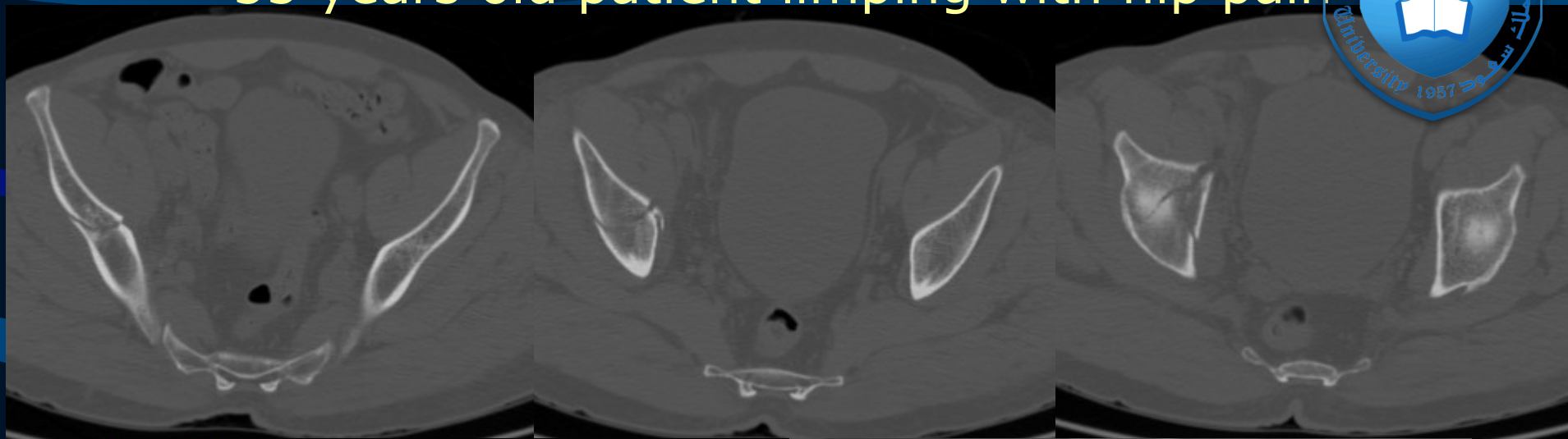
55 years old patient limping with hip pain



Supra-acetabular fracture



55 years old patient limping with hip pain



Supra-acetabular fracture

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50 years old patient limping with hip pain



Supra-acetabular fracture

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50 years old patient limping with hip pain



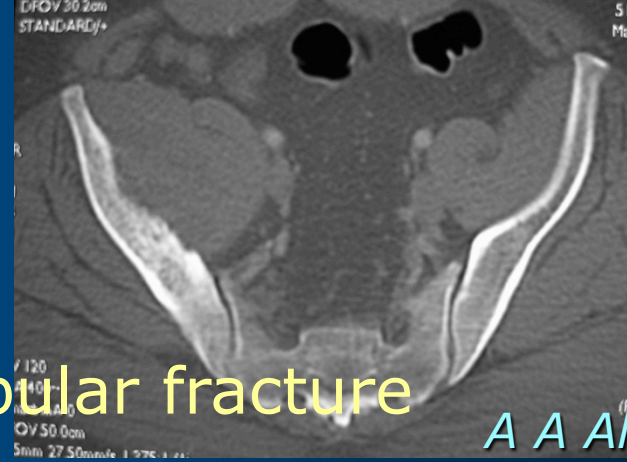
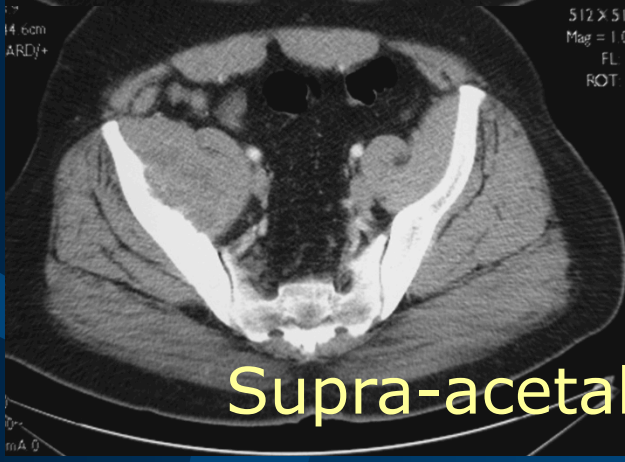
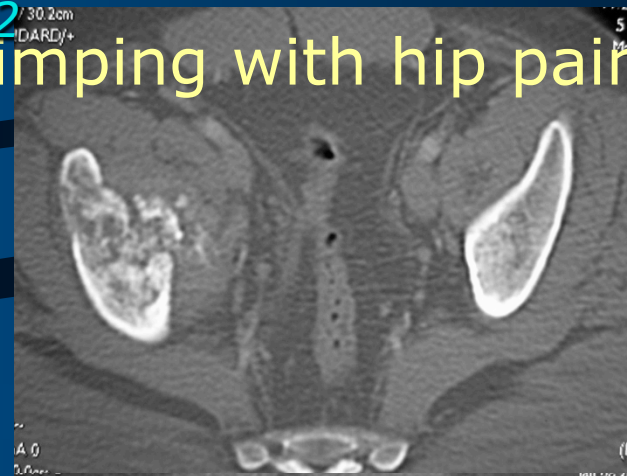
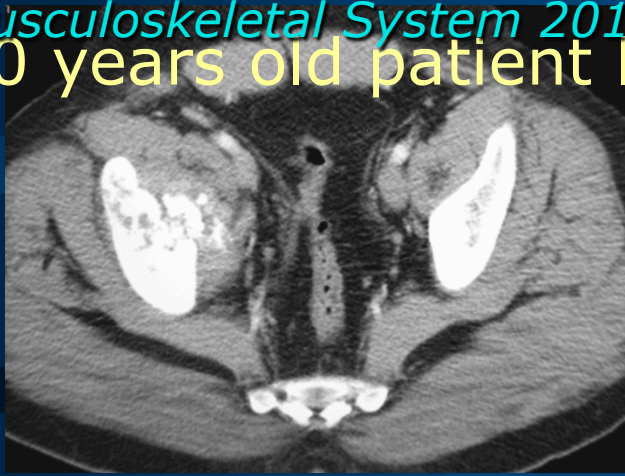
Supra-acetabular fracture

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# Imaging of Musculoskeletal System 2012

## 50 years old patient limping with hip pain

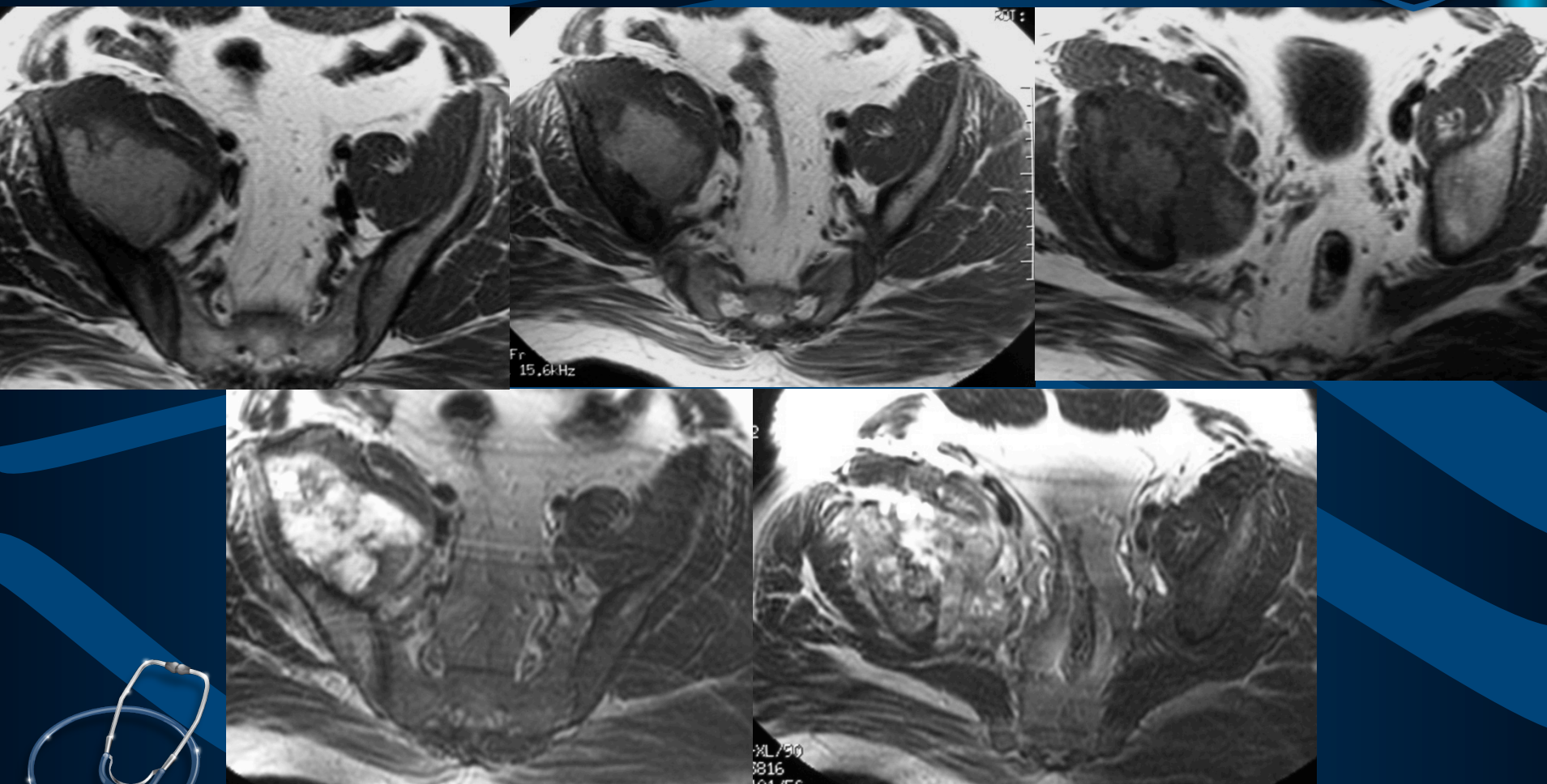


Supra-acetabular fracture

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## 50 years old patient limping with hip pain



**Supra-acetabular fracture !!**

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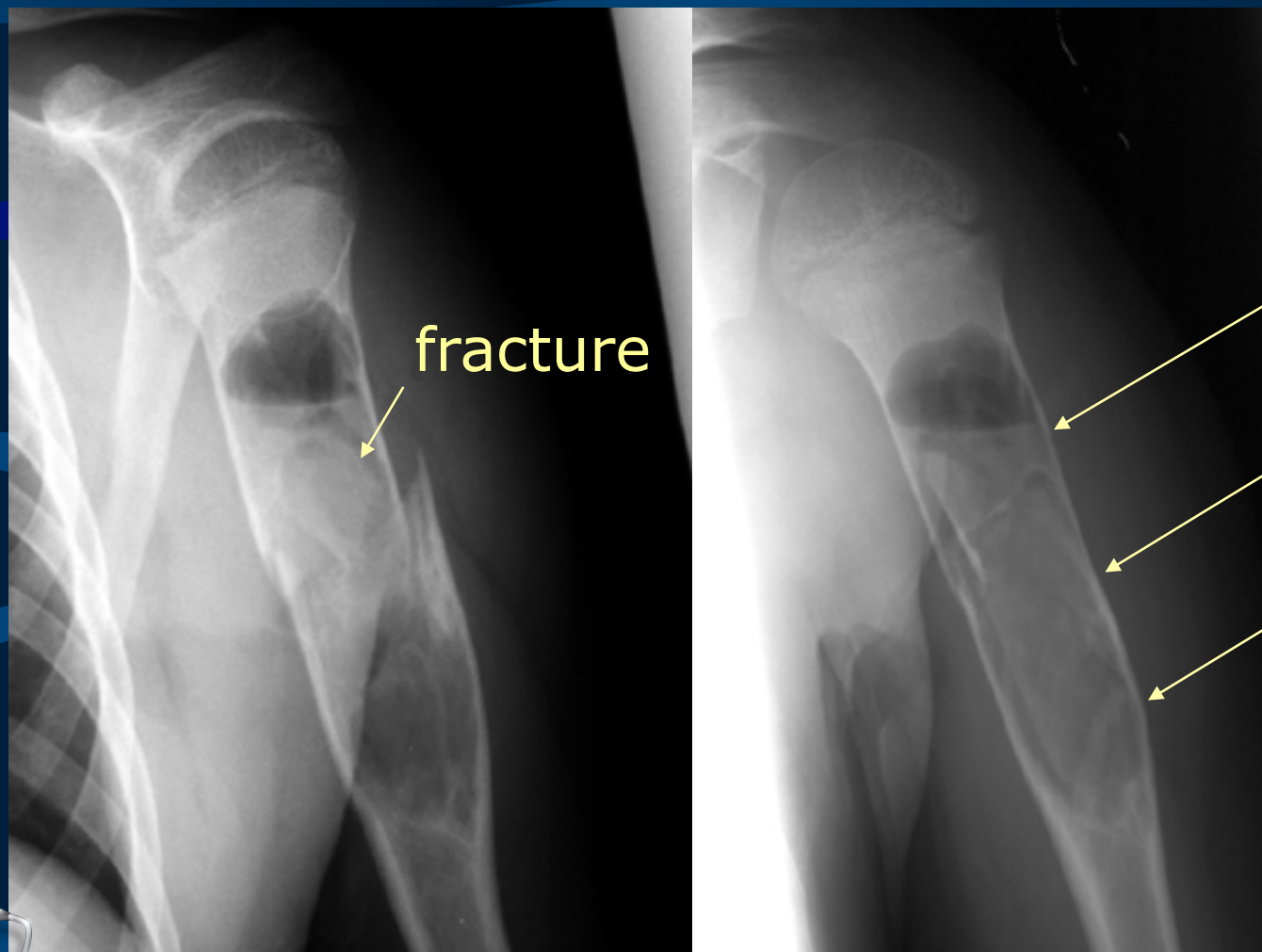
50 years old patient limping with hip pain



Pathological fracture secondary to sarcoma

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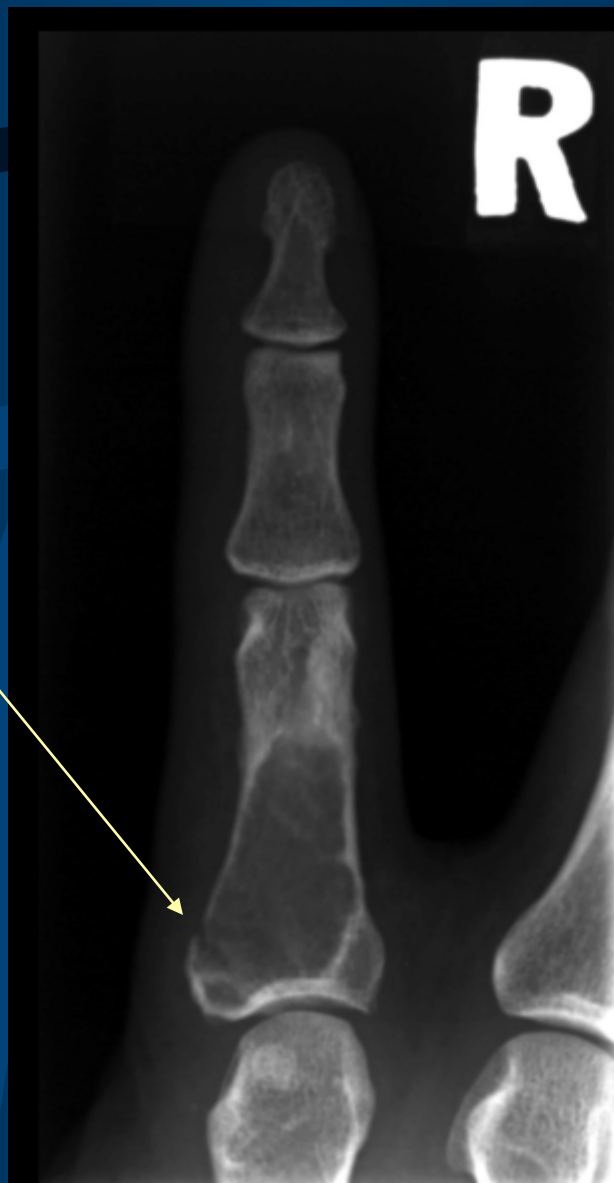


Pathological fracture secondary to bone cyst

## 20 Years old lady finger pain



fracture

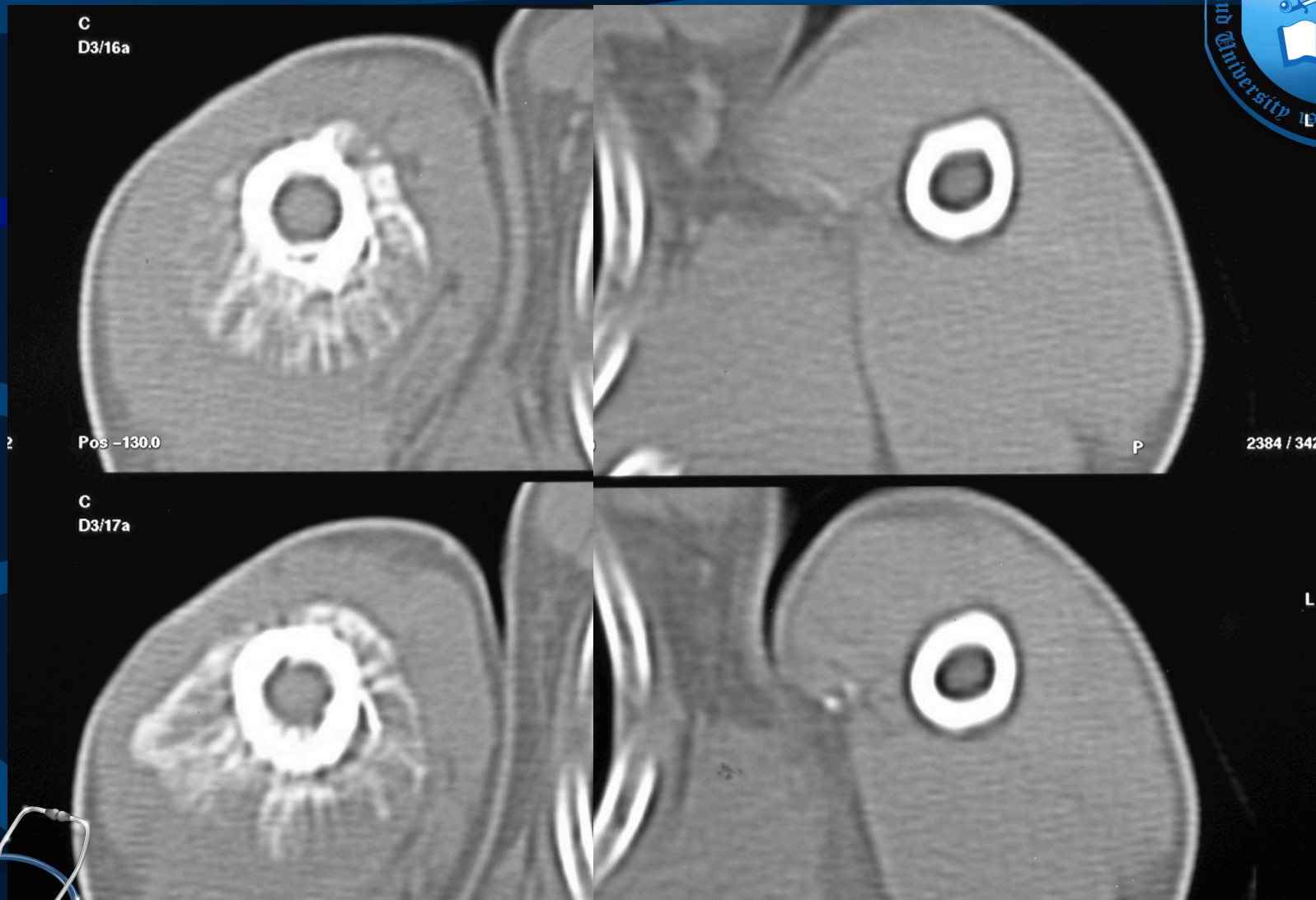




Pathological fracture secondary to sarcoma









## Stress fracture



## Stress fracture



## Stress fracture after one week







**THANKS**

