



# 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

“Where to look & What to look for”

- Recognize features of certain disease entity





# *METABOLIC & ENDOCRINE BONE DISORDERS*

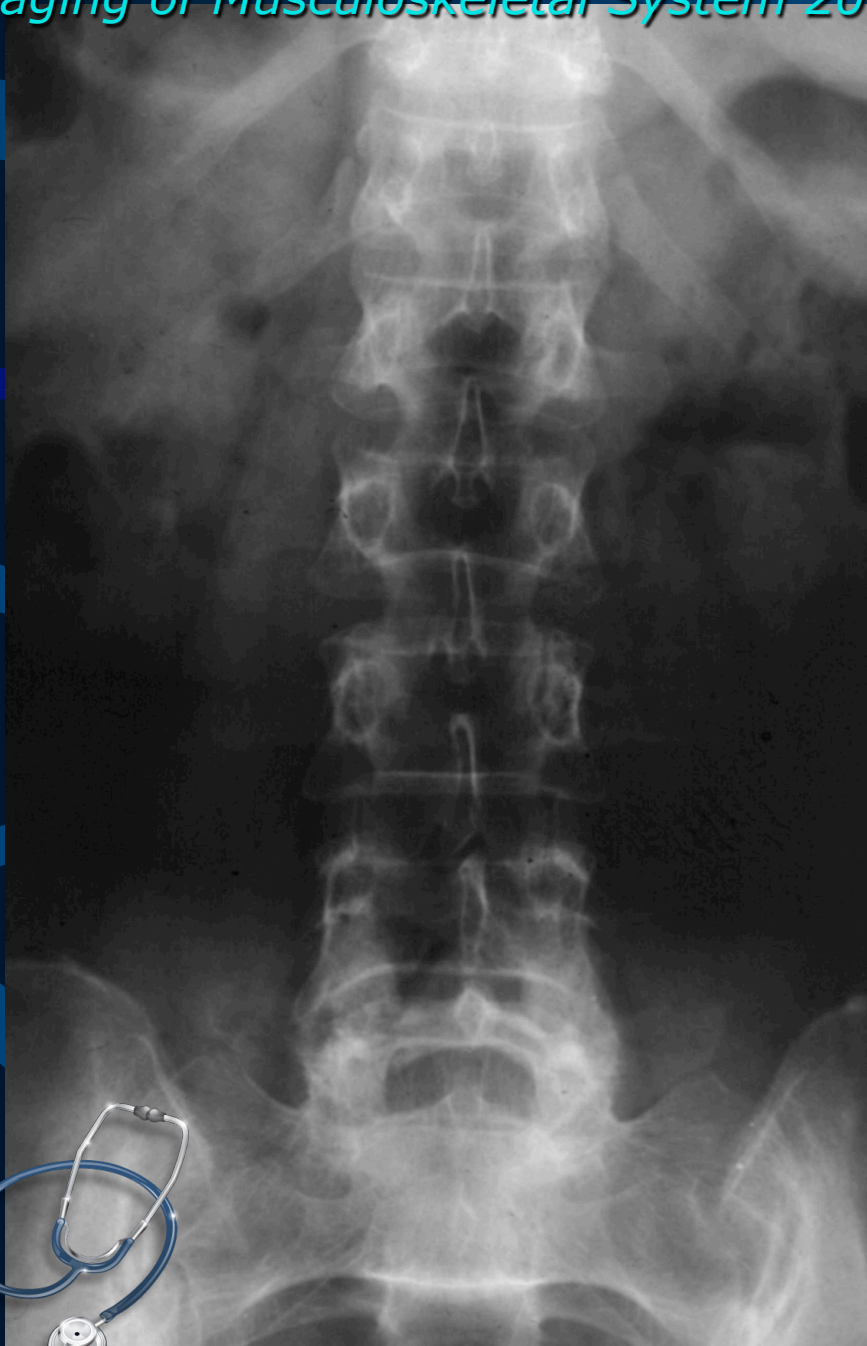


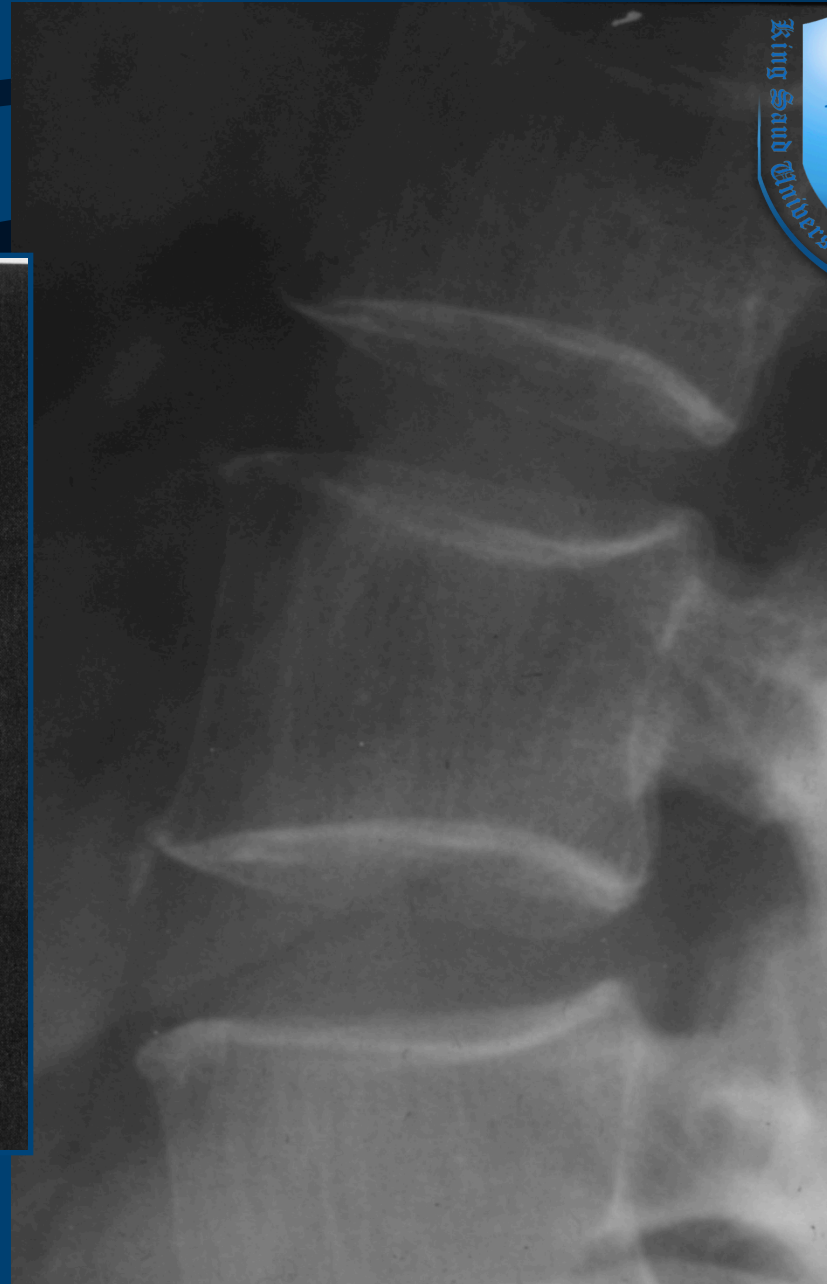
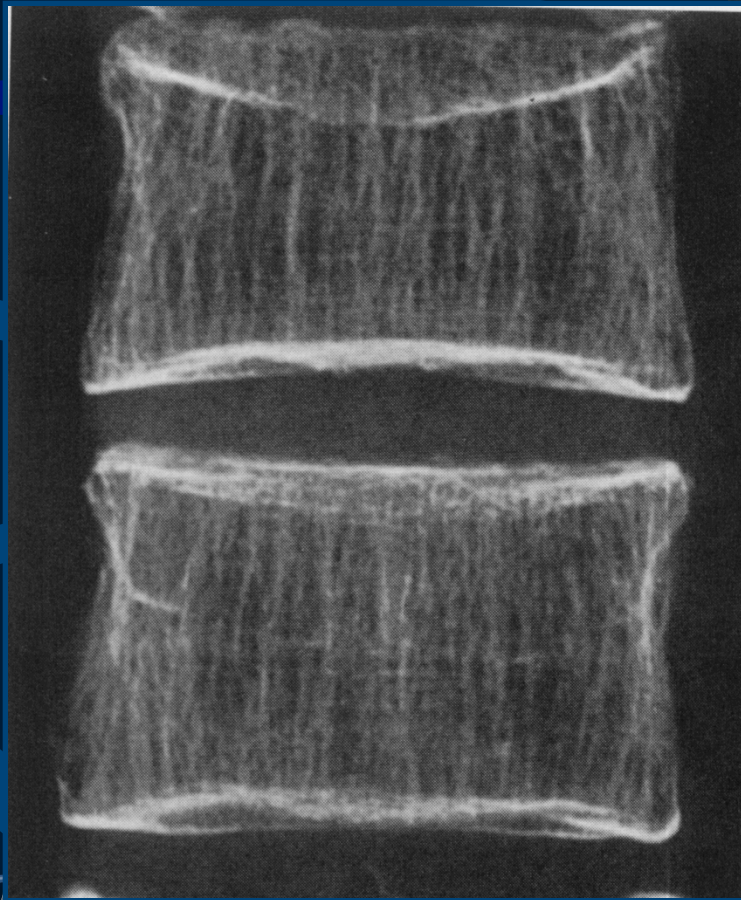


## **CASE NO. 1**

54 years- old female with low back pain  
X-ray of lumbosacral spine requested







## Patient A



Osteomalacia

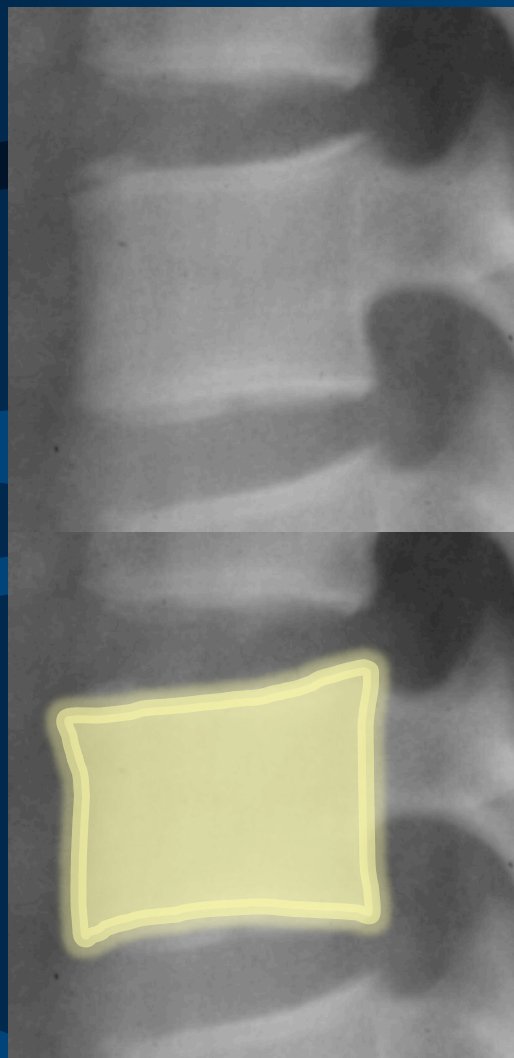
## Patient B



Osteoporosis

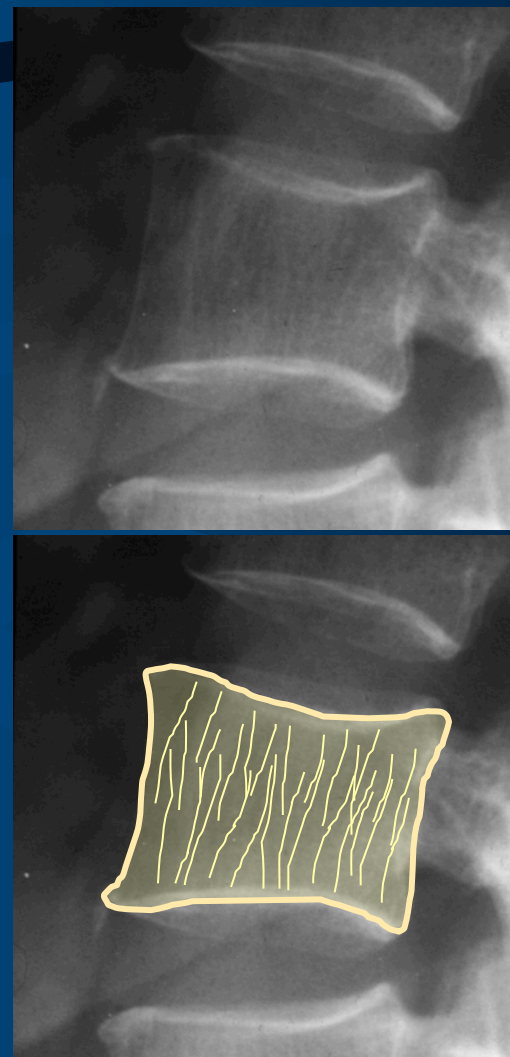


Patient A



Osteomalacia

Patient B



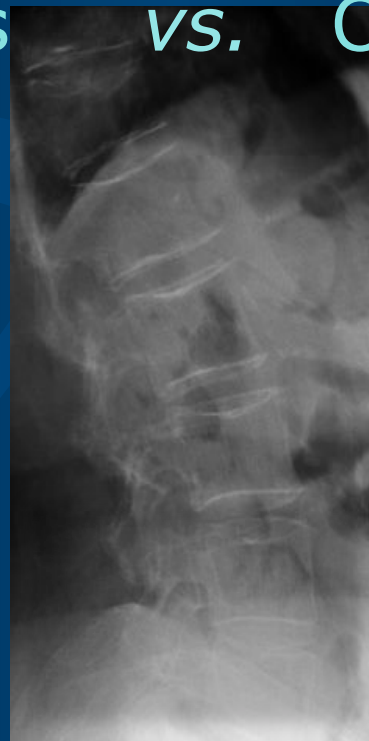
Osteoporosis



# *METABOLIC & ENDOCRINE BONE DISORDERS*

Osteopenia

Osteoporosis vs. Osteomalacia





## **CASE NO. 2**

27 years- old male with long standing history  
of renal failure

X-ray of lumbosacral spine requested





Osteosclerosis  
"Rugger Jersey Spine"

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# *METABOLIC & ENDOCRINE BONE DISORDERS*

## Renal Osteodystrophy

Osteoporosis

Osteomalacia

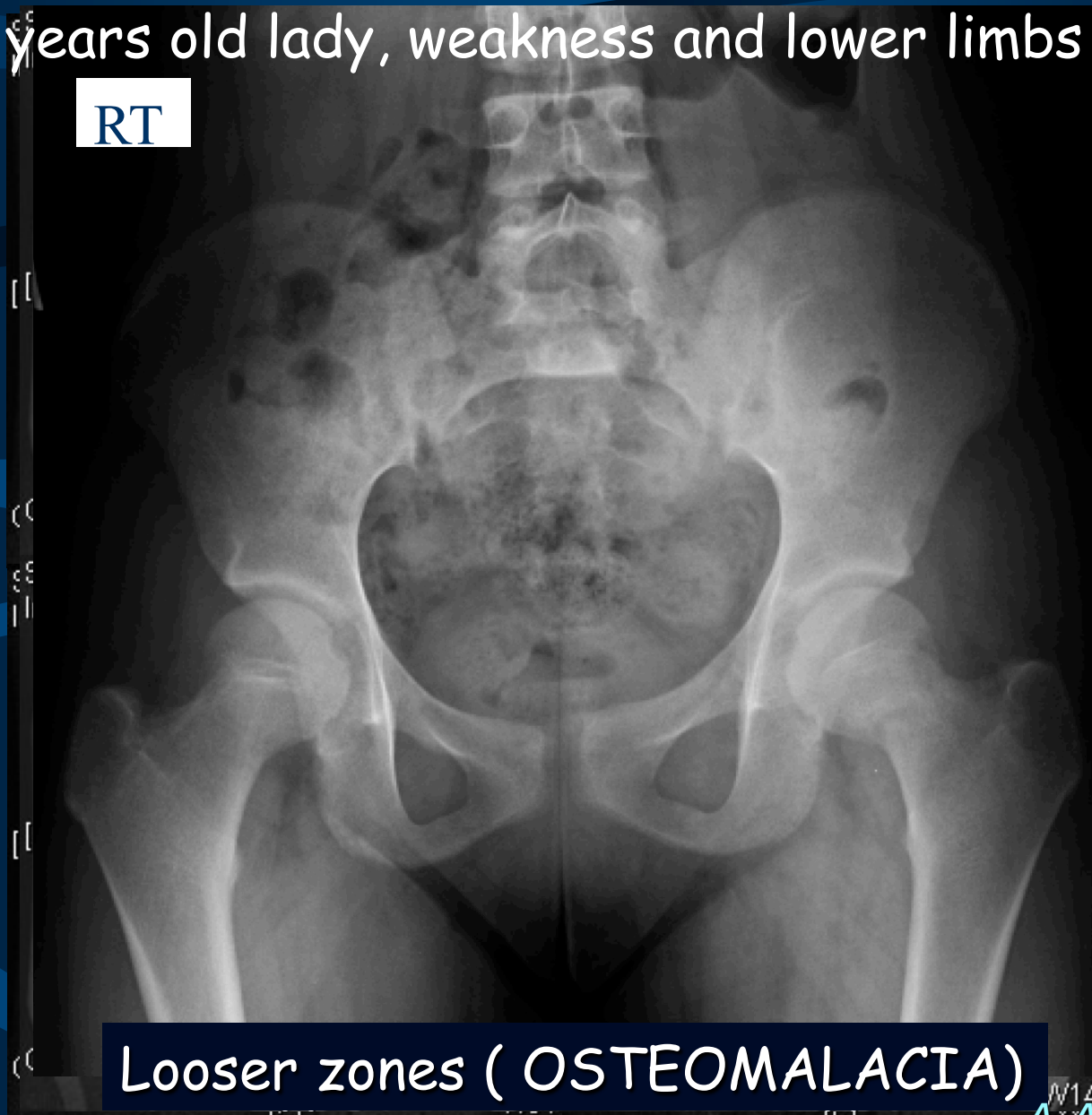
Secondary Hyperparathyroidism

Osteosclerosis



20 years old lady, weakness and lower limbs pain

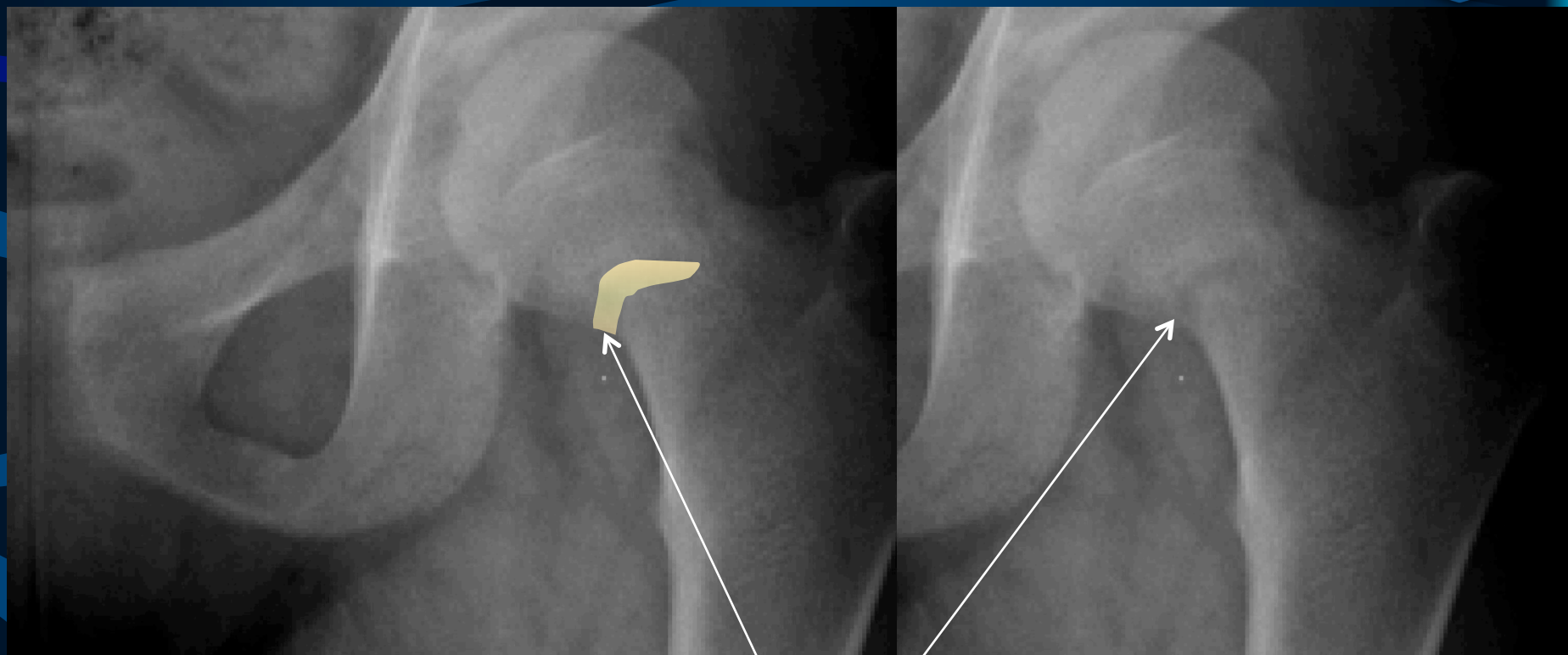
RT



Looser zones ( OSTEOMALACIA)

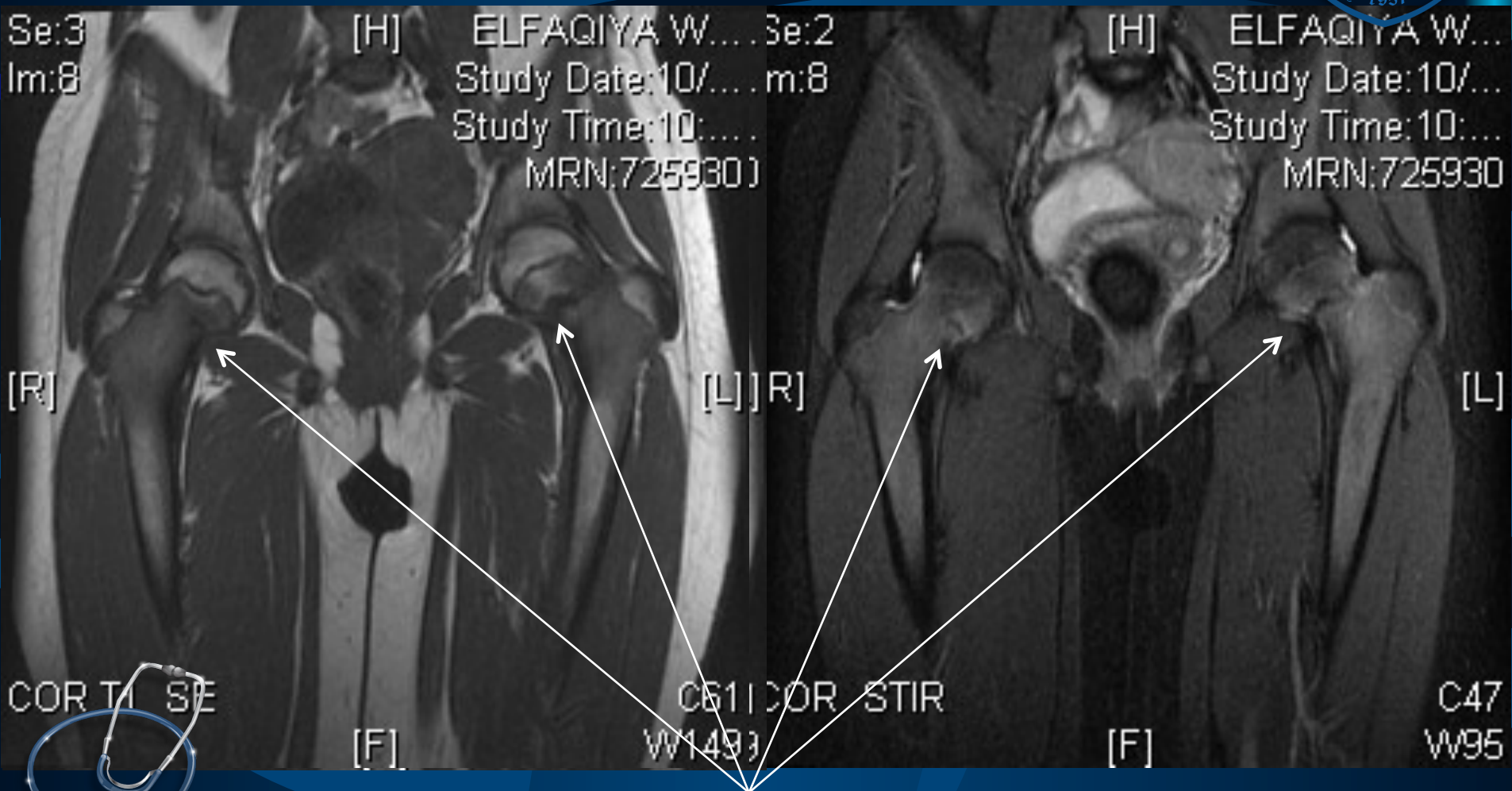


20 years old lady, weakness and lower limbs pain



Looser zones ( OSTEOMALACIA)

20 years old lady, weakness and lower limbs pain



Looser zones ( OSTEOMALACIA)

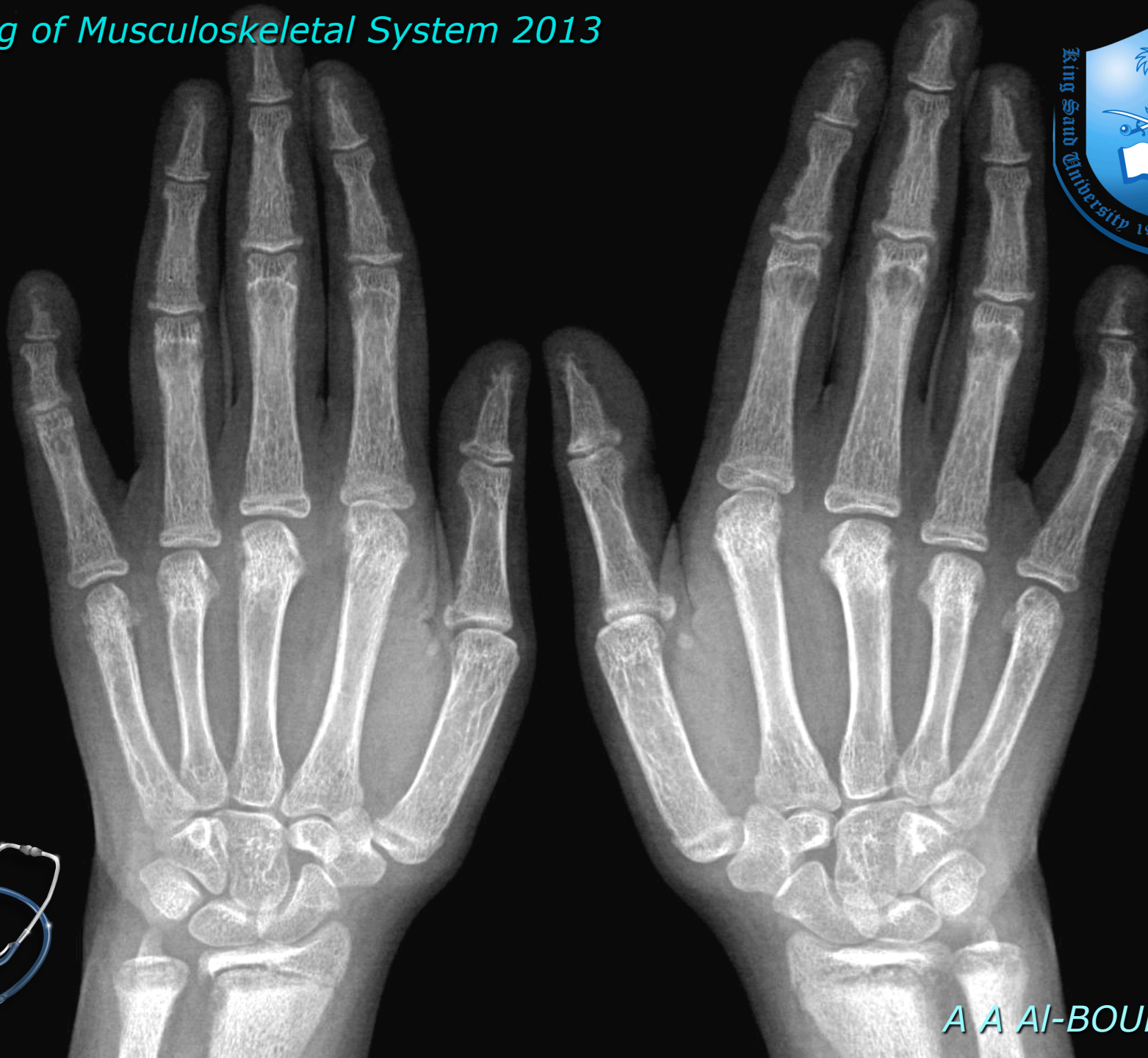
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# HYPERPARATHYROIDISM

- ✓ Bone Resorption
- ✓ Bone Softening
- ✓ Brown Tumors
- ✓ Osteosclerosis
- ✓ Soft tissue calcifications







## Bone Resorption



### Subperiosteal

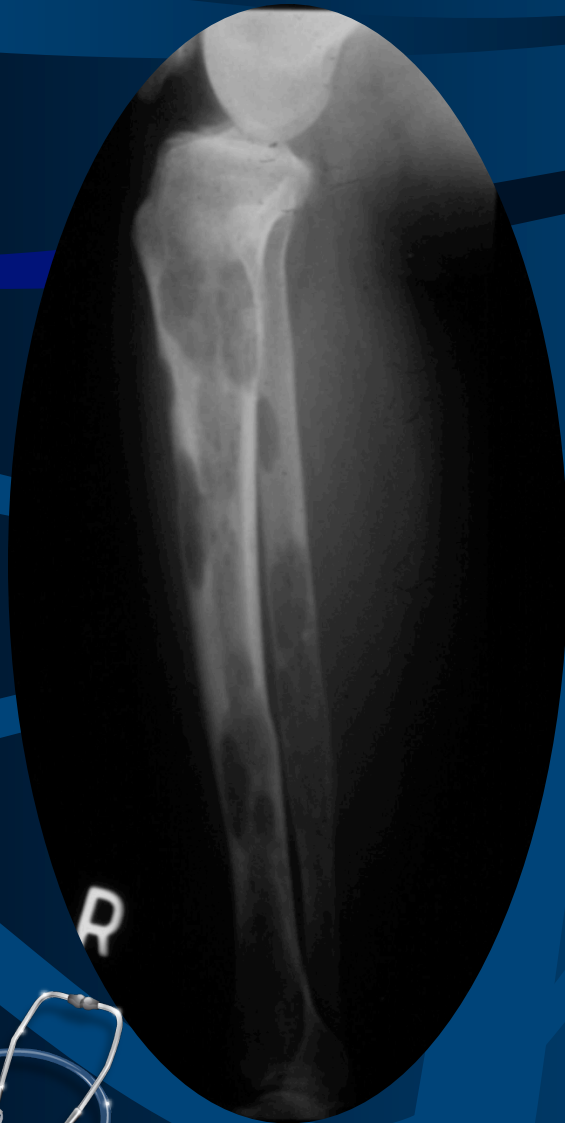


- \* Most useful sign
- \* Virtually Diagnostic
- \* Location

**Hyperparathyroidism**

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Brown Tumors

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## **CASE NO. 3**

45 years- old male presented with history of  
bone enlargement

X-ray of skull and hand are requested



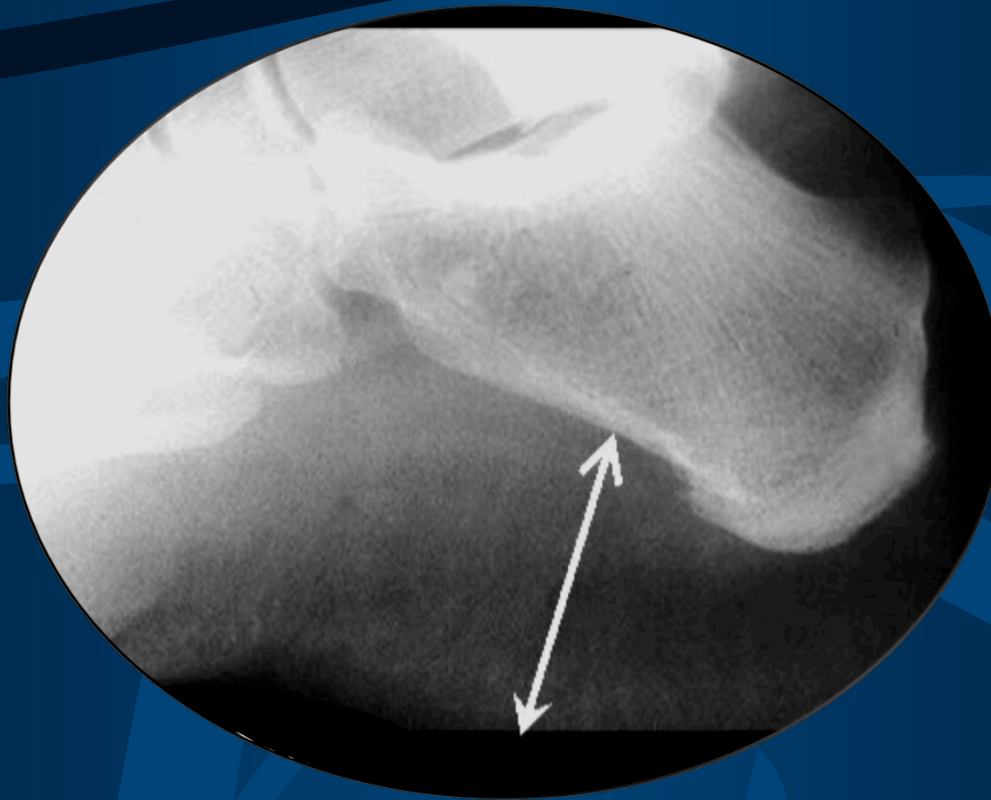
Acromegaly



## Acromegaly



## Acromegaly





# ***ARTHRITIS***





## CASE NO. 4

48 years- old female presented with joint  
pain of the hands & feet  
X-ray of hand requested





*Rheumatoid Arthritis*



*Rheumatoid Arthritis*



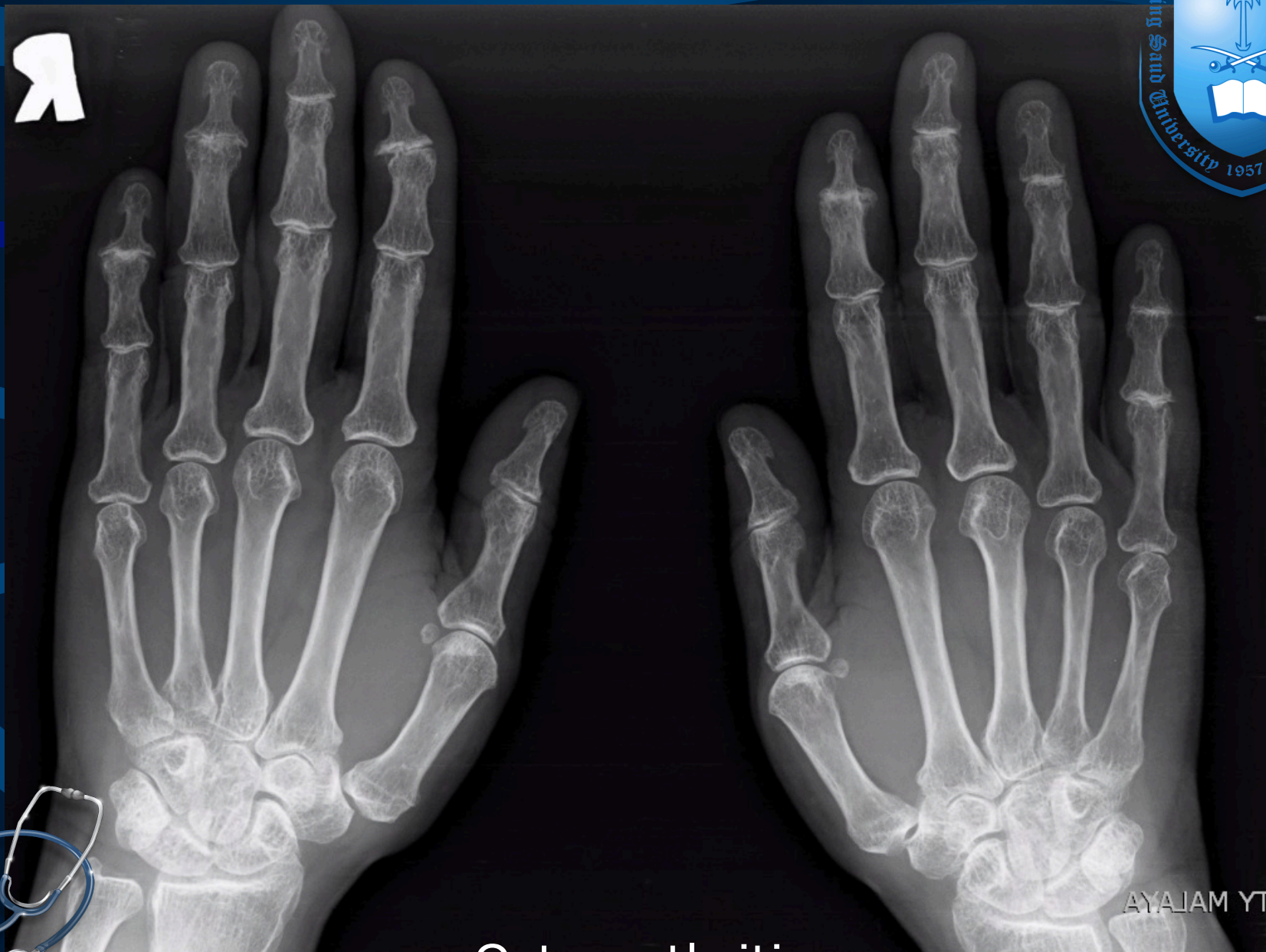
*Rheumatoid Arthritis*



## **CASE NO. 5**

Elderly male patient presented with joint pain  
of the hands X-ray of hand requested





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Osteoarthritis

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## Osteoarthritis

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Se: /3  
Im: 1/1

HAND  
SUPINE

Mag: 0.4x  
Lat: L

Acc: 24337AO  
2007 Mar 08: /3  
Acq Tm: 08:38:15: 2/1

AND  
UPINE

Mag: 0.5x  
Lat: L

1961 Aug 25 F 53

Acc: 24337  
2007 Mar 08: /3  
Acq Tm: 08:39:15: 2/1



Osteoarthritis

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Erosive Osteoarthritis



RT



Psoriatic Arthritis



## **CASE NO. 6**

43 year-old male patient presented with  
hands and feet pain and swelling  
X-ray of hand requested





Gouty Arthritis

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Gouty Arthritis





# *Musculoskeletal Tumors*

- ✓ Osseous
- ✓ Chondral
- ✓ Fibrous
- ✓ Soft tissue





# *Musculoskeletal Tumors*

## KEY FEATURES

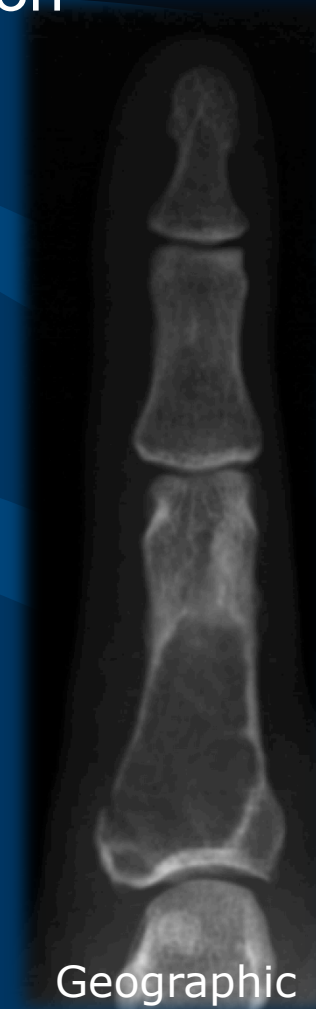
- ✓ Morphology
- ✓ Behavior of lesion
- ✓ Age of patient
- ✓ Site (Location)

*Pattern of bone destruction*  
*Size, Shape & Margin of lesion*  
*Texture of lesion Matrix*  
*Cortex & Periosteal reaction*



# Musculoskeletal Tumors

## Pattern of bone destruction



# Musculoskeletal Tumors

## Pattern of bone destruction



Moth-eaten

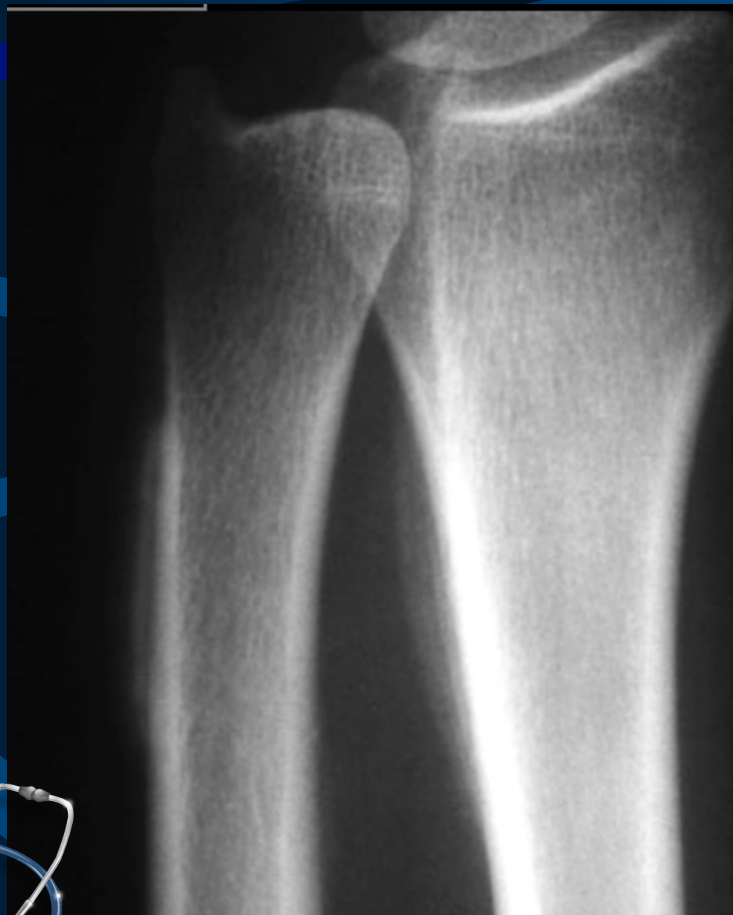


Permeative



# Musculoskeletal Tumors

## Periosteal reaction



# Musculoskeletal Tumors

## KEY FEATURES

- ✓ Morphology
- ✓ Behavior of lesion
- ✓ Age of patient
- ✓ Site (Location)





# *Musculoskeletal Tumors*

Osseous

Sclerotic

Lytic

Mixed





## **CASE NO. 7**

13 year-old boy patient presented with knee  
pain and swelling

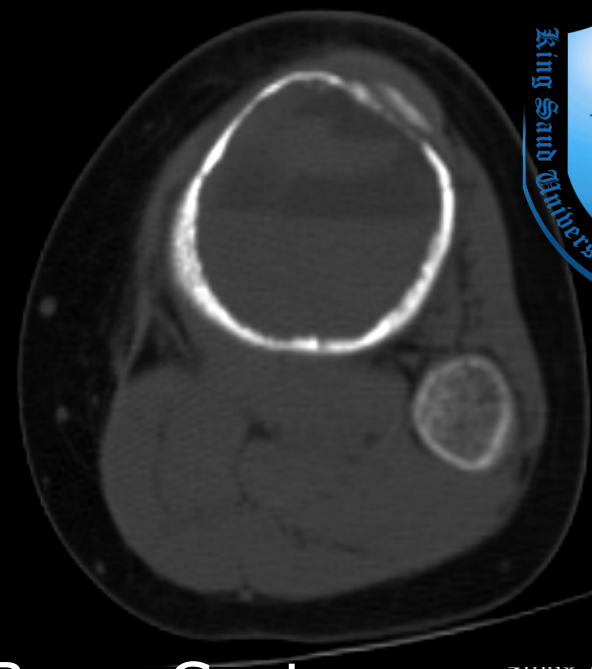
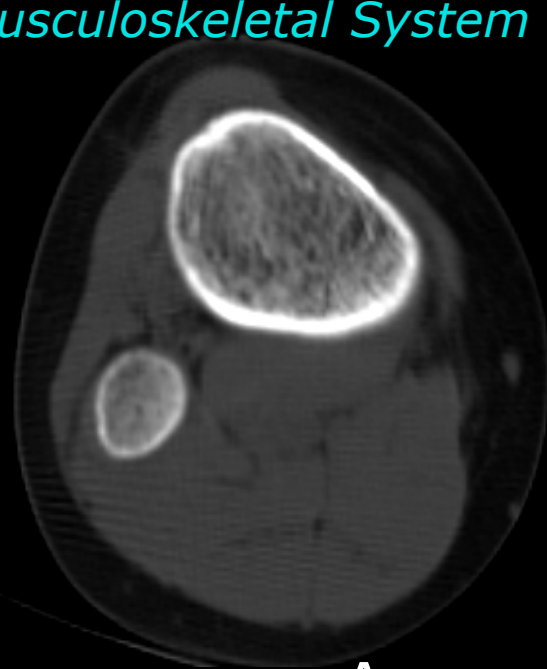
X-ray of knee requested



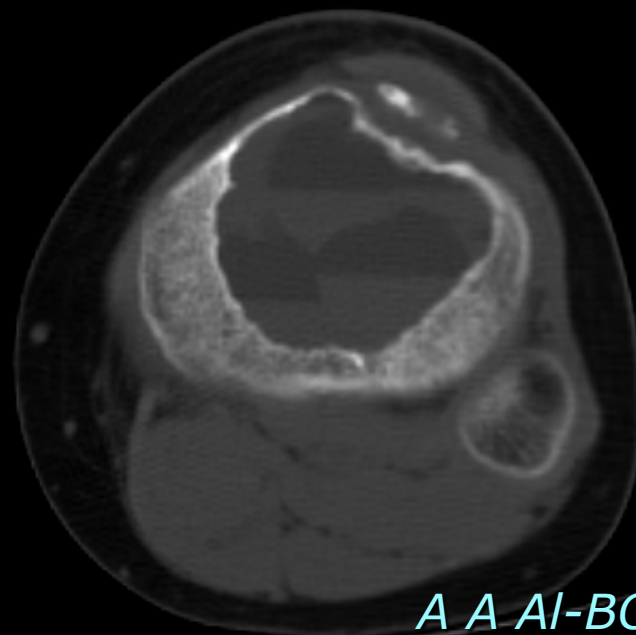
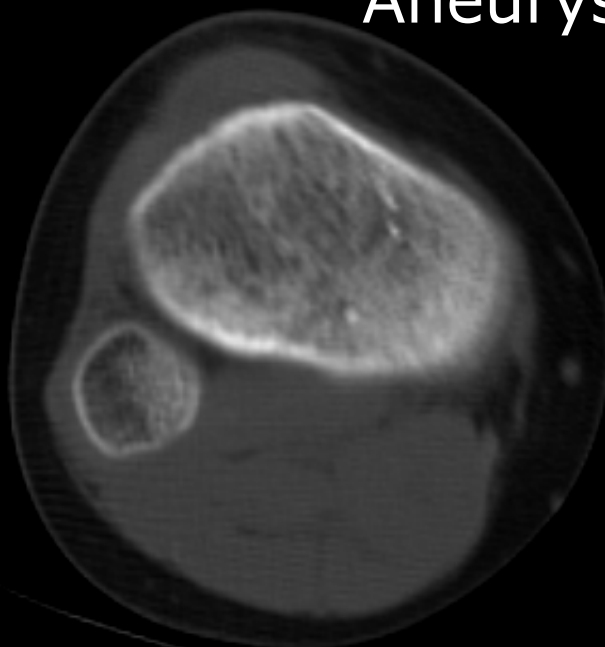


Aneurysmal Bone Cyst





Aneurysmal Bone Cyst

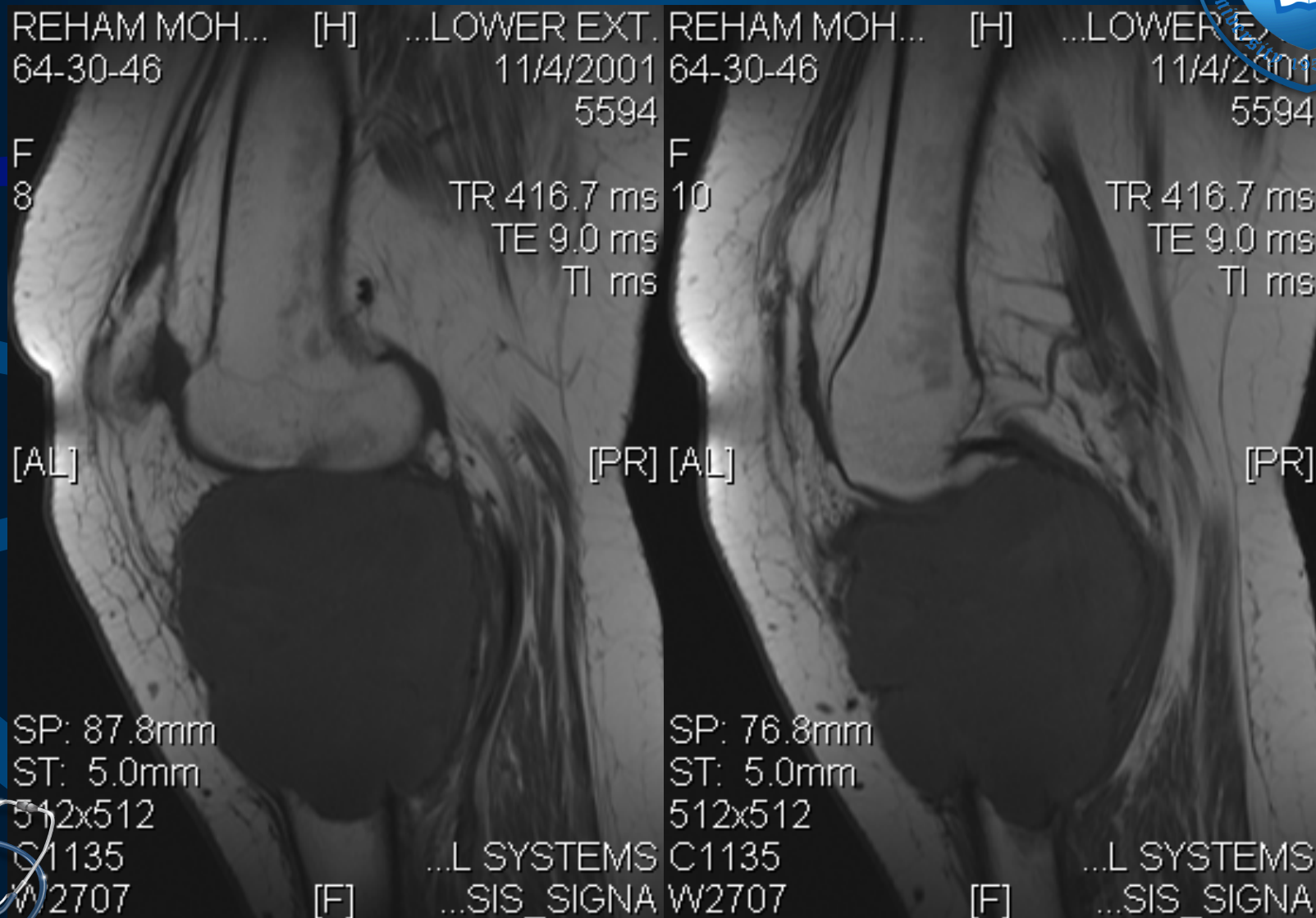


## Adult Patient

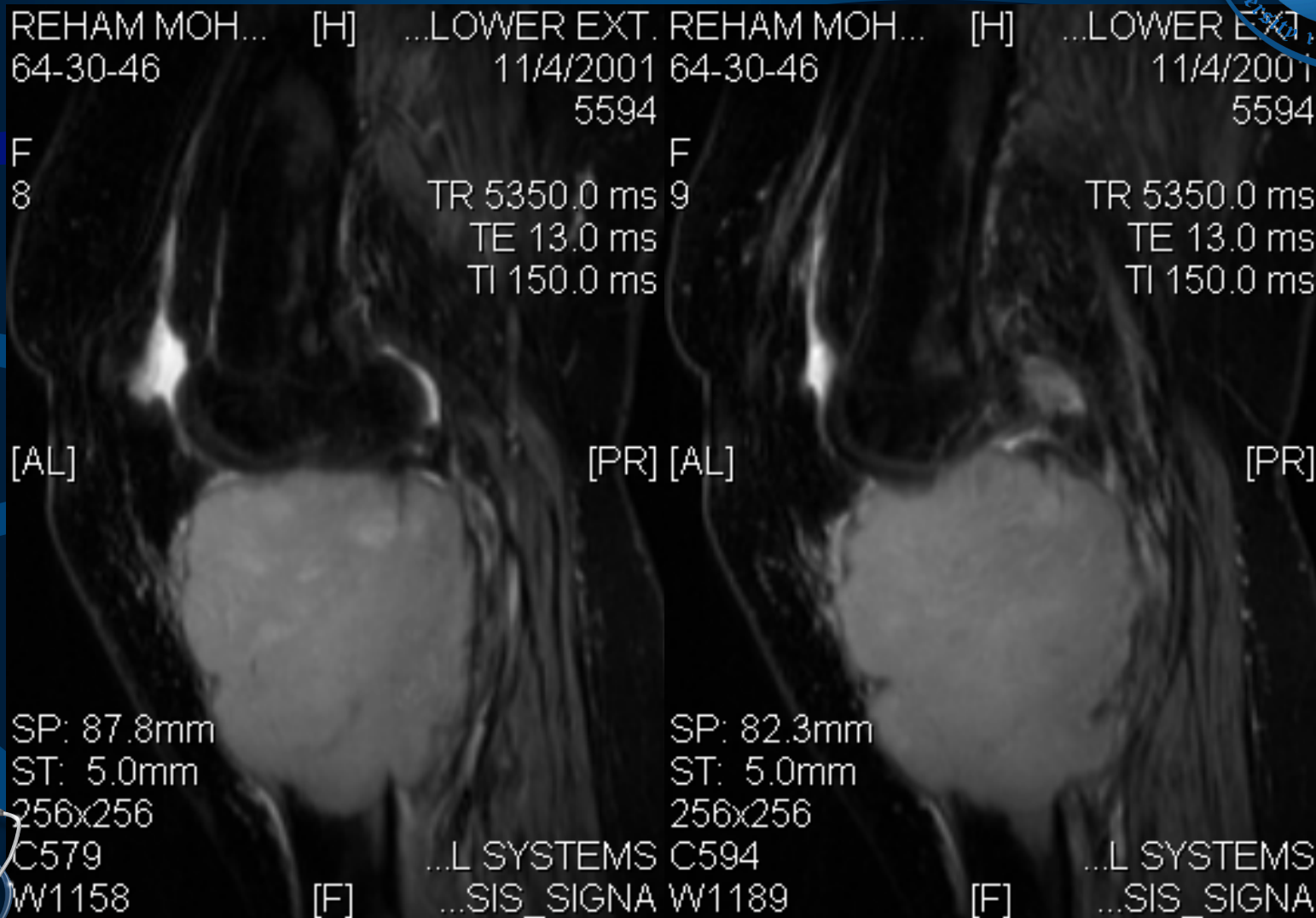


Giant Cell Tumor

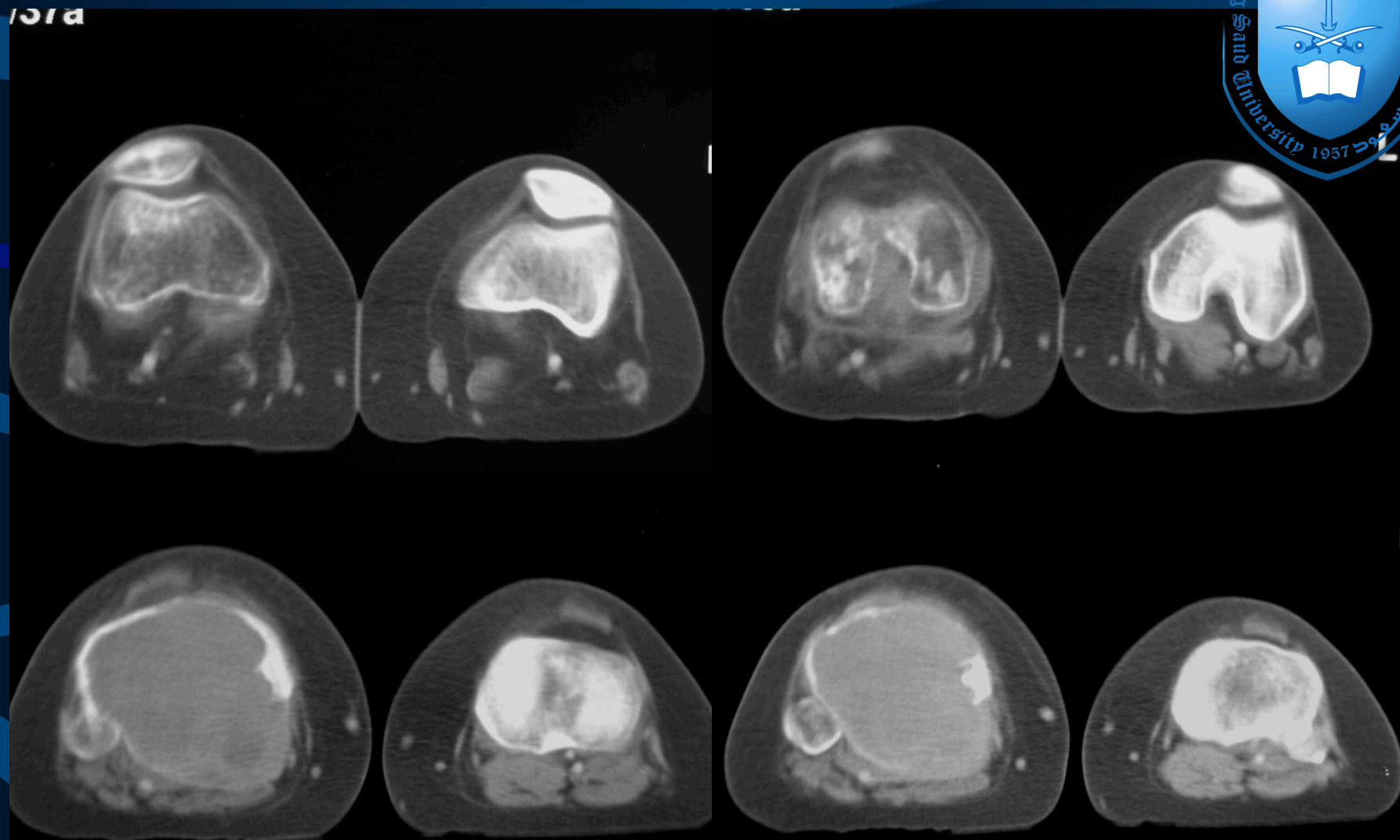




Giant Cell Tumor



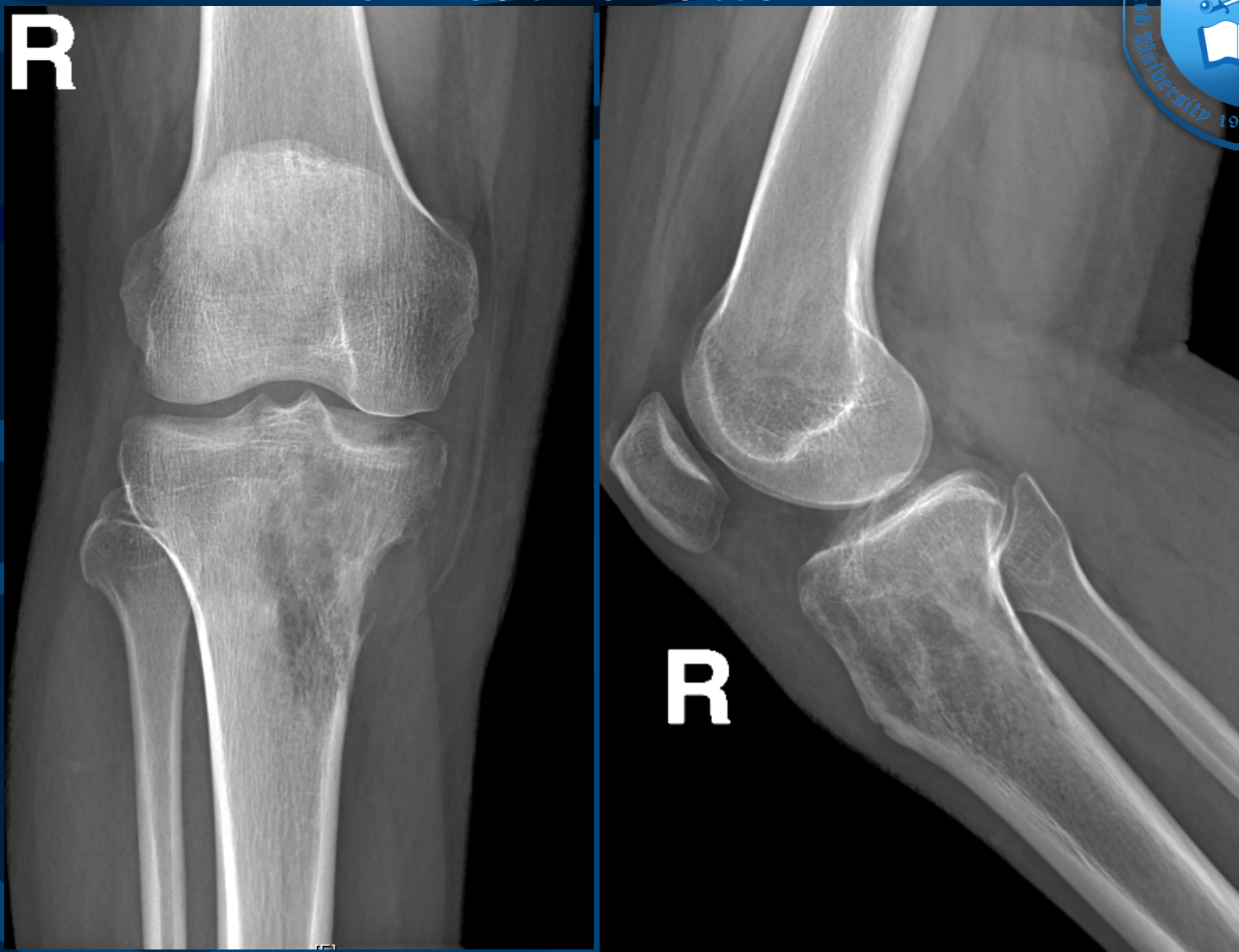
Giant Cell Tumor



Giant Cell Tumor



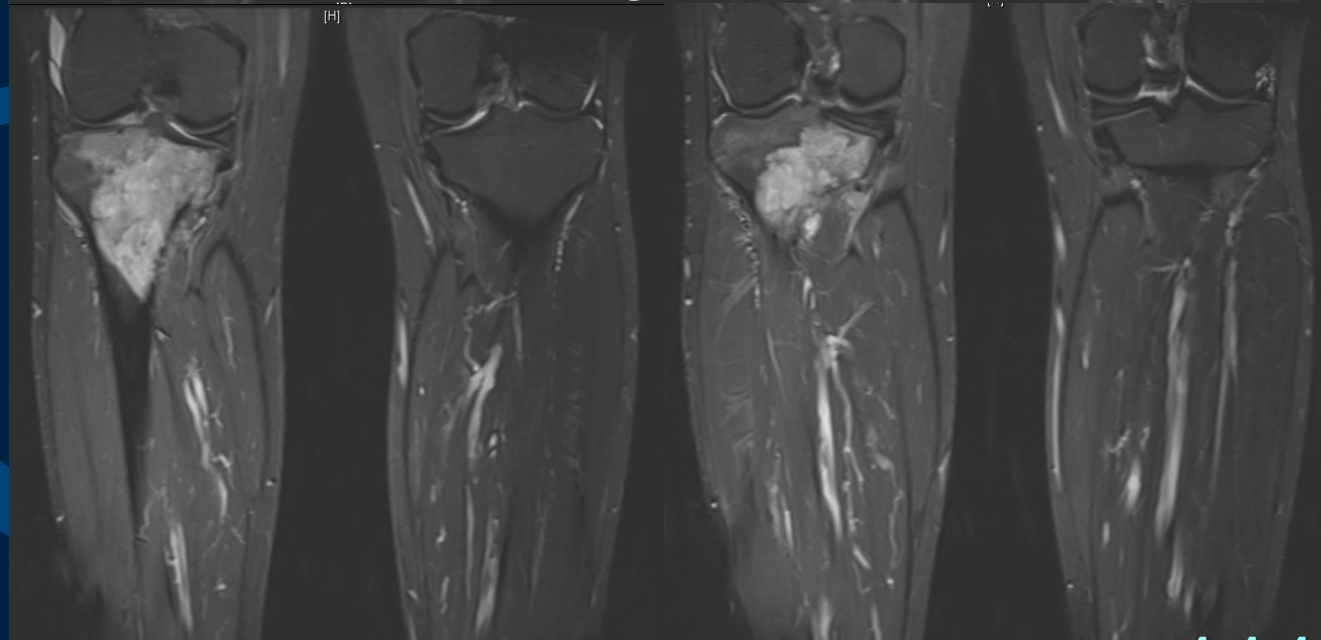
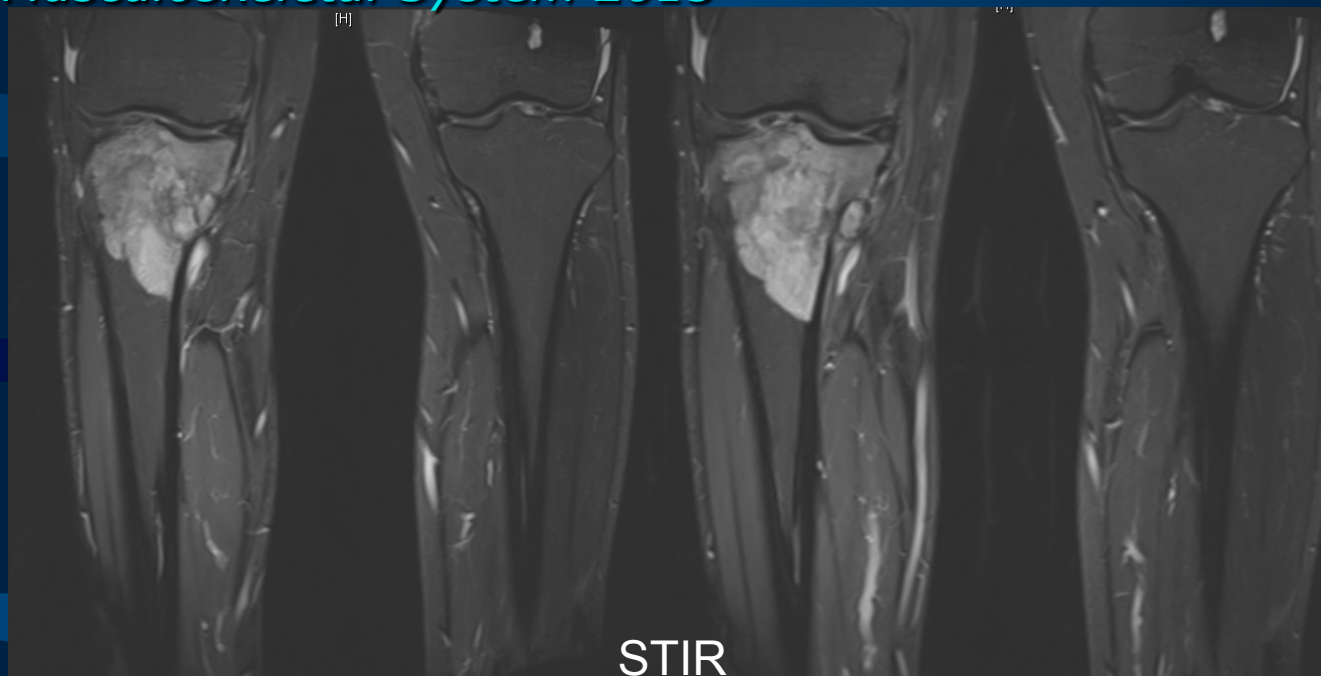
## Permeative Pattern

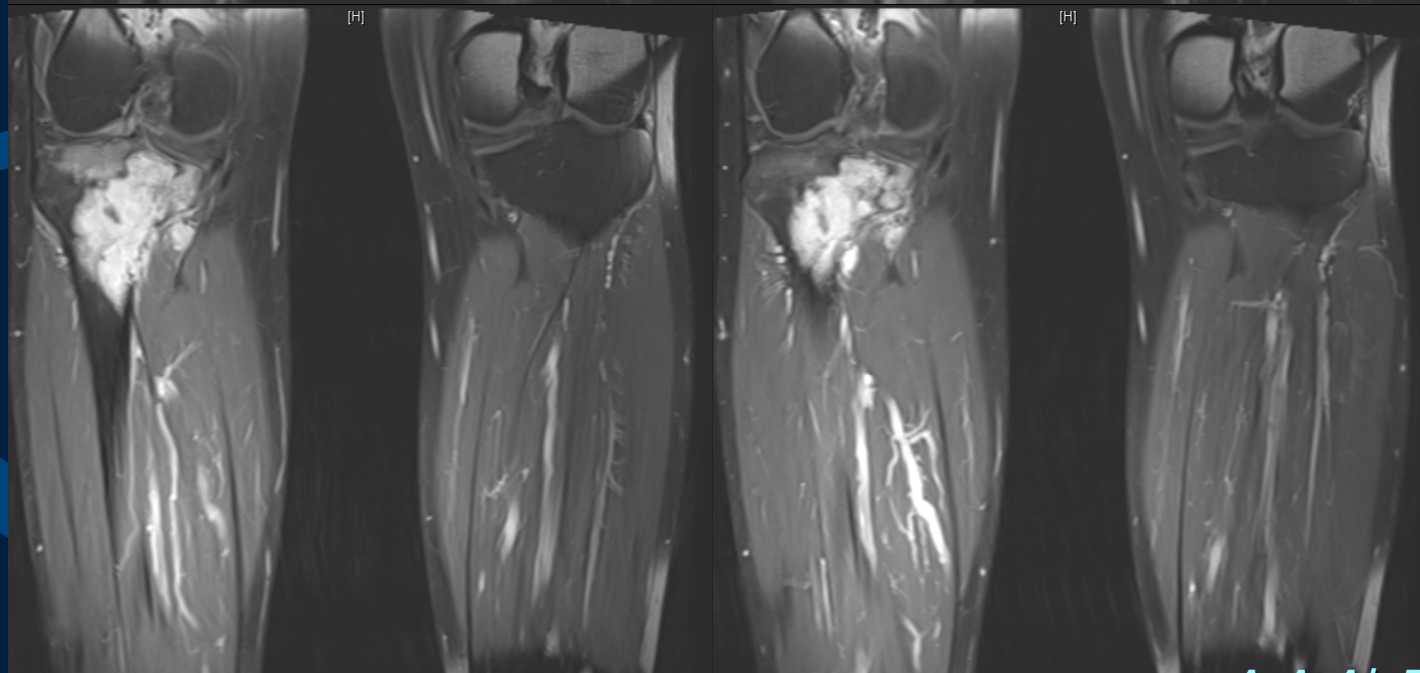


Osteosarcoma / Lymphoma

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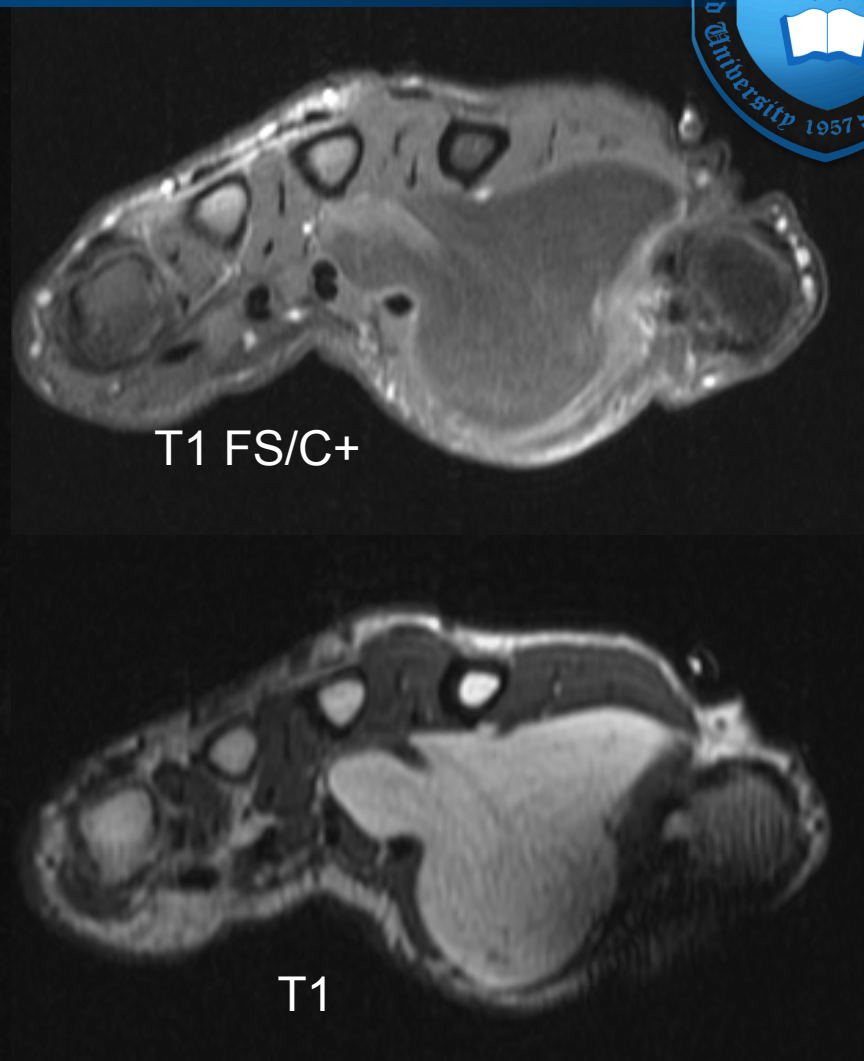
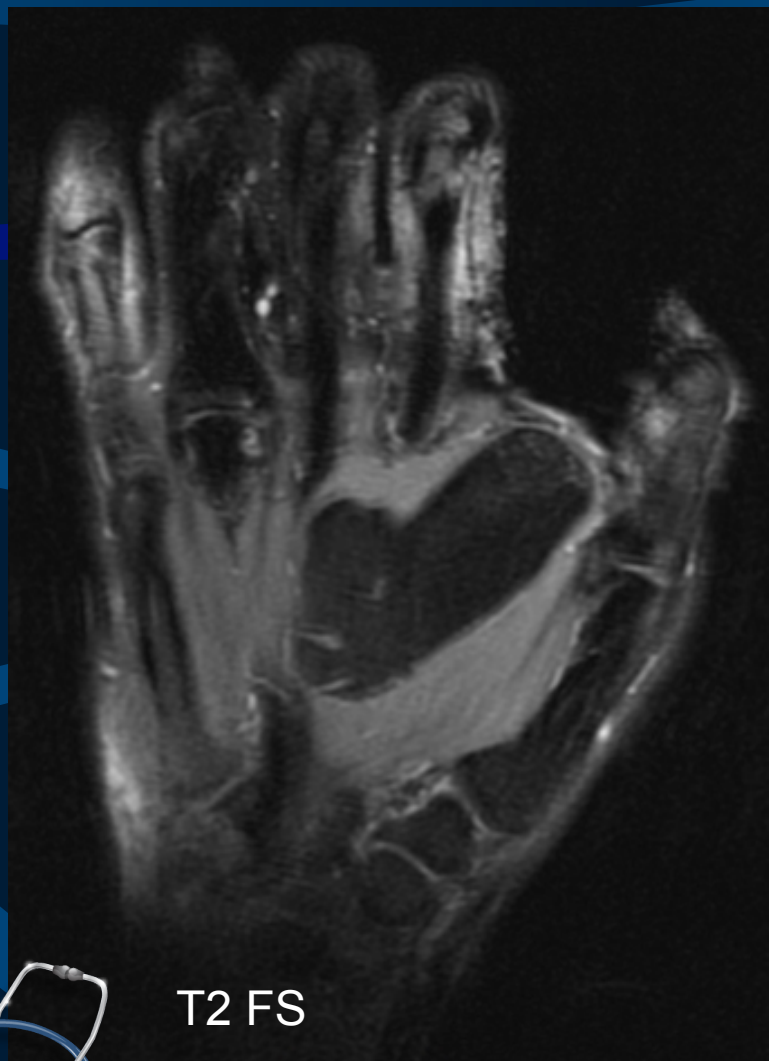


## **CASE NO. 8**

Adult female patient presented with hand swelling  
X-ray of hand requested







## Soft Tissue Lipoma



## **CASE NO. 9**

57 years old female patient presented with bone ache  
Had history of breast carcinoma







**THANKS**

