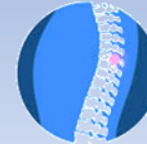




Conventional Diagnostic Radiography in Rheumatic Diseases



BERLIN PHARMACEUTICAL INDUSTRY CO. LTD.

34th Review in Internal Medicine

Third-year Resident

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Asavatanabodee P

PAIJIT ASAVATANABODEE

Rheumatic Disease Unit

Department of Medicine

Phramongkutklo Hospital

"ABCDEF-SP"

mnemonic for radiographic interpretation

A – Adequacy, **A**lignment

B – Bone (vertebral body)

C – Cartilage (disc space, joint space)

D – Distribution

E – Endplate of vertebra,
(subchondral bone of facet joint)

Enthesis

F – Foramen

S – Soft tissue

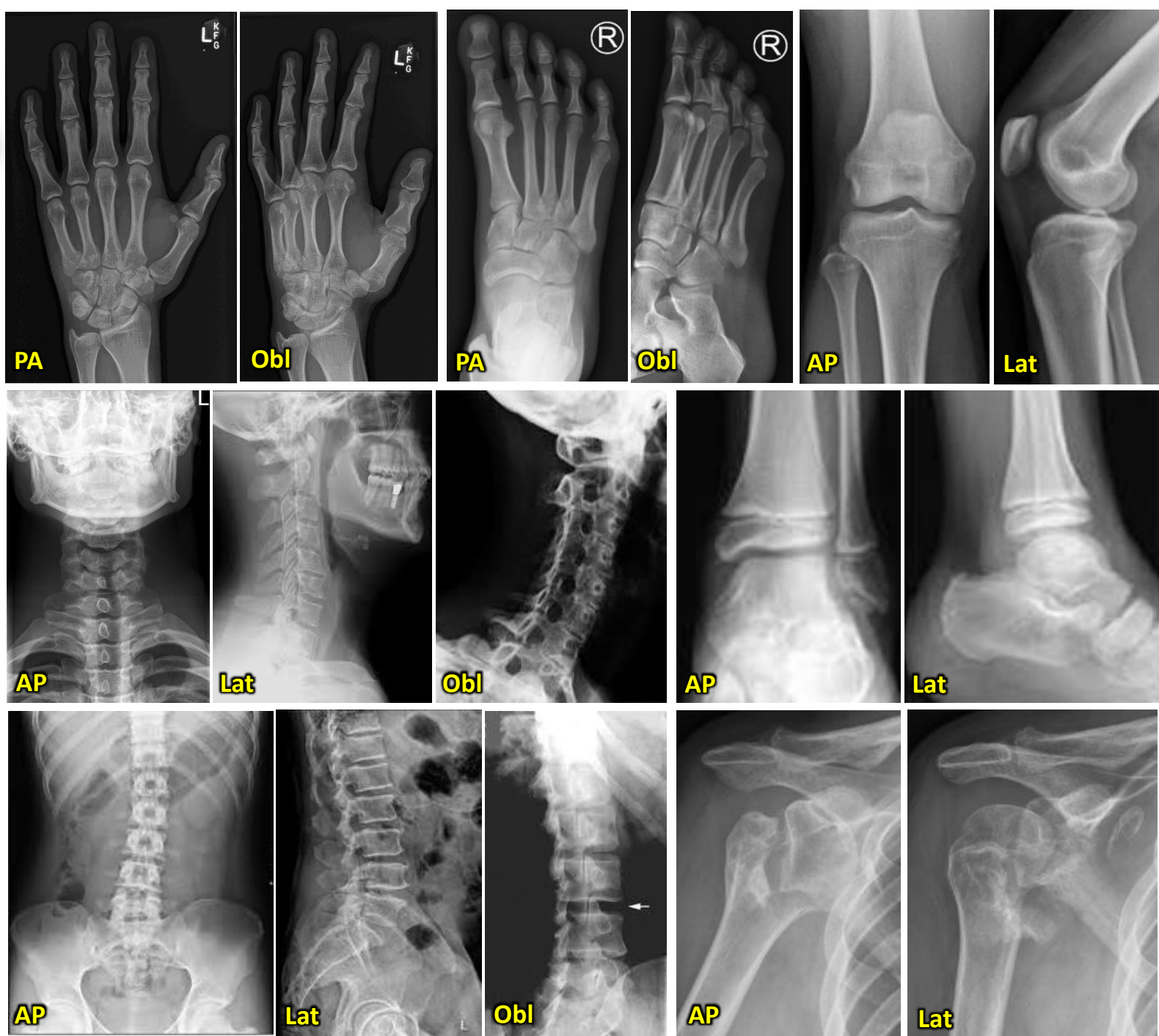
P – Pedicle, **P**erosteum

Take a glance



- Joint / bone / bone and joint disease
- Aggressive / benign / combined feature
- Symmetrical / asymmetrical involvement
- Distinctive radiographic signs

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Quiz 1





Female 48 years old

**Chronic polyarthritis
for 12 months**

Which is most likely diagnosis?

- 1. SLE**
- 2. TB arthritis**
- 3. Psoriatic arthritis**
- 4. Rheumatoid arthritis**

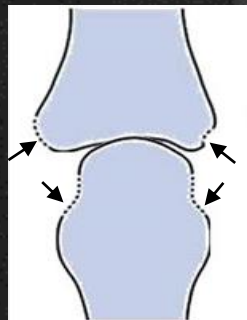
- Inflammatory joint disease
- Aggressive features
- Symmetrical pattern

Female 48 years old

Chronic polyarthritis
for 12 months

Which is most likely diagnosis?

1. SLE
2. TB arthritis
3. Psoriatic arthritis
4. **Rheumatoid arthritis**



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Rheumatoid arthritis

Mal-alignment (**fixed** joint deformity)

Fusiform-shaped peri-articular soft tissue swelling

Juxta-articular osteopenia

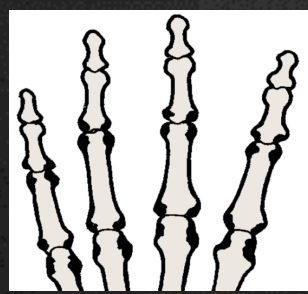
Diffuse narrowing of joint space

Ill-defined marginal and central joint erosions

Symmetrical joint involvement

Synovial joints: MCP, PIP, wrist, MTP, knee, ankle, elbow, shoulder

Axial joints: atlanto-axial joint, subaxial joints, SC and AC joints

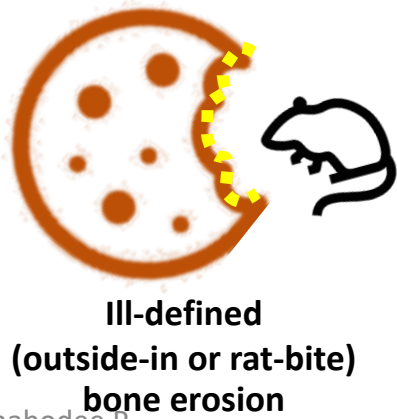
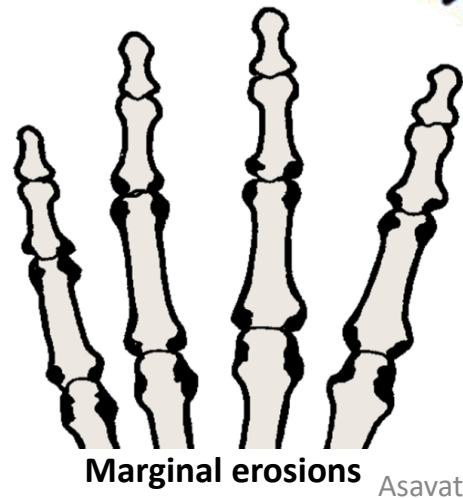
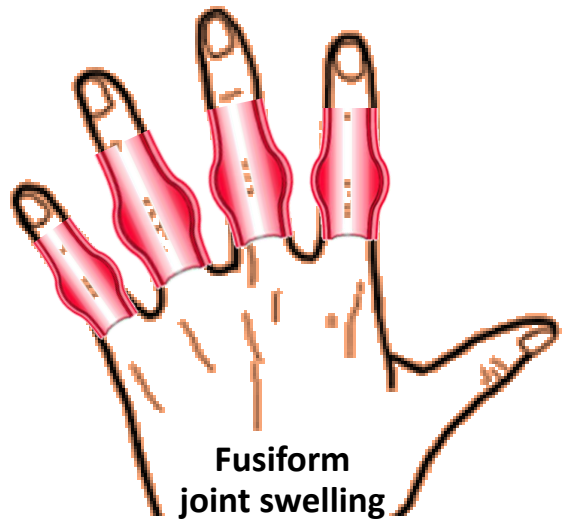
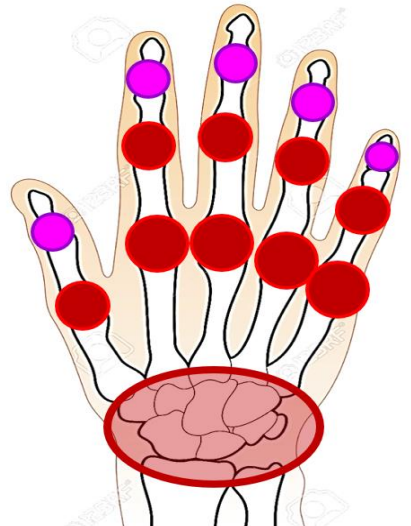
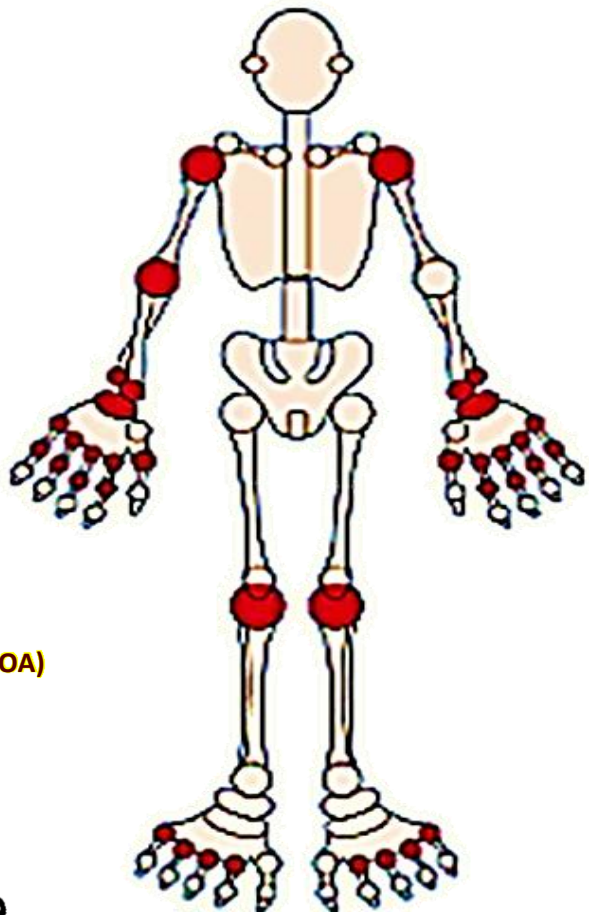
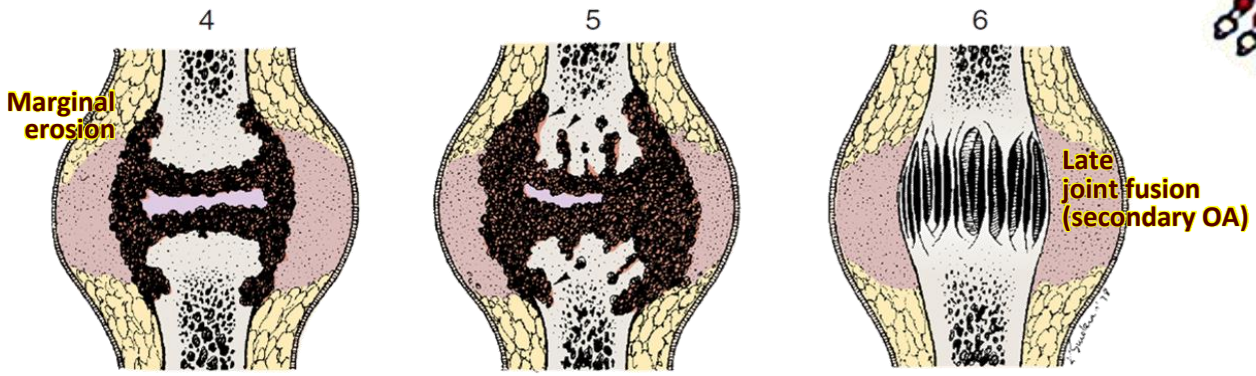
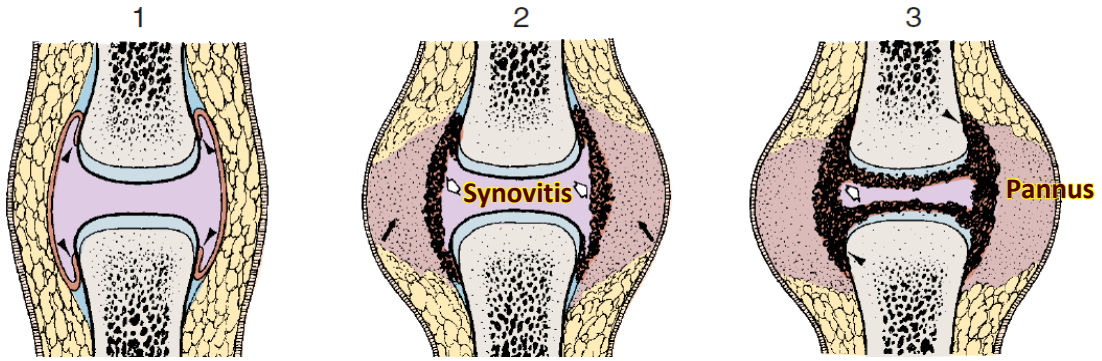


MCPs, PIPs, wrists
(less DIPs)

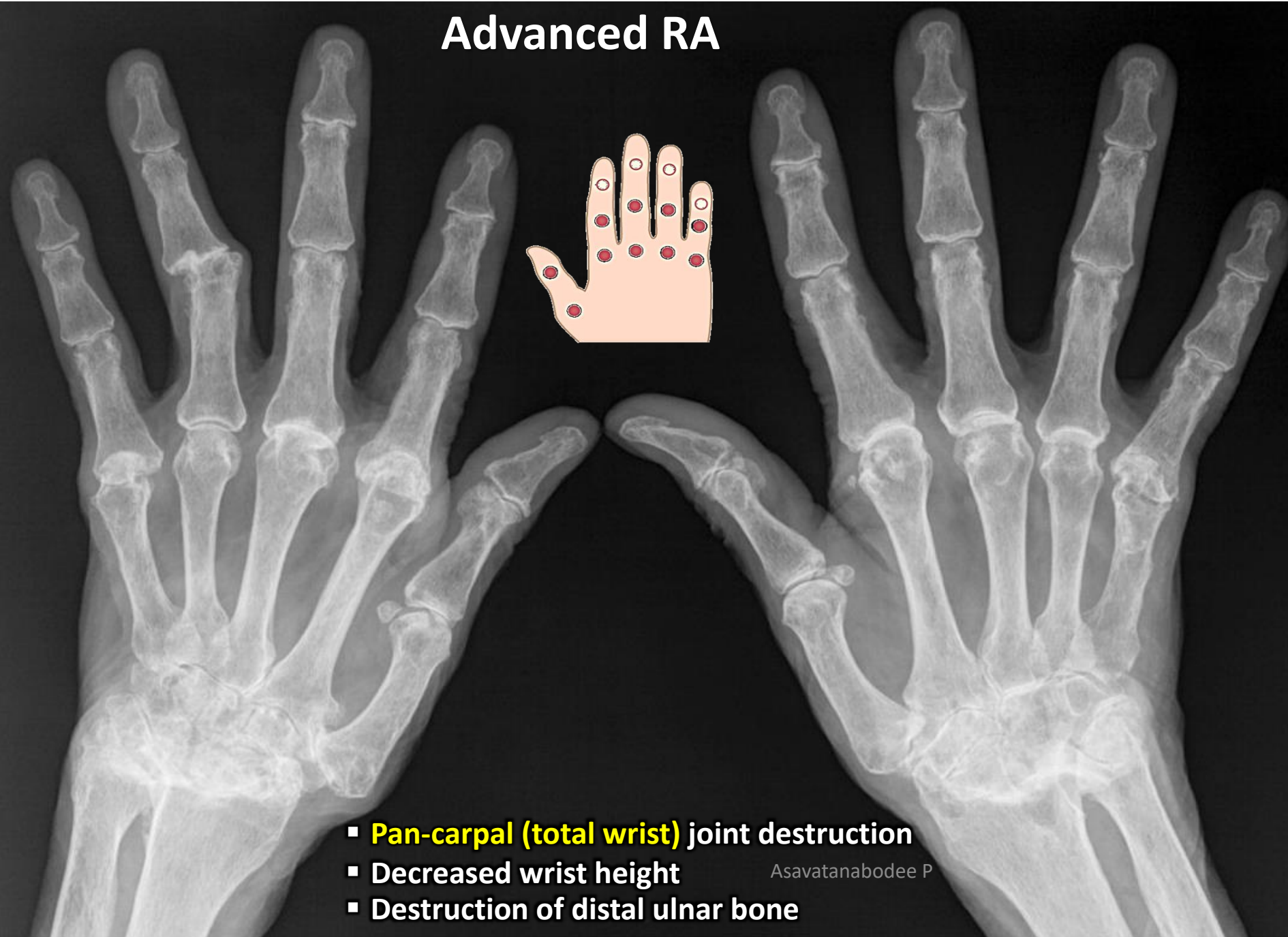


Symmetrical
intra-synovial
aggressive
inflammatory joint disease

Rheumatoid arthritis

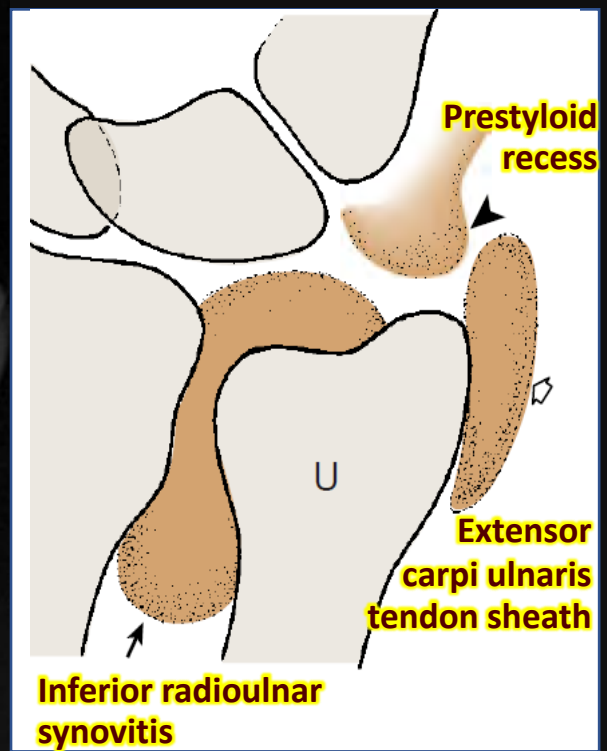


Advanced RA

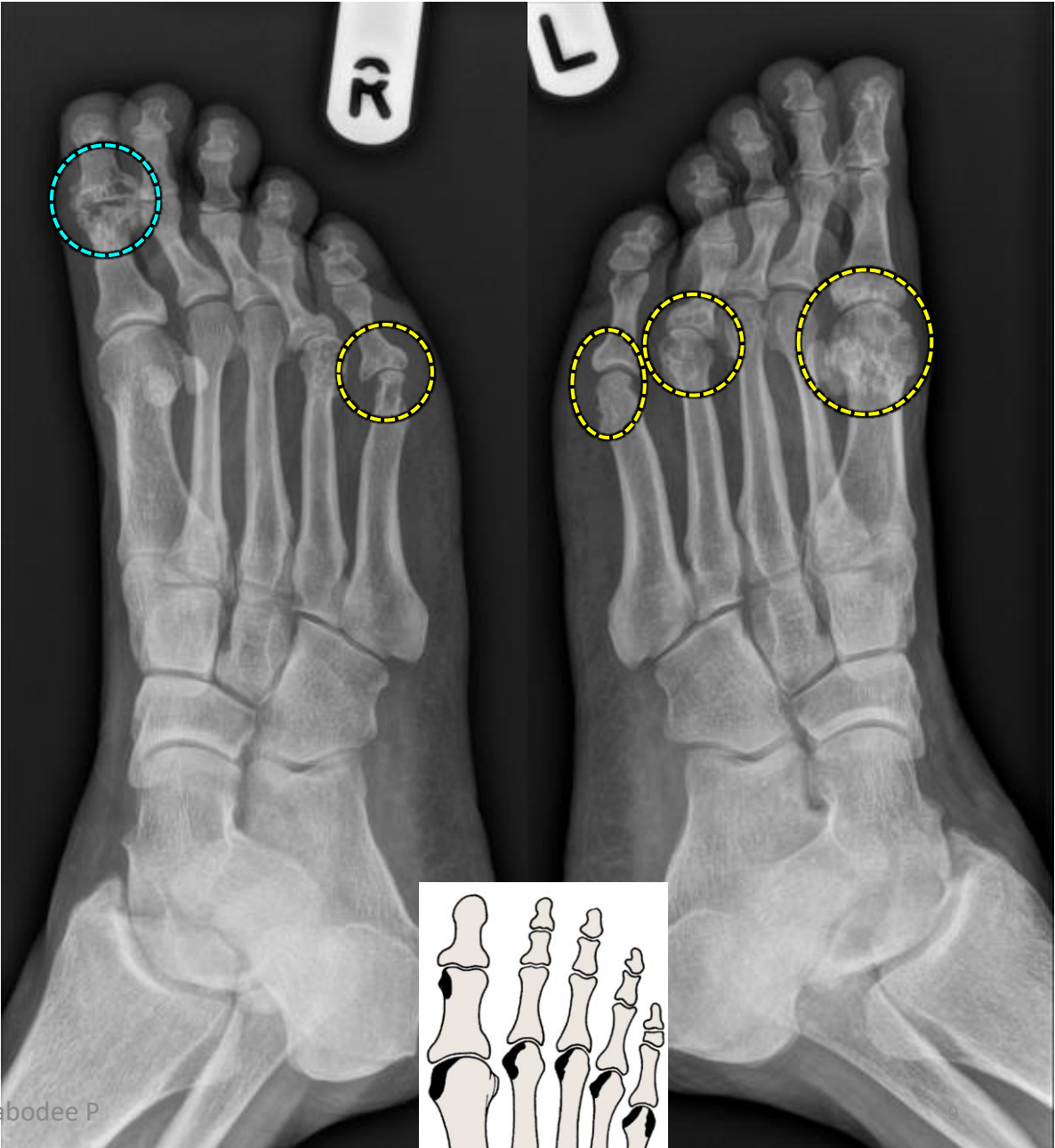
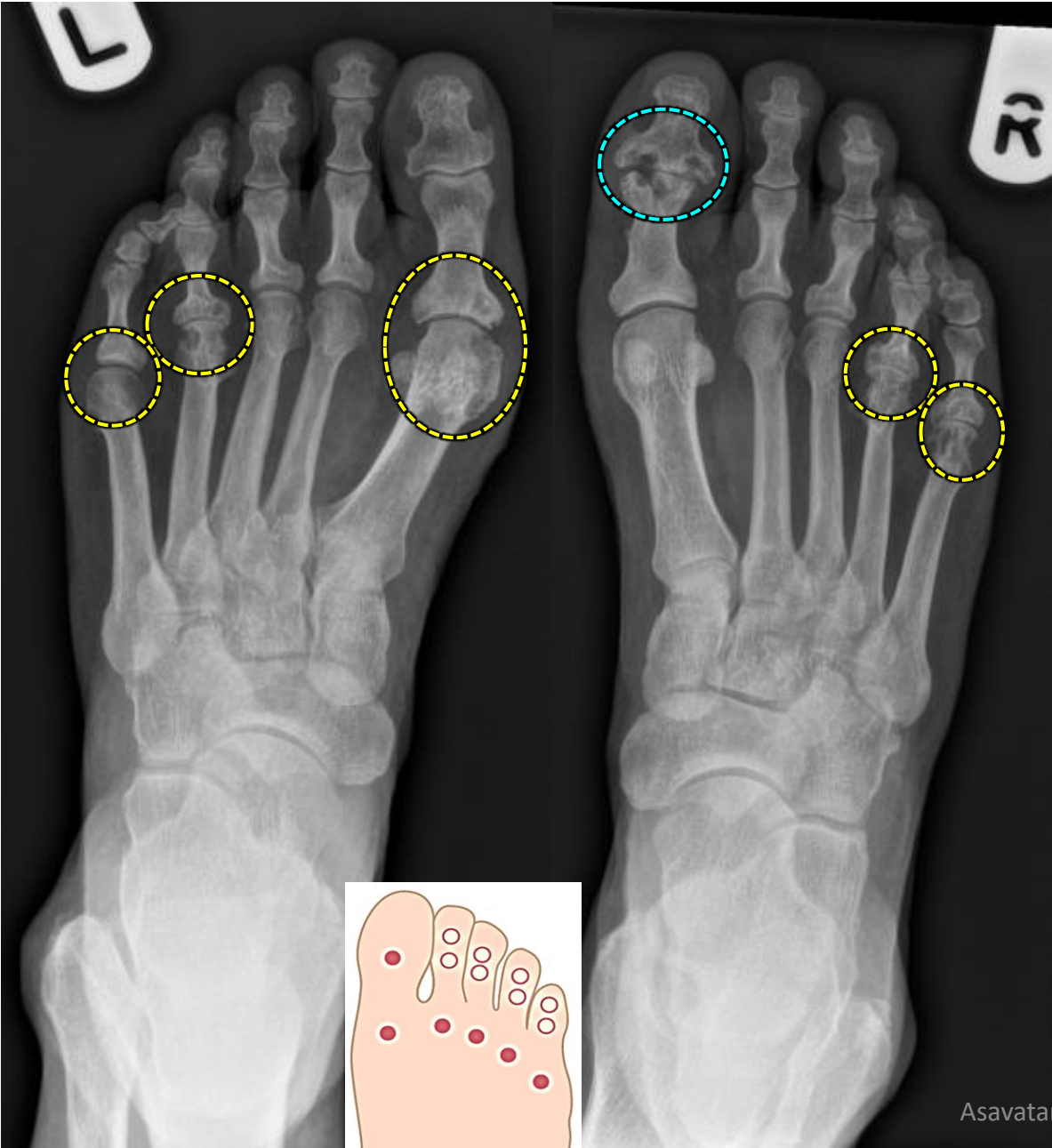


- **Pan-carpal (total wrist) joint destruction**
- **Decreased wrist height**
- **Destruction of distal ulnar bone**

Asavatanabodee P

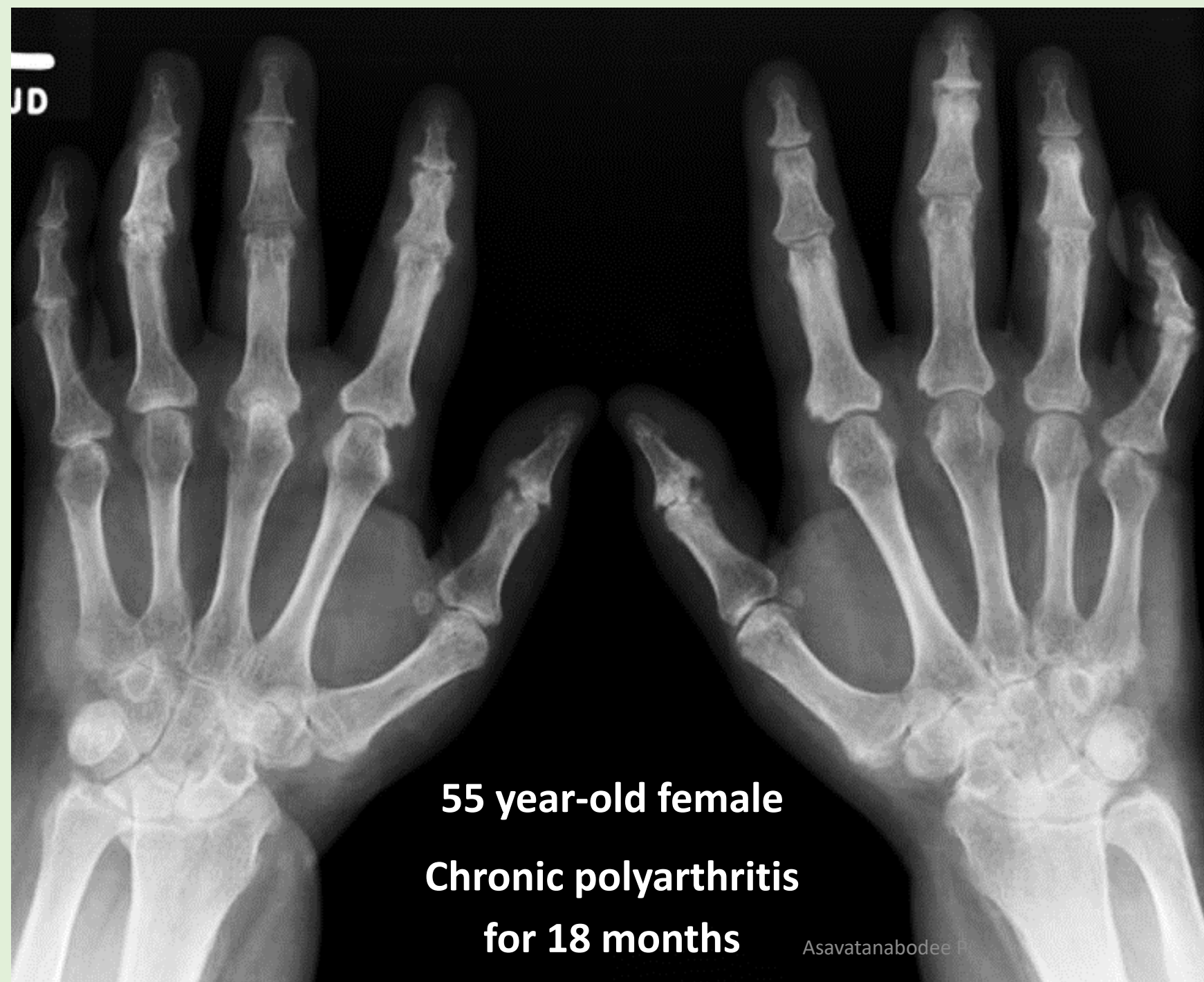


Rheumatoid arthritis (feet)



Quiz 2



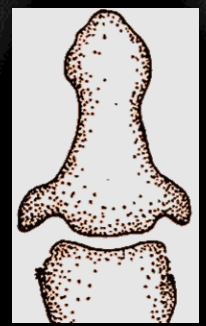
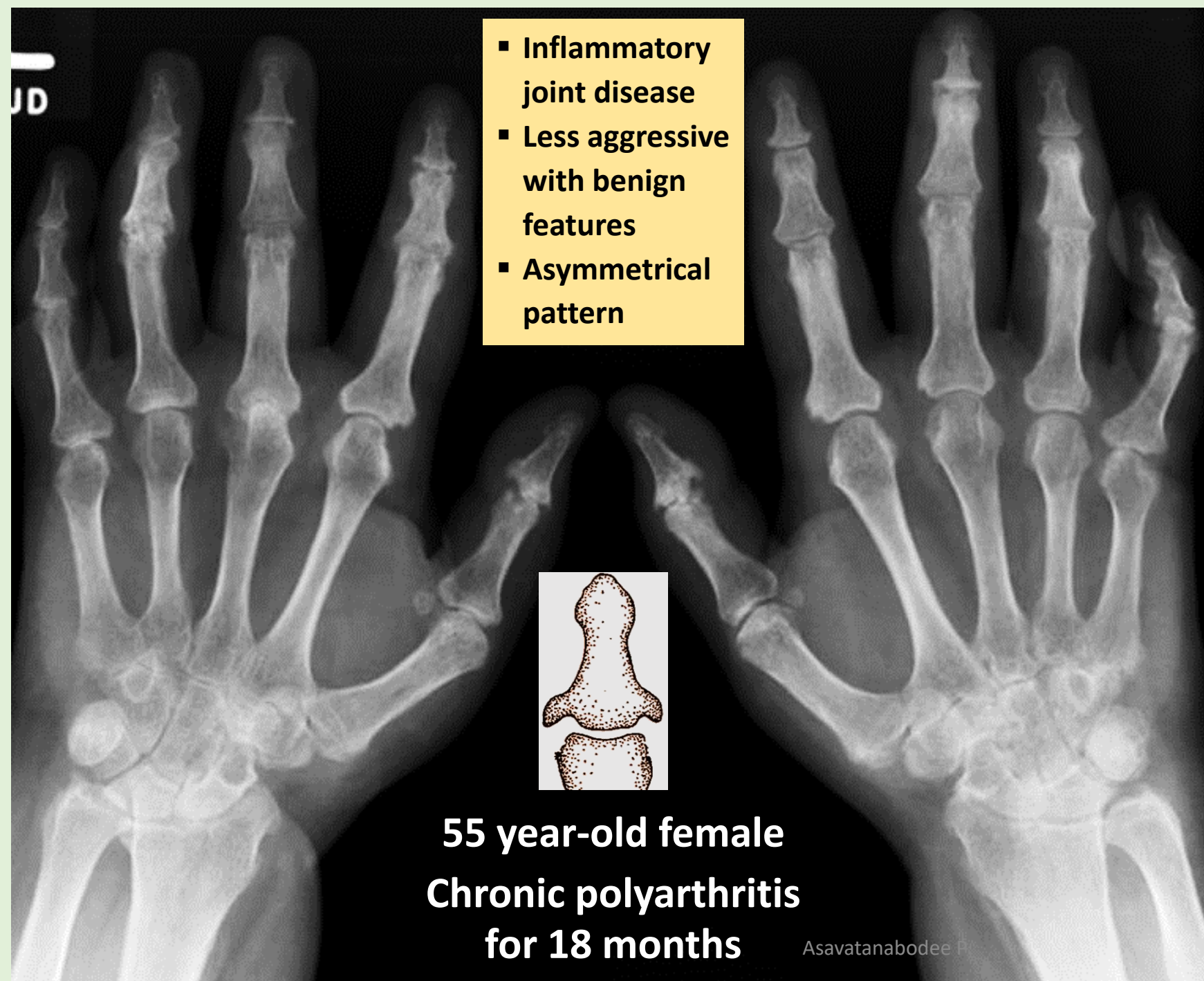


Which is most likely diagnosis?

- 1. RA**
- 2. Gout**
- 3. TB arthritis**
- 4. Psoriatic arthritis**

UD

- Inflammatory joint disease
- Less aggressive with benign features
- Asymmetrical pattern



55 year-old female
Chronic polyarthritis
for 18 months

Asavatanabodee P



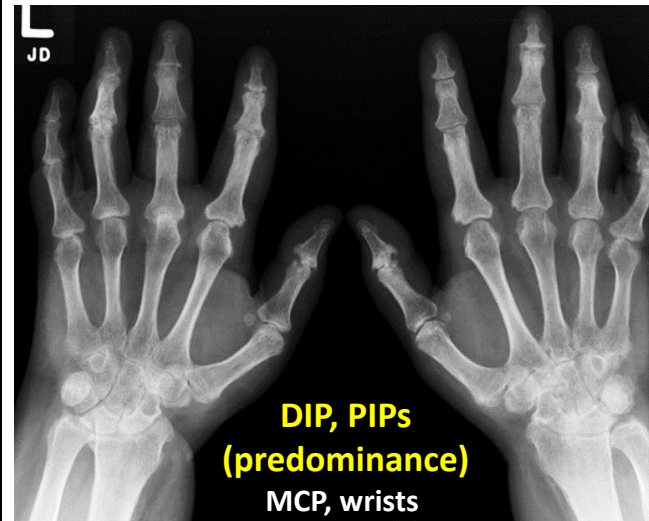
Which is most likely diagnosis?

1. RA
2. Gout
3. TB arthritis
4. Psoriatic arthritis

Psoriatic arthritis



Asymmetrical intra-synovial **less aggressive and benign inflammatory** joint disease with **peri-articular new bone proliferation (enthesophyte)**



Mal-alignment (**fixed** joint deformity), early joint fusion

Sausage-like digital soft tissue swelling

Juxta-articular osteopenia

Diffuse narrowing of joint space

Well-defined marginal and central joint erosions

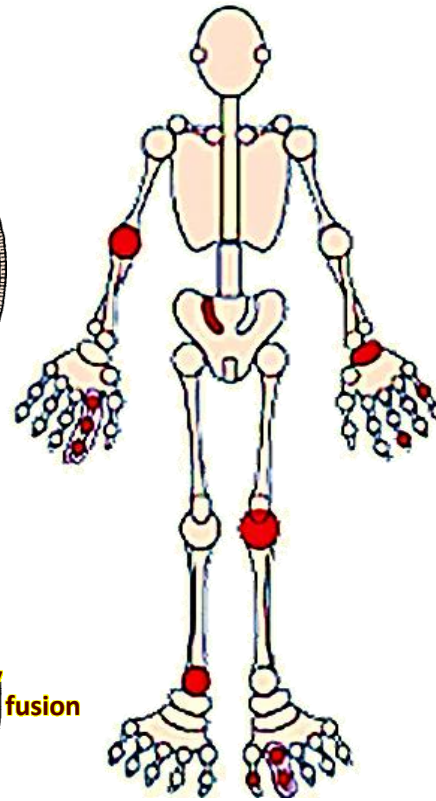
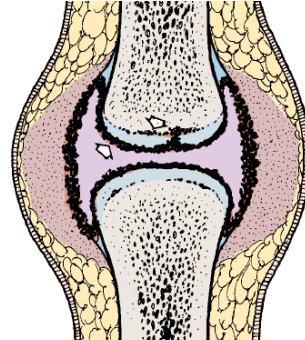
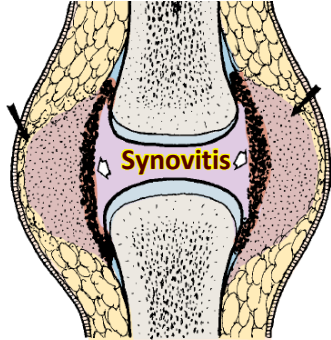
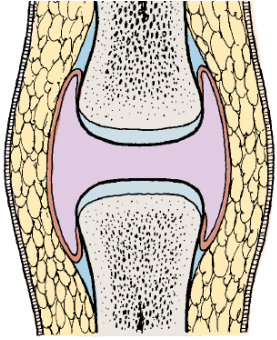
Articular bone resorption with fluffy (whiskering) peri-articular new bone **enthesophyte: mouse-ear, pencil-in-cup**

Asymmetrical joint involvement

Synovial joints: DIP, PIP, IPs of toe, MCP, wrist, MTP, hip, knee, ankle, elbow, shoulder

Axial joints: SI, spine, atlanto-axial joints

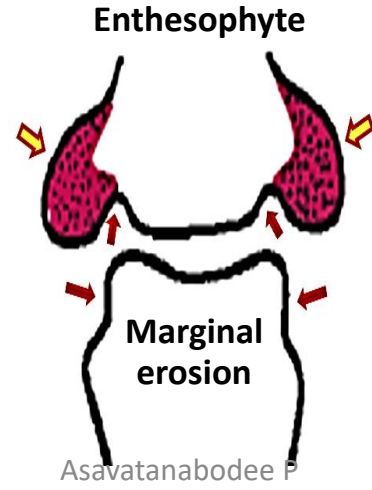
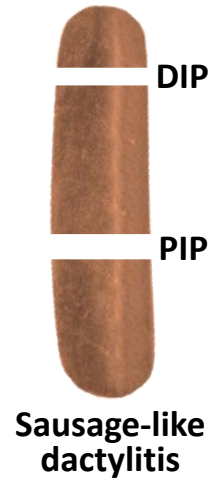
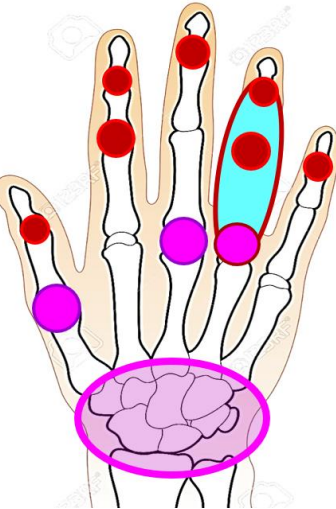
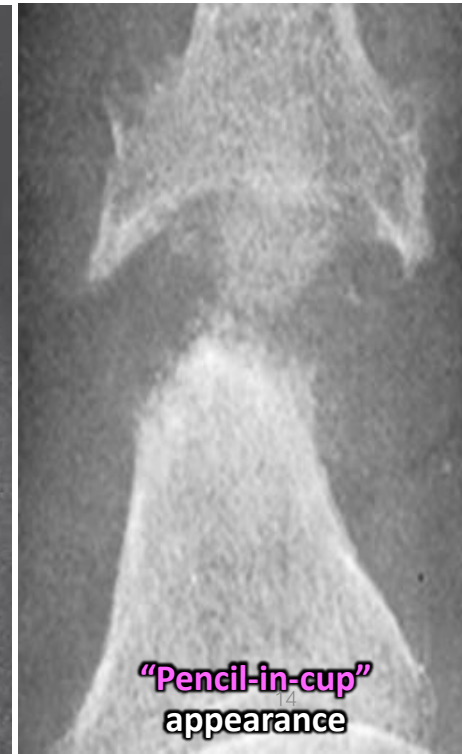
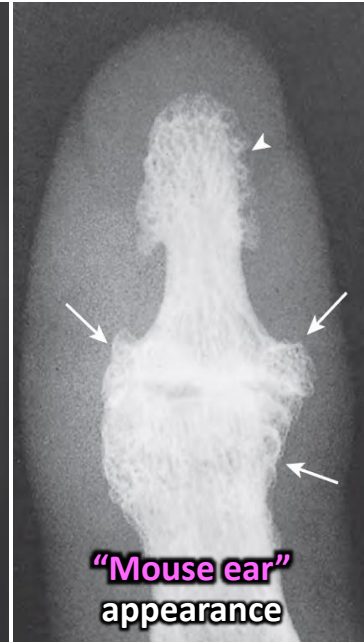
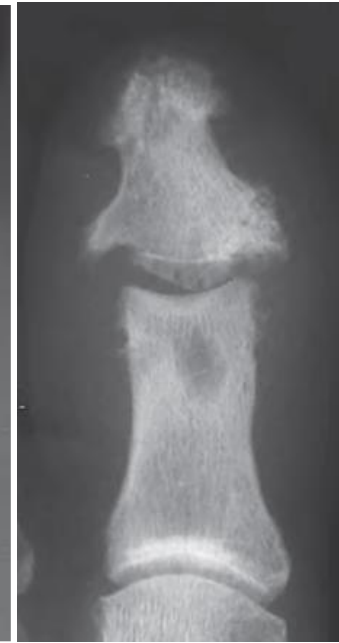
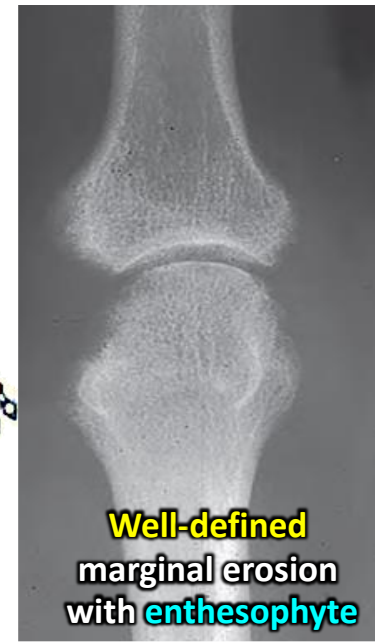
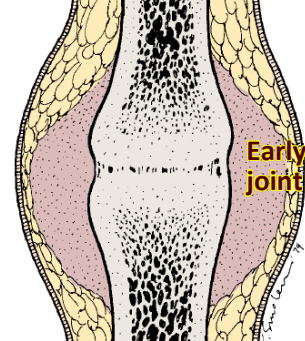
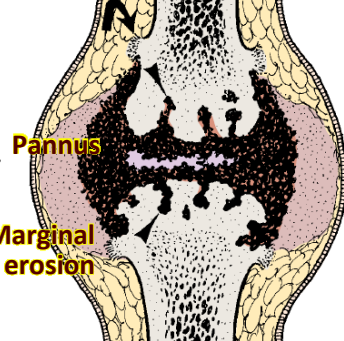
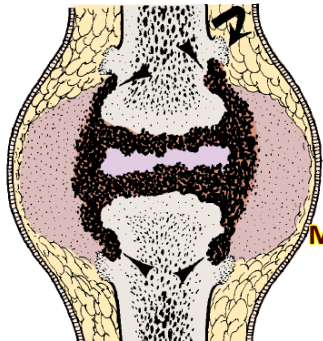
Psoriatic arthritis



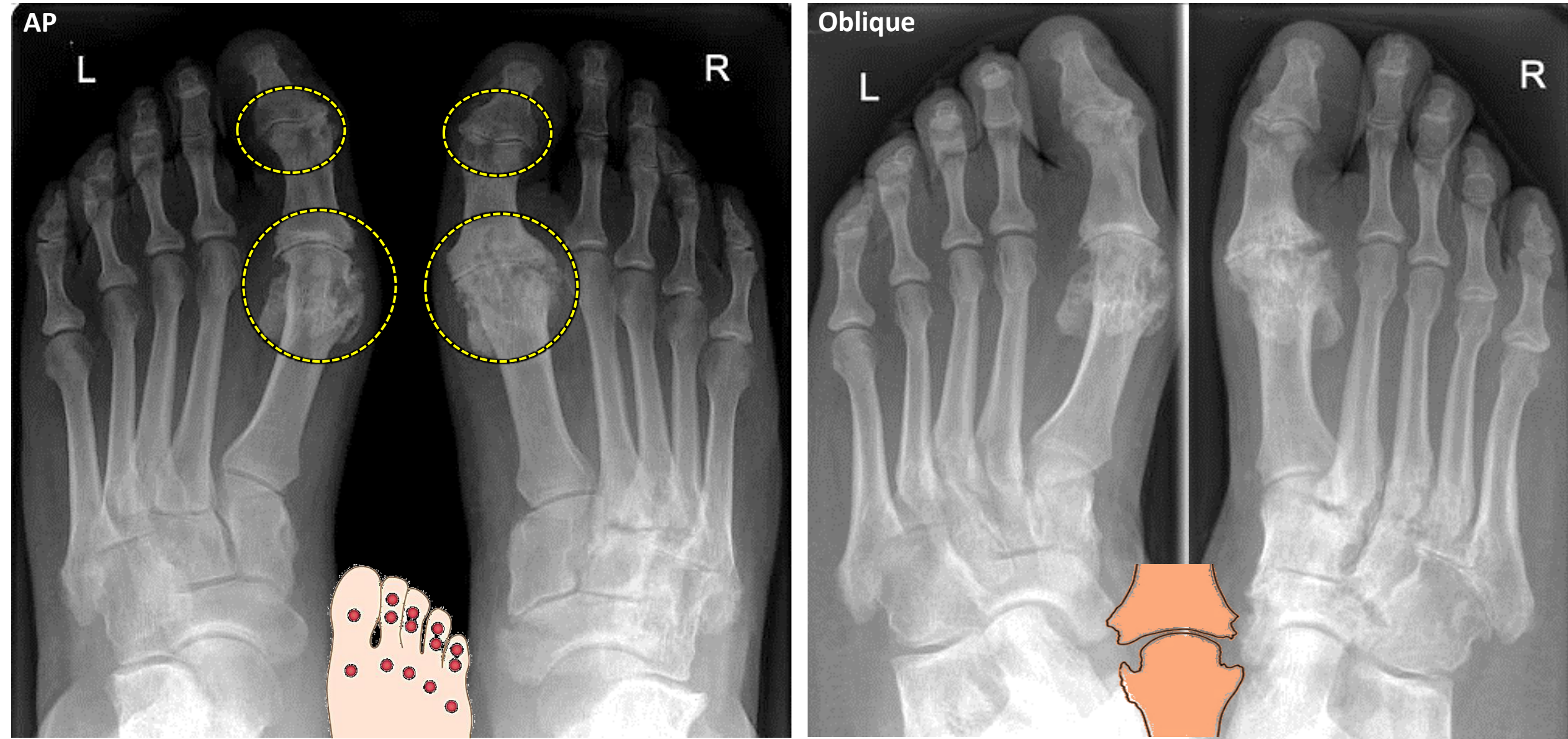
4 **Enthesophyte**

5

6



Psoriatic arthritis (feet)



Psoriatic arthritis mutilans



Opera glass deformity
(la main en lorgnette)

Quiz 3





70 year-old female

**Chronic finger joint
pain for 4 years**

**Which is most likely
diagnosis?**

- 1. RA**
- 2. Osteoarthritis**
- 3. CPP arthropathy**
- 4. Psoriatic arthritis**

- Non-inflammatory joint disease
- Benign features
- Symmetrical pattern

70 year-old female

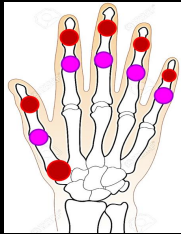
Chronic finger joint pain for 4 years

Which is most likely diagnosis?

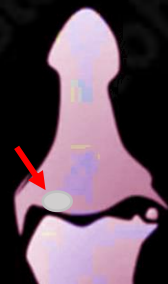
1. RA
2. **Osteoarthritis**
3. CPP arthropathy
4. Psoriatic arthritis



**Primary
non-inflammatory
osteoarthritis**



**DIP, PIP, first IP,
first MCP, radial
CMC, radial wrist**



**Subchondral geode
(sclerotic bone cyst)**

**Symmetrical intra-articular
benign non-inflammatory joint disease**

Asavatanabodhee P

Mal-alignment (**fixed "zigzag"** joint deformity)

Bony joint hypertrophy or **nodular soft tissue shadow** over joint dorsum

Age-related generalized osteopenia
No juxta-articular osteopenia

Eccentric (non-uniform) or **concentric (uniform)** narrowing of joint space

Erosion of articular bone surface with subchondral bone cyst and subchondral bone **sclerosis**

Marginal horizontal-directed (buttress) **osteophytes**

Symmetrical joint involvement (**primary OA**)

Peripheral joints: DIP, PIP, radial MCP and wrist, 1st MTP, hip, knee

Axial joints: intervertebral, uncovertebral, apophyseal joints

Main Causative Factors According to Location of Osteoarthritis

Affected Joint(s)	INTRINSIC FACTORS					EXTRINSIC FACTORS		
	Age	Female Sex	Heridity	Obesity	Inflammation	Chronic Arthritis Trauma	Minor Mechanical Disturbance	Dysplasia or Angulation
Fingers: DIP and nodal generalized osteoarthritis	+	++	++					
Fingers: PIP and nonnodal generalized osteoarthritis	+			+	++			
First carpometacarpal	+	+						
First metatarsophalangeal	(+)						+	
Hip	(+)							++
Knee	(+)	+		+			+	++
Glenohumeral	(+)					+	+	++
Ankle						+		
Wrist						+		

1. Primary non-inflammatory osteoarthritis
2. Primary inflammatory (erosive) osteoarthritis
3. Secondary osteoarthritis

Primary non-inflammatory OA

R
JR



DIP

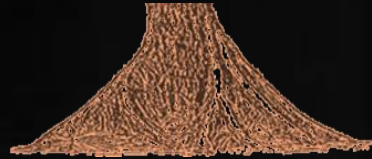
PIP and
1st IP

1st MCP

Radial
wrist



Horizontal-directed
(buttress) osteophyte

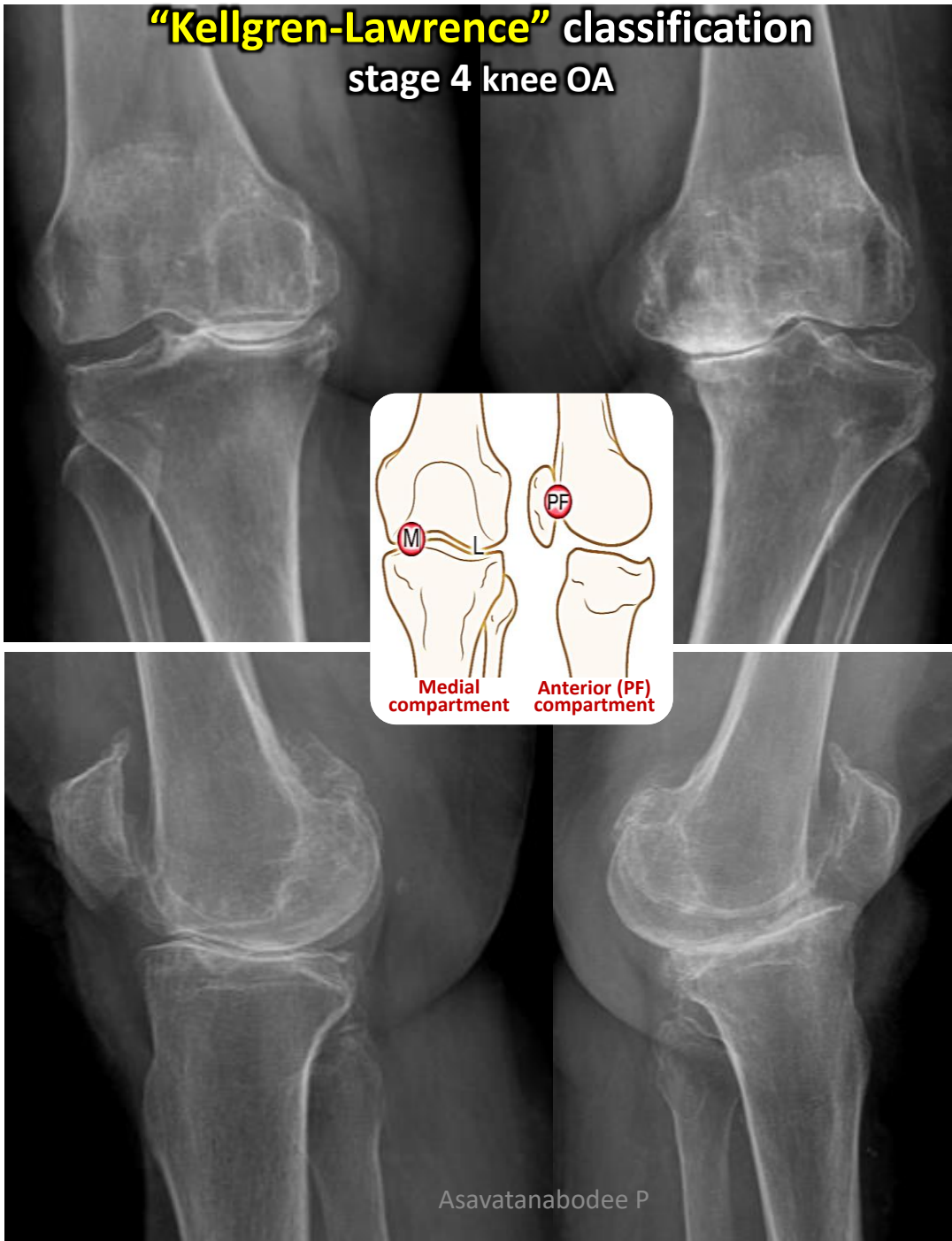


Primary knee OA

Genu varus
knee deformity
(bow legs)



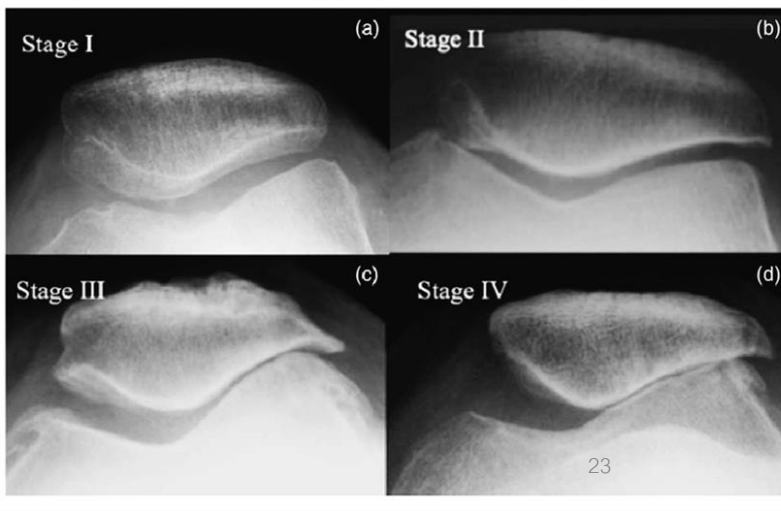
"Kellgren-Lawrence" classification stage 4 knee OA



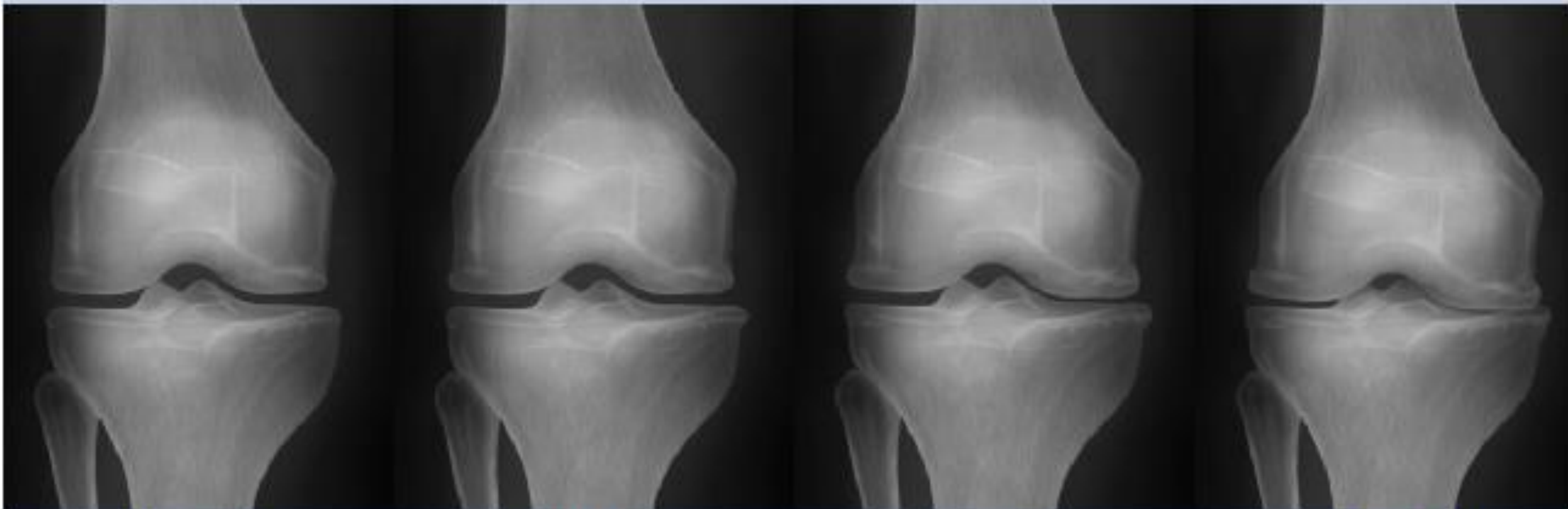
"Iwano" classification stage 4 patellofemoral OA



Iwano classification



Kellgren-Lawrence (KL) grading scale of knee osteoarthritis



Grade 1

Grade 2

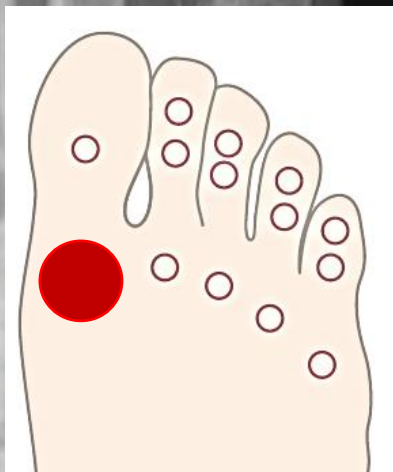
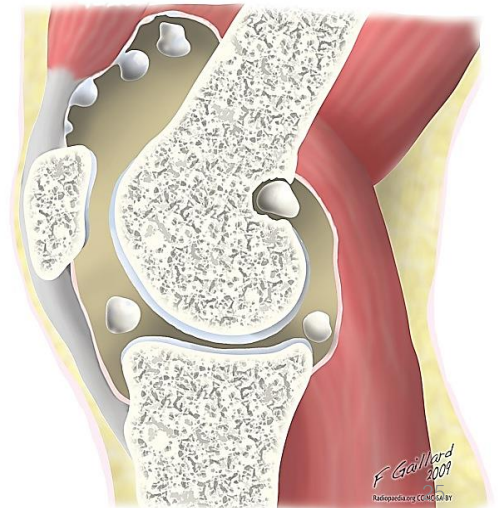
Grade 3

Grade 4

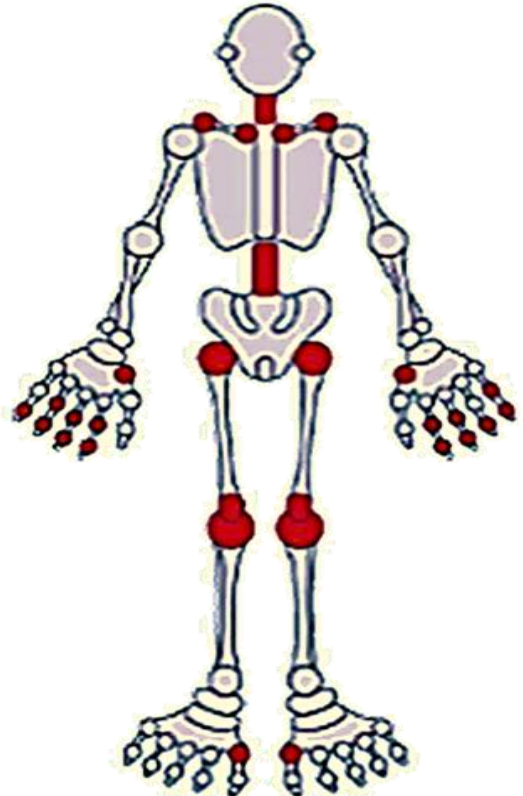
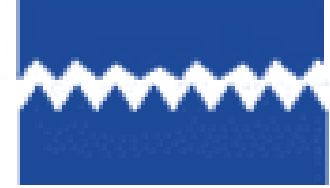
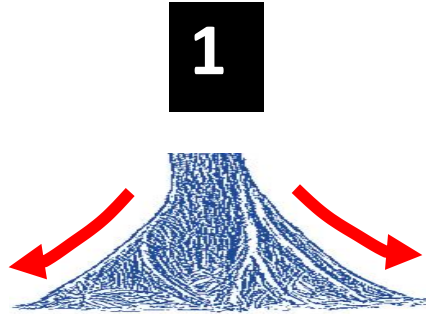
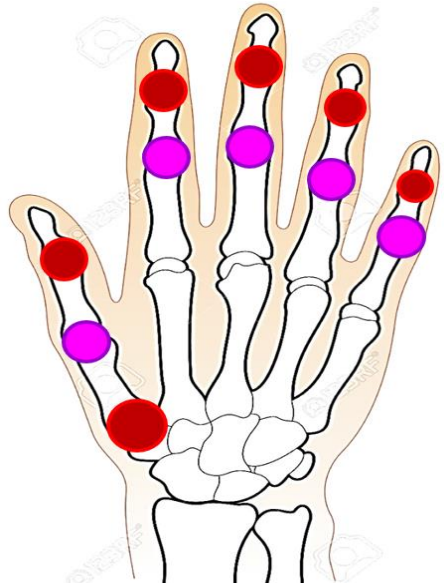
CLASSIFICATION	Normal	Doubtful	Mild	Moderate	Severe
DESCRIPTION	No features of OA	Minute <u>osteophyte</u> : doubtful significance	Definite osteophyte: normal joint space	<u>Moderate joint space reduction</u>	Joint space greatly reduced: <u>subchondral sclerosis</u>

First MTP osteoarthritis

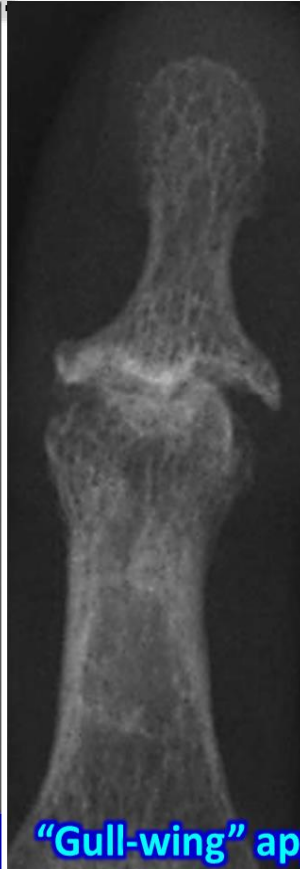
- Hallux valgus
- Mild overlying soft tissue swelling
- Multiple **intra-articular osseous loose bodies** (*synovial osteochondromatosis, OA repetitive microtrauma, neuropathic arthropathy*)



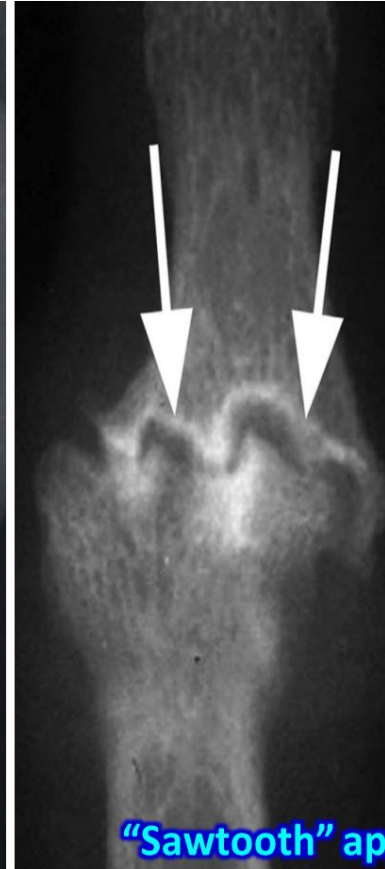
Primary osteoarthritis



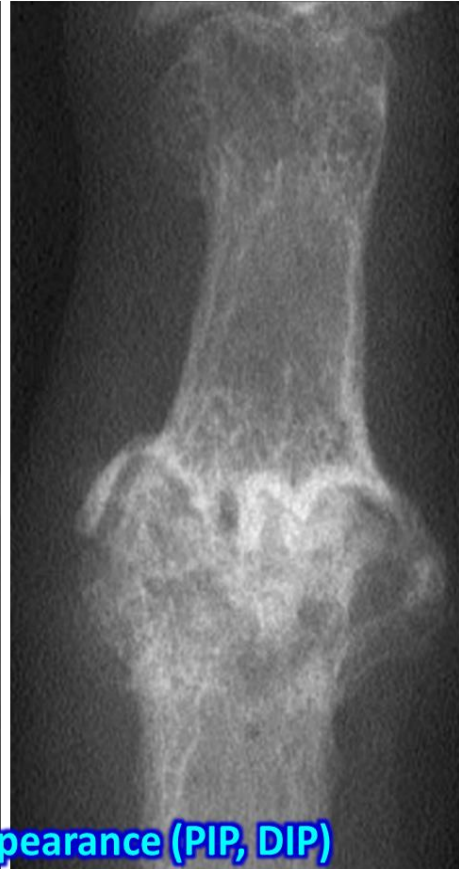
"Butress" osteophyte
Non-inflammatory osteoarthritis



"Gull-wing" appearance (DIP)

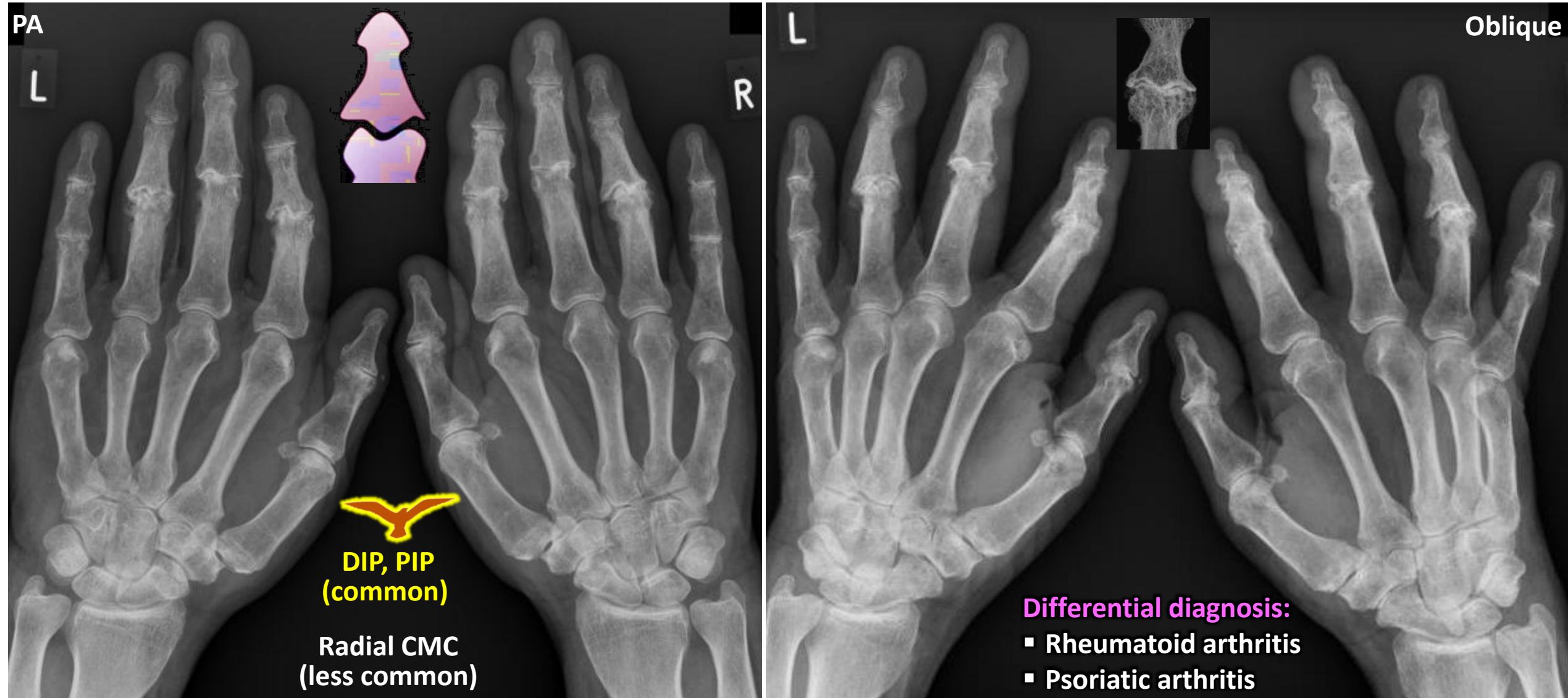


"Sawtooth" appearance (PIP, DIP)

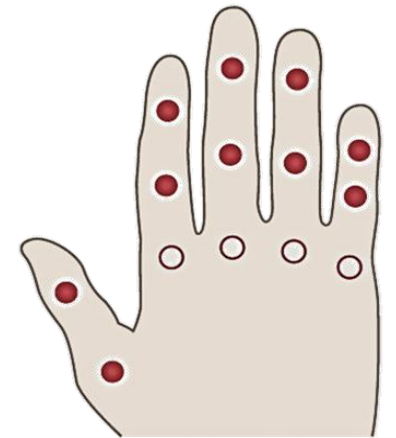


Erosive (inflammatory) osteoarthritis

Primary **inflammatory (erosive)** osteoarthritis of hands



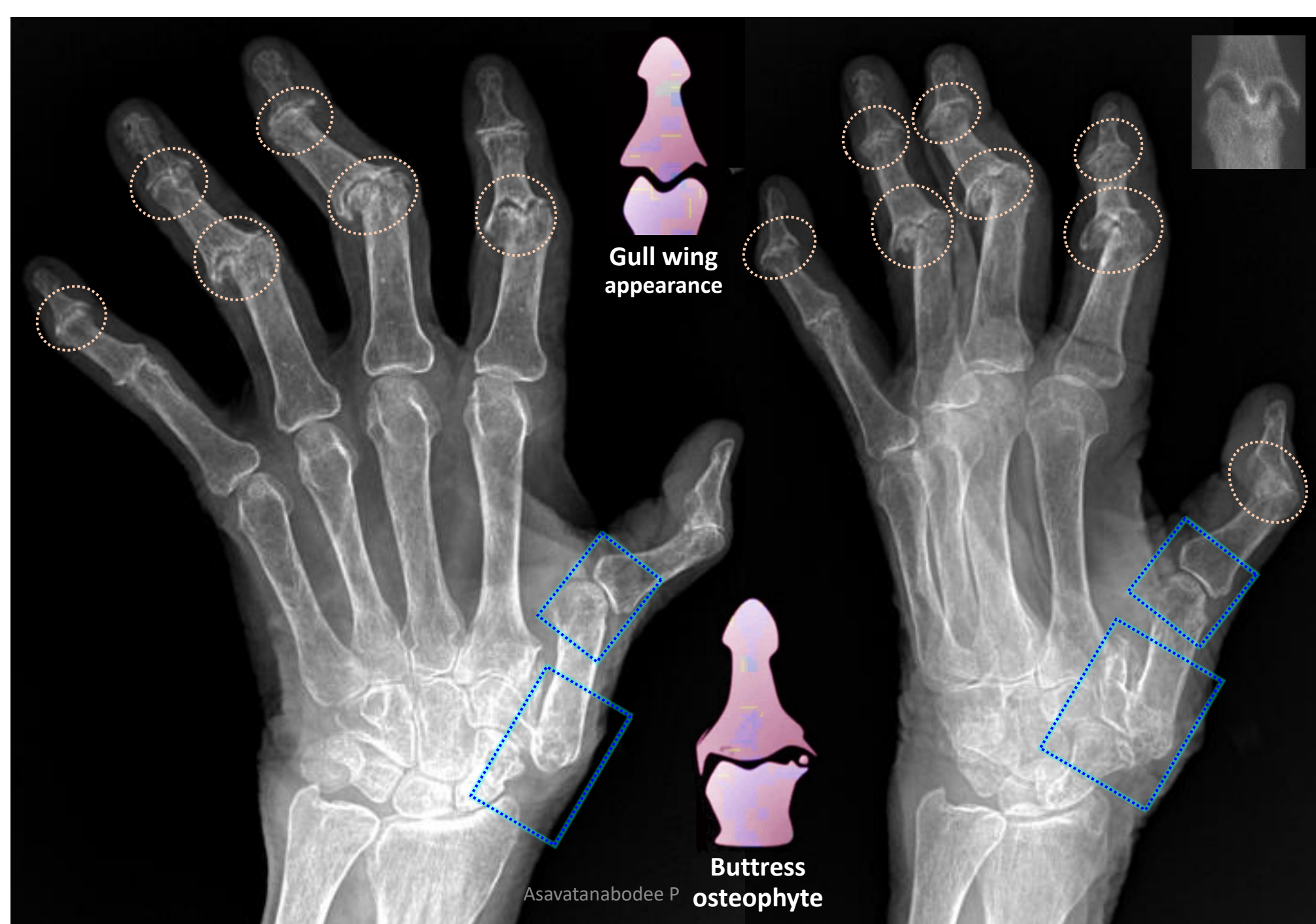
Primary osteoarthritis of hands



Inflammatory (erosive) osteoarthritis



Non-inflammatory osteoarthritis



Gull wing appearance

Buttress osteophyte

Quiz 4





55-year-old male

Chronic polyarthritis for 3 years

Which is most likely diagnosis?

- 1. Gout**
- 2. Osteoarthritis**
- 3. Tumor metastasis**
- 4. Osteoarticular tuberculosis**

55-year-old male

Chronic polyarthritis for 3 years

Which is most likely diagnosis?

1. Gout
2. Osteoarthritis
3. Tumor metastasis
4. Osteoarticular tuberculosis



- Soft tissue mass shadow
- Bone and joint involvement
- Less aggressive with benign features
- Asymmetrical pattern

R



Chronic tophaceous gout

Soft tissue mass (tophi)

No juxta-articular osteopenia

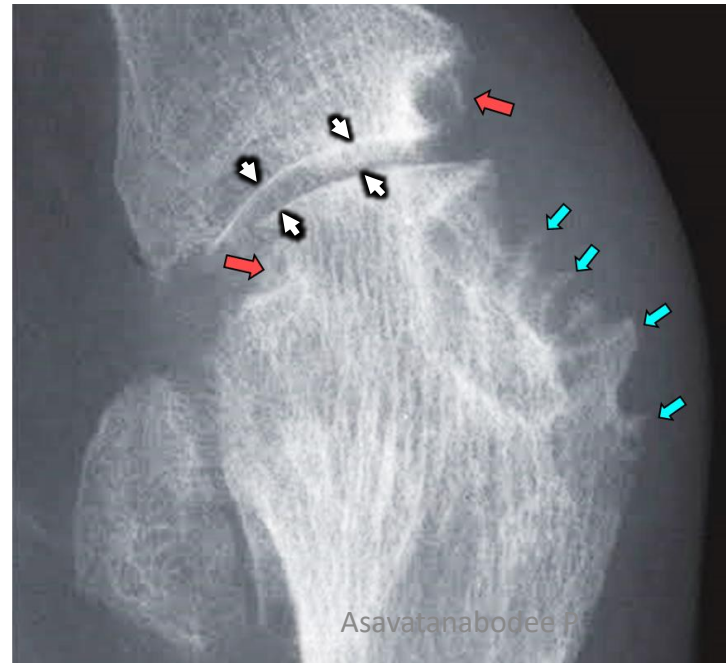
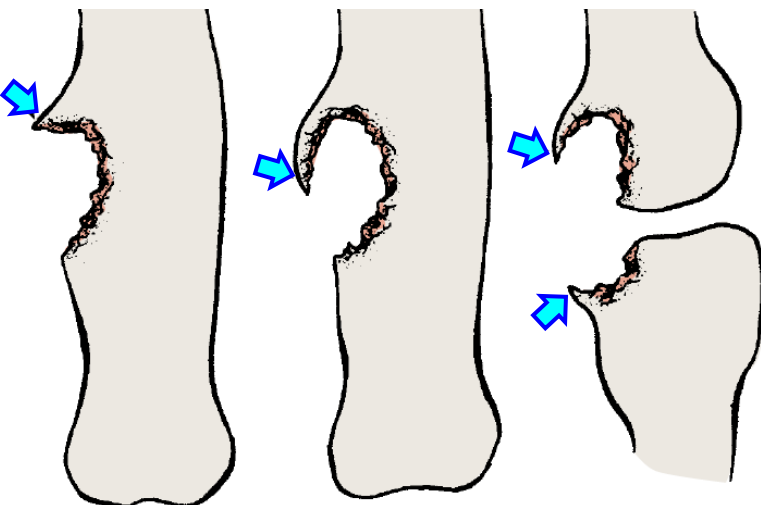
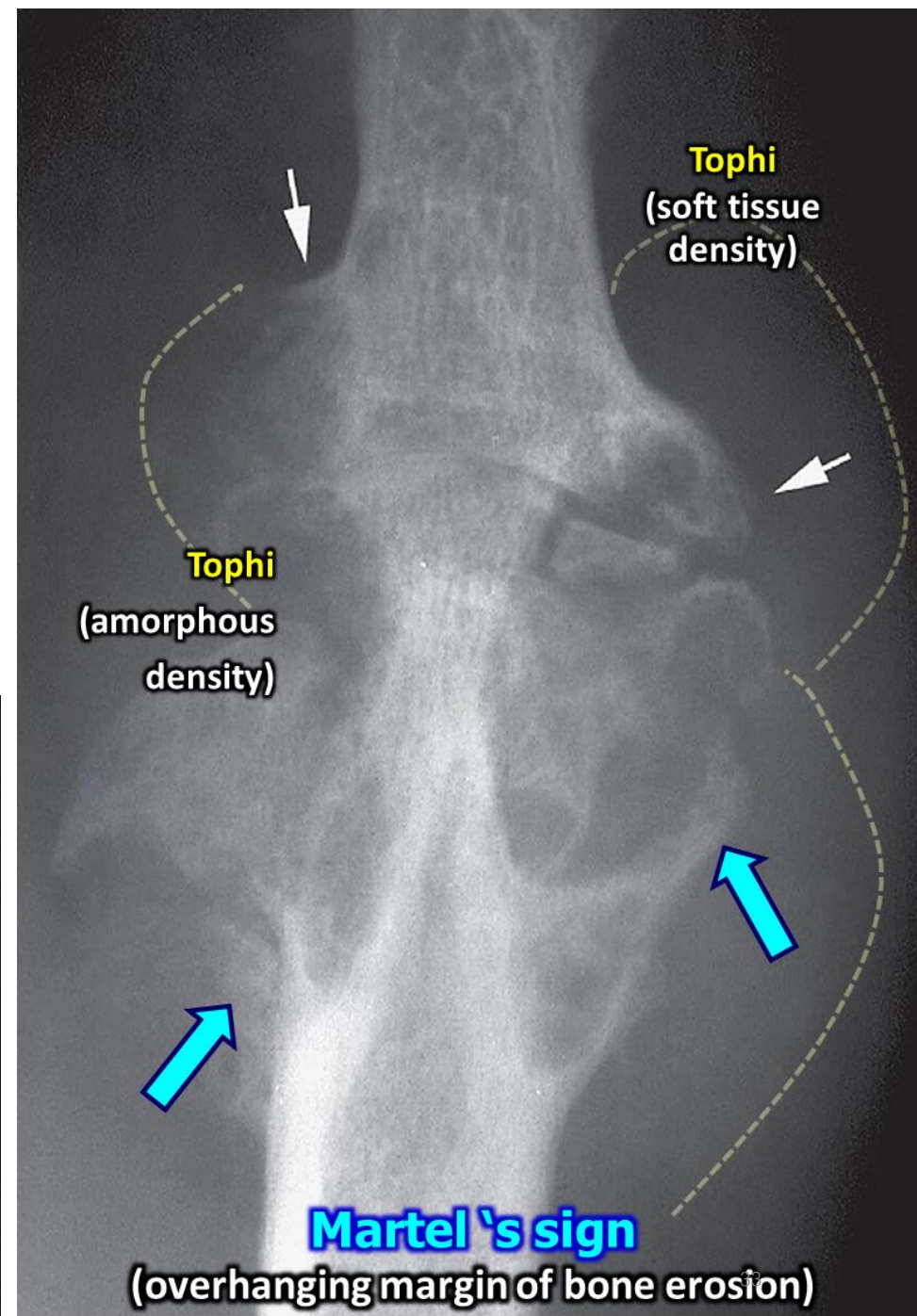
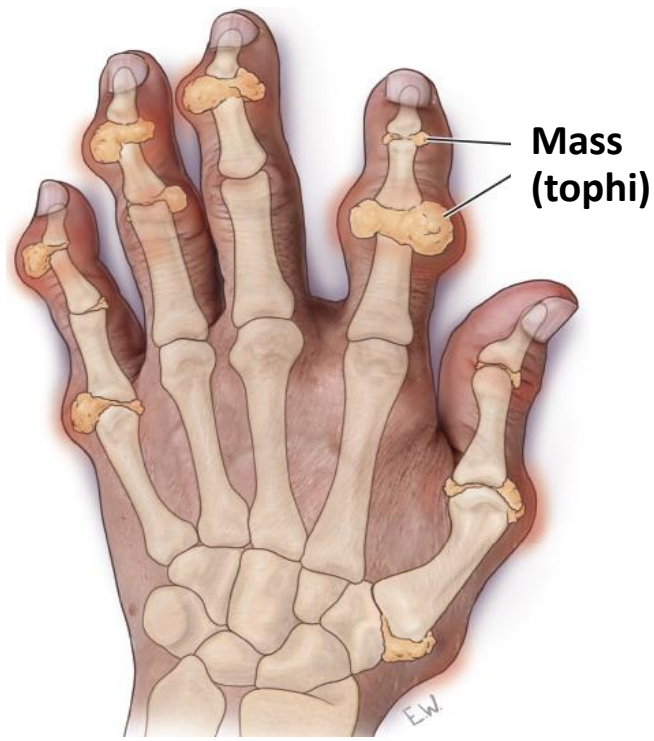
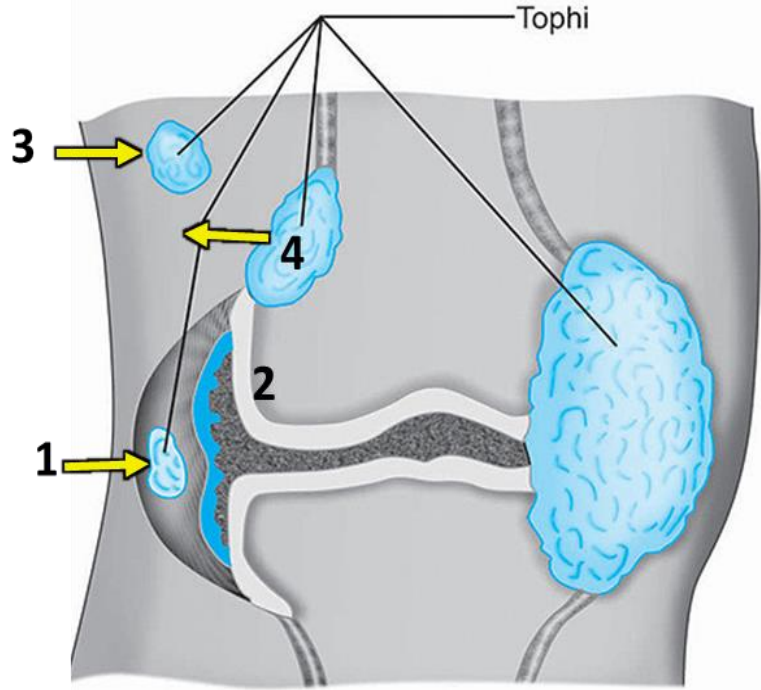
Relatively sparing
or normal joint space

Well-defined
intra- and/or extra-articular
osteolytic lesions
(punched osteolytic lesion)

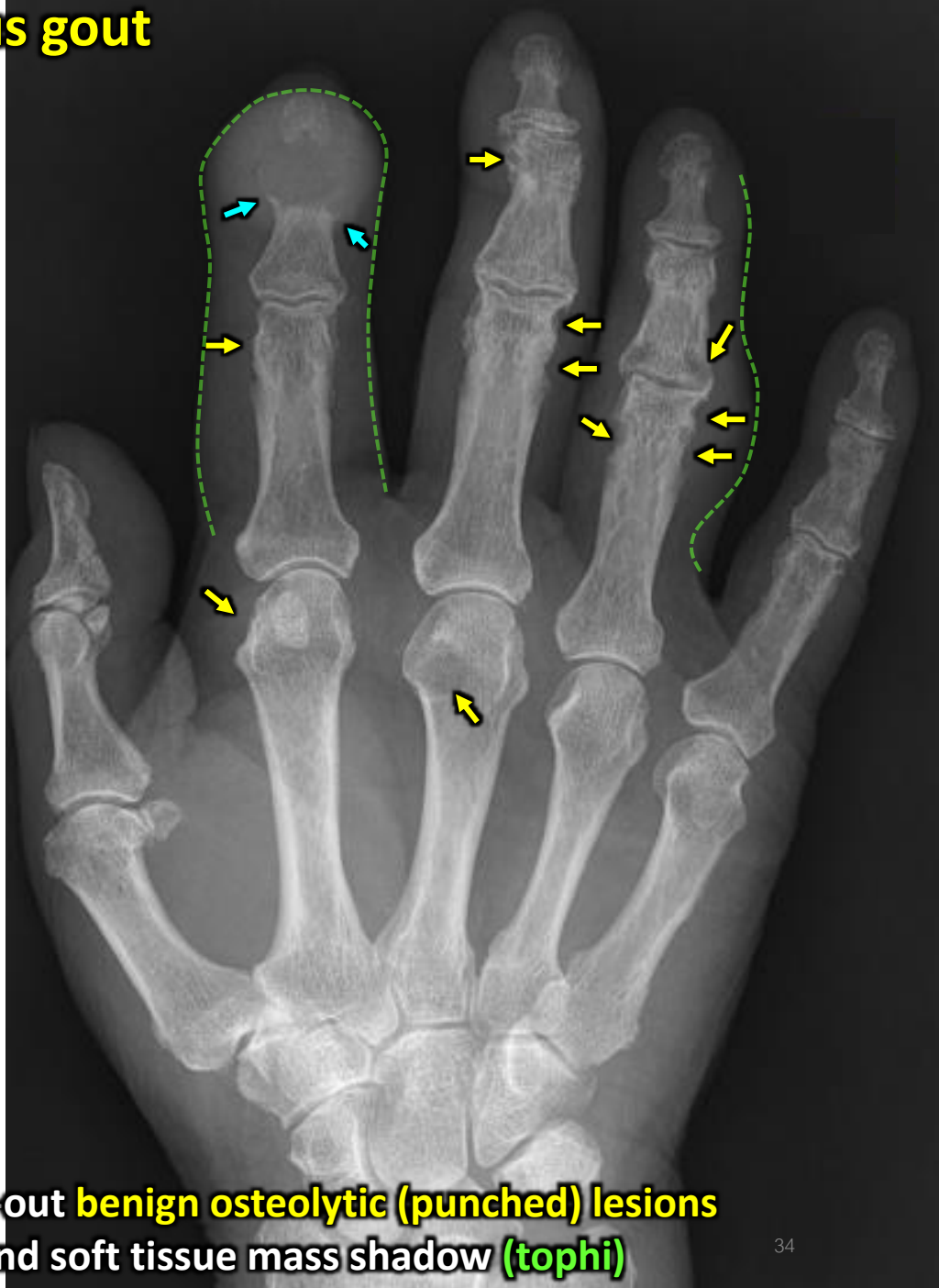
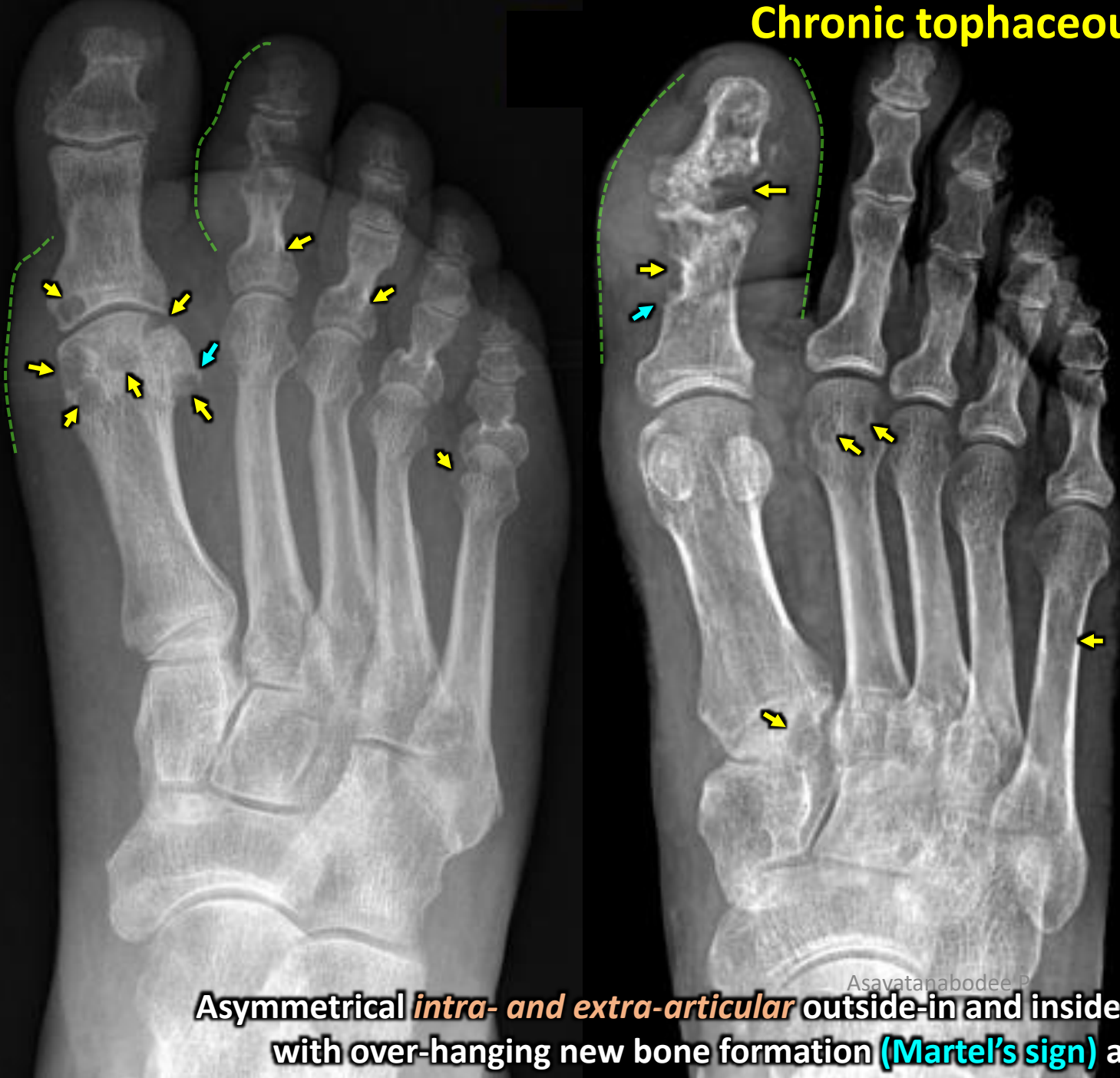
Overhanging new bone
proliferation at erosive edge
("Martel's" sign)



Chronic tophaceous gout



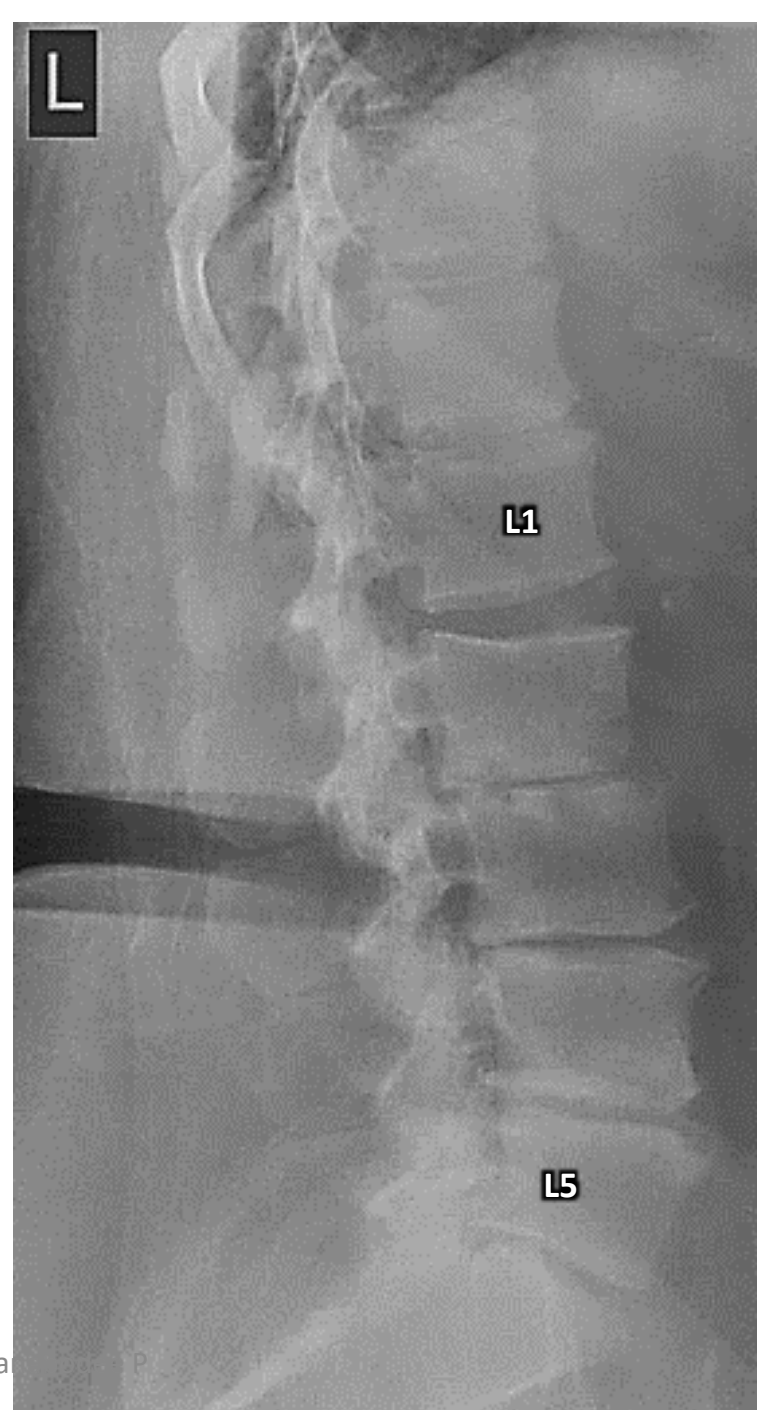
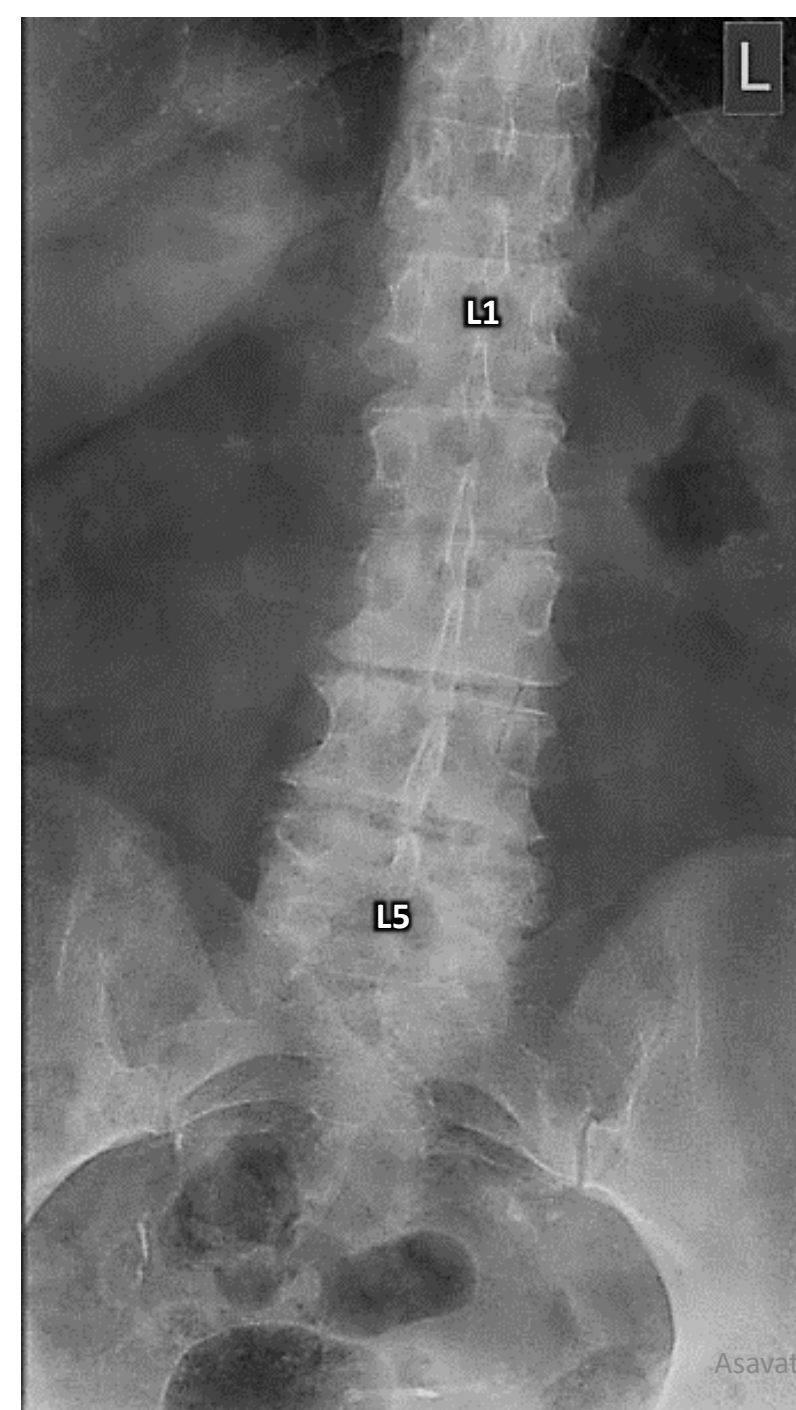
Chronic tophaceous gout



Asavatanabodee P
Asymmetrical *intra- and extra-articular* outside-in and inside-out **benign osteolytic (punched) lesions** with over-hanging new bone formation (**Martel's sign**) and soft tissue mass shadow (**tophi**)

Quiz 5



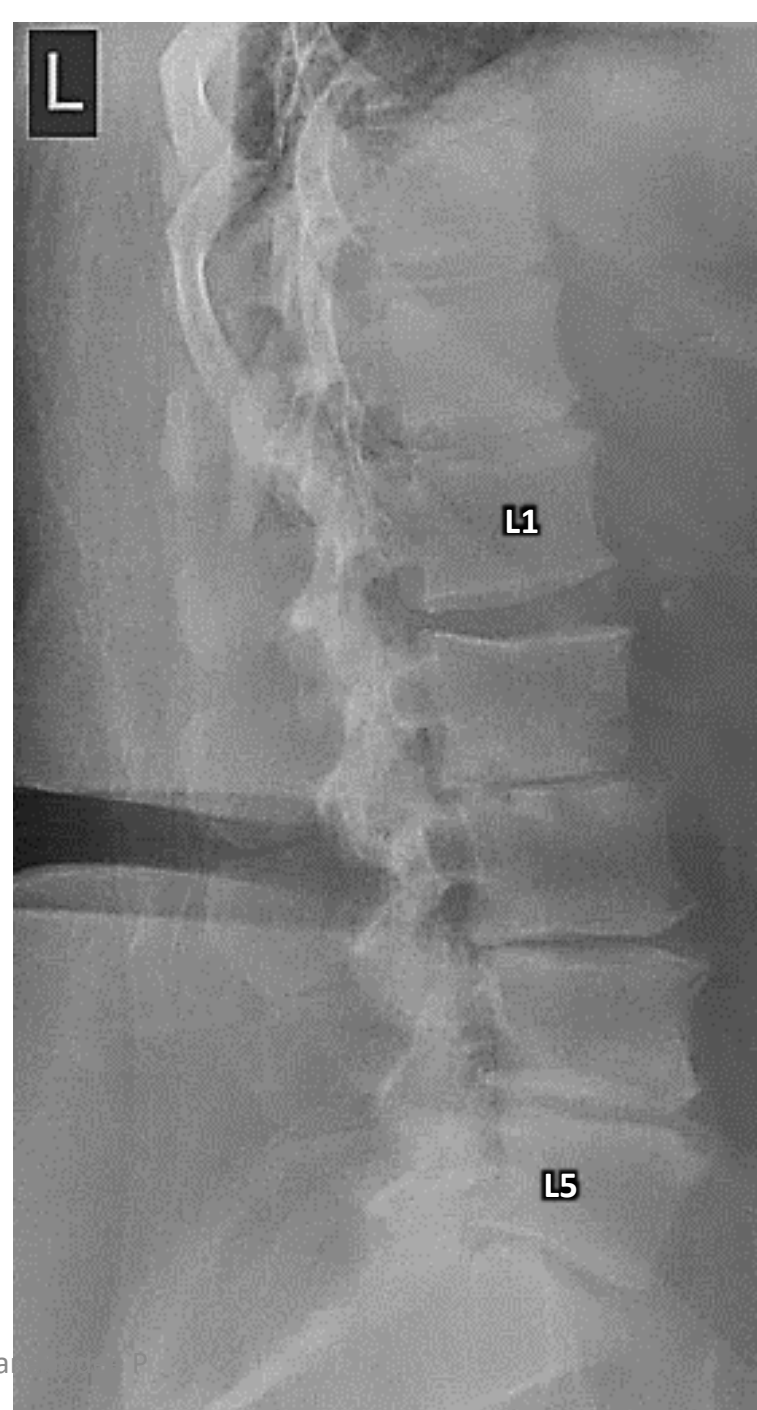
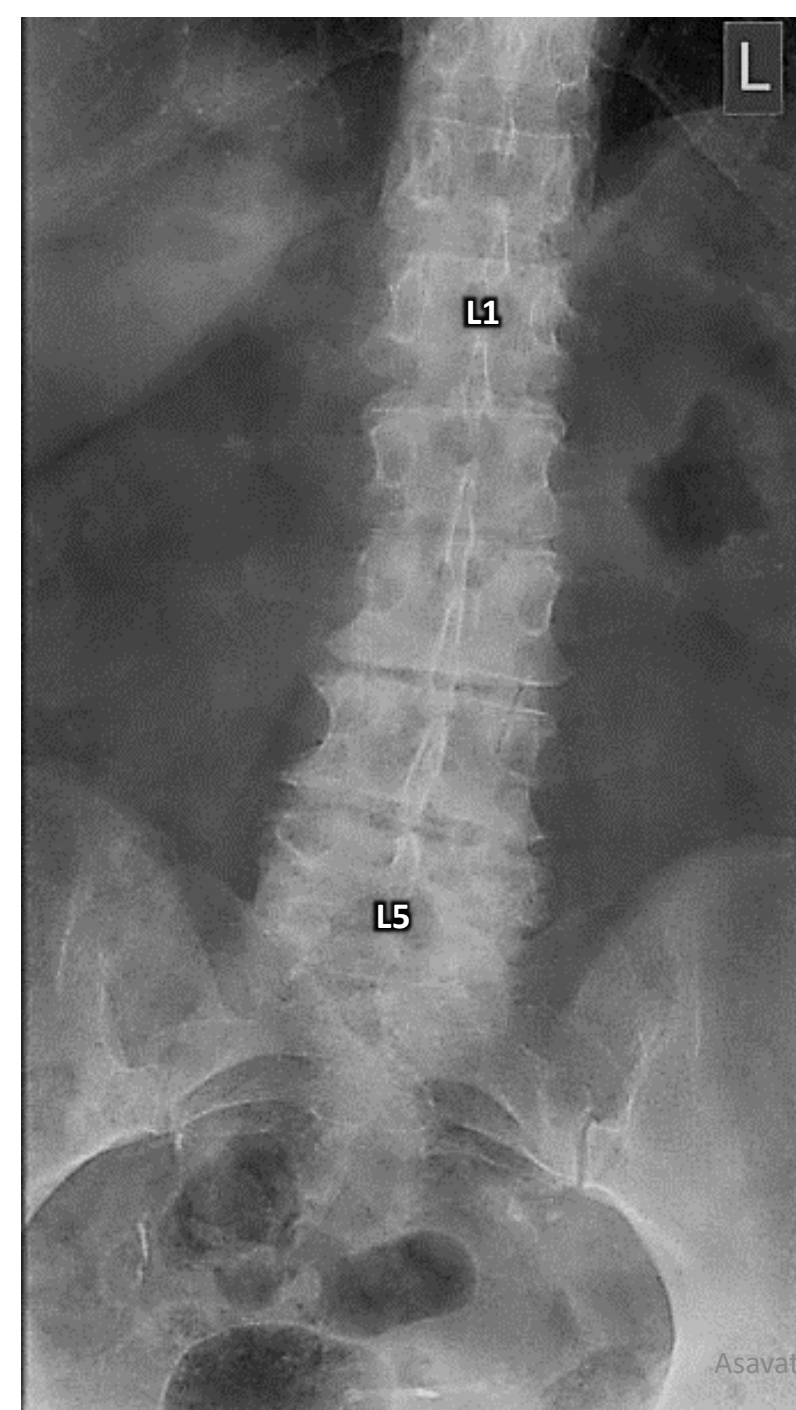


75 years old male

**Fever with severely
progressive low back pain
for 3 months**

**Which is most likely diagnosis
of **severe back pain**?**

- 1. Ankylosing spondylitis**
- 2. Osteoporotic vertebral
compression fracture**
- 3. Infective spondylodiscitis**
- 4. Degenerative disc disease**

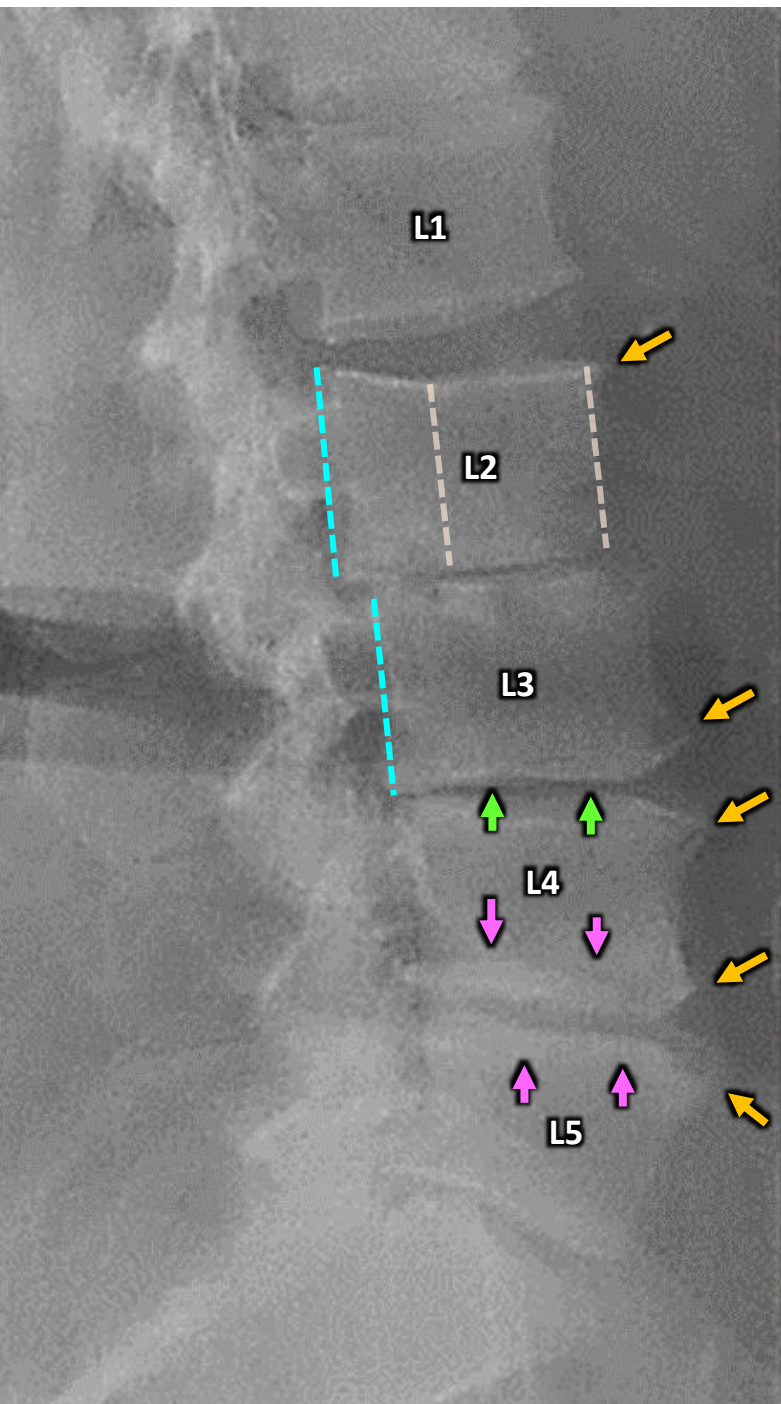


75 years old male

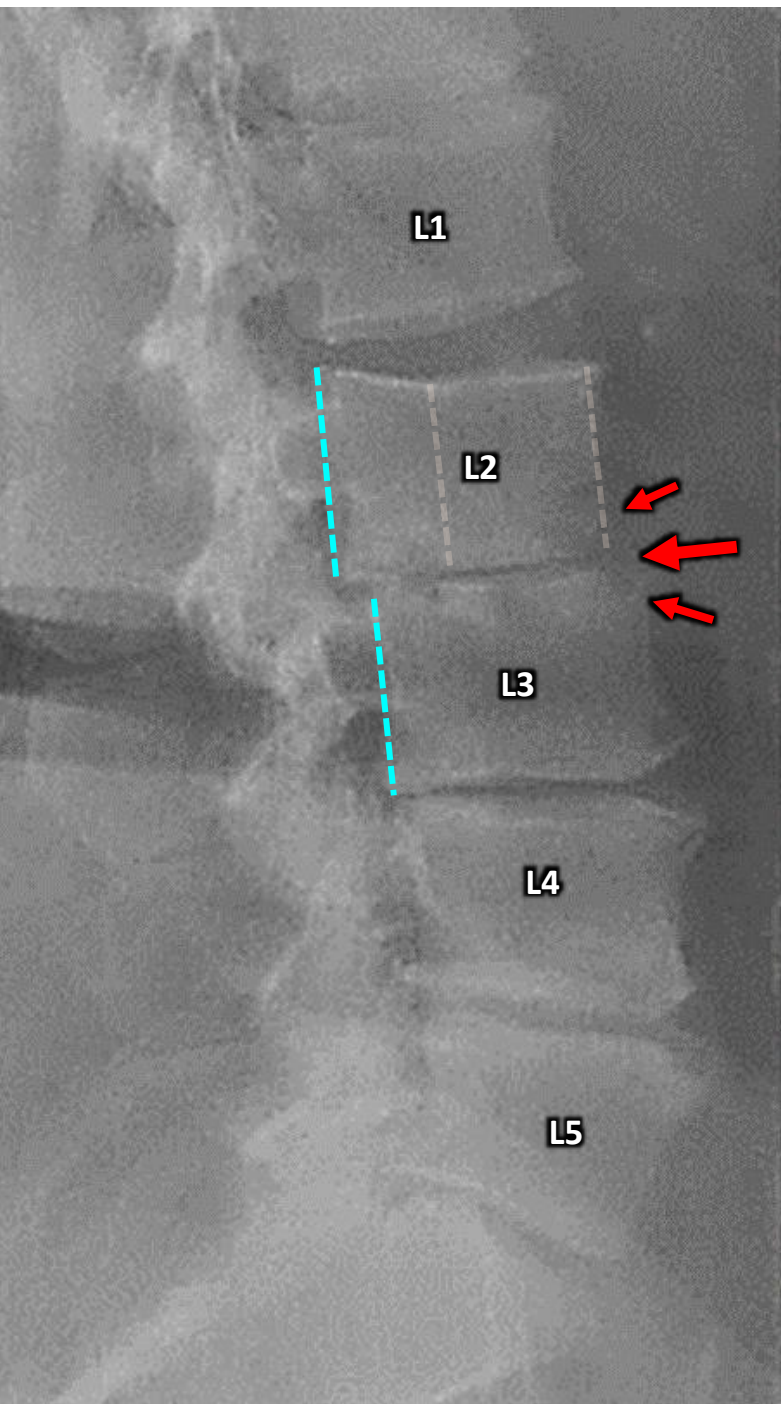
Fever with severely progressive low back pain for 3 months

Which is most likely diagnosis of **severe back pain**?

1. Ankylosing spondylitis
2. Osteoporotic vertebral compression fracture
3. **Infective spondylodiscitis**
4. Degenerative disc disease



- Straightening of lumbar spine curvature
 - Retro-spondyloolisthesis (L2-L3)
- } Mal-alignment
- Generalized osteopenia
 - Anterior compression (wedged) fracture (decreased anterior height) of L2 vertebra
 - Widening disc space of L1-L2
- } Osteoporotic vertebral compression fracture (OVCF) of L2 vertebra
- Decreased disc space of L3-L4 with vacuum phenomenon
 - Sclerosis of vertebral endplates of L4-L5
 - Anterior marginal osteophytes of L2-L5 vertebrae
- } Degenerative spine of L3-L4, L4-L5



- Straightening of lumbar spine curvature
- Retro-spondylolisthesis (L2-L3)
- **Generalized osteopenia**
- **Anterior compression (wedged) fracture (decreased anterior height) of L2 vertebra**
- **Widening disc space of L1-L2**
- **Decreased disc space of L3-L4 with vacuum phenomenon**
- **Sclerosis of vertebral endplates of L4-L5**
- **Anterior marginal osteophytes of L2-L5 vertebrae**
- **Uniform narrowing of disc space with osteolysis of opposing endplates of L2-L3**
- **Blurring (erosions) of anterior cortical outlines of L2 and L3 vertebrae**

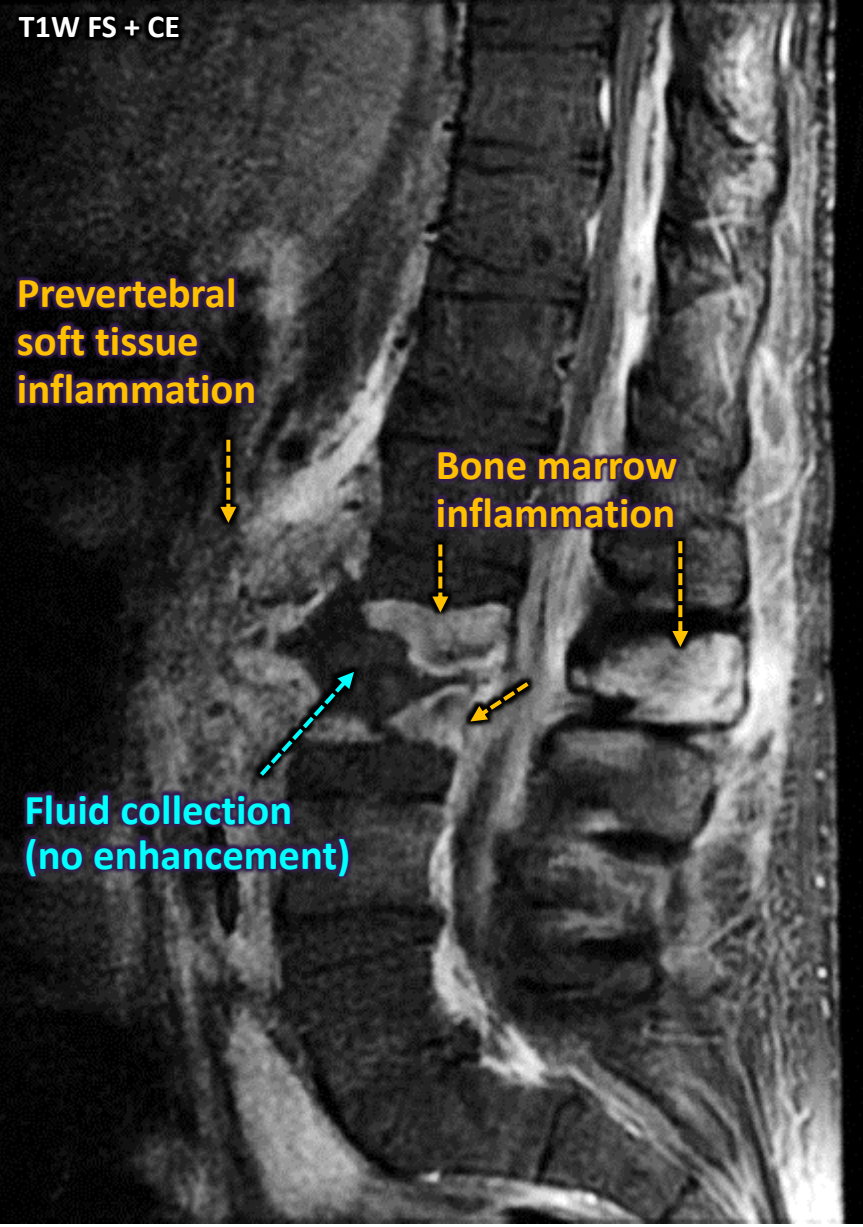
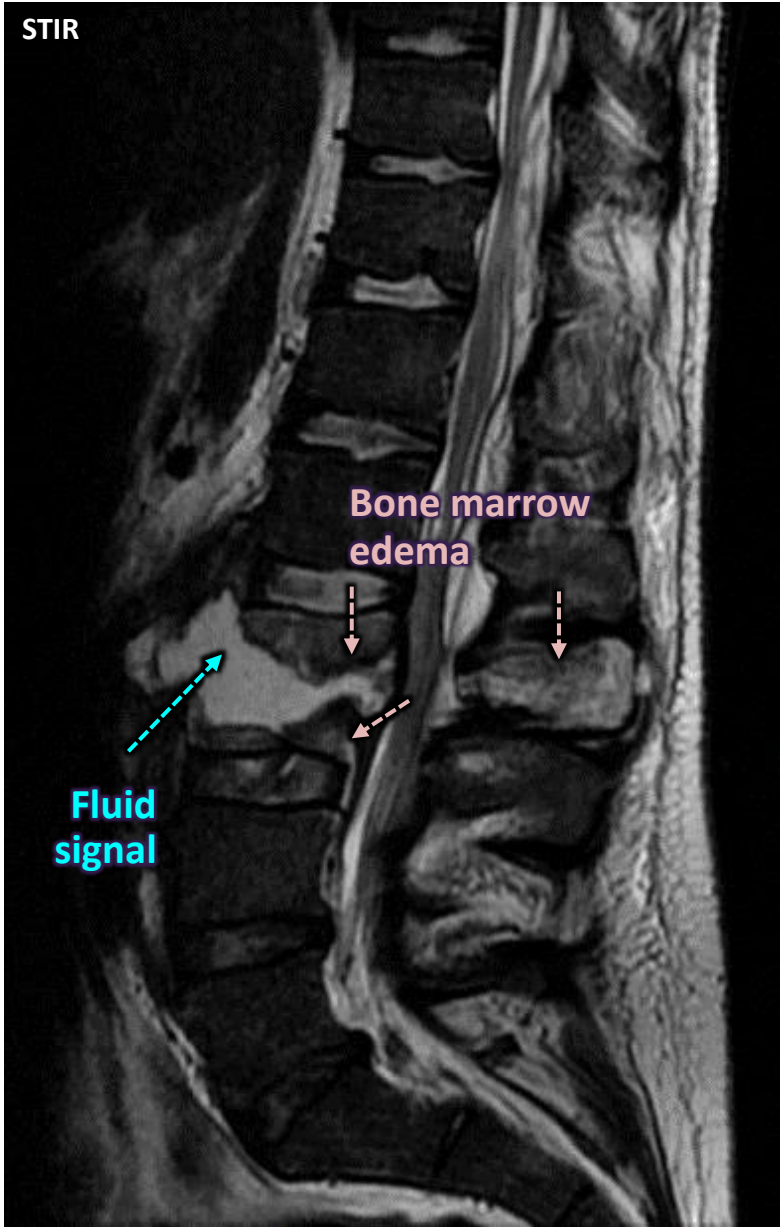
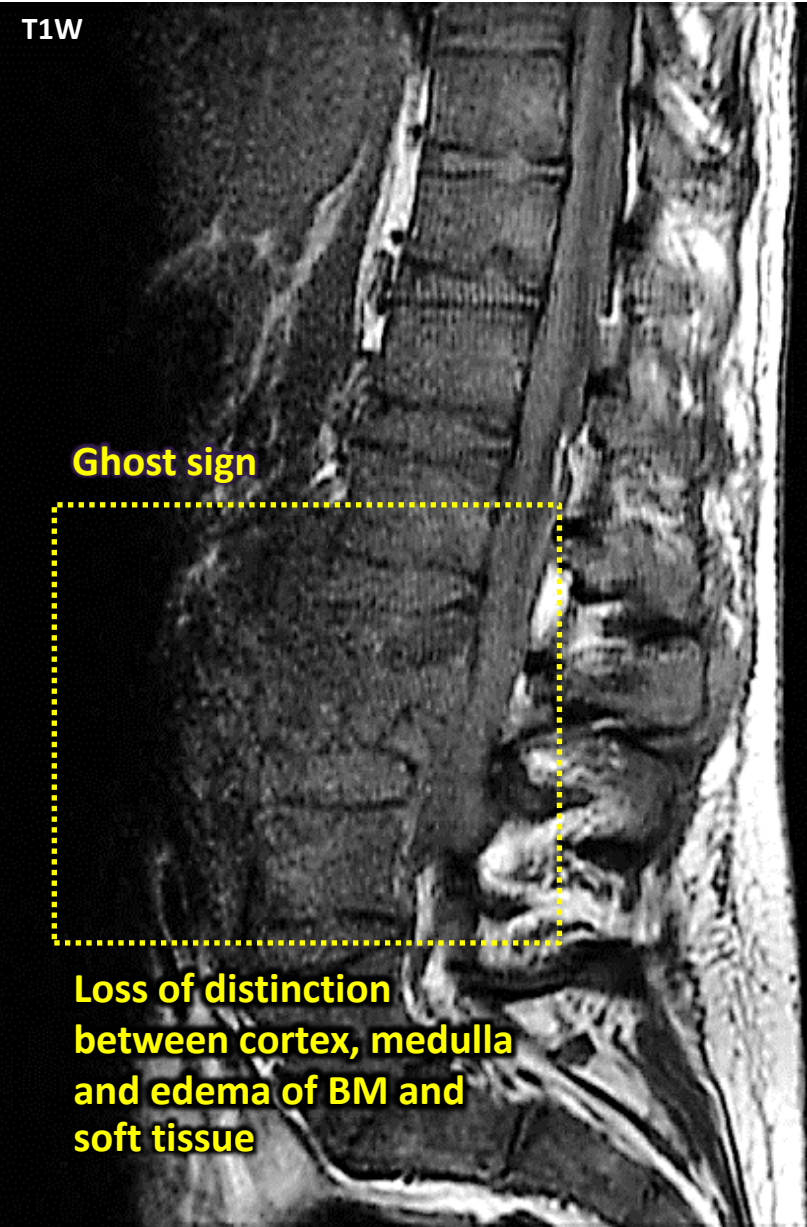
Mal-alignment

Osteoporotic vertebral compression fracture (OVCF) of L2 vertebra

Degenerative spine of L3-L4, L4-L5

Infective spondylodiscitis of L2-L3

Infective spondylodiscitis



Quiz 6

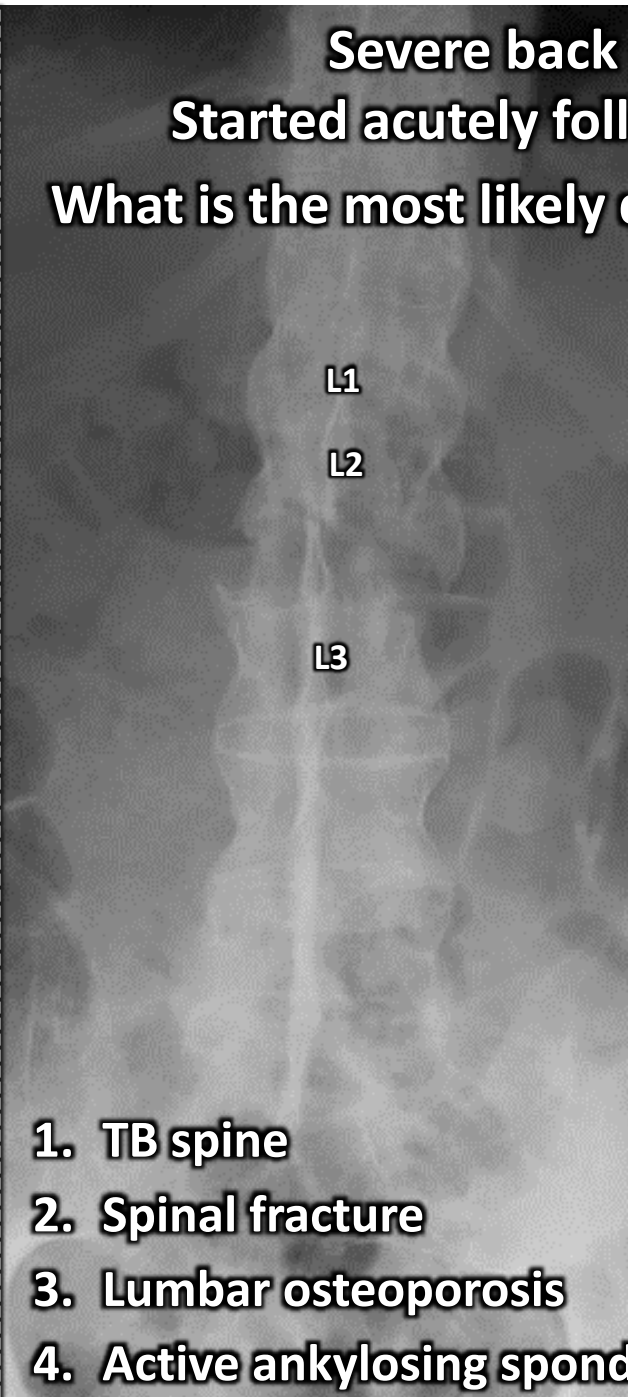




61 years old male
Ankylosing spondylitis 20 years

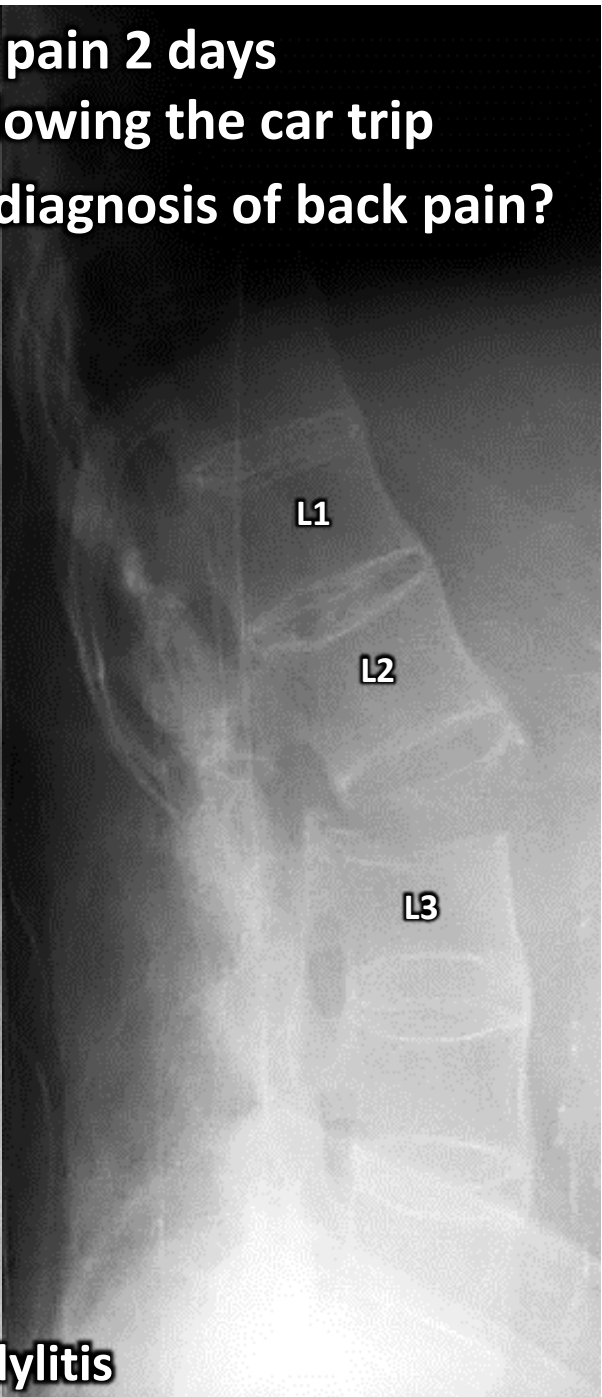


Asavatanabodee P



Severe back pain 2 days
Started acutely following the car trip
What is the most likely diagnosis of back pain?

- 1. TB spine**
- 2. Spinal fracture**
- 3. Lumbar osteoporosis**
- 4. Active ankylosing spondylitis**





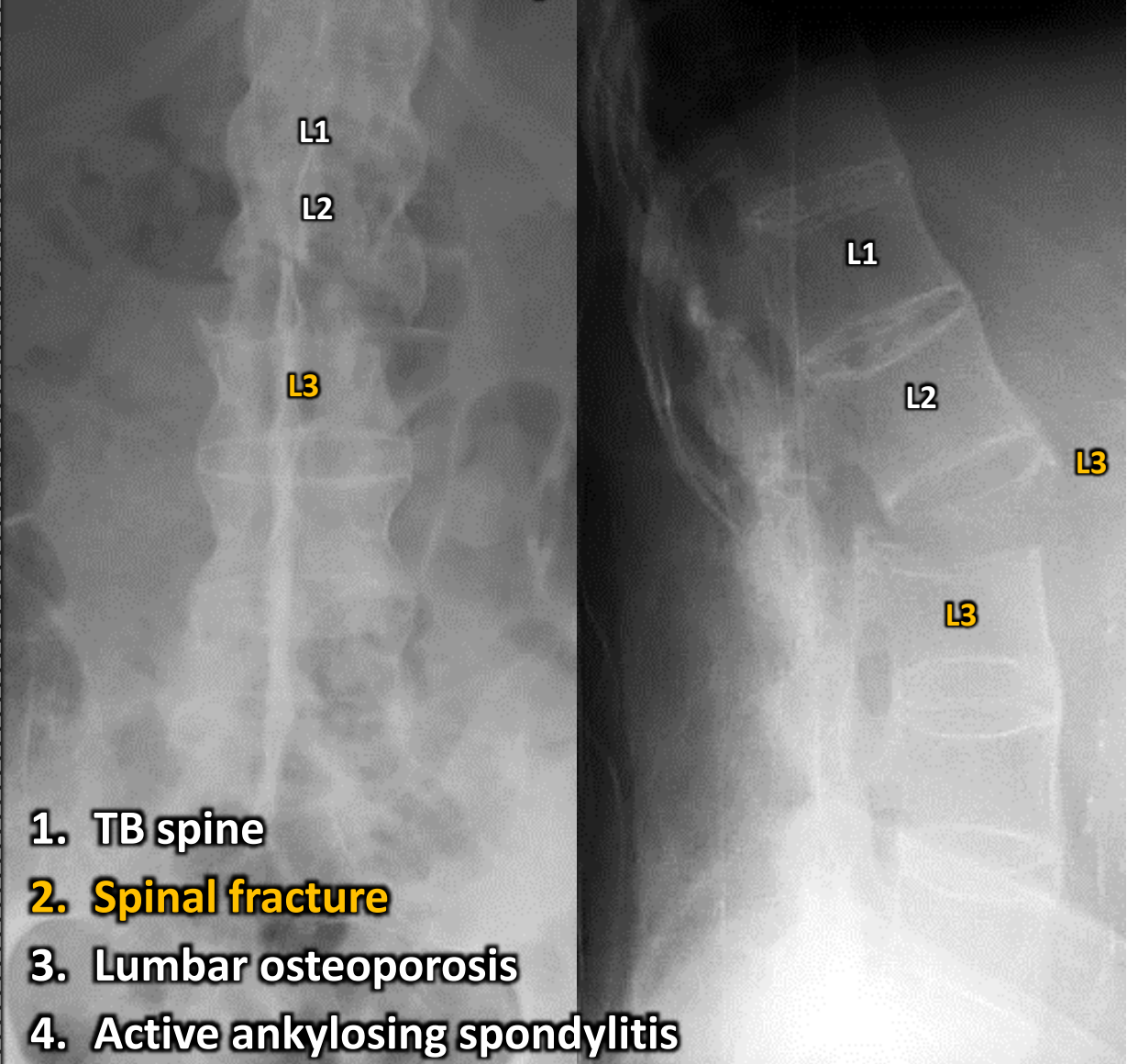
Ankylosing spondylitis

- 1. Dagger sign
- 2. Trolley track sign
- 3. Bamboo spine
- 4. Bilateral SI joint fusion

61 years old male
Ankylosing spondylitis 20 years

Asavatanabodee P

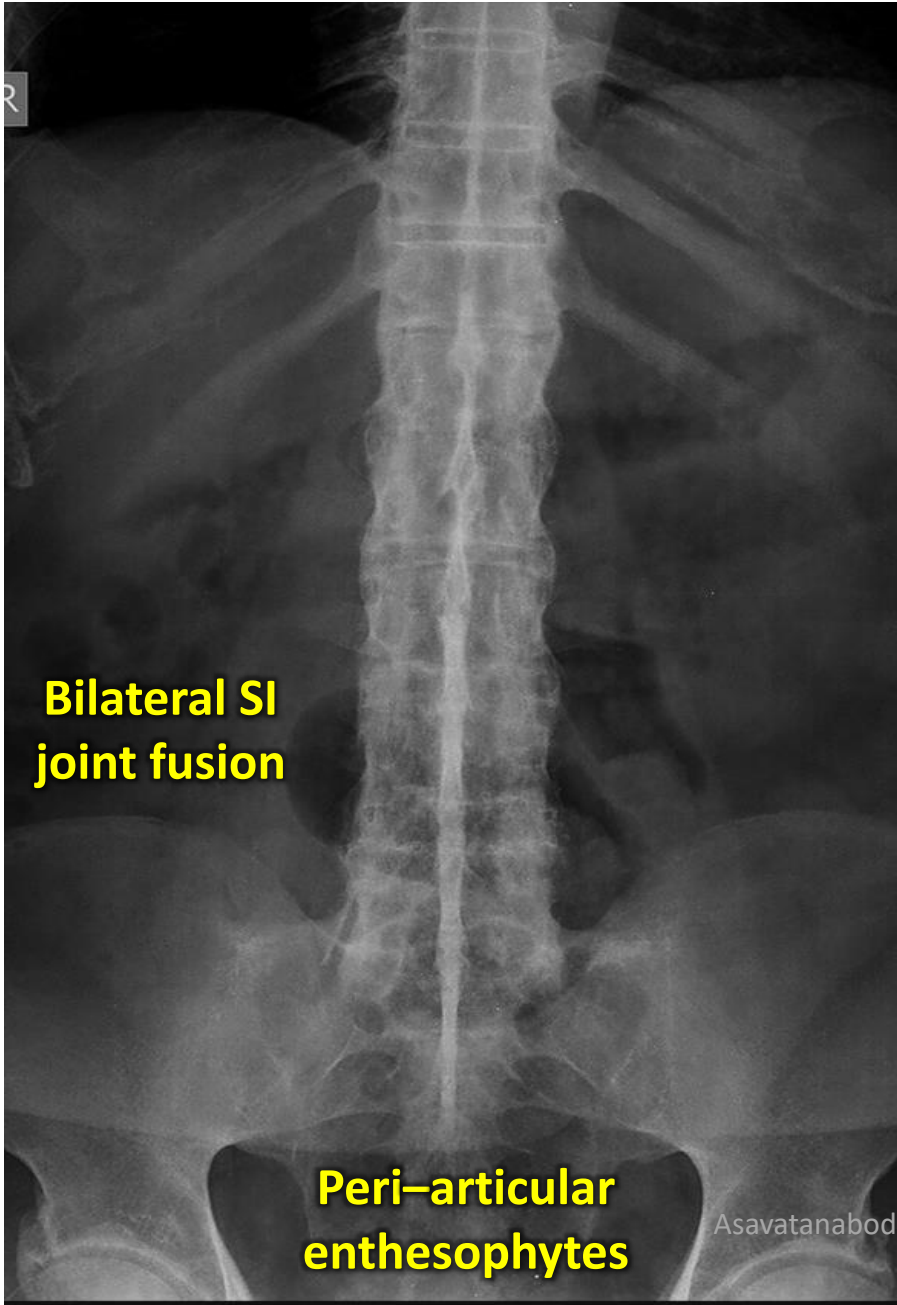
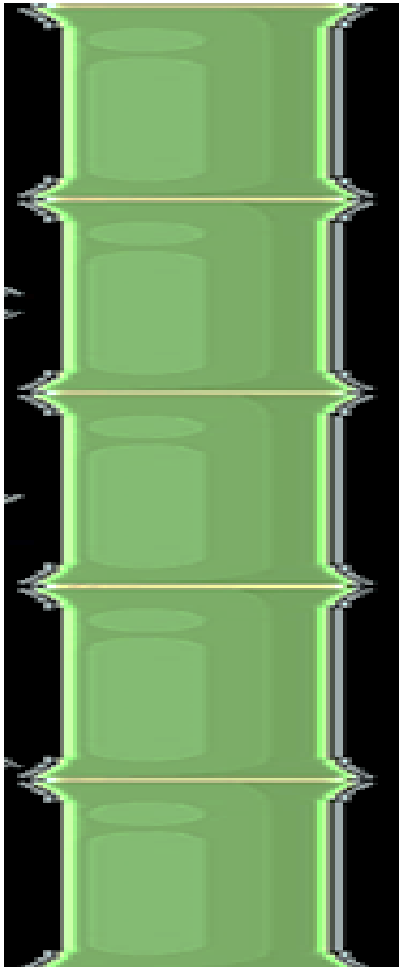
Severe back pain 2 days
Started acutely following the car trip
What is the most likely diagnosis of back pain?



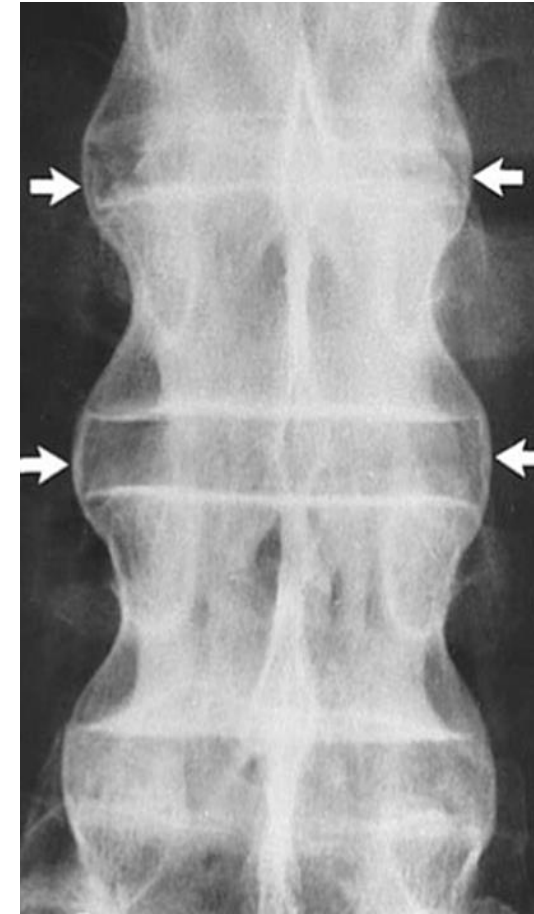
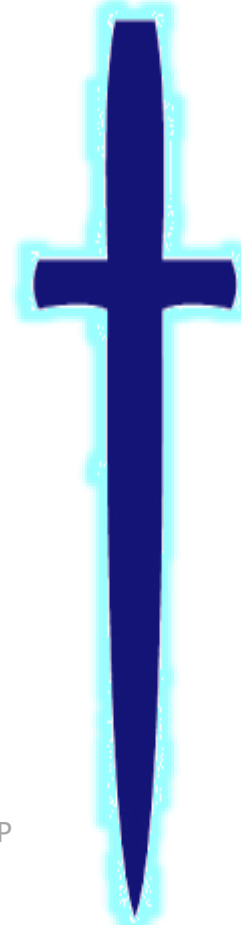
- 1. TB spine
- 2. **Spinal fracture**
- 3. Lumbar osteoporosis
- 4. Active ankylosing spondylitis

Ankylosing Spondylitis (AS)

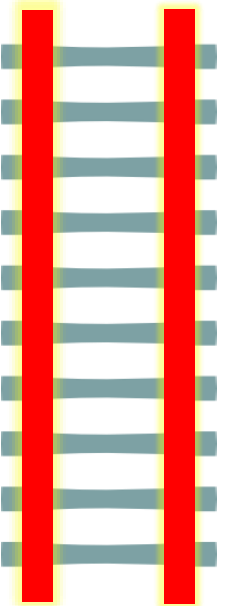
Calcification of outer fibers (Sharpey's fiber) of annulus fibrosus



Calcification of supraspinous ligaments and interspinous membranes



Sclerosis and fusion of facet joints



Bamboo spine

Dagger sign

Trolley track sign

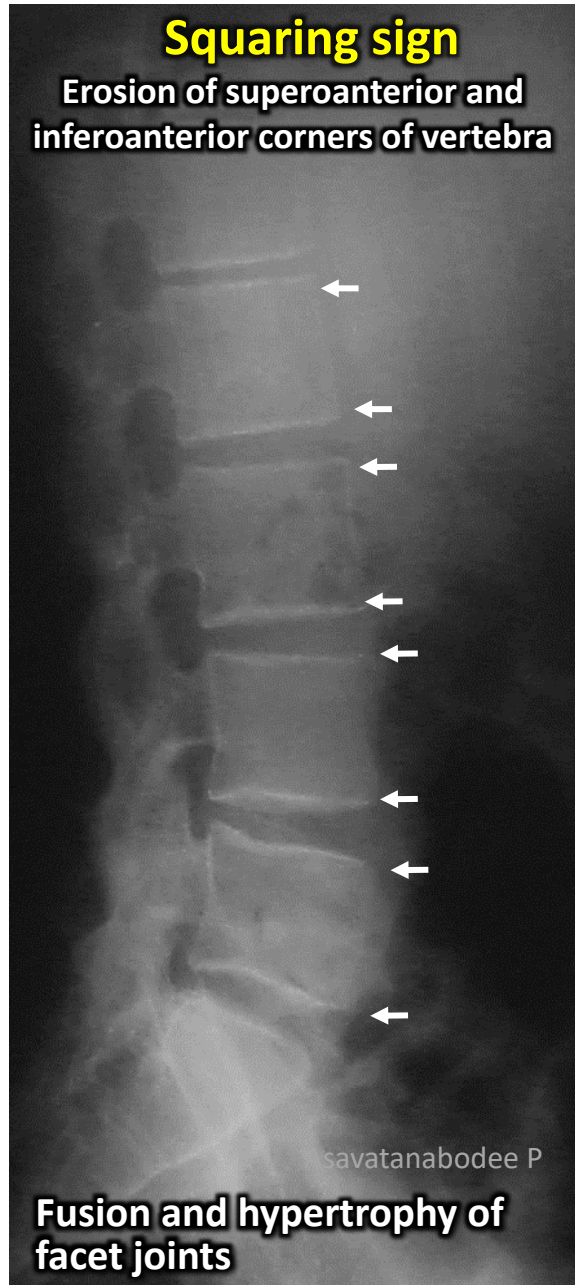
Ankylosing Spondylitis (AS)

Normal



Squaring sign

Erosion of superoanterior and inferoanterior corners of vertebra



Normal

Osteitis

Corner erosion

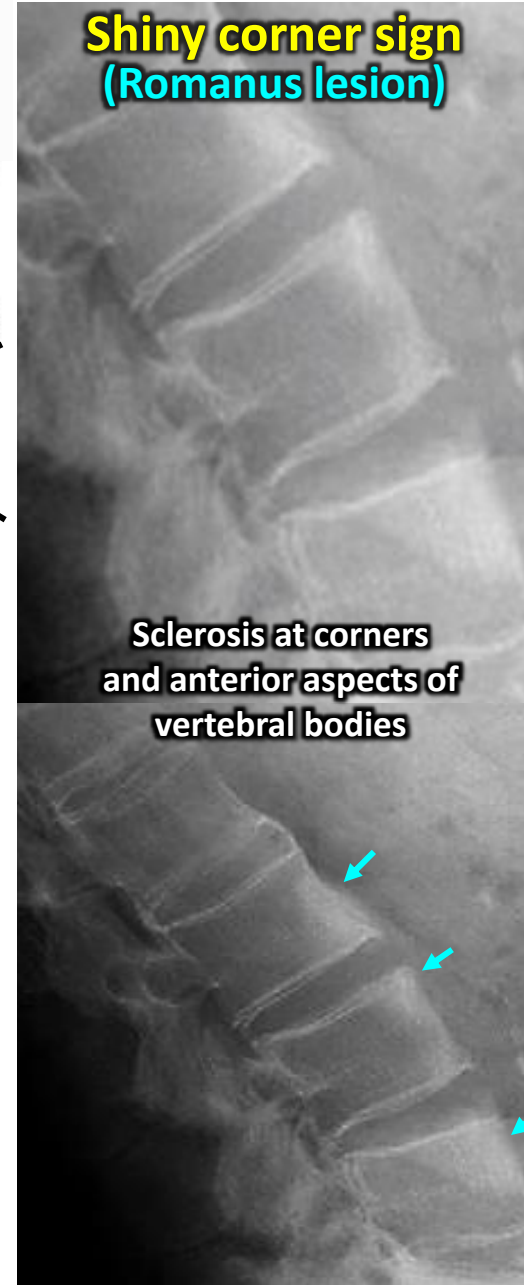
Corner sclerosis

Romanus lesion

New bone

pro-liferation

Shiny corner sign (Romanus lesion)



Sclerosis at corners and anterior aspects of vertebral bodies

Bamboo spine



Symmetrical thin marginal intervertebral bridging calcifications⁴⁵
(thin syndesmophytes)

savatanabodee P

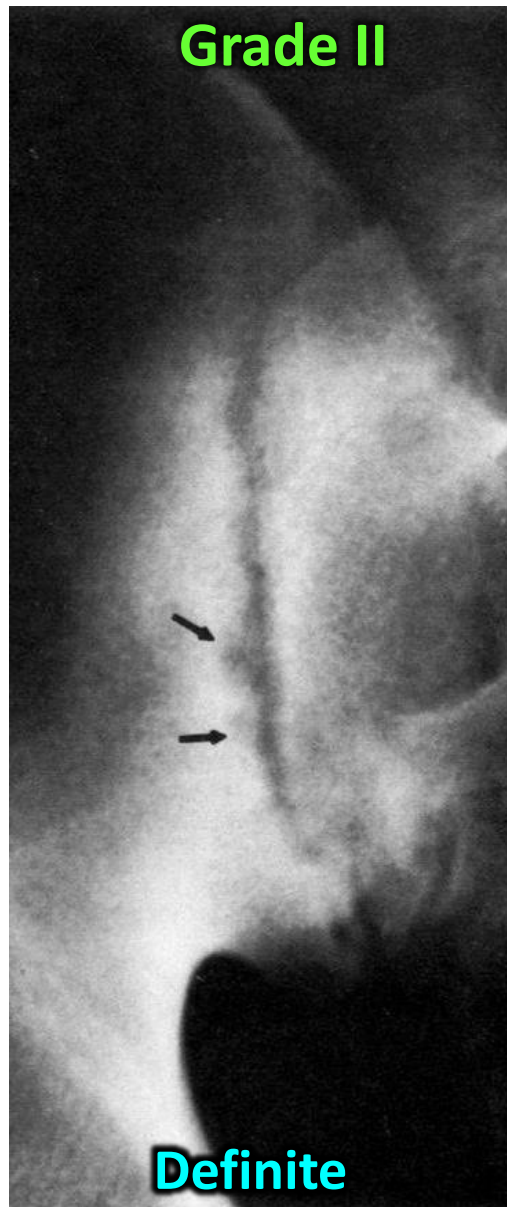
Staging of sacroiliitis in spondyloarthropathies

Ferguson view

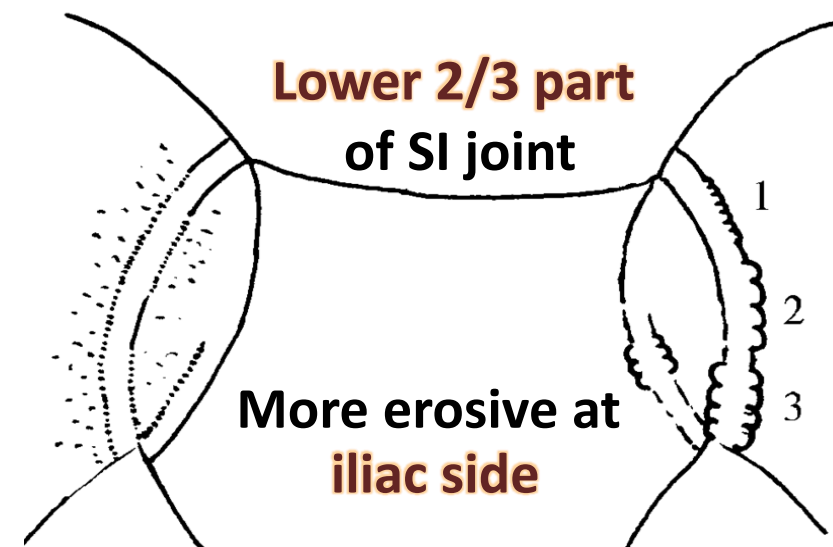
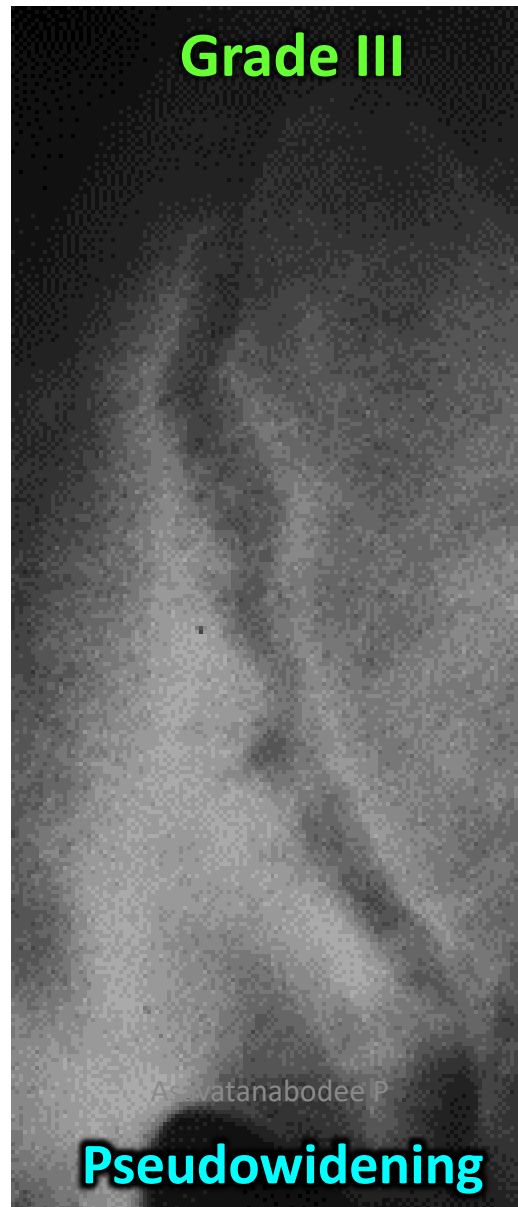
Grade I



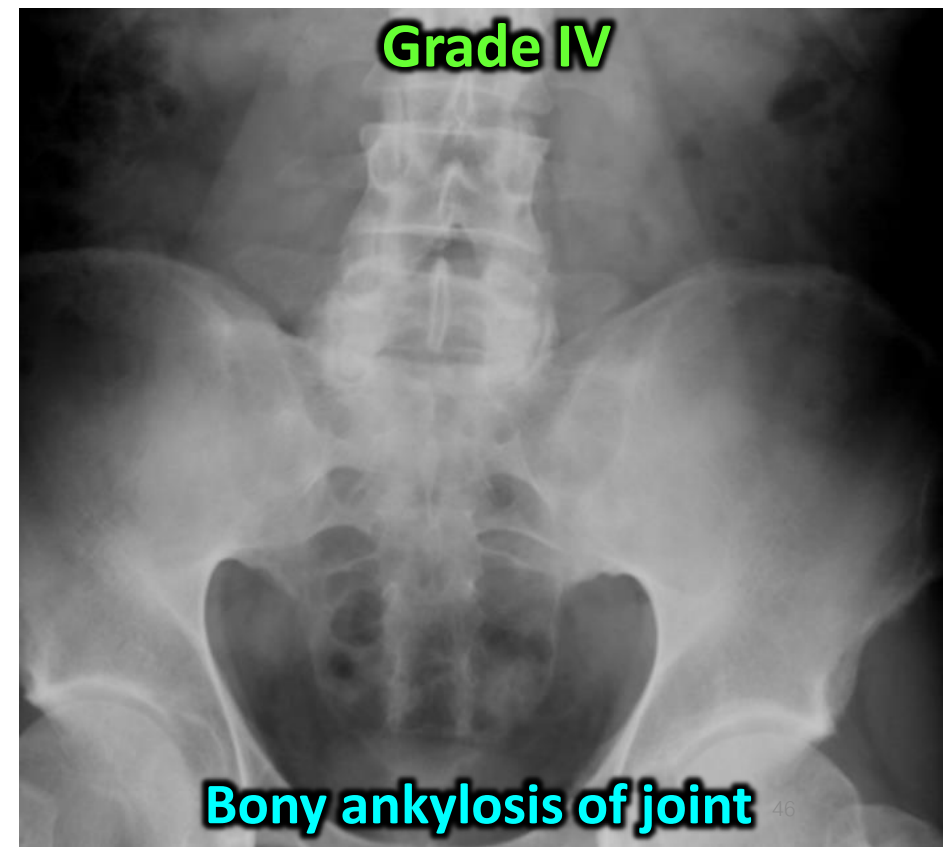
Grade II

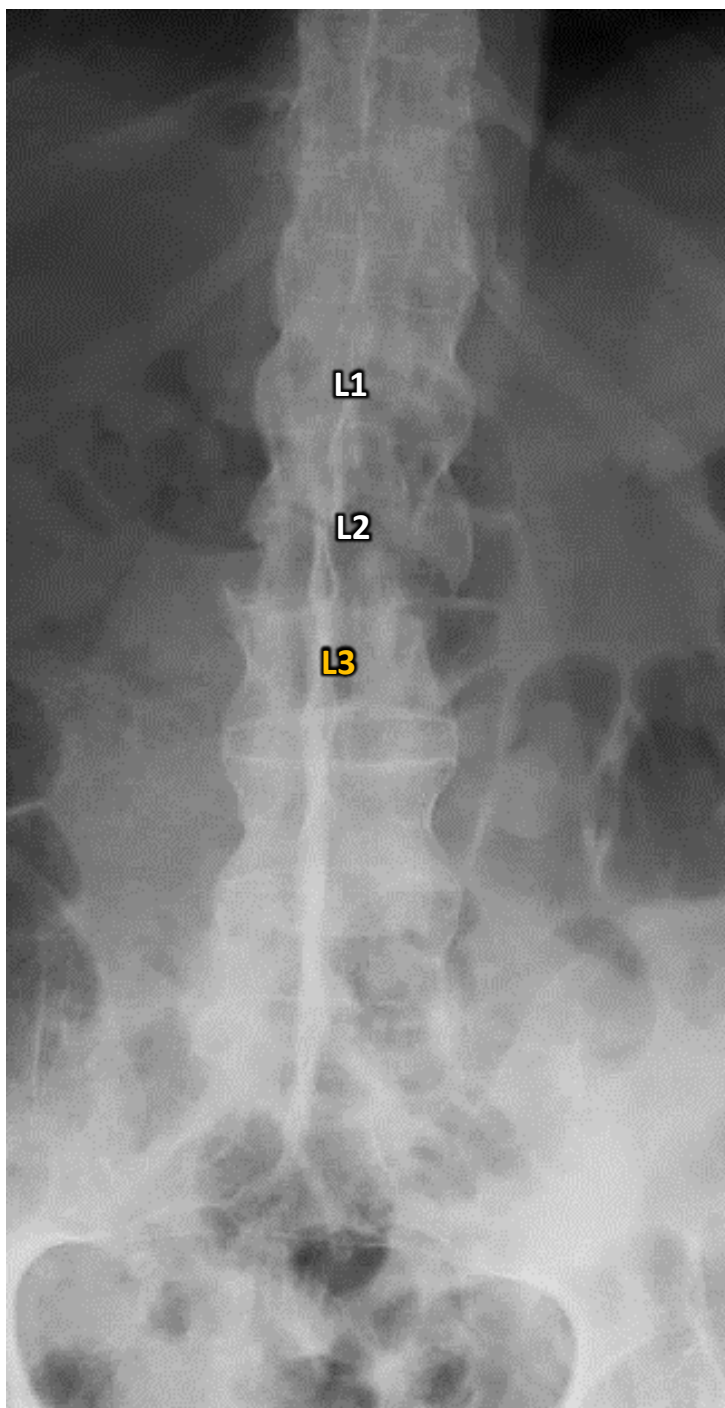


Grade III



Grade IV



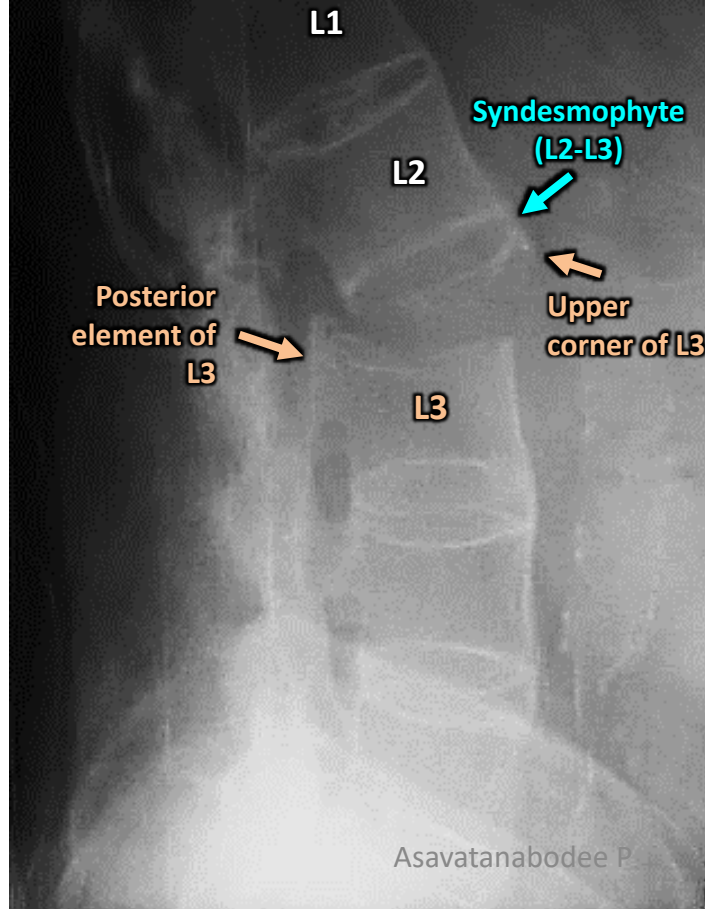


Broken carrot stick



Spinal fracture

Broken chalk stick



61 years old male

Ankylosing spondylitis 20 years

Severe back pain 2 days following the car trip

Loss of lumbar lordosis

Bamboo spine

Generalized osteopenia

Intra-vertebral fracture across the upper vertebral endplate of L3 with displacement (**"chalk stick"** or **"carrot stick"** spinal fracture) → **pseudarthrosis**

Quiz 7





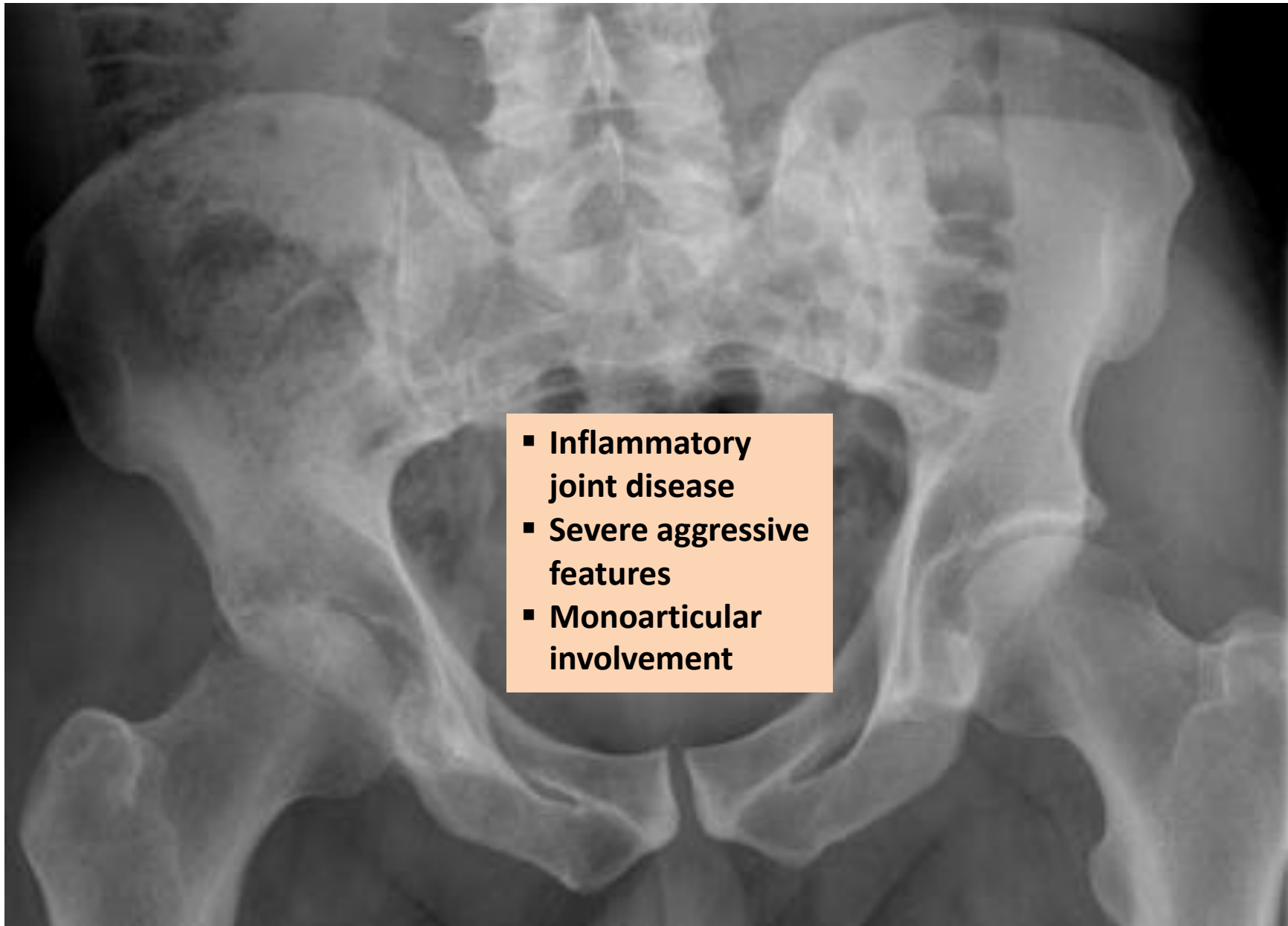
45 years old male

IV drug abuse

**Fever with severe
right hip pain for 2 weeks**

**Which is most likely
diagnosis?**

- 1. Septic joint**
- 2. Ankylosing spondylitis**
- 3. Avascular necrosis of
femoral head**
- 4. Osteoarthritis of hip joint**



- Inflammatory joint disease
- Severe aggressive features
- Monoarticular involvement

45 years old male

IV drug abuse

Fever with severe right hip pain for 2 weeks

Which is most likely diagnosis?

1. **Septic joint**
2. Ankylosing spondylitis
3. Avascular necrosis of femoral head
4. Osteoarthritis of hip joint

Aggressive intra-synovial inflammatory joint destruction

Septic arthritis of right hip joint

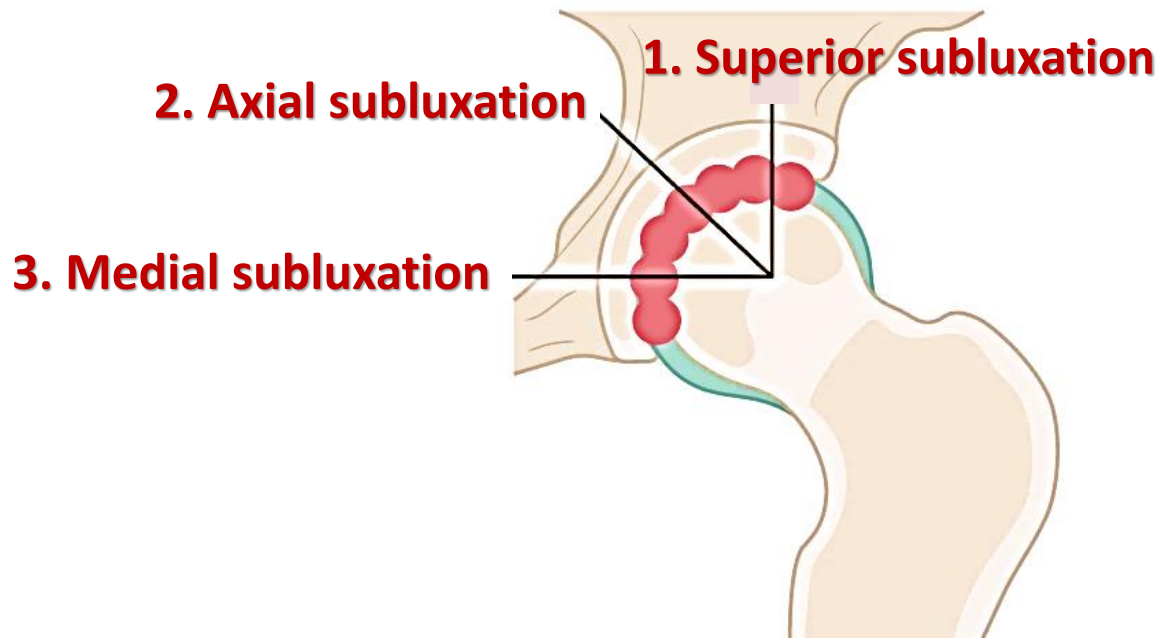
Marked juxta-articular
osteopenia

Uniform (concentric)
narrowing of joint
space

Ill-defined erosions at
marginal and opposing
subchondral bones

Flattening of superficial
femoral head (mild
femoral head collapse)





1. Superior subluxation

- **Primary osteoarthritis (common)**
- **Avascular necrosis (femoral head collapse and secondary OA changes)**

2. Axial subluxation

Chronic arthritides:

- **Septic arthritis**
- **Rheumatoid arthritis**
- **Spondyloarthritis (AS, PsA)**
- **Chronic CPP arthropathy**
- **Osteoarthritis (less common)**

Axial

Superior

Medial

Asavatana Poojee P

3. Medial subluxation

- **Acetabular dysplasia → premature osteoarthritis**
- **Primary osteoarthritis (less common)**

Superior

Medial

Axial

49 years old male

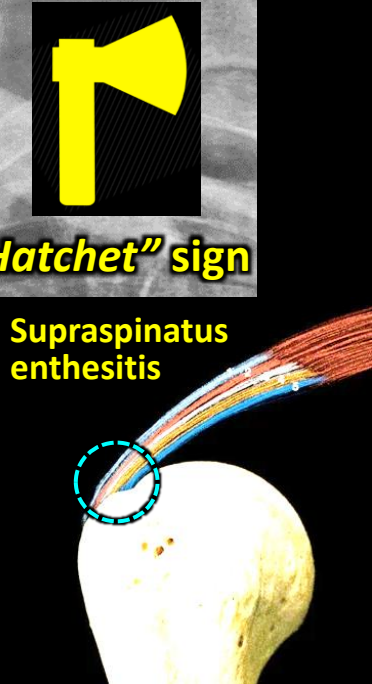
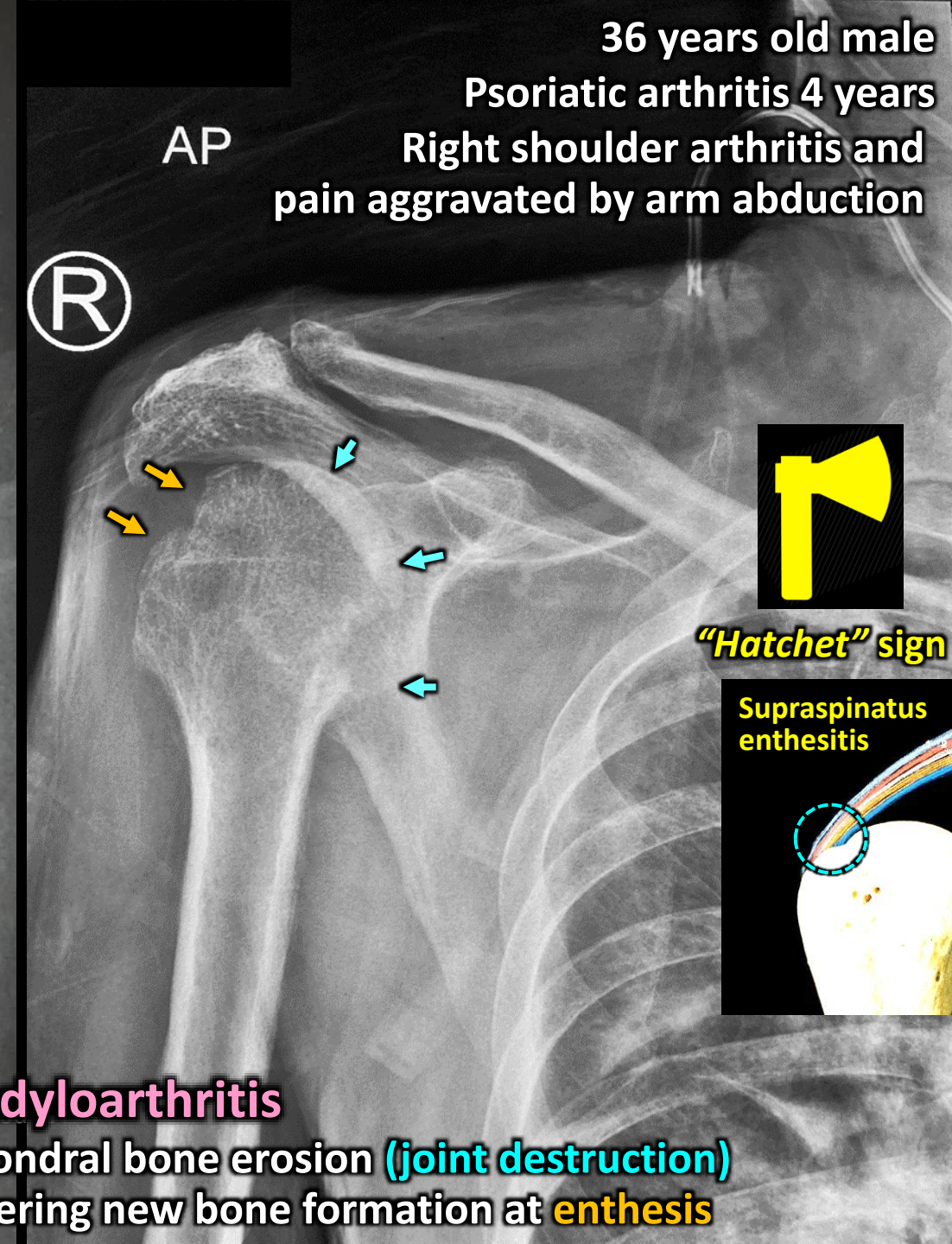
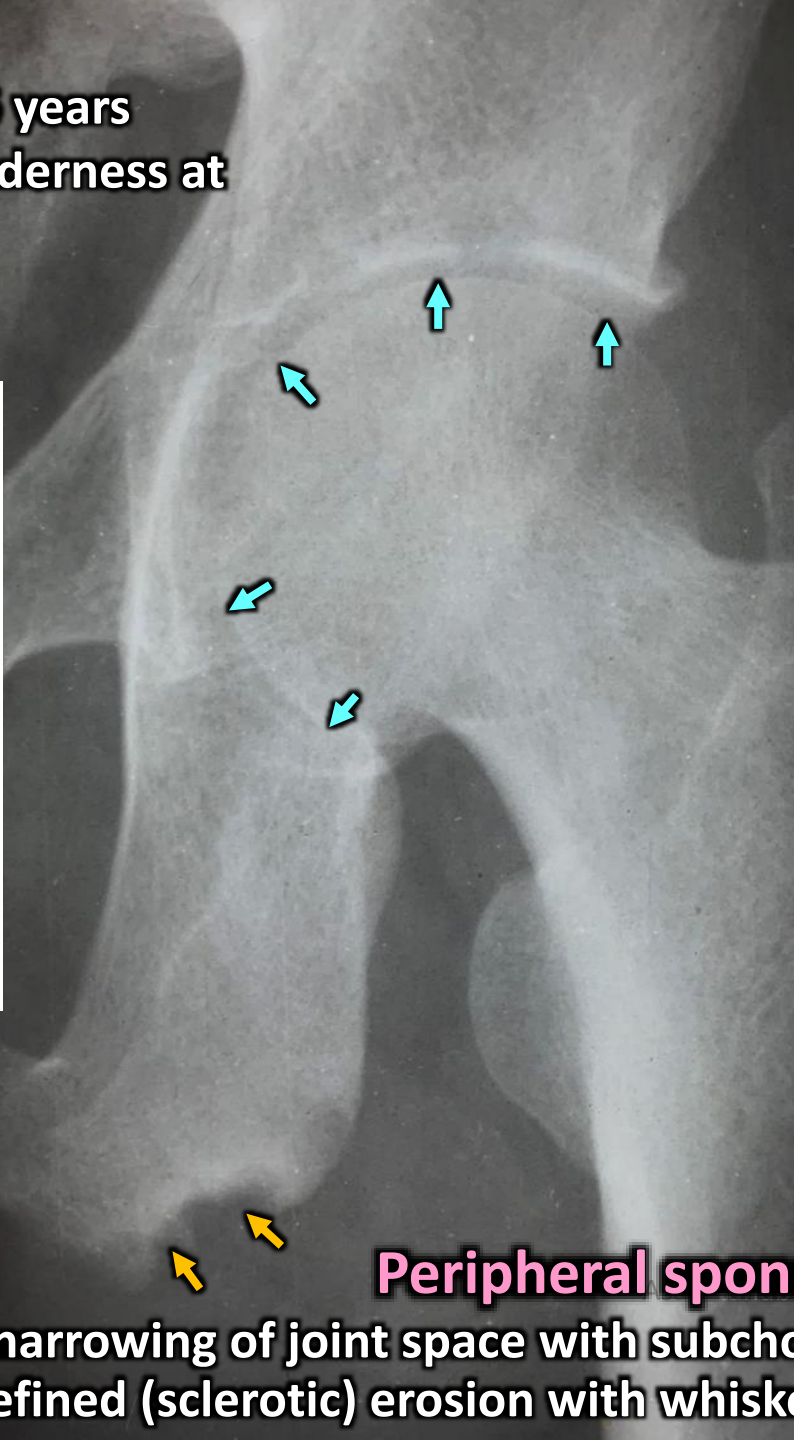
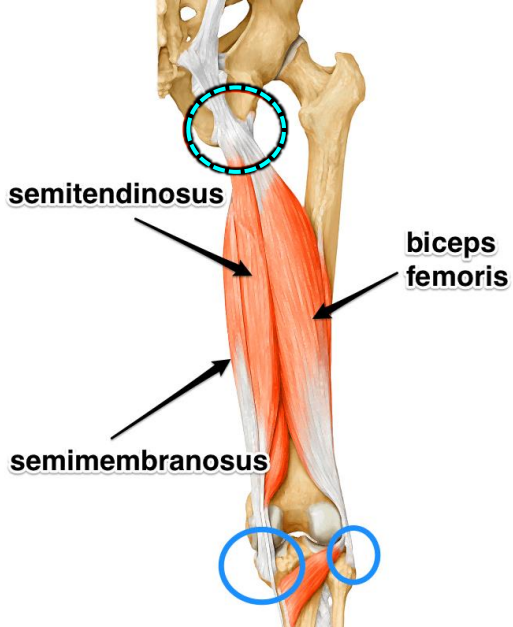
Psoriatic arthritis 6 years

Lt hip pain and tenderness at the sitting bones

36 years old male

Psoriatic arthritis 4 years

Right shoulder arthritis and pain aggravated by arm abduction



Peripheral spondyloarthritis

Diffuse narrowing of joint space with subchondral bone erosion (**joint destruction**)

Well-defined (sclerotic) erosion with whiskering new bone formation at **enthesis**

Basic femoral head migration (subluxation of hip joint)

Superolateral subluxation

Osteophytes

Avascular necrosis of femoral head with secondary OA changes

Superior subluxation

Primary osteoarthritis of hip joint (**common**) with superolateral subluxation

Medial subluxation

Cam

Buttressing osseous hypertrophy

Primary osteoarthritis of hip joint (**less common**) with medial subluxation

Axial subluxation

Rheumatoid arthritis with axial subluxation (protrusio acetabuli)

Ischemic necrosis

Osteophyte

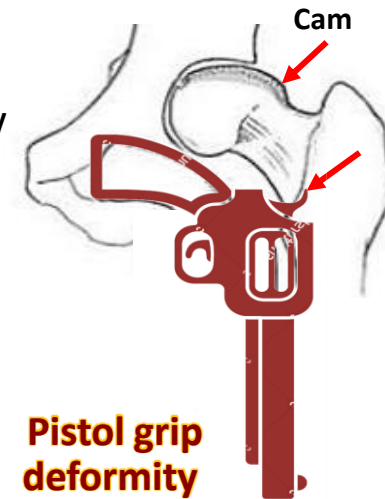
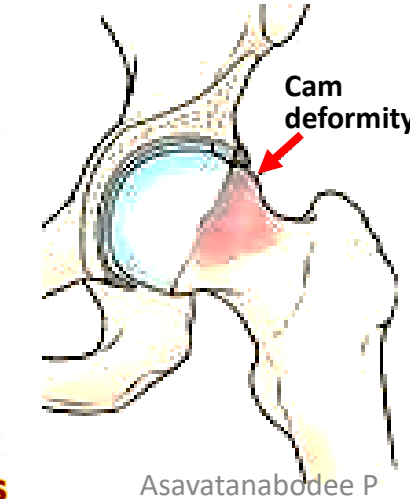
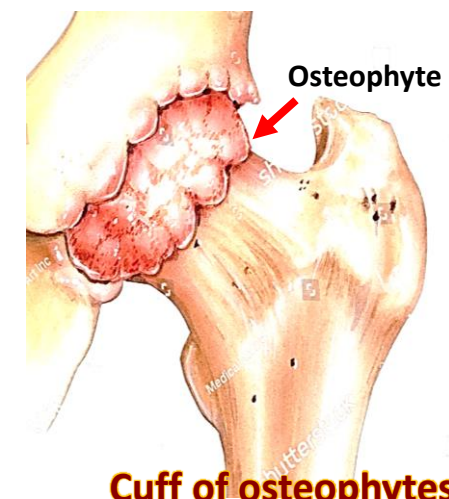
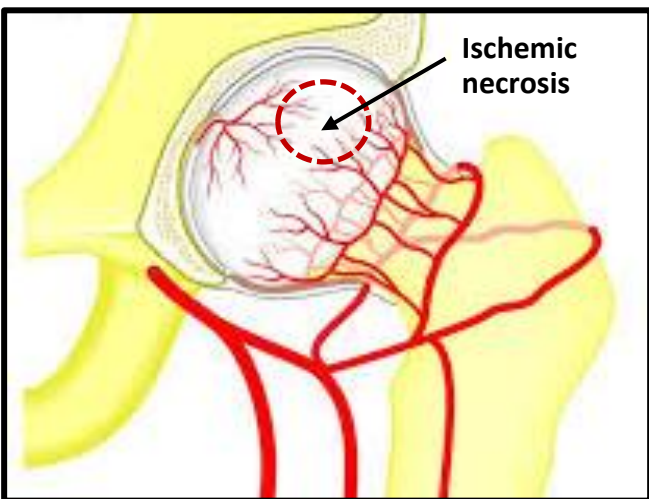
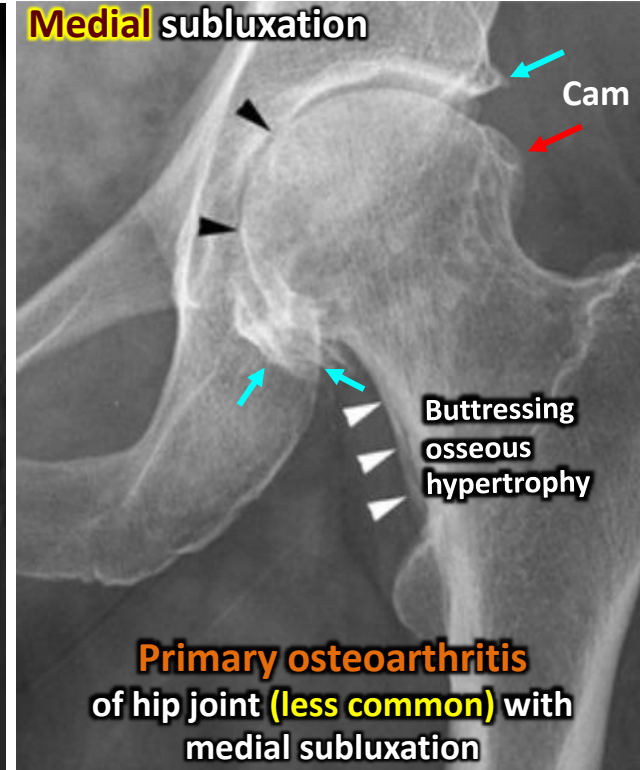
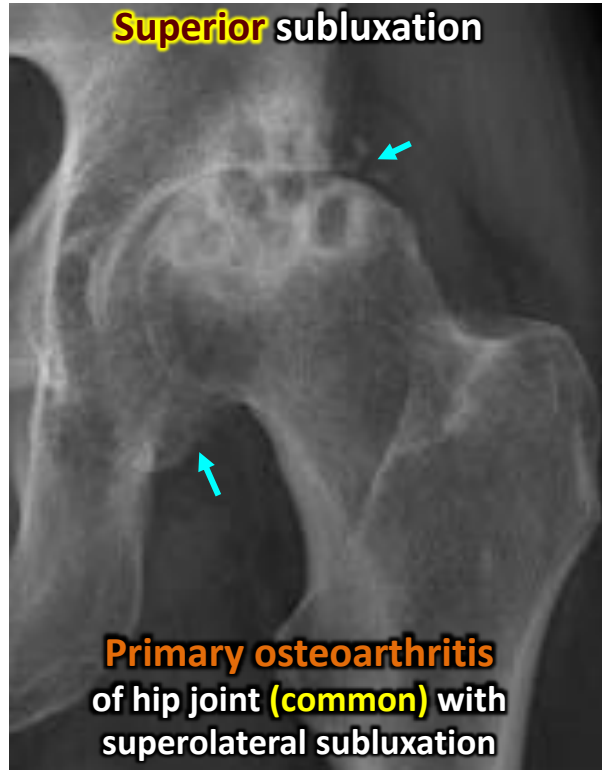
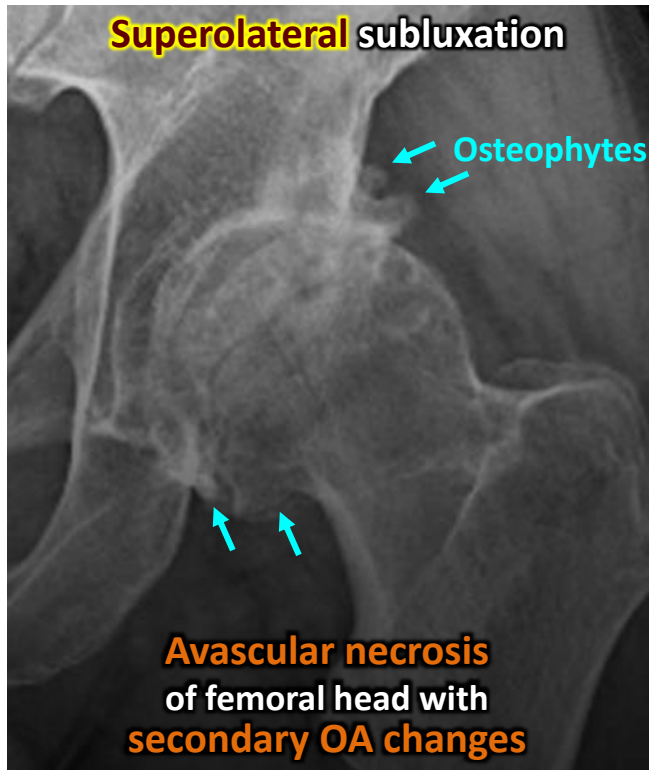
Cuff of osteophytes

Cam deformity

Asavatanabodee P

Pistol grip deformity

Cam



Quiz 8



**Female 52 years old:
Both knee pains
and unintentional
weight loss
for 3 months**

R



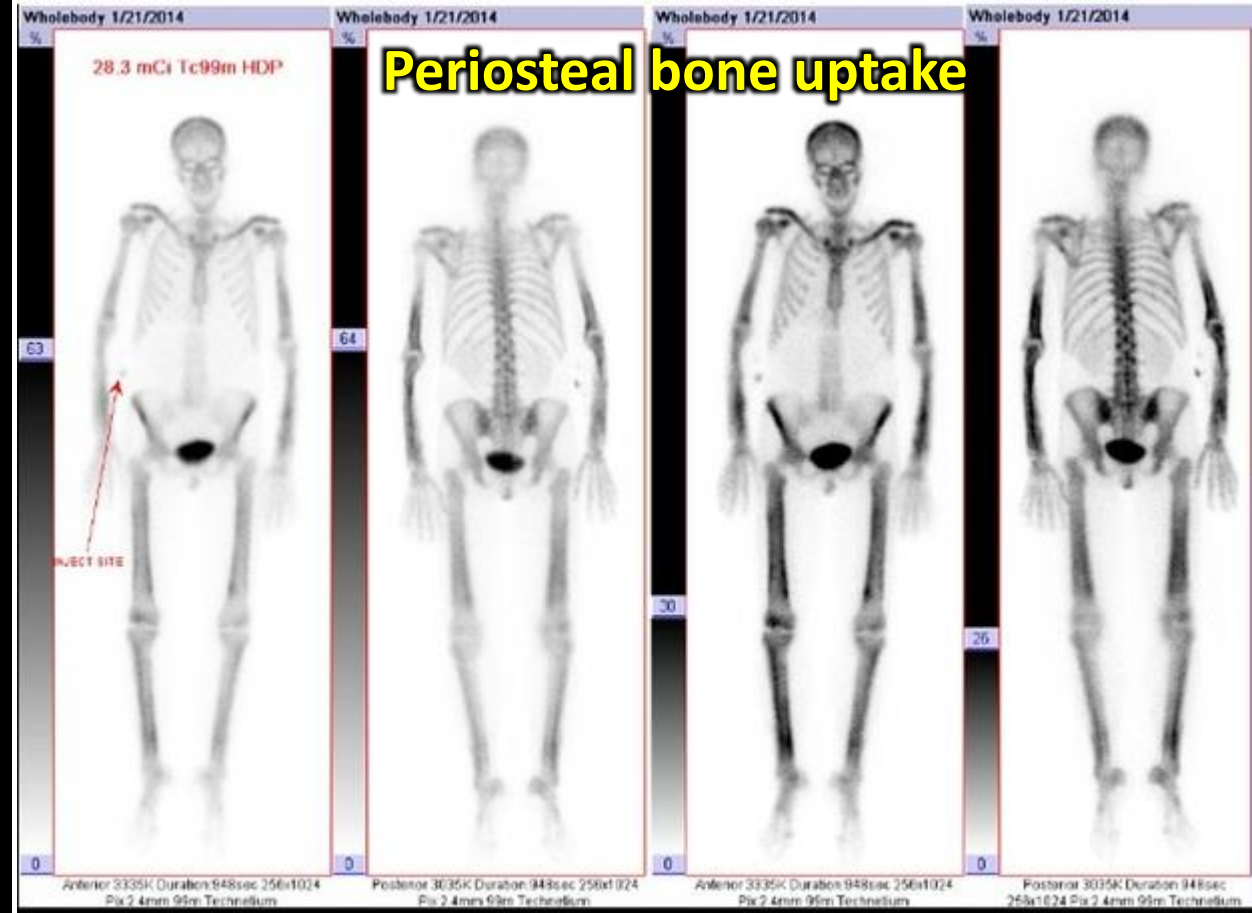
What is the most likely diagnosis?

- 1. Bone metastasis**
- 2. Multiple myeloma**
- 3. Hyperparathyroidism**
- 4. Hypertrophic osteoarthropathy**

Female 52 years old:
Both knee pains
and unintentional
weight loss
for 3 months

- Periosteal (extra-articular) bone involvement
- Benign feature
- Diffuse pattern

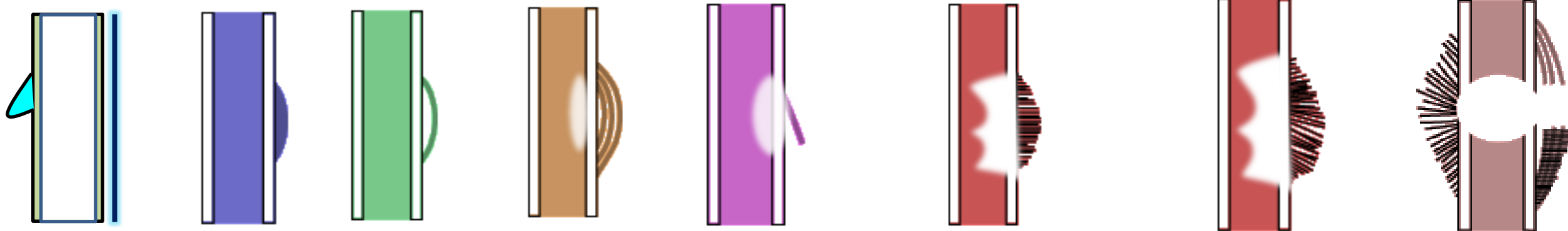
Thick and wavy solid (benign) periosteal new bone formation



What is the most likely diagnosis?

1. Bone metastasis
2. Multiple myeloma
3. Hyperparathyroidism
4. **Hypertrophic osteoarthropathy**

Periosteal bone reaction



Cuneiform
(buttress)
and linear

Solid

Single
lamellated

Multiple
lamellated
(onion-skin)

Codman's
triangle

Parallel spiculated
(sunray or "hair-on-end")

Diverging spiculated
(sunburst)

Complex
pattern

Continuous pattern without bone involvement

Solid (benign) periosteal reaction

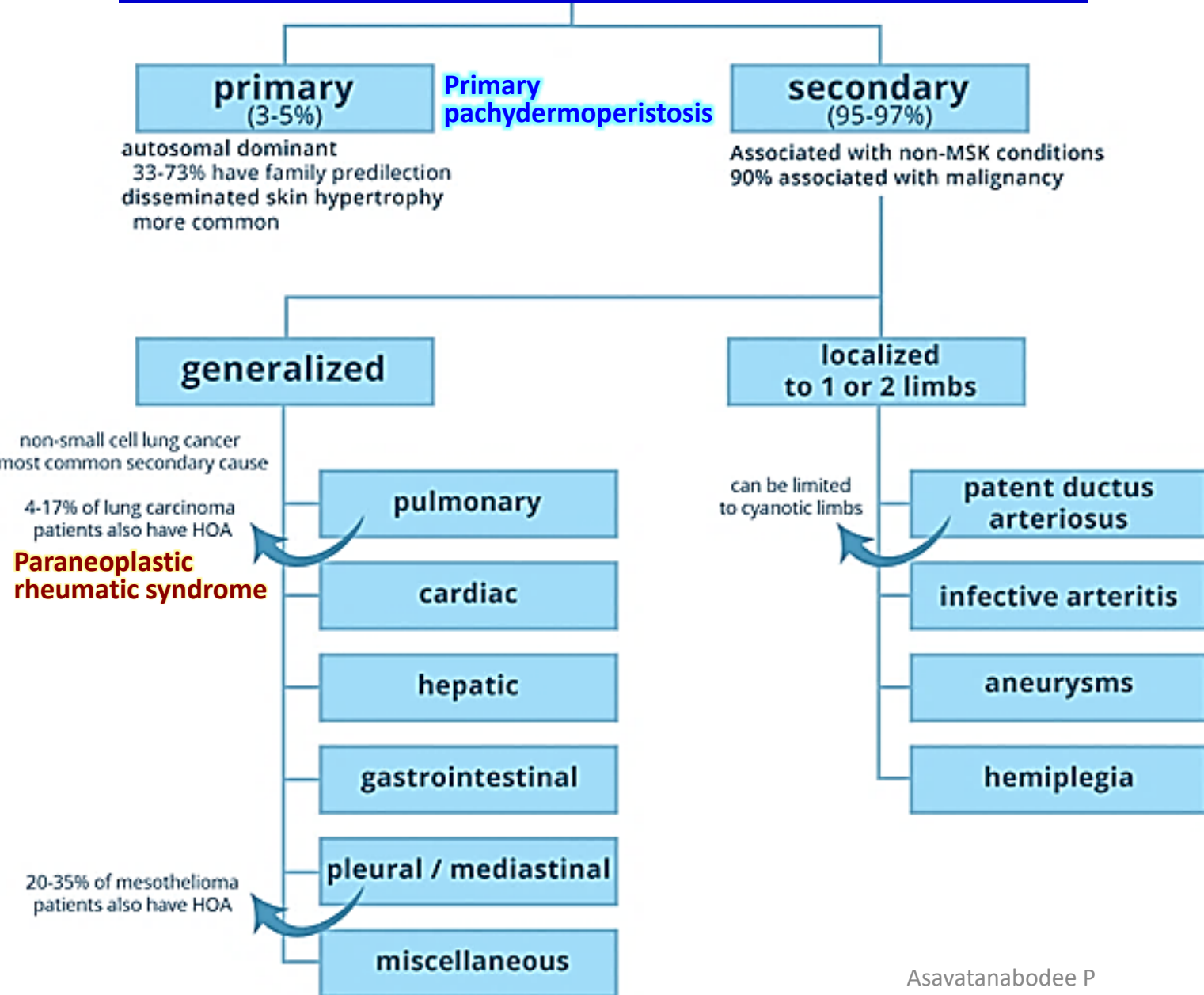
- * Infection
- * Benign neoplasms (osteoid osteoma)
- * Eosinophilic granuloma
- * **Hypertrophic osteoarthropathy (HOA)**
- * DVT (lower extremity)

Interrupted pattern with cortical or/and endosteal bone destruction

Aggressive periosteal reaction

- * Osteomyelitis
- * **Malignant** neoplasms
 - Osteosarcoma / Chondrosarcoma
 - Fibrosarcoma
 - Lymphoma / Leukemia
 - Metastasis

Hypertrophic osteoarthropathy (HOA)



Quiz 9

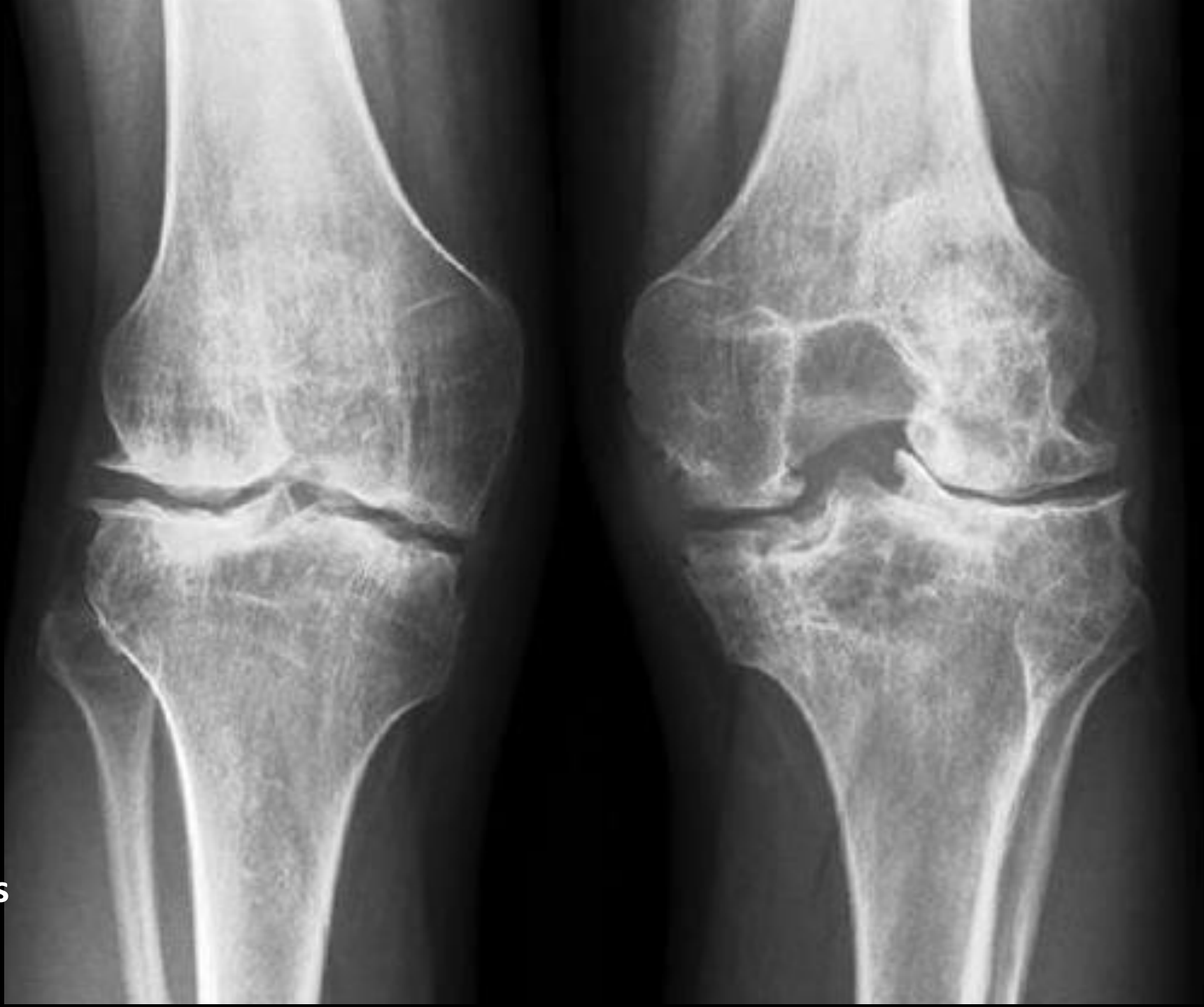


21-year-old man

**Chronic intermittent arthritis
for 10 years**

**What is the most likely
diagnosis?**

- A. Hemophilia**
- B. Charcot's joint**
- C. Spondyloarthropathy**
- D. Juvenile idiopathic arthritis**

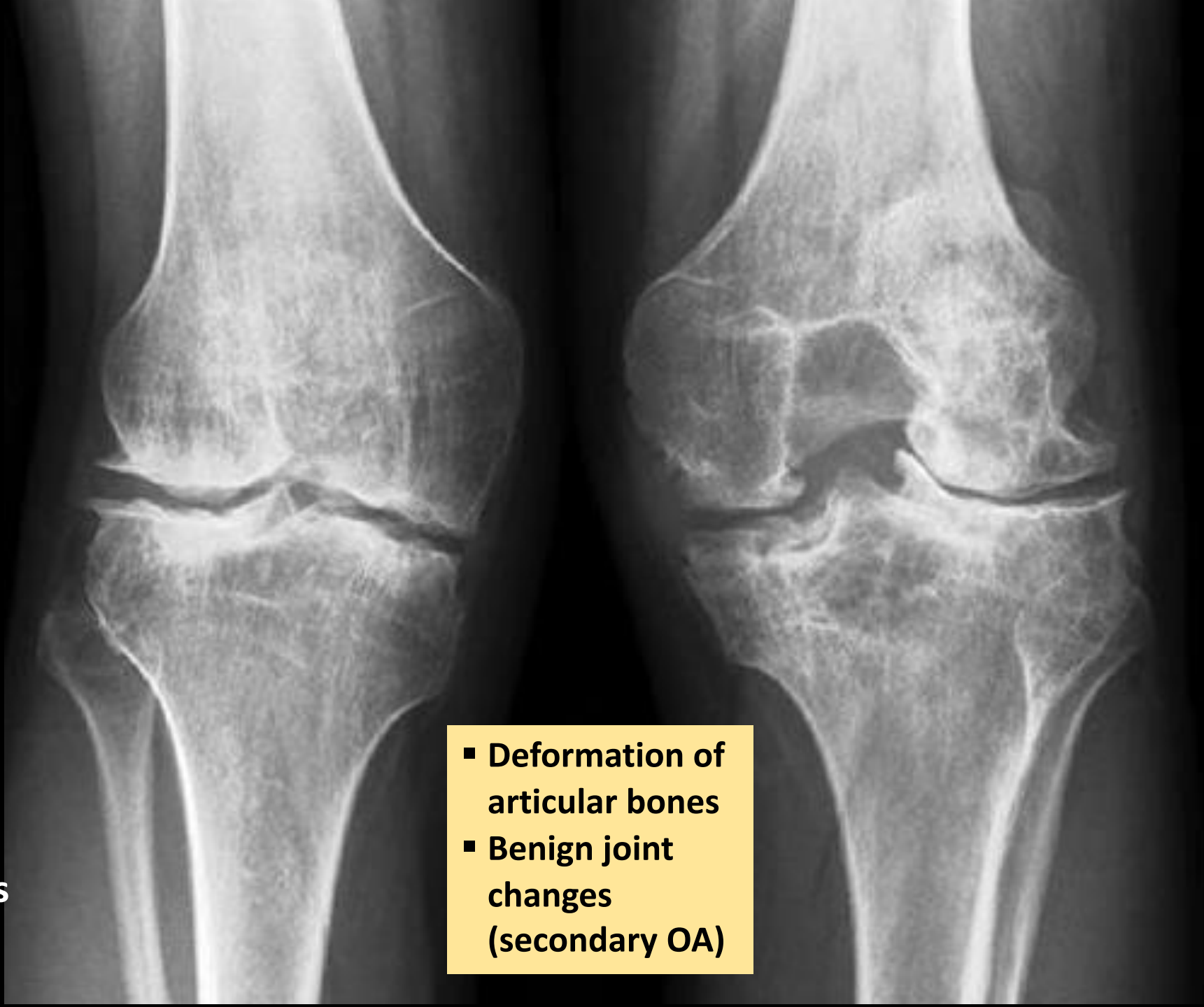


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- D. Juvenile idiopathic arthritis



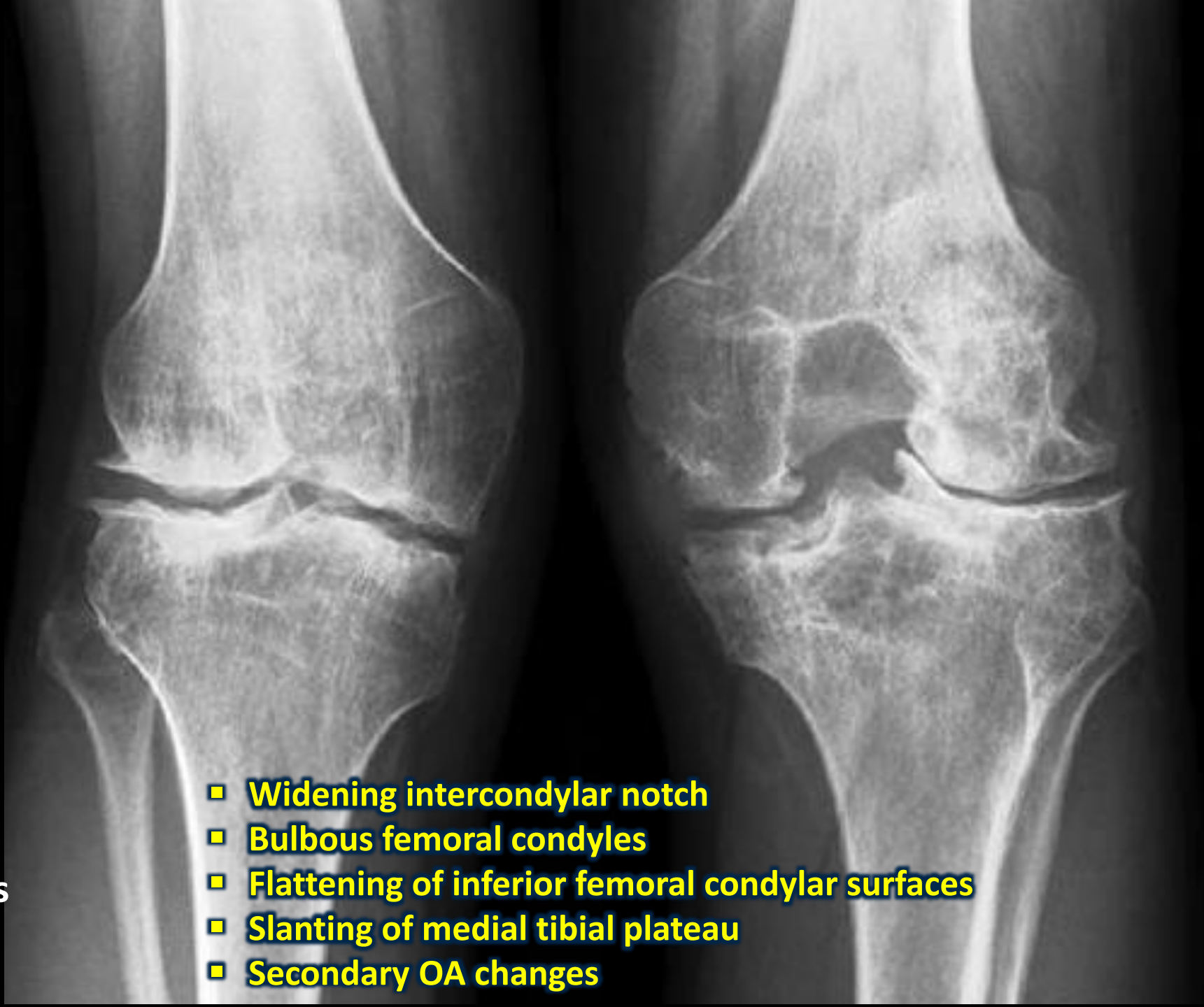
- Deformation of articular bones
- Benign joint changes (secondary OA)

21-year-old man

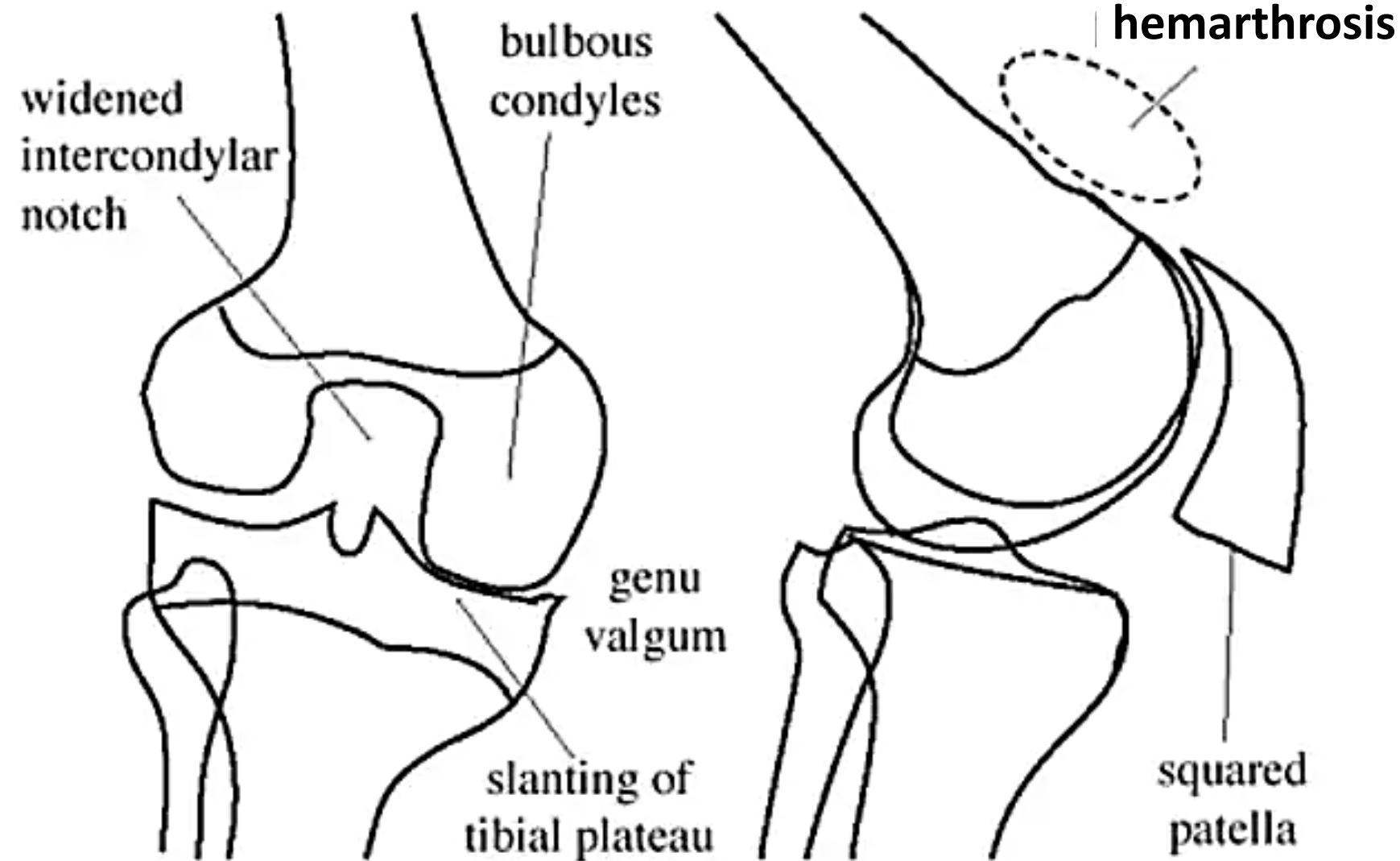
Chronic intermittent arthritis
for 10 years

What is the most likely
diagnosis?

- A. Hemophilia
- B. Charcot's joint
- C. Spondyloarthropathy
- D. Juvenile idiopathic arthritis



Radiographic abnormalities of **hemophilic arthropathy**

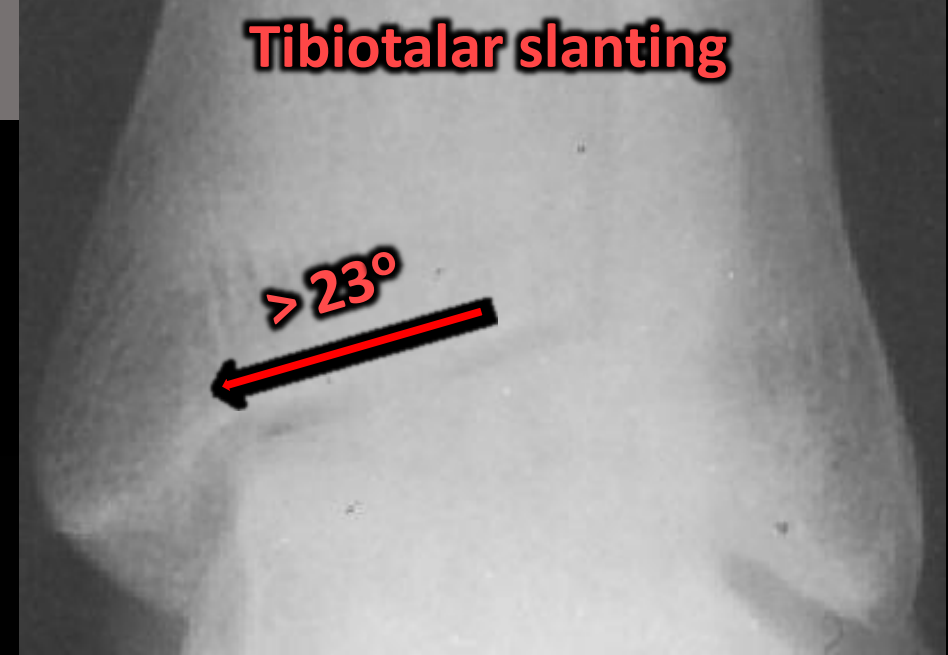


- Abnormal growth of growth plate
- Deformed epiphysis (articular bone) with gracile diaphysis
- Chronic hemosiderin-laden synovitis
- Chronic proliferative synovium (pannus)
- Cartilage damage
- Subchondral bone destruction
- Secondary osteoarthritis

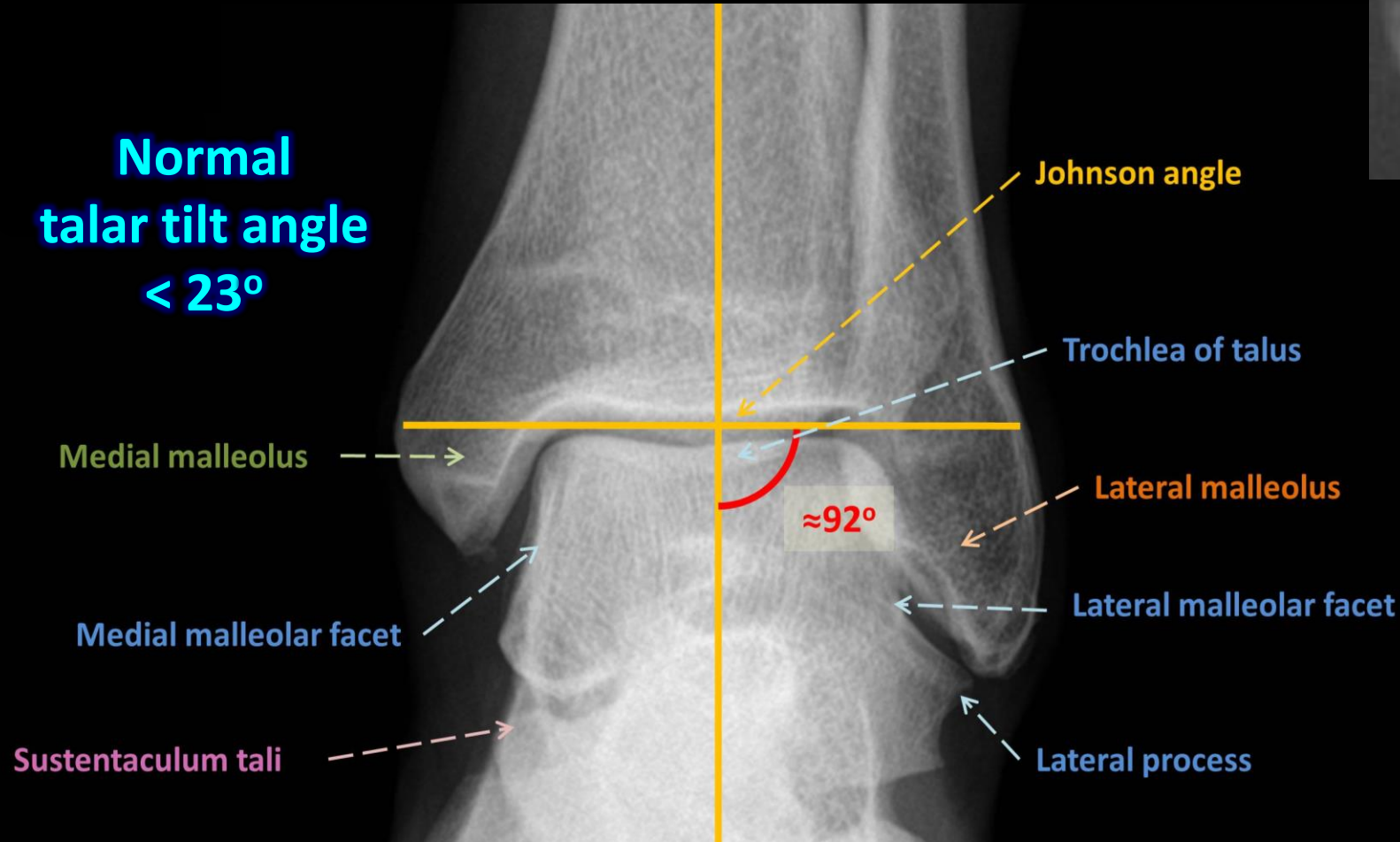
Hemophilic ankle arthropathy

Tibiotalar tilt:

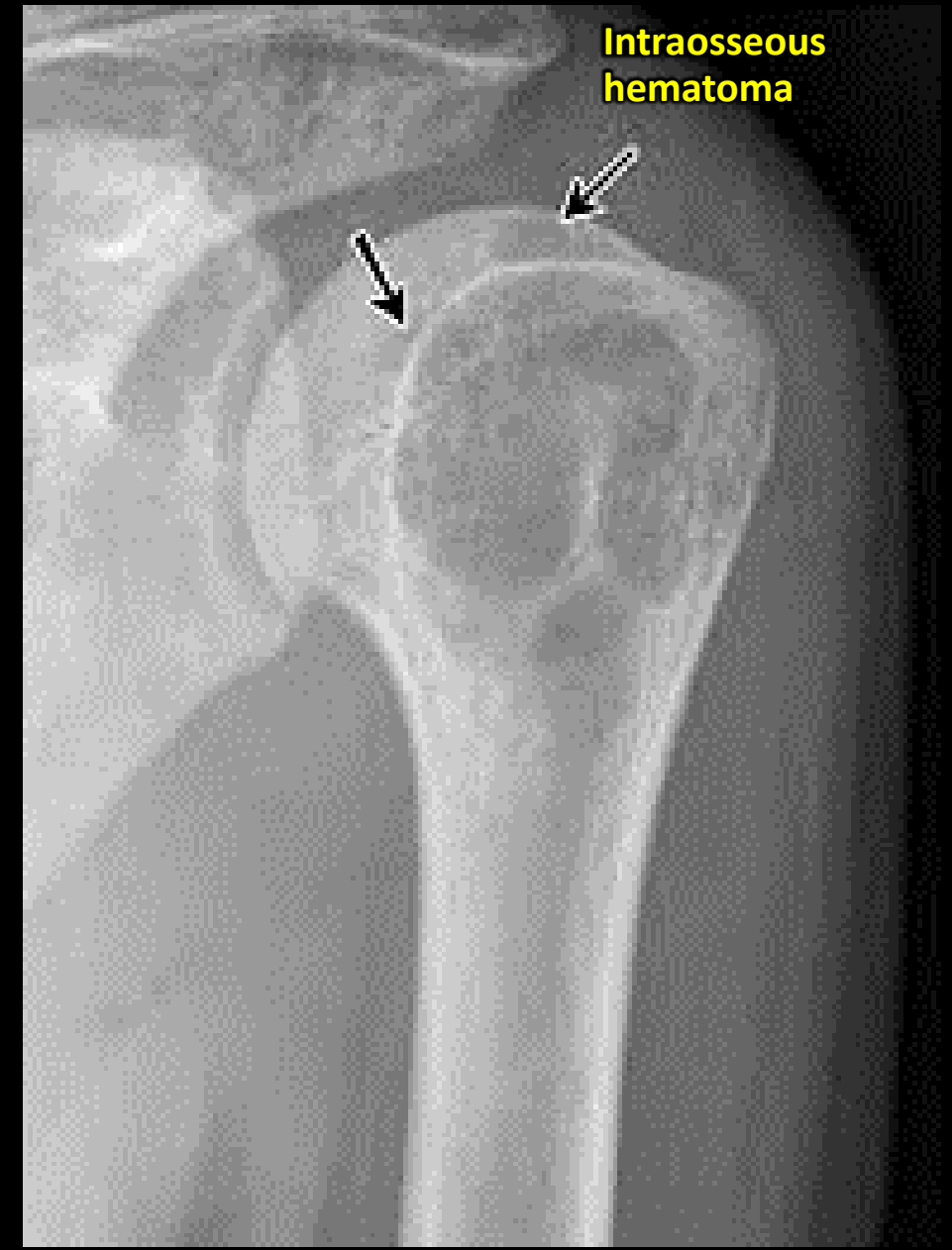
Relative undergrowth of lateral side of tibial epiphysis and leads to pronated foot



Normal talar tilt angle
 $< 23^\circ$



Hemophilic pseudotumor



Quiz 10

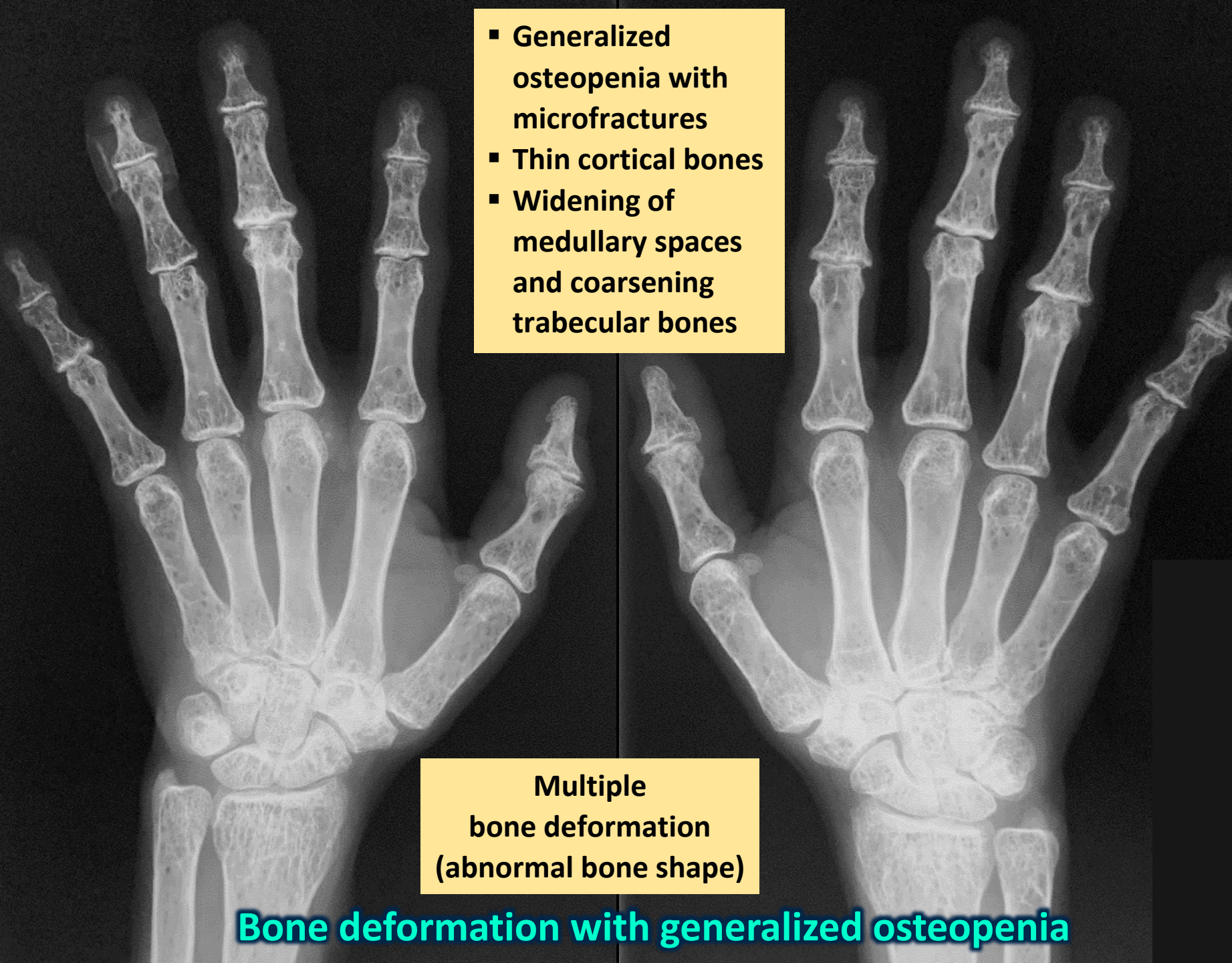




**32-year-old female:
Malaise, diffuse bone
and joint pain**

What is the diagnosis?

- A. Thalassemia**
- B. Hypothyroidism**
- C. Rheumatoid arthritis**
- D. Hyperparathyroidism**



- Generalized osteopenia with microfractures
- Thin cortical bones
- Widening of medullary spaces and coarsening trabecular bones

Multiple bone deformation (abnormal bone shape)

Bone deformation with generalized osteopenia

**32-year-old female:
Malaise, diffuse bone
and joint pain**

What is the diagnosis?

- A. *Thalassemia***
- B. Hypothyroidism**
- C. Rheumatoid arthritis**
- D. Hyperparathyroidism**

Rodent or chipmunk facies



Thalassemia

Dental malocclusion



Hair-on-end or crewcut appearance

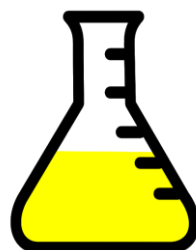
Bone deformation



Test tube



Sausage



Erlenmeyer flask



Thin cortex with widening of medullary space



Reinforcement (bar) lines: stress microfracture

Generalized osteopenia in thalassemia



Cobwebbing trabeculae



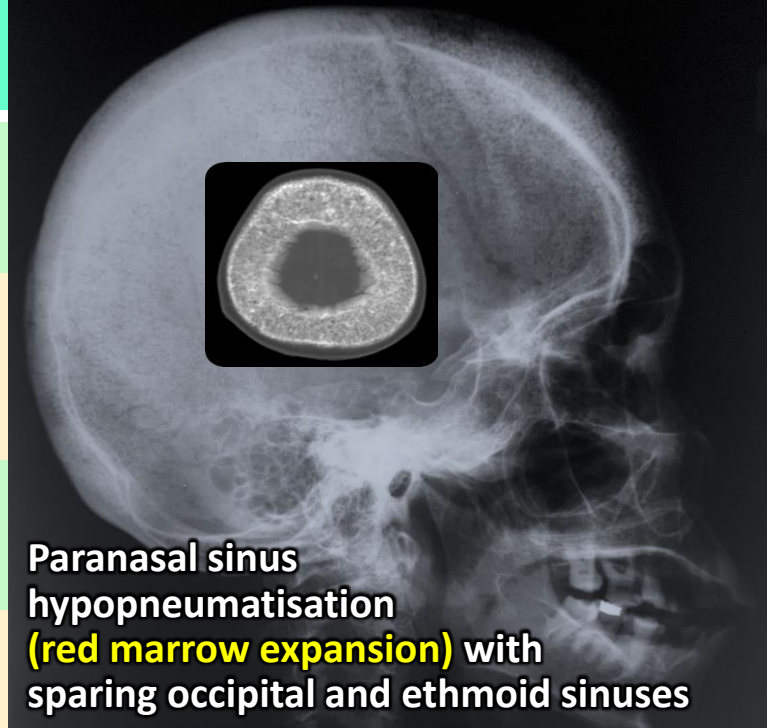
Raindrops on dirty mirror



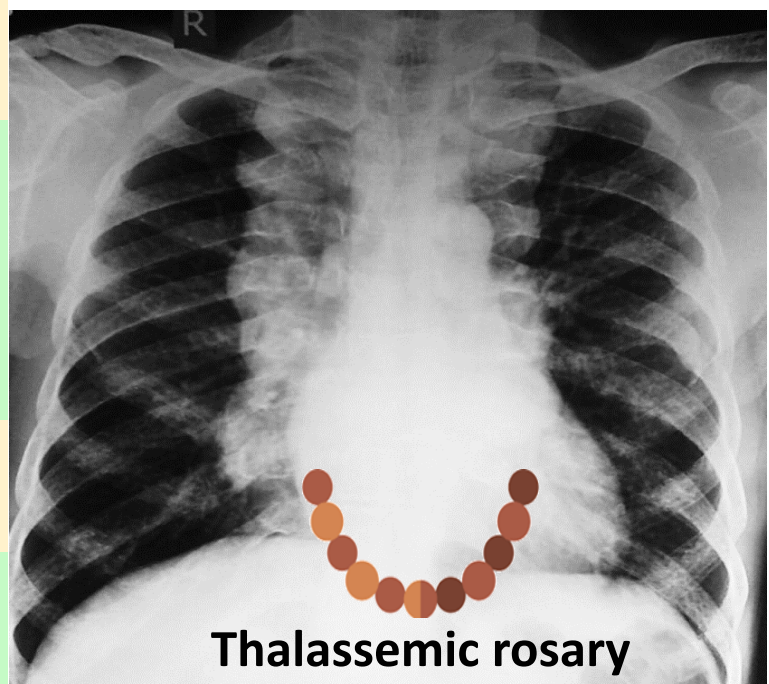
Generalized osteopenia
Biconcave (middle) spinal compression fractures

Radiographic abnormalities of thalassemia

Vertebral bodies	Coarse vertical trabeculae (cob-webbing appearance) Biconcave (middle column) compression fracture
Skull	Widening of the diploic space with a thinning of the tables with perpendicular-orientated coarse spiculated trabeculae "hair-on-end" appearance (occipital bone is usually not involved)
Facial bones	Prominence of the lateral margins of malar eminences Anterior and medial displacement of developing teeth
Appendicular bones	Cortical thinning, osteopenia, coarse trabeculae, ± fractures, squared, sausage-shaped or Erlenmeyer flask-like deformed bones, reinforcement lines, multiple small cystic lesions in diaphysis ("raindrop on the dirty mirror" appearance)
Ribs	Widening, generalized osteopenia, or localized lucency Cortical erosions, subcortical lucency "Rib-within-a-rib" appearance in the middle > anterior portions Bulbous expansion of the posterior and anterior segments
Extramedullary hemopoiesis	Prominent lobulated soft tissue densities at posterior > anterior mediastinum, pelvis, spinal canal
Premature epiphyseal fusion	Shortening, eccentric and angulation of humerus, distal femur, proximal tibia, proximal femur



Paranasal sinus hypopneumatization (**red marrow expansion**) with sparing occipital and ethmoid sinuses



Thalassemic rosary

	Gouty Arthritis	Rheumatoid Arthritis
Distribution	Asymmetric joint involvement	Symmetric joint involvement
Soft tissue swelling	Eccentric	Fusiform
Soft tissue calcification	Occasional	Rare
Osteoporosis	Absent or mild	Moderate or severe
Joint space loss	Frequently absent	Diffuse; occurs early in disease course
Bony erosions	Eccentric Frequent sclerotic margin Intraarticular and extraarticular Overhanging edge	Marginal Rare sclerotic margin Intraarticular No overhanging edge
Malalignment, subluxation	Rare	Common

Characteristic
Synovial joint involvement
Soft tissue swelling
Osteoporosis
Marginal erosions
Central erosions and cysts
Bony ankylosis
Bony proliferation
Malalignment and subluxation

+	+
+	+
+	±
+	+
+	+
±	+
-	+
+	±
+	+
+	+
+	+
-	-
±	±
±	±
±	±
±	±
±	±
±	±
±	±
±	±

	Rheumatoid Arthritis	Psoriatic Arthritis	Reactive Arthritis
Types of involved articulations	Synovial joints*	Synovial joints Symphyses Entheses	Synovial joints Symphyses Entheses
Distribution of arthritis	Appendicular and axial skeleton Polyarticular Symmetric Upper and lower extremities Cervical spine	Appendicular and axial skeleton Polyarticular or pauciarticular Symmetric, asymmetric, or unilateral Upper and lower extremities Sacroiliac joints and entire spine	Appendicular and axial skeleton Polyarticular or pauciarticular Asymmetrical Lower extremities Sacroiliac joints and, less commonly, spine
Nature of Lesions[†]			
Osteoporosis	++	+	+
Soft tissue swelling	++	++	++
Joint space narrowing	++	+	+
Severe periarticular osteolysis	+	++	+
Intraarticular bone ankylosis	+	++	++ [‡]
Bone proliferation and periostitis	- [§]	++	++
Tuft resorption	-	++	-

Bursal and tendon sheath involvement
Soft tissue swelling
Bony erosions
Bony proliferation
Cartilaginous joint involvement
Bony erosions
Bony proliferation
Bony ankylosis
Enthesopathy
Bony erosions
Bony proliferation

*Symphyses and entheses are less commonly and less extensively involved in rheumatoid arthritis than in psoriatic arthritis or reactive arthritis.
[†]-, absent; +, occasionally present; ++, commonly present.
[‡]Less frequent than in psoriatic arthritis.
[§]Occasionally seen in male patients with rheumatoid arthritis and in those with both rheumatoid arthritis and diffuse idiopathic skeletal hyperostosis.

A large, ornate, multi-story building with a prominent red-tiled tower and a fountain in the foreground. The building features classical architectural elements like arched windows and a balcony. The fountain in the foreground is a circular stone structure with a central sculpture. The scene is set at dusk or dawn, with a cloudy sky and some interior lights visible through the windows.

**Thank You for Your Attention
and
Good luck on Your Exam**