



# The Arthritis

แพทย์หญิงปฐนิยะดา วิเชียรธรรม

Puchaniyada Vijiradharma, M.D.



1. อายุรแพทย์โรคข้อและรูมาติสซั่ม
2. อายุรแพทย์
3. แพทย์ทั่วไป
4. นักศึกษาแพทย์
5. พยาบาลและบุคลากรทางการแพทย์อื่นๆ

# Rheumatology

Muscle

Tendon

Joint

Bone

Connective tissue



หญิง 73 ปี ปวดข้อนิ้วมือนิ้วเท้าข้อเท้า 2 วัน ก่อนหน้านี้ 2 สัปดาห์  
มีไข้ มีตุ่มกดเจ็บบนแดงที่ขา ไม่เคยเป็นมาก่อน



















## โรคที่น่าสงสัยที่สุดในขณะนี้

1. Rheumatoid Arthritis
2. Psoriasis Arthritis
3. Crystal Arthritis
4. Systemic lupus erythematosus
5. Erosive osteoarthritis

# APPROACH

- History
- Physical Examination
- Investigations
- Follow up



# HISTORY

- Gender, age, occupation
- Onset, duration, distribution
- Associated symptoms
- Associated diseases
- Previous medication / treatments
- Family history

# Gender, age, occupation

- **Young** - Infectious, CNTD, Inflammatory joint, MSU ( >30 yr.)
- **Elderly** - Degenerative, Crystal-induced arthritis,
- **Female** - SLE , MCTD, RA, Inflammatory myositis
- **Male** - Crystal ( MSU), SpA

# Onset, duration, distribution

- Acute / Chronic ( > 6 weeks)
- Outstanding extremely activities? Diving??
- Location, Mono / Poly
- Pain, tender, warm, swelling, Loss of function
- Episode, Pattern and chronology of symptoms ( severity & progression )
- Aggravators or relievers
- Associated S & S

# Associated symptoms

- Fatigue
- Fever
- Weakness/ instability
- Stiffness after prolong rest
- Myalgia
- Eye symptoms, Skin / nails changes, GI/GU symptom
- Emotional change



# Associated diseases

- Endocrine: Thyroid disease, Hyper PTH, DM, Acromegaly
- Hematologic: Hemophilia, Thalassemia  
Hematologic malignancy; MM, AML, Lymphoma
- Psoriasis
- Inflammatory bowel disease, PBC, PSC
- HIV, CAH/ Acute hepatitis (HBV, HCV)
- Malignancy (solid)

# Previous medication / treatments

- Blood transfusion
- Anti-thyroid drug: PTU, MMI
- Antihypertension: Beta-blocker, hydralazine. Verapamil
- Antibiotic: penicillin
- Pill, hormonal therapy
- Interferon
- Herbal medicine
- Drug abuse : exogenous steroid, IVDU

# Family History

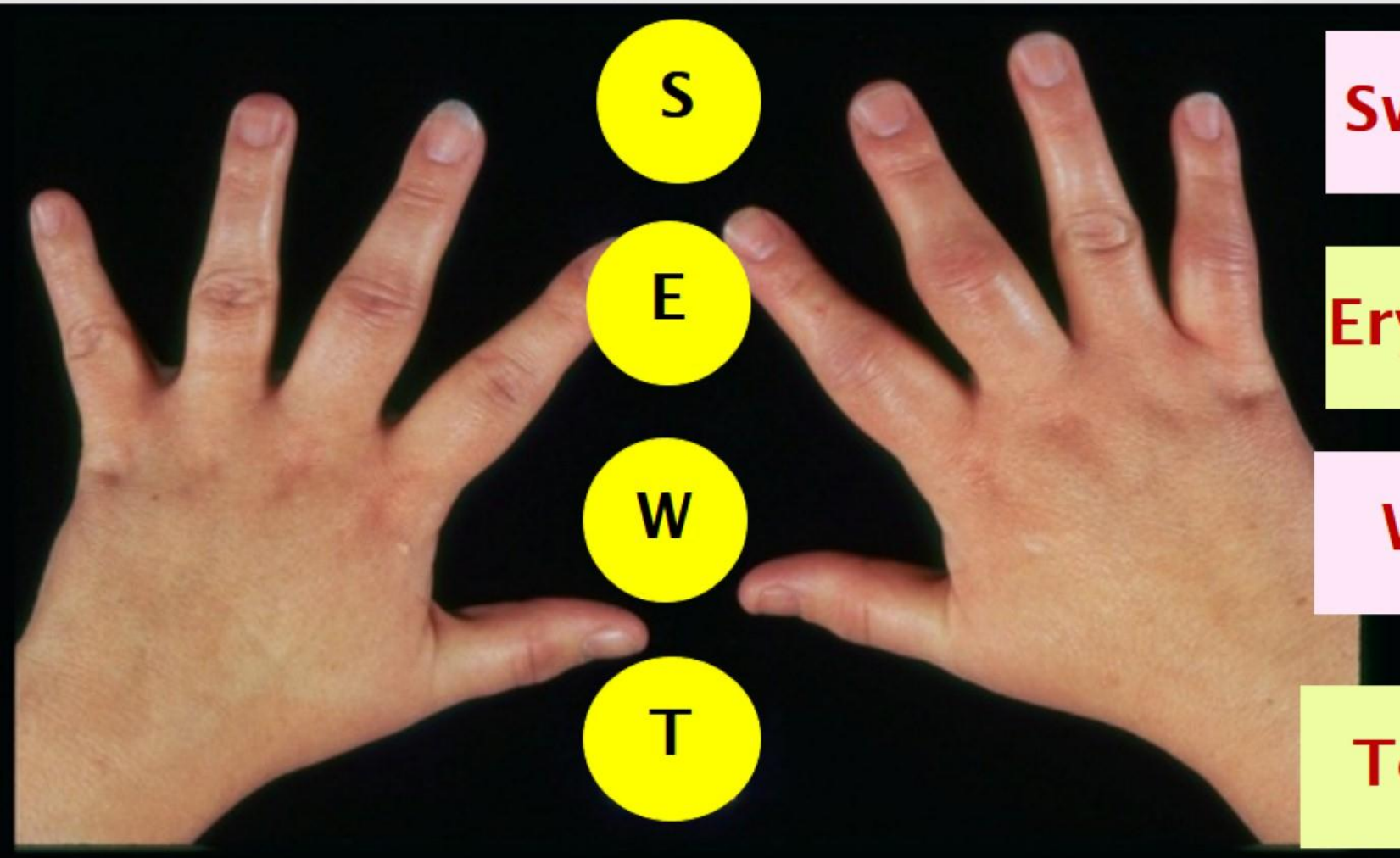
- SLE
- RA
- SpA
- GA

# Physical Examination

- Gait
- The Standing, posture
- Spine, Arms, Hands, Legs
- Inflammations?
- Function? POM (pain on motion) or LOM (limitation of motion) ??
- Review of the systems



# INFLAMMATORY = ARTHRITIS

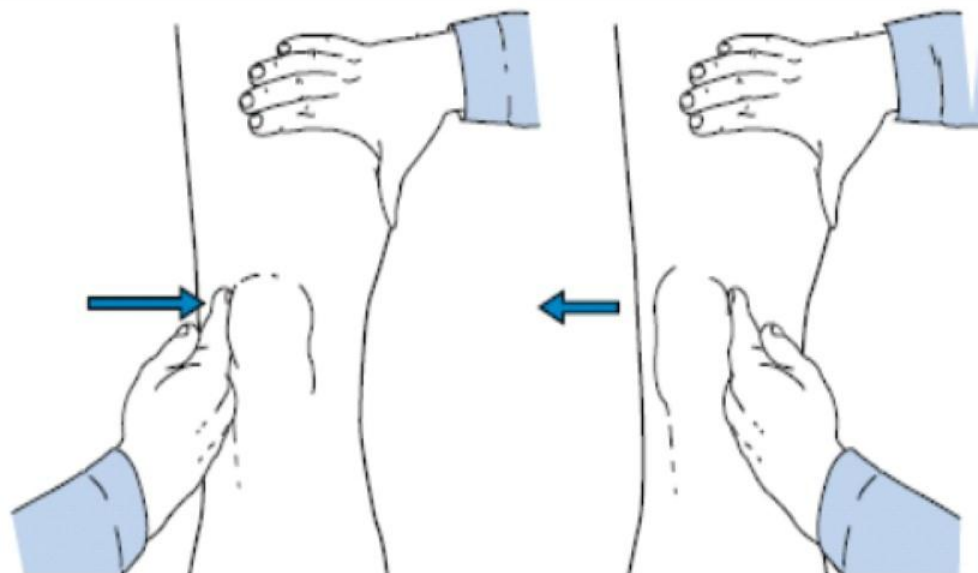
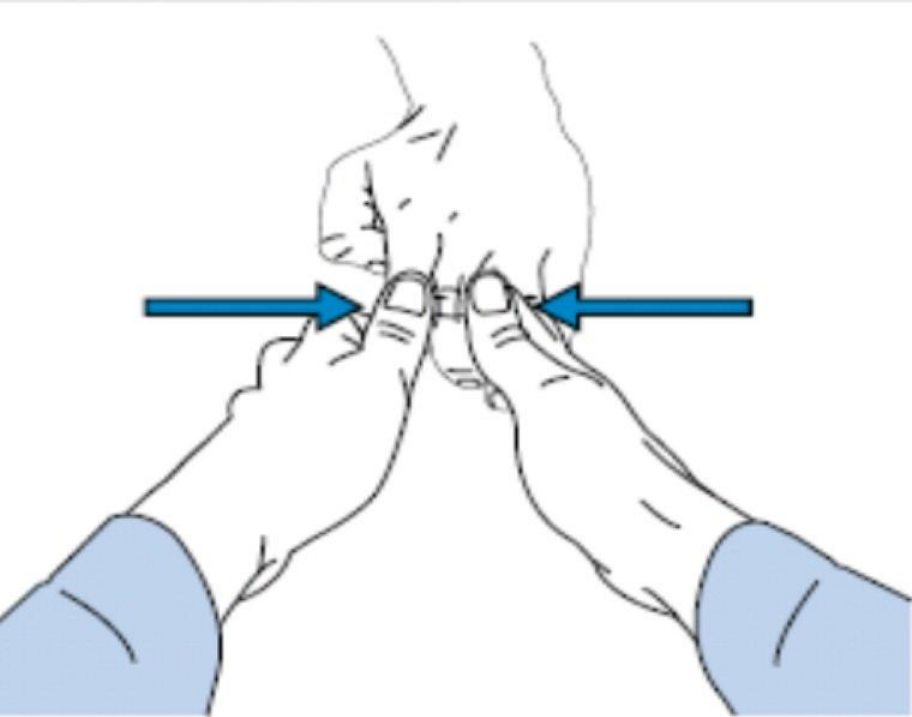


Swelling

Erythema

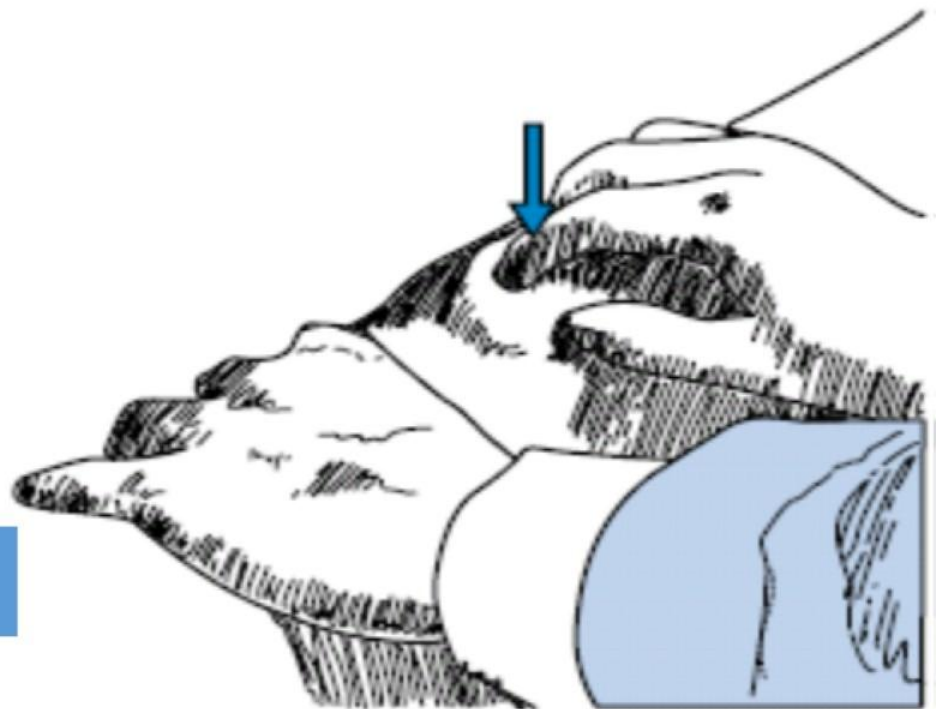
Warm

Tender



**Palpation of the joints**

**Joint effusion**



# Warning signs of inflammatory Arthritis

- Swelling in one or more joints
- Early morning stiffness
- Recurring or tenderness in any joints
- Inability to move joint normally
- Obvious redness and warmth of joint
- Unexplained weight loss, fever or weakness
- Symptoms like these persisting for 2 weeks

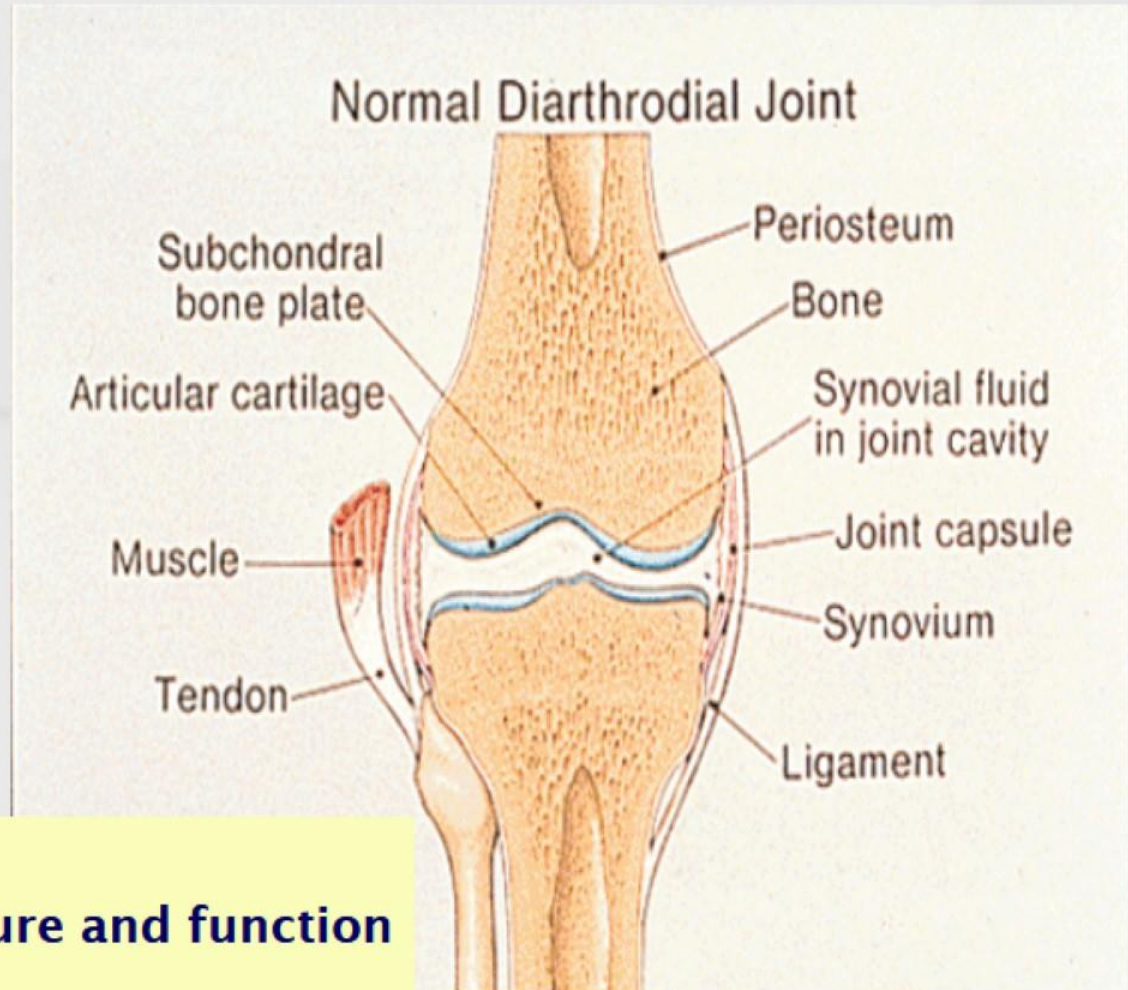
# ANATOMY and PHYSIOLOGY of JOINTS

- Site where 2 or more bones attached
- Provide stability and mobility
- Classified
  - degree of joint movement
  - tissues that connect the joint  
Fibrous, Cartilaginous, Synovium



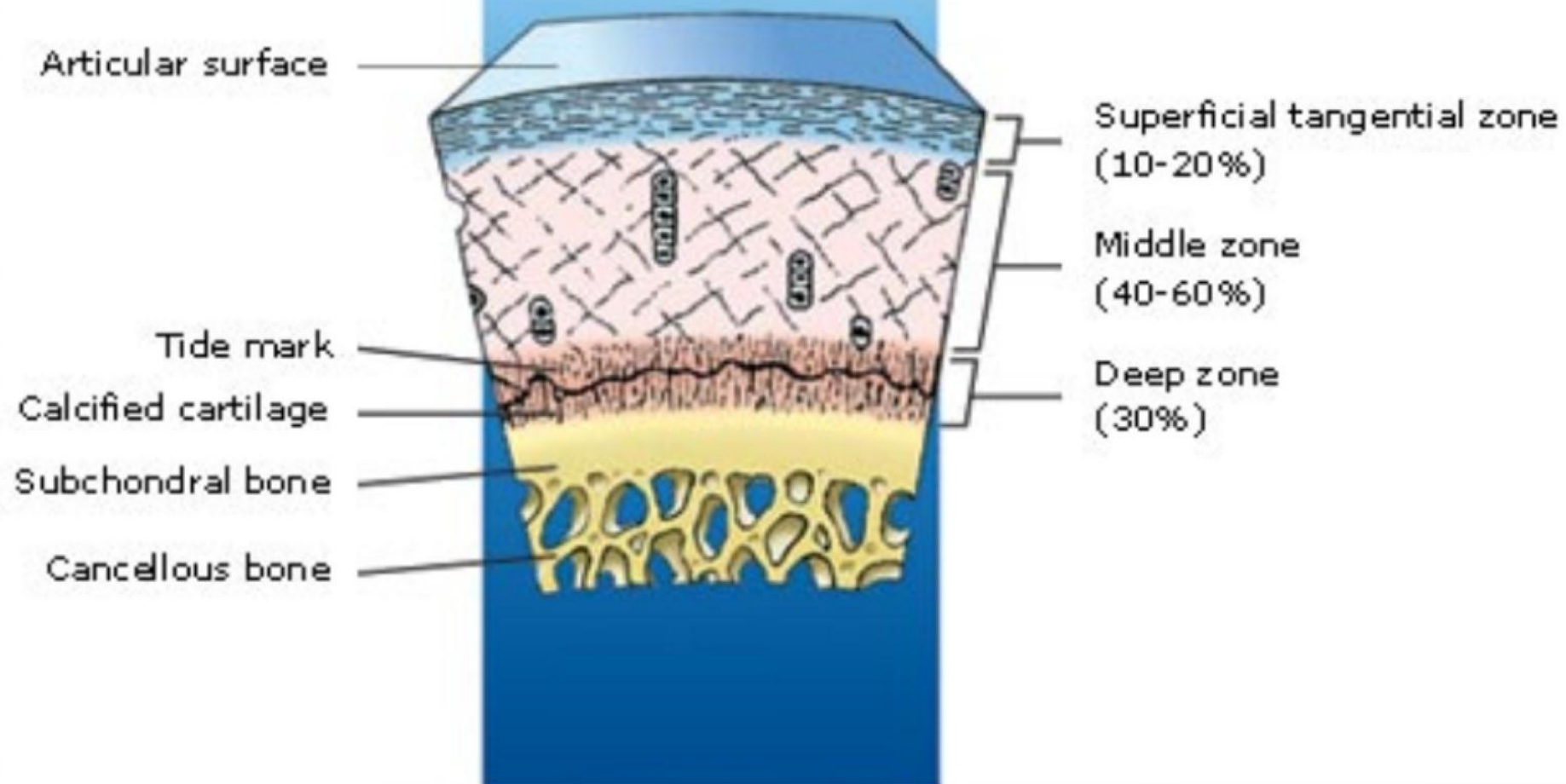
# STRUCTURE OF THE SYNOVIAL JOINT

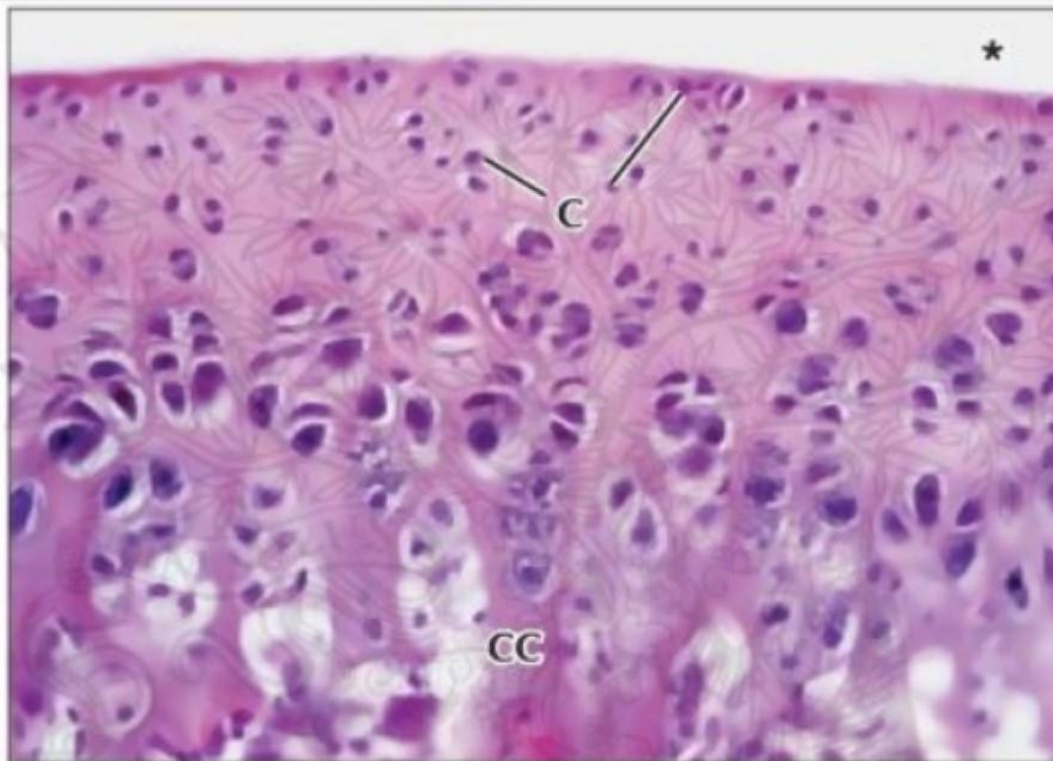
- **Joint cavity**
- **Synovial membrane**
- **Synovial fluid**
- **Hyaline cartilage**



- **The most movement**
- **The most complex structure and function**
- **Stability of posture**

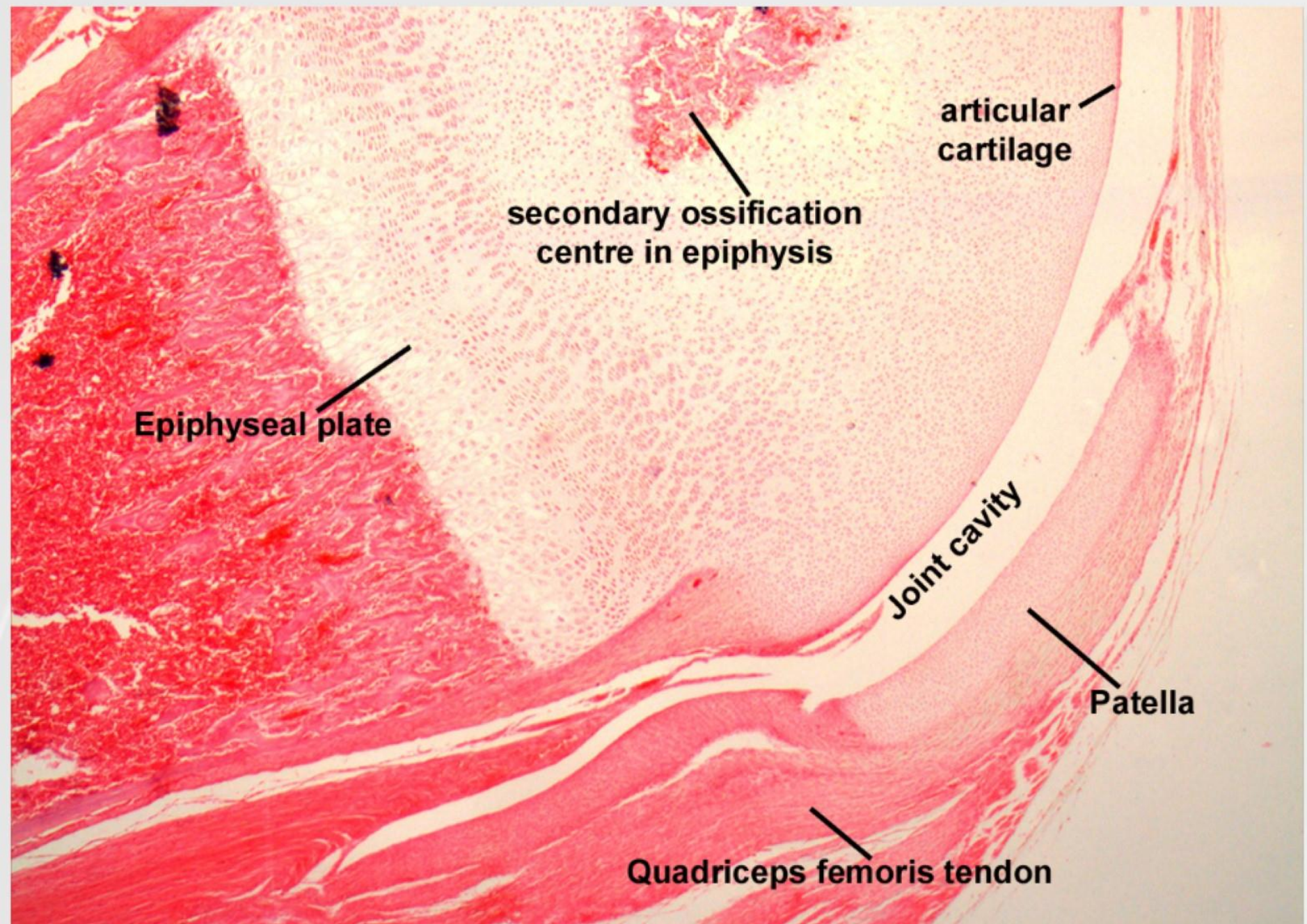




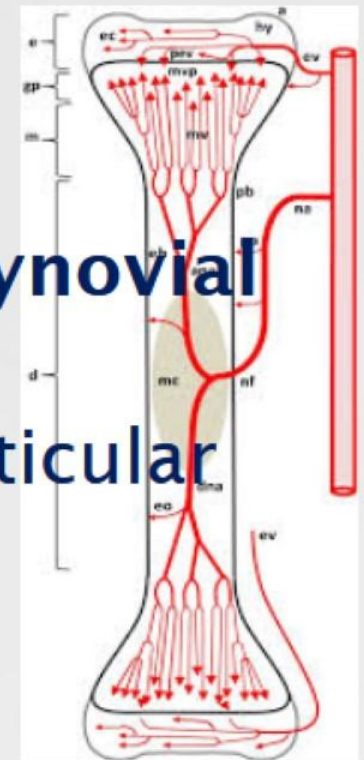
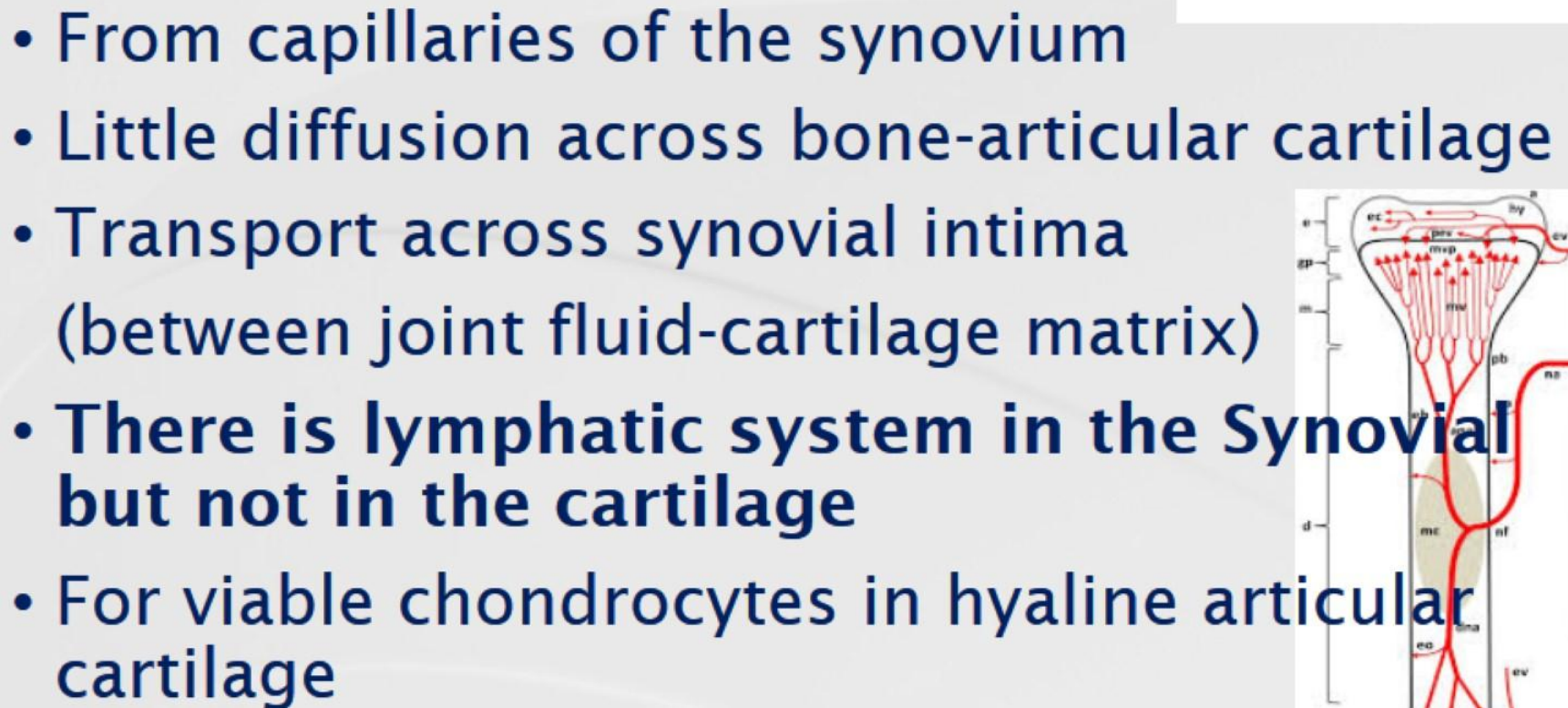


**Light micrograph of articular hyaline cartilage from a developing rat knee joint.** Articular cartilage has a complex internal structure, as well as sharing features with other types of hyaline cartilage. Of its four poorly demarcated zones, the most superficial, uppermost zone forms the gliding surface and is in contact with the synovial cavity (\*) of the joint. Small round chondrocytes (C) are oriented parallel to the surface; chondrocytes in deeper zones are larger, more rounded, and arranged in vertical columns. The deepest zone contains calcified cartilage (CC), which separates hyaline cartilage from subchondral bone. The term chondron encompasses the chondrocyte and its pericellular and territorial matrix. Lacking a perichondrium, articular cartilage is a variant of hyaline cartilage found elsewhere (e.g., in the trachea, nasal septum, and larynx). 100 $\times$ . Hematoxylin and phloxine orange G.









# Synovial & Synovial Fluid

Total weight

- Water 66-78%
- Solid 22-34%

**Lubrication &  
Force distribution**

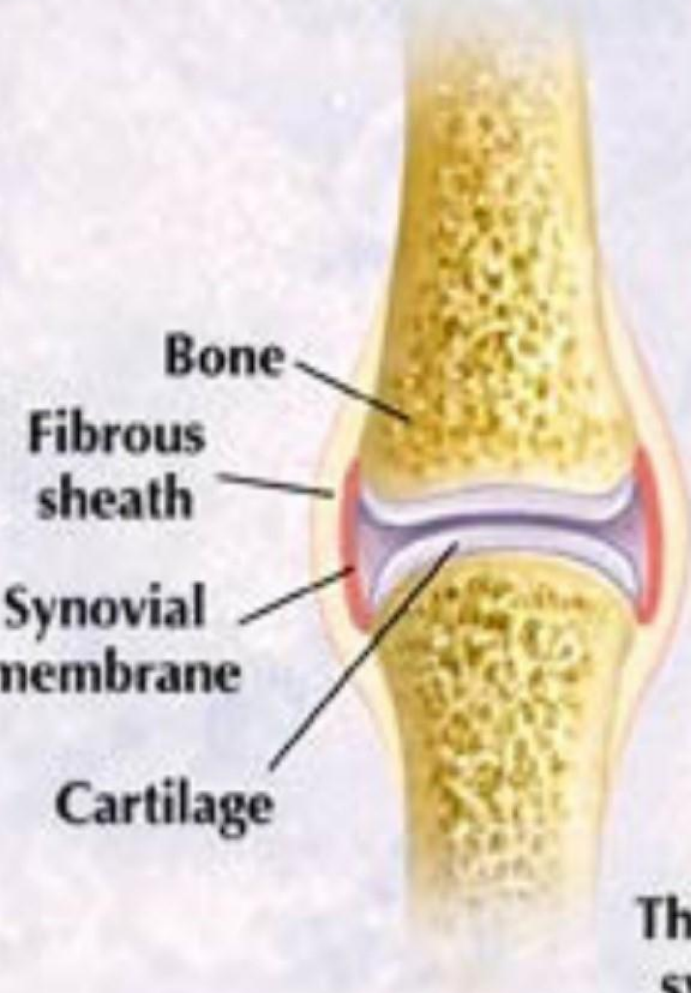
**Dry weight**

- Inorganic Ash 5-6% ( HA)
- Organic -
  - Type II collagen 48-62%
  - Proteoglycan 22-38%
  - Matrix protein 5-15%





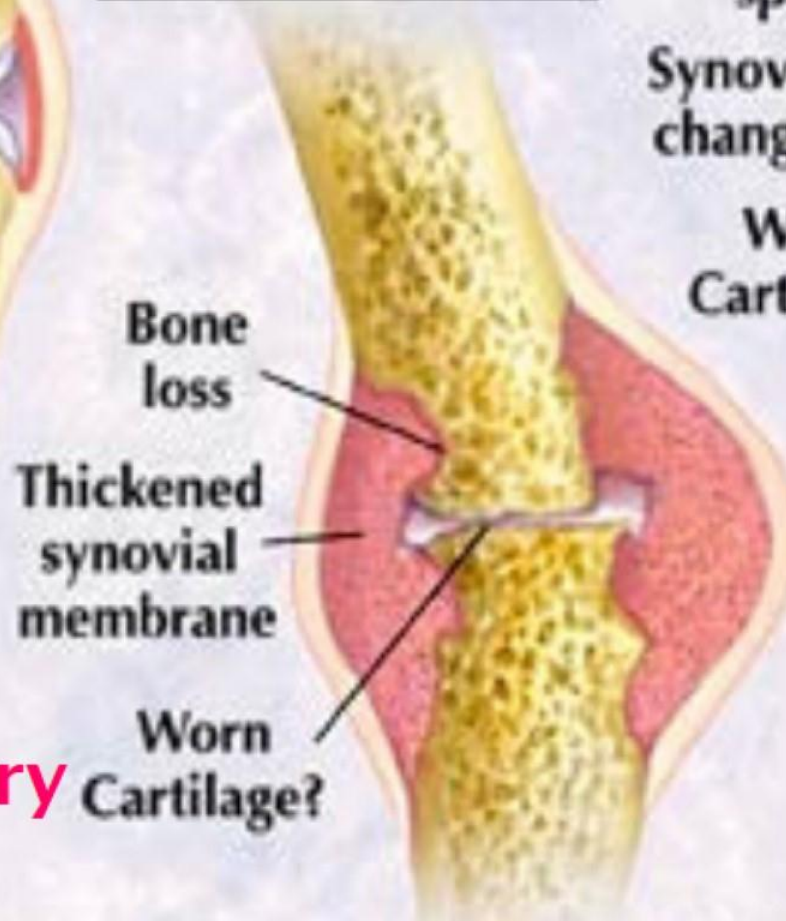
Normal Joint



Osteoarthritis



Rheumatoid arthritis



**Inflammatory**

**Degenerative**



# Pattern of disease progression

- **Intermittent** – Crystal-induced Arthritis, Reactive Arthritis, Acute Rheumatic Fever
- **Migratory** – Acute Rheumatic Fever, DGI
- **Additive** – RA , Gout, SpA
- **Persistent pattern** – RA, SLE, MCTD

# Intermittent Arthritis

## Mechanical

- Loose body
- Ligament tear/laxity

## Crystal

- MSU
- CPPD
- CaHA

## Infection

- Lyme
- Whipple's
- ReA
- Acute Rheumatic Fever

## Others

Hemophilia

Palindromic Rheumatism

Intermittent Hydrathrosis

Osteochondromatosis

FMF

Sarcoidosis



# Acute Monoarthritis

## Non-Inflammatory

- Trauma
- Sickle-cell disease
- Osteonecrosis
- Hemarthrosis

## Inflammatory

- Bacteria
- Crystals
- First episode of Intermittent or chronic arthritis

# Acute Polyarthrititis

## Infectious-related

- Viral – Parvovirus  
HIV,HBV,Chikungunya  
etc.
- Bacterial esp.  
Gonococcal
- Rheumatic fever
- Lyme disease

## Non-Infectious related

- HSP
- Sickle-cell disease
- Leukemia
- Sarcoidosis
- Episode of  
Intermittent and  
chronic arthritis

# Chronic Mono-/Oligoarthritis

## Non-Inflammatory

- Chronic Jt.structure
- Degenerative
- Osteonecrosis
- Tumor
- RSD
- Neuropathic joint

## Inflammatory

- Chronic Infection; TB, Fungus, Lyme
- Crystal
- SpA, JClA, Atypical RA
- Pigmented Villonodular

# Chronic Polyarthrititis

- RA
- CNTD
- SpA
- JCIA
- Chronic Tophaceous gout, CPPD-Pseudo RA
- Hypertrophic Osteoarthropathy
- Hypothyroidism/ Hyper PTH



# Musculoskeletal Complaints

- Diagnostic information provided by

- History 80 %

- Physical examination 15 %

- Laboratory/radiographs 5 %

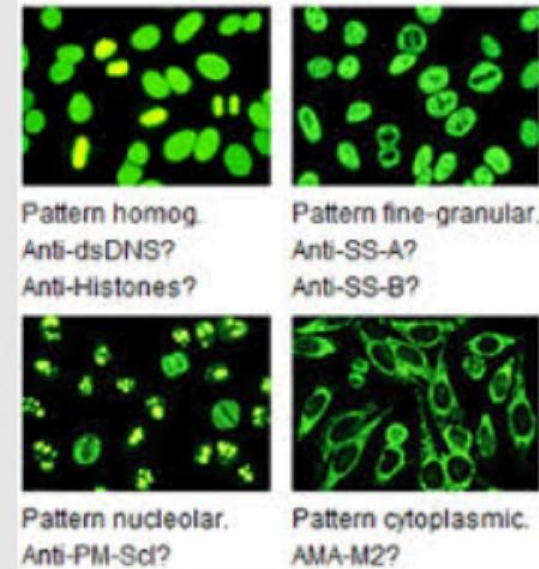
*ACR 1996*

**Categories of synovial fluid based upon clinical and laboratory findings**

Measure	Normal	Noninflammatory	Inflammatory	Septic	Hemorrhagic
Volume, mL (knee)	<3.5	Often >3.5	Often >3.5	Often >3.5	Usually >3.5
Clarity	Transparent	Transparent	Translucent-opaque	Opaque	Bloody
Color	Clear	Yellow	Yellow to opalescent	Yellow to green	Red
Viscosity	High	High	Low	Variable	Variable
WBC, per mm <sup>3</sup>	<200	200-2,000	2,000-10,000	>100,000*	200-2,000
PMNs, percent	<25	<25	≥50	≥75	50-75
Culture	Negative	Negative	Negative	Often positive	Negative
Total protein, g/dL	1-2	1-3	3-5	3-5	4-6
LDH (compared to levels in blood)	Very low	Very low	High	Variable	Similar
Glucose, mg/dL	Nearly equal to blood	Nearly equal to blood	>25, lower than blood	<25, much lower than blood	Nearly equal to blood

\* Lower with infections caused by partially treated or low virulence organisms

# Laboratory



Peripheral (rim)		anti-DNA (not seen on HEp-2)	SLE
Homogeneous (diffuse)		anti-DNA anti-histone anti-DNP (nucleosomes)	RA & SLE Misc. Disorders (anti-ssDNA)
Speckled		anti-Sm & RNP anti-Ro & La anti-Jo-1 & Mi-2 anti-Scl-70	SLE & SS PM/DM PSS (Systemic)
Centromere		anti-centromere	PSS (CREST)
Nucleolar		anti-nucleolar	SLE & PSS

Table II. Frequency of FANA test results (n=2,140).

Titres	Serum Samples n	(%)	Significance
Negative	1,529	(71.44)	Negative
1:40	119	(5.56)	Negative*
1:80	100	(4.67)	Borderline
1:160	89	(4.15)	Borderline
1:320	88	(4.11)	Significant
1:640	128	(5.90)	Significant
1:1,280	49	(2.20)	Significant
1:2,560	22	(1.02)	Significant
1:5,120	14	(0.65)	Significant
1:10,240	2	(0.09)	Significant

\* A 1:40 titre was considered not significant because of the frequency of such low titres in the presumed normal population.

Table III. Clinical Prevalence and Relevance of Autoantibodies

Antibody	Associated Disease	Frequency in patients with disease	IFA Pattern
SSA (Ro)	SLE, Sjgren's syndrome, neonatal lupus	- 25-35% SLE - 40-70% Sjgren's syndrome - 100% neonatal lupus	Fine Speckles
SSB (La)	Sjgren's syndrome, SLE	- 30% in Sjgren's - 10% in SLE	Fine Speckles
Sm	SLE (Highly specific)	- 15-30% in SLE	Coarse Speckles
RNP	Mixed Connective Tissue Disease (sclerodactyly, Raynaud's phenomenon, esophageal dysmotility)	- 95% MCTD - 20% Systemic Sclerosis - 30-50% SLE	Large, Coarse Speckles
Scl-70	Scleroderma	- 20-35% Scleroderma	Granular Nucleolar homogenous
Jo-1	Polymyositis	- 20-40% Polymyositis	Speckled Cytoplasm
Centromere	Scleroderma CREST variant (calcinosis, Raynaud's, esophageal dysmotility, sclerodactyly and telangiectasia)	- 80% limited systemic sclerosis - 15% Systemic Sclerosis	Discrete speckled, centromere in metaphase cells
Histones	Drug induced SLE	- 90% Drug induced Lupus	Homogenous pattern
DsDNA	SLE	- 40-60% SLE	Homogenous pattern



# IMAGING

- Plain film AP, Lateral, Oblique
- Lateral Flexion/ Extension
- Ultrasonography
- CT – bone
- MRI – Soft tissue
- Arthrogram
- Angiogram

หญิง 73 ปี ปวดข้อนิ้วมือนิ้วเท้าข้อเท้า 2 วัน  
ก่อนหน้านี 2 สัปดาห์มีไข้ มีตุ่มกดเจ็บนูนแดงที่ขา  
ไม่เคยเป็นมาก่อน



# Acute Polyarthrititis

## Infectious-related

- Viral – Parvovirus  
HIV,HBV,Chikungunya  
etc.
- Bacterial esp.  
Gonococcal
- Rheumatic fever
- Lyme disease

## Non-Infectious related

- HSP
- Sickle-cell disease
- Leukemia
- Sarcoidosis
- Episode of  
Intermittent and  
chronic arthritis



การตรวจที่ท่านจะทำเพื่อช่วยการวินิจฉัย

1. CBC
2. Hemoculture
3. Skin biopsy
4. Both hands AP, both legs AP lateral, both feet AP, both ankles lateral
5. Synovial examination

table  
H ID : 26



R  
Portable  
TECH ID : 26

















R

UPRIGHT





L

UPRIGHT



**การอ่านภาพรังสีข้อ**

**ABCDE SP**

**A Alignment**

**B Bone Density**

**C Cartilage**

**D Distribution/Destruction/Deformity**

**E Erosion/Sclerosis**

**S Soft tissue**

**P Periosteal Reaction**



**Alignment** Varus/Vulgas Medial/Lateral Ulna/Radial

**Bone Density** Osteopenia, Osteosclerosis

**Cartilage** Widening, Narrowing( symmetry=uniform-diffuse/asymmetry.=non-uniform=segmental), Chondrocalcinosis

**Distribution/Destruction/Deformity** Axial or Peripheral, Upper or Lower, Large or small jt, Bilateral or unilateral, Mutilation, Ankylosis

**Erosion/Sclerosis** Synovial, Marginal, Subchondral, Weight-bearing, Subperiosteal, cortical, Subcortical, Endosteal, Ill-define, Well-define, from inside, from outside

**Soft tissue** Shape: Fusiform, Nodular, Soft tissue enlargement or swelling

Density: Metallic, Calcify or Ossification, Fluid, Fat, Air

**Periosteal Reaction** Soft: Sunburst, Hair-on-end, Codman's triangle (rapidly growth-process) Solid (slowly growing process)



- A: ulna deviation of hands, flexion deformity of knees, loss arch of feet
- B: Osteopenia
- C: Juxta-articular Osteopenia, Asymmetrical NJS of DIPs and PIPs, knees and ankles, subchondral bone cysts vs. subchondral bone sclerosis and spur, **gull-wing appearance, exuberant spur, patella wrapped-around, chondrocalcinosis**
- D & E: dislocation of some DIPs
- S: Surrounding soft tissue of joints swelling
- P: Calcified vessels





CBC ; WBC 9,000/mm<sup>3</sup> Hb 9.5 g/dl MCV 93.1 fl  
PMN 7,650/mm<sup>3</sup> Lymp 2567/mm<sup>3</sup>  
PLT 150,000/mm<sup>3</sup>

Gluc 169 mg/dl

BUN/Cr 59.30/2.36 mg/dl

Electrolyte, LFT, CPK, LDH, uric ; WNL

CRP 123.87 mg/L

DCT/ICT 1+

VDRL, HBsAg, HCV, ANA, ANCA, RF, anti CCP, anti SSA,  
anti SSB ; all negative

Sputum GS, AFB, Mod AFB, CS; NIL

H/C \*III ; NG

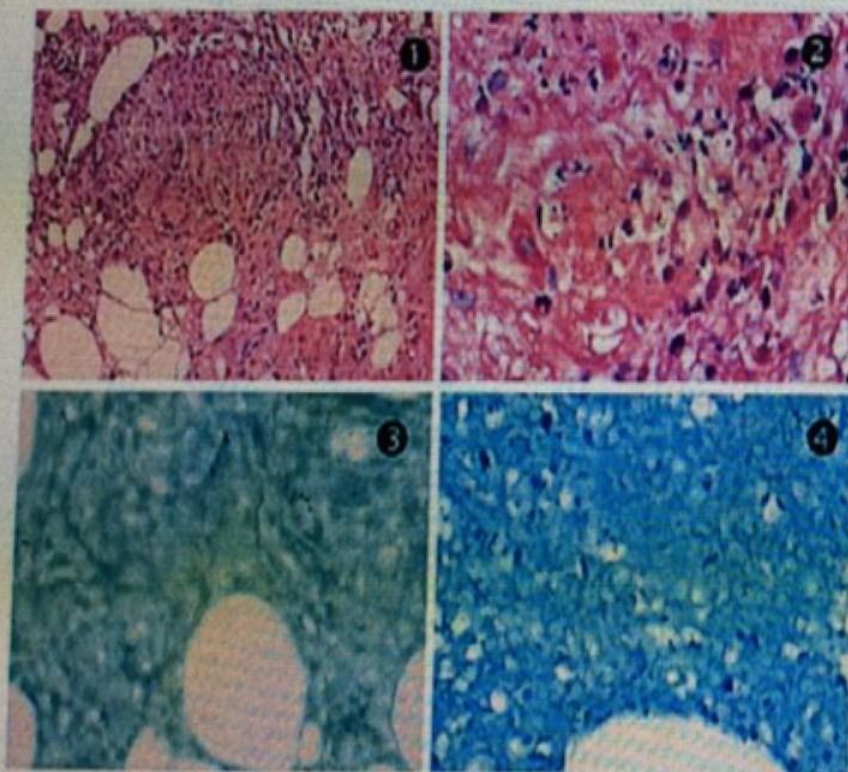
TE ECHO ; no evidence of IE .



**Additional report:**

Previous section reveals granulomatous lobular panniculitis. (fig.1)

PAS (fig.2), GMS ( fig.3) and acid-fast (fig.4) stains fail to reveal organism in the infiltrate.

***Pathological Diagnosis:***

Granulomatous lobular panniculitis.

Note: The differential diagnosis is between infectious process and reactive process, especially erythema induratum.

- Quantiferon TB **positive 0.83 IU/ml**
- Hemoculture for TB ; **M.tuberculosis**
- SF yellow, slightly turbid  
leukocyte 723/mm<sup>3</sup> erythrocyte 1,700/mm<sup>3</sup>  
PMN 53% Lymph 47%  
**Calcium pyrophosphate crystal seen.**



# Problem lists

**1.Fever**

**2.Granulomatous Lobular Panniculitis**

**3.Inflammatory polyarthrititis : CPPD/EOA**

**4.Anemia ; low SI and R/O AIHA**

5.U/L DM, HT, HPL, CKD, CAD S/P CABG, AF, VHD

6.U/L Hypothyroidism, 2 hyper PTH

7.U/L GOA, EOA, flat feet

8.Elderly



# Primary Osteoarthritis

- Idiopathic :Occurring in previous intact joint
- No apparent initiating factor
- Related to aging process
  - People > 65 years 80-90% >> evidence of OA
  - Collagen, Proteoglycan- decrease tensile strength
  - Decrease nutrient supply to cartilage
  - Age > 55 years: DIPs, Knee
  - Female > Male = 12:1
- Mostly : DIPs, PIPs, CMC
- All Race

# Primary Osteoarthritis

## 1. Primary Generalized Osteoarthritis ( PGOA)

- Familial, Premature OA
- First CMC, Knee, Hip, Spine
- Heberden, Bouchard node

## 2. Erosive Inflammatory Osteoarthritis ( EOA)

## 3. Chondromalacia Patellae

- Young adult
- Crepitus, Pain at anterior Knee
- Cartilagenous change along undersurface of patella
- MRI

# **Erosive Inflammatory Osteoarthritis ( EOA)**

**Post-menopausal Female, Hereditary  
Inflammation:IL-1, Bilateral, Symmetrical**

**DIPs, other hand joints  
Ankylose**

**Hormonal change ? : Post-menopausal**

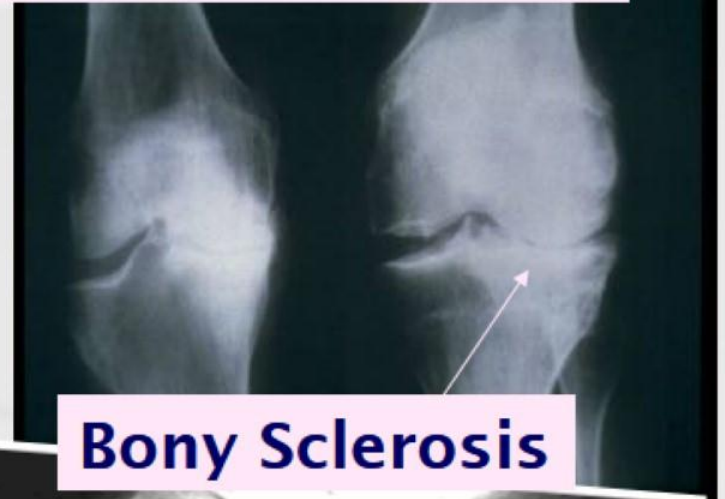
**Hypothyroidism, Autoimmune Thyroiditis,  
Hyperparathyroidism, CPPD, CKD,  
Scleroderma, Sjogren's syndrome**



# EROSIVE OSTEOARTHRITIS



**Asymmetrical NJS**



**Bony Sclerosis**

**Bouchard node**

**Heberden node**



**Hard**

**Spur**

**osteophyte**



**Gull-wing appearance**







# การรักษา

- **Joint Protection:**

  - Avoid excessive strain on affected joint**

- **Stretching exercise**

- **Lose weight**

- **Acetaminophen / NSAIDs**

- **Intraarticular Steroid Injection**

- **SYSADOAs:**

  - Diacerein, IA Hyaluronic acid**

- **DMARDs : Hydroxychloroquine**

- **Surgery**

Punzi L, Romanda R, Sfriso R, Erosive osteoarthritis, Best Pract Res Clin Rheumatol 2004  
Greenspan A, Erosive osteoarthritis, Semin Musculoskeletal Radio.2003; 712(155-159)Ehrlich  
GE, Erosive osteoarthritis: Presenting, clinical pearls and therapy, Curr Rheumatol 2001;3;484-488  
Bryant LR, des Rosier KF, Carpentry MT, Hydroxychloroquine on treatment of Erosive osteoarthritis, J  
Rheumatol 1995;22:1529-1531, 18:739-758

หญิง 73 ปี ท้องเสียเป็นๆ หายๆ  
ไอเสมหะมากในคอเช้าๆ เป็นมา 1 เดือน  
มีไข้หนาวสั่น ปวดตัว

ปวดข้อไหล่ขวา ศอกขวา และเข่าขวา 1 วันก่อนมา รพ.

- BT 38.9 c BP 149/75 mmHg PR 73/min RR 18/min
- Occasionally rhonchi BUL
- W-S-T-E 4+ right shoulder, elbow and knee, ballottement



L

SUPIN



R

CROSS TABLE



R

INE











ท่านสงสัยโรคใด ?

1. Septic Arthritis
2. Rheumatic fever
3. Crystal Arthritis
4. Rheumatoid arthritis
5. Osteoarthritis

# Acute Monoarthritis

## Non-Inflammatory

- Trauma
- Sickle-cell disease
- Osteonecrosis
- Hemarthrosis

## Inflammatory

- Bacteria
- Crystals
- First episode of Intermittent or chronic arthritis



- CBC; WBC 13,010/mm<sup>3</sup> Hb 14.5 g/dl PMN 6,436/mm<sup>3</sup>  
Lymph 2,653/mm<sup>3</sup> plt 329,000/mm<sup>3</sup>
- Creatinine 0.63 mg/dl
- ALT 20 U/L
- Uric 5 mg/dl
- CPK 49 U/L LDH 128 U/L
- UA; NIL
- Sputum GS, AFB, mod AFB , PCR for TB; all negative
- ASO titer, RF, anti CCP Ab, ANA; all negative

- SF Yellow turbid

leukocyte 165,000/mm<sup>3</sup>

erythrocyte 10,500/mm<sup>3</sup>

PMN 90% lymph 10%

**CPPD crystal seen**

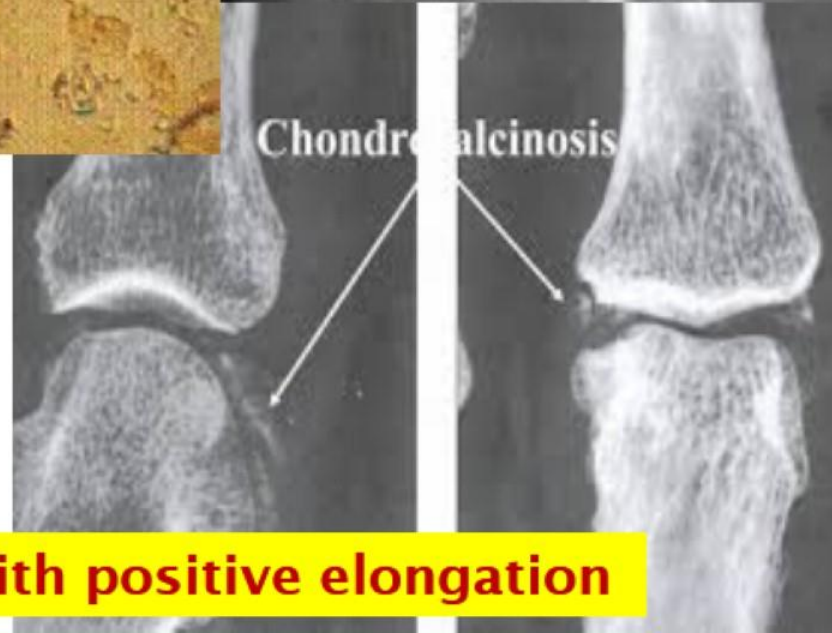
SF gram's stain ; no organism found

H/C, SF culture ; no growth

SF for AFB, PCR TB and culture TB ; negative.

# CPPD : Calcium Pyrophosphate Dihydrate

**Chondrocalcinosis**



**Weakly positive birefringent with positive elongation**

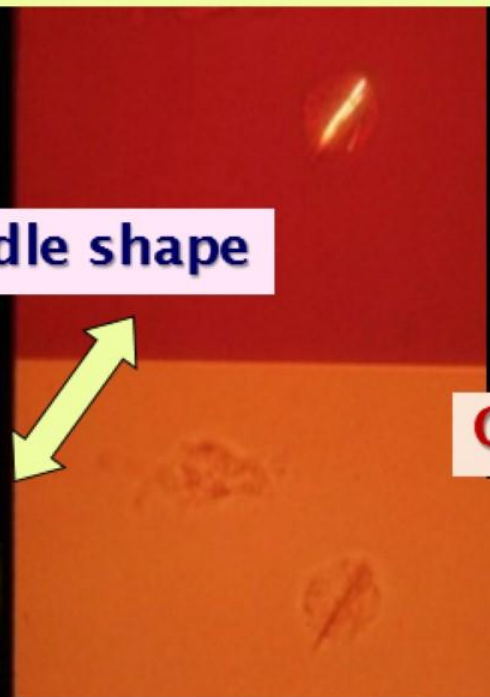


# GOUTY ARTHRITIS

Strongly Positive birefringens with negative elongation



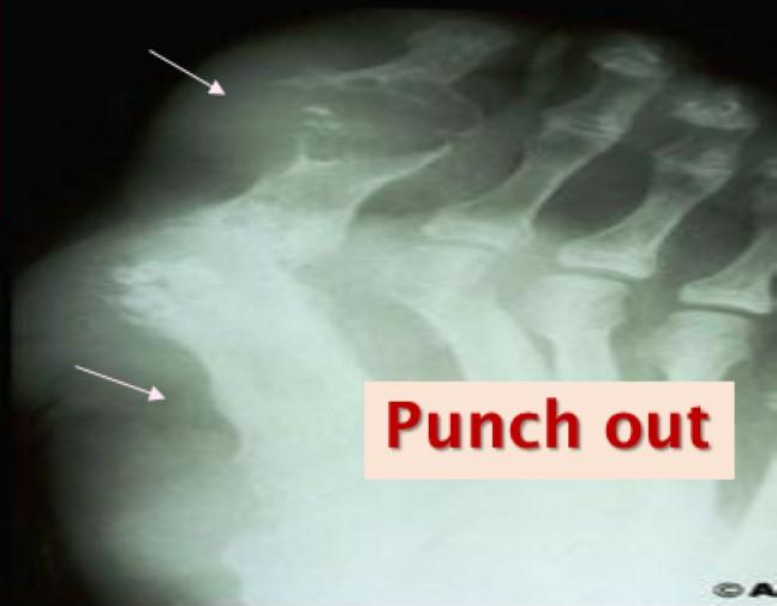
Needle shape



Overhanging

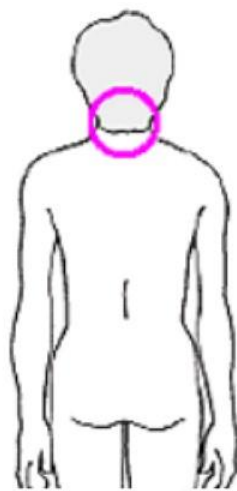
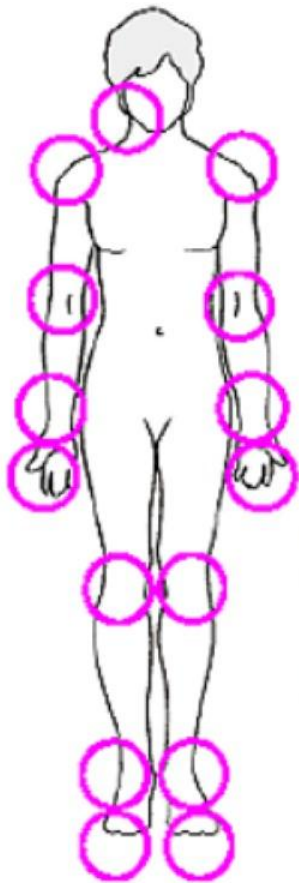


Tophi

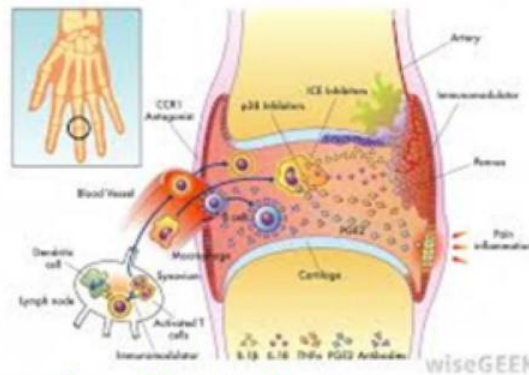


Punch out

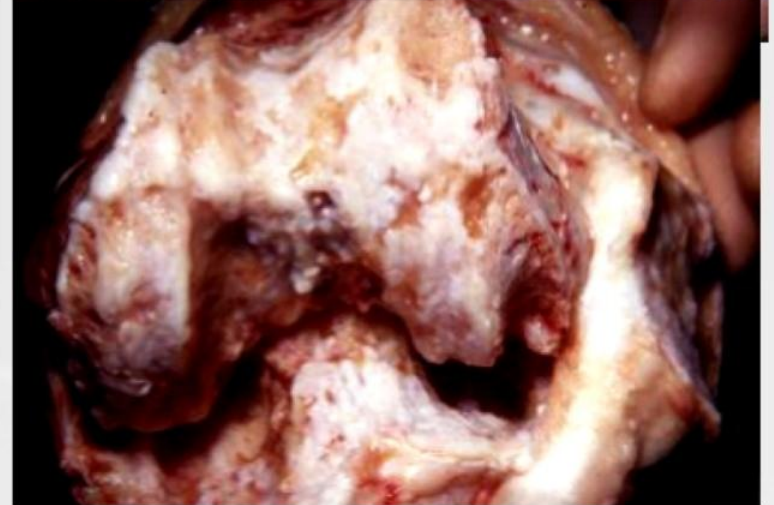
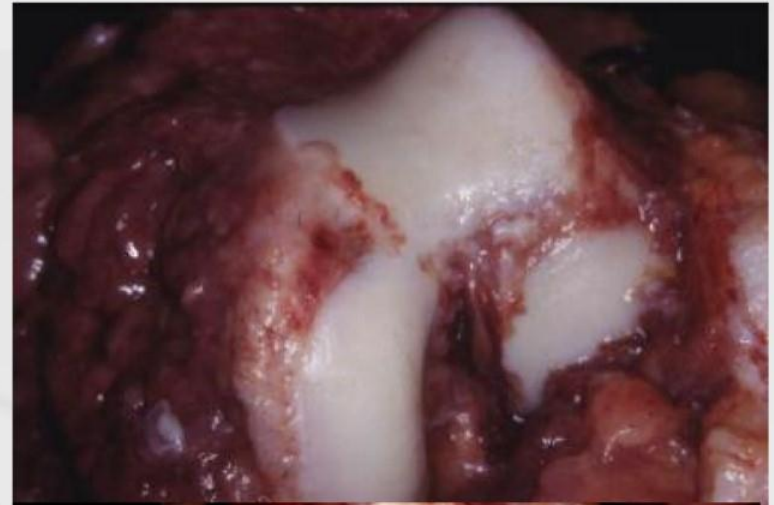
# RHEUMATOID ARTHRITIS



Rheumatoid arthritis



Joints that may be affected  
by rheumatoid arthritis





**Laxity of supporting soft tissue structures;  
Characteristic changes of hands**

**Ulna**

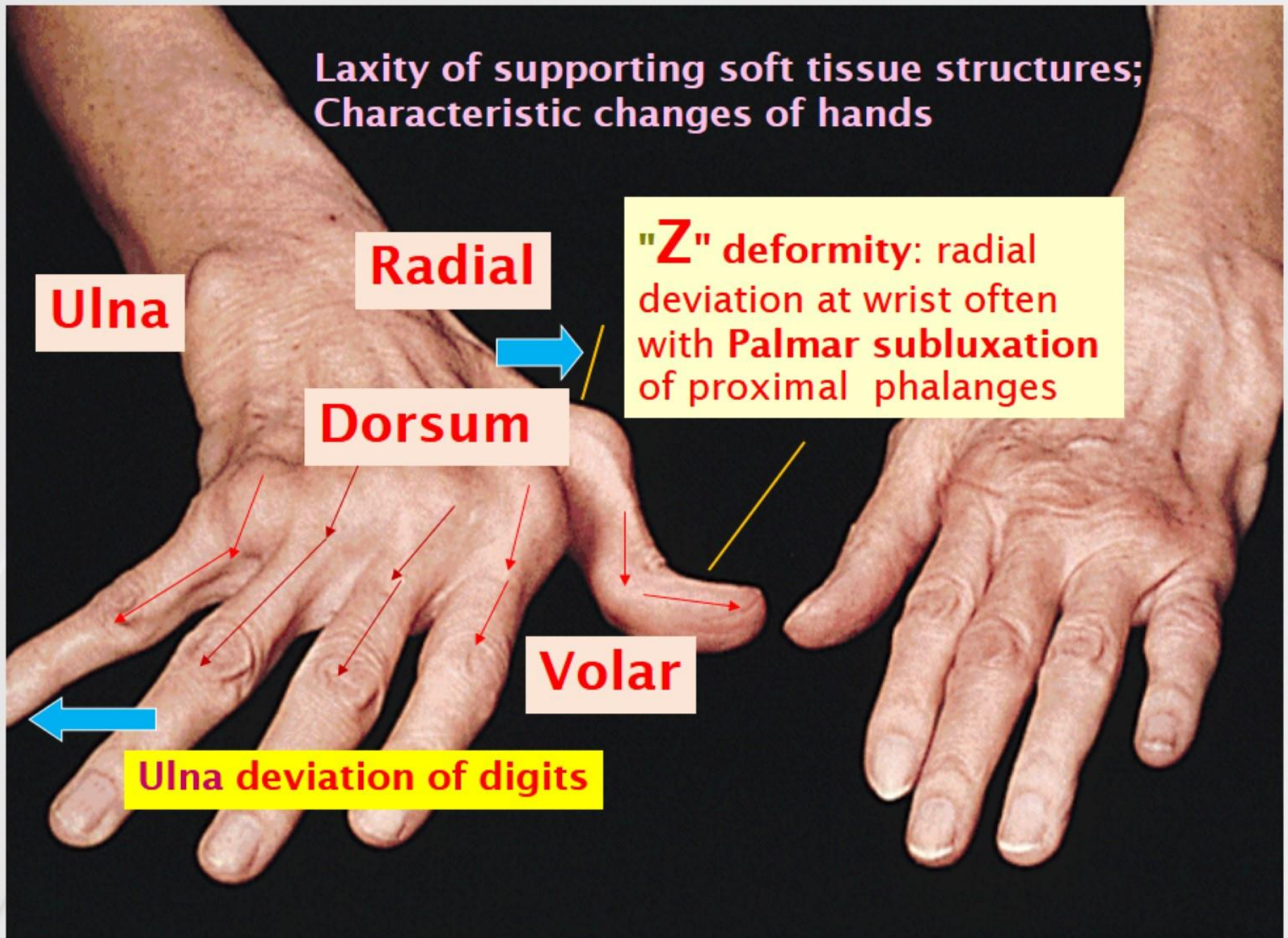
**Radial**

**Dorsum**

**"Z" deformity:** radial deviation at wrist often with **Palmar subluxation** of proximal phalanges

**Volar**

**Ulna deviation of digits**







**TABLE 1: 1987 ACR Classification Criteria For RA**

1987 Classification Criteria	
Criteria	<ol style="list-style-type: none"> <li>1. Morning stiffness (at least one hour)</li> <li>2. Arthritis in three or more joint areas</li> <li>3. Arthritis of hand joints (<math>\geq 1</math> swollen joints)</li> <li>4. Symmetric arthritis</li> <li>5. Rheumatoid nodules</li> <li>6. Serum RF</li> <li>7. Radiographic changes (erosions) on X-rays of hands</li> </ol>
Applicable for	All arthritis patients
Results in	Classification of RA (yes/no)
Positive in case	Four of the seven criteria must be present. Criteria one through four must have been present for at least six weeks.
Test characteristics	Sensitivity of 79%–80% and specificity of 90%–93% for established RA. Sensitivity of 77%–80% and specificity of 33%–77% for early RA.

# Previous Criteria for RA

**Table 2 – The 1987 revised American College of Rheumatology criteria for the classification of RA<sup>a</sup>**

Criterion	Definition
1. Morning stiffness for 6 weeks	Morning stiffness of joints lasting at least 1 hour before maximal improvement
2. Arthritis of 3 or more joint areas for 6 weeks	At least 3 joint areas simultaneously have soft tissue swelling or fluid observed by physician
3. Arthritis of hand joints for 6 weeks	At least 1 joint area swollen (as in criterion 2) in the wrists, MCP joints, or PIP joints
4. Symmetrical arthritis for 6 weeks	Simultaneous involvement of the same joint area (as in criterion 2) on both sides of body
5. Rheumatoid nodules	Subcutaneous nodules over bony prominences or extensor surfaces, or around joints
6. Serum rheumatoid factor	Presence of abnormal amounts of rheumatoid factor by any method, with < 5% in controls
7. Radiographic changes	Changes typical of RA on hand and wrist radiographs, such as erosions and periarticular osteopenia

RA, rheumatoid arthritis; MCP, metacarpophalangeal; PIP, proximal interphalangeal.

<sup>a</sup> A patient is said to have RA if at least 4 of the 7 criteria are present.

Data from Saraux A et al. *Arthritis Rheum.* 2001.<sup>12</sup>



Categories	Score
Patients who need to be investigated: (1) At least one joint involved with definite clinical synovitis (2) Patients presenting with synovitis not explained by any other disease	
Classification criteria for RA (add scores of categories A-D; definite RA = a score of $\geq 6/10$ )	
<b>A) Joint involvement</b>	
• 1 large joint	0
• 2–10 large joints	1
• 1–3 small joints ( with or without large joint involvement)	2
• $\geq 4$ –10 small joints ( with or without large joint involvement)	3
• $>10$ joints ( with at least 1 small joint involved)	5
<b>B) Serology ( at least 1 test result is needed for classification)</b>	
• Negative RF and negative ACPA	0
• Low positive RF or low positive ACPA	2
• High positive RF or high positive ACPA	3
<b>C) Acute-phase reactant (at least 1 test result is needed for classification)</b>	
• Normal CRP and normal ESR	0
• Abnormal CRP or abnormal ESR	1
<b>D) Duration of symptoms</b>	
• $<6$ weeks	0
• $\geq 6$ weeks	1
<b>Abbreviations:</b> <b>ACPA:</b> Anti-citrullinated protein antibody; <b>CRP:</b> C reactive protein; <b>ESR:</b> Erythrocyte sedimentation rate; <b>RA:</b> Rheumatoid arthritis; <b>RF:</b> Rheumatoid factor	

**Table 1. Sensitivity and Specificity of Frequently Used Classification Criteria for Chronic Immune-mediated Rheumatic Diseases.**

Classified Disease	Sensitivity (%)	Specificity (%)	Comment or Reference of Validation Studies	Classification Study Reference
Spondyloarthritis (SpA)	83%	84%	Comparison of 2 sets of candidate criteria	Rudwaleit <i>et al.</i> , 2009
(Early) rheumatoid arthritis	85%	50%	Britsemmer <i>et al.</i> , 2011	Aletaha <i>et al.</i> , 2011
	97%	55%	Kennish <i>et al.</i> , 2012	
	74%	74%	van der Linden <i>et al.</i> , 2011	

# NEW Criteria for RA

## ACR/EULAR Classification Criteria for RA

0
1
2
3
5
0
2
3
0
1
0
1

$\geq 6$  = definite RA

What if the score is  $<6$ ?

Patient might fulfill the criteria...

→ **Prospectively** over time  
(cumulatively)

→ **Retrospectively** if data on all  
four domains have been  
adequately recorded in the past



# Comparison of Criteria for RA

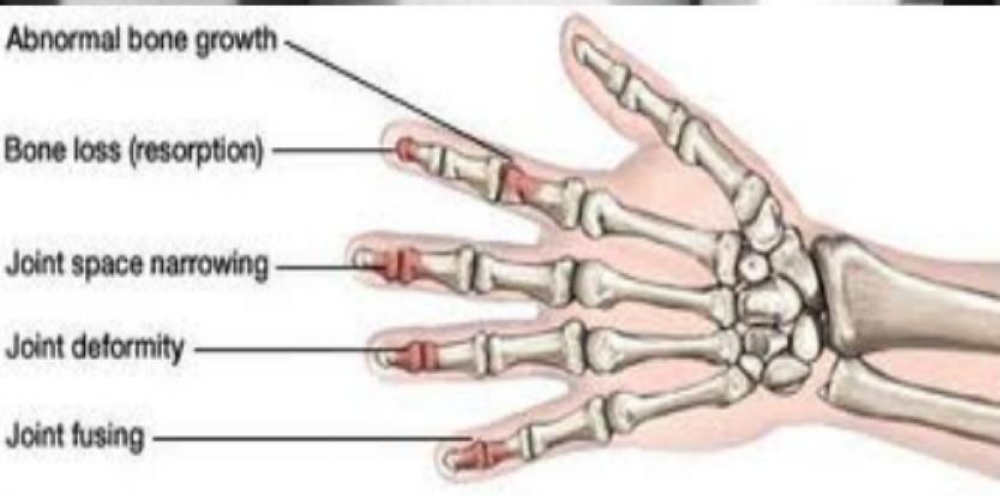
■ Table 1. Comparison of Historical and Current Classification Criteria for RA<sup>28</sup>

Criteria	1987 Criteria <sup>7</sup>		2010 Criteria <sup>8</sup>	
	Description	Score	Description	Score
Morning stiffness	In and around joints, for at least 1 hour	1	Clinical synovitis/swelling in at least 1 joint not explained by another disease	NA
Joint involvement	Physician observed soft tissue swelling or fluid in 3 of 14 possible joints	1	1 large joint	0
			2-10 large joints	1
			1-3 small joints (with or without large joint)	2
			4-10 small joints (with or without large joint)	3
			>10 joints (at least 1 small)	5
Arthritis of hand joints	At least 1 swollen hand or wrist area	1	NA	NA
Symmetric arthritis	Simultaneous bilateral involvement	1	NA	NA
Rheumatoid nodules	Subcutaneous nodules over bony prominences, extensor surfaces, or in juxtaarticular regions observed by physician	1	NA	NA
Serology	Positive RF serum test	1	Negative RF and negative ACPA	0
			Low-positive RF or ACPA	2
			High-positive RF or ACPA	3
Radiographic changes	Erosions or unequivocal bony decalcification in or adjacent to the involved joints, but not consistent with osteoarthritis	1	NA	NA
Acute phase reactants	CRP and ESR	NA	Normal CRP and ESR	0
			Abnormal CRP or ESR	1
Duration of symptoms	First 4 criteria must be present for at least 6 weeks	NA	<6 weeks	0
			≥6 weeks	1
Criteria score required		≥4/7		≥6/10

ACPA indicates anti-citrullinated protein antibody; CRP, C-reactive protein; ESR, erythrocyte sedimentation rate; NA, not applicable; RF, rheumatoid factor.



## Psoriasis Arthritis: Polyarticular type



## **๓.การรักษา**

- **Non-medication**
- **Medication(s)**
  - **NSAIDs +/- Corticosteroid**
  - **DMARDs**
  - **SYSADO**
  - **Calcium-vitamin D and Bisphosphonate etc.**



ชาย 43 ปี ชาวเยอรมัน  
เปลี่ยนเครื่องหลายที จุดหมายที่มัลดีฟ  
มีใช้หนาวสั้น ปวดตามข้อมือ ข้อมันว ข้อเข้าข้อเท้า 3 วัน  
ปกติแข็งแรงดี







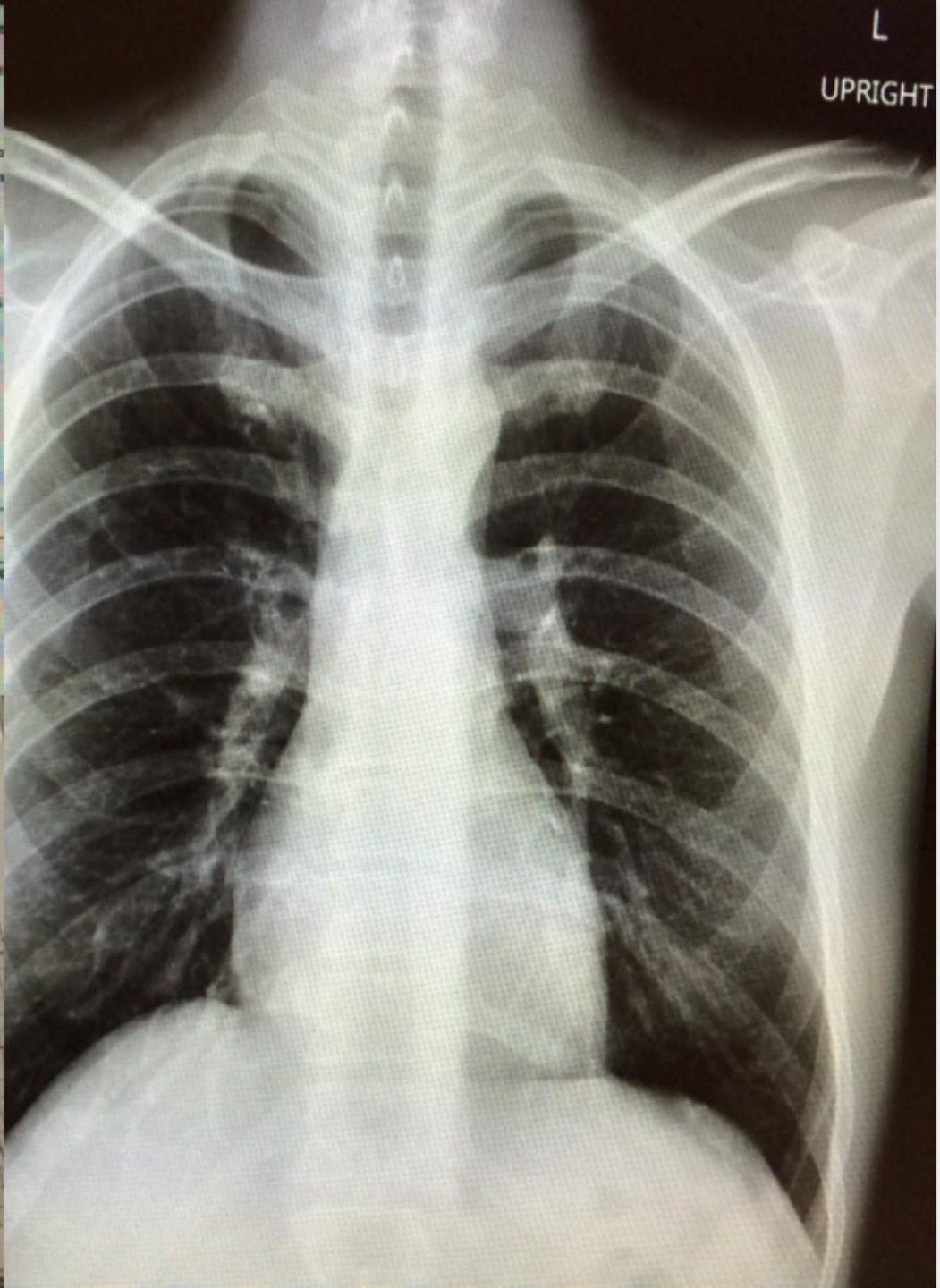
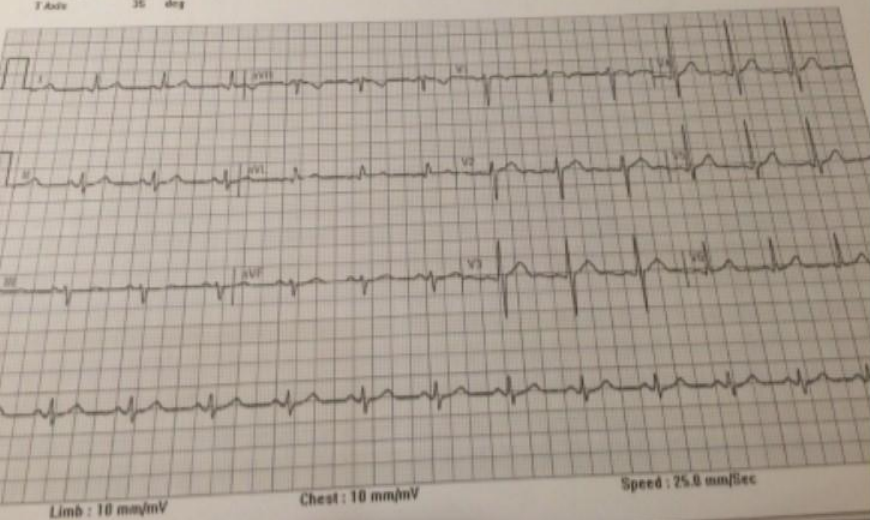
LVIDs	1.37 cm	Sinus to valsava	3.53 cm	MV A Vel
LVPWs	1.49 cm			MV E/A Rat
EDV(Teich)	131.20 ml			MV PHT
ESV(Teich)	39.50 ml			MVA By PH
EF(Teich)	69.90 %			E'
%FS	39.72 %			E/E'
SV(Teich)	91.71 ml			Lateral E'
SI(Teich)	47.52 ml/m <sup>2</sup>			LVOT maxP
LVd Mass	222.96 g			LVOT mean
LVs Mass	179.25 g			LVOT VTI
LVd Mass Index	115.52 g/m <sup>2</sup>			HR
LVs Mass Index	92.88 g/m <sup>2</sup>			LVSV Dopp
Ao Diam	2.80 cm			LVCO Dopp
LA Diam	3.70 cm			AV maxPG
AV Cusp	2.36 cm			AV meanPG
LA/Ao	1.32			AV VTI
TAPSE	22.245 mm			AVA Vmax
IVC collapse	50.00 %			AVA (VTI)
IVC max	1.89 cm			PV Vmax
IVC min	0.94 cm			PV maxPG
IVS/Post wall	0.97			TVs
RWT	0.38			

### Echo Summary

- Normal LV size and good contraction, no regional wall motion abnormality, EF 69%
- The right heart was within normal limit
- Valves were intact, tricuspid aortic valve
- Trivial MR, trivial TR
- E/E' 4.56

### IMP: Near normal Echo study

PATIENT'S NAME		8437	85/10/1971	Height 8 cm	Weight 9 kg
Heart Rate	77	bpm	normal sinus rhythm	15/07/2016 12:54:44	
PR Interval	138	ms	left axis	Approved by CHATTANJHI YOGENDRA M.D.	
QRS Duration	184	ms	ECG without pathological findings		
QT Interval	391	ms			
QTc Interval	445	ms			
P Axis	58	deg			
QRS Axis	15	deg			
T Axis	35	deg			



ท่านสงสัยโรคใด ?

1. Septic Arthritis
2. Reactive Arthritis
3. Crystal Arthritis
4. Rheumatoid arthritis
5. Rheumatic fever

# Acute Polyarthrititis

## Infectious-related

- Viral – Parvovirus  
HIV, HBV, Chikungunya  
etc.
- Bacterial esp.  
Gonococcal
- Rheumatic fever
- Lyme disease

## Non-Infectious related

- HSP
- Sickle-cell disease
- Leukemia
- Sarcoidosis
- Episode of  
Intermittent and  
chronic arthritis



# Acute bacterial arthritis (Septic arthritis)

- **Gonococcal arthritis** (5-10%)

- **Non-Gonococcal arthritis**

  - Gram + cocci - **Staph 30-50%**

  - Strept 15-30%

  - Gram - Rod - Enterobacteriaceae 10-20%  
(SLE : Salmonellar sp)

## 3 Mechanisms

1. Hematogenous (Bacteremia)
2. Extension from adjacent tissue
3. Direct penetration

# Association factors and causative agent

## 1. Age

Newborn; Gr.B strept., Enterobacteriaceae,  
S.aureus, K.Kingae

2 mo – 2 yr; H.influenza, S.aureus, S.pneumo

Reproductive; S.aureus, Strep.spp., N.gono.,  
Enterobacteriaceae

Pregnancy, postpartum, menstruation; N. gono

Elderly; S.aureus, Strep.spp., Enterobacteriaceae



# Association factors and causative agent

## 2. Underlying conditions

DM, Alcoholic, Cirrhosis, CRF, Malignancy;

S.aureus., Strep.spp., Enterobacteria

(B.Pseudomallei)

SLE; S.aureus, S.pneumo., Salmonella, Norcardia

IVDU/HIV; S.aureus, Strep.spp., P.aeruginosa

Hemoglobinopathy ; S.aureus, S.pneumo.,  
Salmonella

# Association factors and causative agent

## 3. Drugs

Steroid, chemotherapy,  
immunosuppression;

S.aureus, Strep.spp., Enterobacteriaceae

## 4. Joint disease

OA; S.aureus, Strep.spp., Enterobacteriaceae

RA; S.aureus, Enterobacteriaceae

Prosthetic joint; Strep.spp., S.epidermidis  
(MRSE), S.aureus (MRSA), P.aeruginosa

# Association factors and causative agent

## 5. Animal bite

Cat/Dog; Pasteurella multocida,  
Capnocytophaga spp.

Rat; Streptobacillus moniliformis,  
oral flora- anaerobes, Strep.spp.,  
E.coli



**Table 1. Common Bacterial Etiologies of Septic Arthritis**

Native Joints	Prosthetic Joints
<p>Gram positive cocci</p> <ul style="list-style-type: none"><li><i>Staphylococcus aureus</i></li></ul> <p>Streptococci</p> <ul style="list-style-type: none"><li><i>Streptococcus pyogenes</i></li><li><i>Streptococcus pneumoniae</i></li><li>Group B streptococci</li><li>Viridans group streptococci</li></ul> <p>Gram positive bacilli</p> <ul style="list-style-type: none"><li><i>Clostridium</i> sp.</li></ul> <p>Gram negative cocci</p> <ul style="list-style-type: none"><li><i>Neisseria gonorrhea</i></li></ul> <p>Gram-negative bacilli</p> <ul style="list-style-type: none"><li>Enteric gram-negative bacilli (e.g. <i>Escherichia coli</i>)</li><li><i>Pseudomonas aeruginosa</i></li><li><i>Eikenella corrodens</i> (following human bite trauma)</li><li><i>Pasteurella multocida</i> (following animal bite trauma)</li><li><i>Kingella kingae</i> (especially pediatric cases)</li><li><i>Haemophilus influenza</i> (especially pediatric cases)</li></ul>	<p>Early infection (up to 3 months post-operative)</p> <ul style="list-style-type: none"><li><i>S. aureus</i> (including methicillin-resistant)</li><li><i>Streptococcus pyogenes</i></li><li><i>Enterococcus</i> sp.</li><li>Gram-negative bacilli</li></ul> <p>Delayed infection (4–24 months post-operative)</p> <ul style="list-style-type: none"><li>Coagulase-negative staphylococci</li><li><i>Propionibacterium acnes</i></li><li>Other skin commensals</li></ul> <p>Late infection (more than 24 months post-operative)</p> <ul style="list-style-type: none"><li>Coagulase-negative staphylococci</li><li><i>S. aureus</i></li><li>Viridans group streptococci</li><li>Gram-negative rods, especially <i>E. coli</i></li><li>Anaerobes</li></ul>

References: 9-11, 13, 16, 19, 21, 22

เจาะตรวจน้ำไขข้อทุกรายใน

# **Acute monoarthritis**

## **Synovial fluid analysis**

1. Gross, viscosity, clarity & Microscopic
2. Protein, Glucose level
3. Gram vs Culture

## 1. Fresh SF 1 drop

- Cell (HF) = 1x500/cub.mm.
- Crystal, cell type

## 2. SF

- Positive gram 50 % (GC ~25-30%)
- Hemo C/S 50 %
- SF C/S >90 %
- Culture growth: delayed in “HACEK” (fastidious/ slow growing organisms) need >2 wks



**Categories of synovial fluid based upon clinical and laboratory findings**

Measure	Normal	Noninflammatory	Inflammatory	Septic	Hemorrhagic
Volume, mL (knee)	<3.5	Often >3.5	Often >3.5	Often >3.5	Usually >3.5
Clarity	Transparent	Transparent	Translucent-opaque	Opaque	Bloody
Color	Clear	Yellow	Yellow to opalescent	Yellow to green	Red
Viscosity	High	High	Low	Variable	Variable
WBC, per mm <sup>3</sup>	<200	200-2,000	2,000-10,000	>100,000*	200-2,000
PMNs, percent	<25	<25	≥50	≥75	50-75
Culture	Negative	Negative	Negative	Often positive	Negative
Total protein, g/dL	1-2	1-3	3-5	3-5	4-6
LDH (compared to levels in blood)	Very low	Very low	High	Variable	Similar
Glucose, mg/dL	Nearly equal to blood	Nearly equal to blood	>25, lower than blood	<25, much lower than blood	Nearly equal to blood

\* Lower with infections caused by partially treated or low virulence organisms

● ยาปฏิชีวนะที่ใช้ในการรักษาเชื้อแบคทีเรียที่ทำให้เกิดข้ออักเสบติดเชื้ออย่างฉับพลันก่อให้เกิดผลเฉพาะเชื้อ และความไวต่อยา

ชนิดของเชื้อที่น่าจะเป็นสาเหตุของข้ออักเสบ	ยาปฏิชีวนะชนิดฉีดเข้าหลอดเลือดดำตัวแรกที่ควรให้	ขนาดของยาชนิดฉีดในผู้ใหญ่	ยาปฏิชีวนะชนิดฉีดเข้าหลอดเลือดดำที่เป็นตัวเลือก	ยาปฏิชีวนะชนิดรับประทานที่สามารถใช้ได้ <sup>1</sup>	ระยะเวลาที่ให้ยาในการรักษา
Methicillin-sensitive Staphylococcus aureus และ Methicillin-sensitive S.epidermidis	Cloxacillin	6-8 กรัม/วัน	Cefazolin, Clindamycin, <sup>2</sup> Vancomycin <sup>2</sup>	Dicloxacillin, Cephalexin, Cefuroxime axetil, Clindamycin	4-6 สัปดาห์
Methicillin-resistant Staphylococcus aureus และ Methicillin-resistant S.epidermidis	Vancomycin	30 มก./กก./วัน	Teicoplanin	ขณะนี้ยังไม่มียาใดในประเทศไทยที่โดยผล ในทางประจักษ์เริ่มมียาชนิดที่รับประทานแล้ว	4-8 สัปดาห์
Streptococci	Penicillin G <sup>3</sup>	12-18 ล้าน uni/วัน	Cefazolin, Clindamycin, <sup>2</sup> Vancomycin <sup>2</sup>	Amoxycillin, Cephalexin, Cefuroxime axetil, Clindamycin <sup>2</sup>	2-6 สัปดาห์
Enterococci	Penicillin G + Gentamicin	PGS 12-18 ล้าน uni/วัน, Gentamicin 1.7 มก./กก. ทุก 8 ชั่วโมง	Amoxycillin/clavulanic acid, Clindamycin <sup>2</sup> , Vancomycin <sup>2</sup> ± Gentamicin	Amoxycillin, Amoxycillin/clavulanic acid, Cefuroxime axetil, Clindamycin <sup>2</sup>	2-6 สัปดาห์
Streptococcus pneumoniae	Penicillin G	12 ล้าน uni/วัน	Cefazolin, Ceftriaxone, Cefotaxime, Vancomycin <sup>2</sup>	Amoxycillin, Cephalexin, Cefuroxime axetil	2-4 สัปดาห์
Neisseria gonorrhoeae	Penicillin G	12 ล้าน uni/วัน	Ceftriaxone	Amoxycillin, Cefuroxime axetil, Cefixime	7-10 วัน
Hemophilus influenzae	Cefotaxime	6-8 กรัม/วัน	Ceftriaxone, Cotrimoxazole, Ampicillin	Amoxycillin/clavulanic acid, Cefuroxime axetil, Cefixime	2-4 สัปดาห์
Salmonella spp.	Cefotaxime Ceftriaxone	6-8 กรัม/วัน 1-2 กรัม/วัน	Ampicillin, Ciprofloxacin	Cotrimoxazole, Ampicillin, Ciprofloxacin, Cefixime	3-6 เดือน
Enterobacteriaceae (e.g. Escherichia coli, Klebsiella spp.)	Cefotaxime, Ceftriaxone	6-8 กรัม/วัน 1-2 กรัม/วัน	ตามผลความไวของเชื้อที่เพาะขึ้น ดอยยา	Cefixime, Ciprofloxacin ตามผลความไวของเชื้อที่เพาะขึ้น ดอยยา	4-6 สัปดาห์
Pseudomonas aeruginosa	Ceftazidime Aminicacin	3-6 กรัม/วัน 7.5 มก./กก. ทุก 12 ชม.	Ciprofloxacin, Cefepime, Carbapenems	Ciprofloxacin	4-8 สัปดาห์
Burkholderia pseudomallei	Ceftazidime Cotrimoxazole	3-6 g/วัน 8-10 mg trimethoprim /กก./วัน	Amoxycillin/clavulanic acid + Cotrimoxazole, Imipenem, Sulperazone	Cotrimoxazole + Amoxycillin/clavulanic acid Cotrimoxazole + Doxycycline, Cotrimoxazole + Ciprofloxacin	3-6 เดือน

1. ยาปฏิชีวนะชนิดรับประทานจะเริ่มให้หลังจากที่ผู้ป่วยตอบสนองดีต่อยาปฏิชีวนะชนิดฉีดเข้าหลอดเลือดดำ ซึ่งจะต้องได้อย่างน้อย 2 สัปดาห์ขึ้นไป (ยกเว้นข้ออักเสบจากการติดเชื้อหนองใน) ห้ามเปลี่ยนเป็นยาชนิดรับประทาน ถ้าการตอบสนองยังไม่ดี และไม่มีกรใช้ยาปฏิชีวนะชนิดรับประทานเป็นตัวแรกในการเริ่มการรักษาการติดเชื้อของข้อ
2. ใช้กรณีที่มีประวัติแพ้ penicillin แบบ type I hypersensitivity
3. การตอบสนองของ S.pneumoniae ต่อ penicillin ไม่สัมพันธ์กับผลความไวของเชื้อดอยยา

Organism	Antibiotics	
	Native joint infection	Prosthetic joint infection
Methicillin resistant <i>Staphylococcus aureus</i>	(I) First choice: Vancomycin 2× 1 g/d Linezolid 2× 600 mg/d	(I) First choice (in combination with Rifampicin 600–900 mg): Vancomycin 2× 1 g/d Teicoplanin 800 mg/d for the first 1–4 days, than 800 mg every 2 days Fluoroquinolone (e.g. Ciprofloxacin 2× 500–750 mg/d) Fusidic acid 3× 500 mg/d
Methicillin resistant coagulase negative staphylococci	(II) Alternatives: Cotrimoxazol, Doxycycline, Clindamycin, Rifampicin (always in combination)	(II) Alternatives: Linezolid, Quinupristin/Dalfopristin
Methicillin sensitive <i>Staphylococcus aureus</i>	(I) First choice: beta-lactamase stable penicillin (e.g. Flucloxacillin 4× 2–3 g/d, Nafcillin 4× 2 g/d) Clindamycin 3× 600–900 mg/d	(I) First choice (in combination with Rifampicin 600–900 mg): Flucloxacillin 4× 2–3 g/d Fluoroquinolone (e.g. Ciprofloxacin 2× 500–750 mg/d)
Methicillin sensitive coagulase negative staphylococci	(II) Alternatives: Cefazolin, Vancomycin	(II) Alternatives (in combination with Rifampicin): Cefazolin, Vancomycin
beta-hemolytic Streptococci	(I) First choice: Penicillin G 6× 2 million units/d Ampicillin 3× 2 g/d	(I) First choice: Penicillin G 6× 4–5 million units/d Ampicillin 3× 4 g/d
	(II) Alternatives: Clindamycin, Cefazolin	(II) Alternatives: Vancomycin, Ceftriaxone
<i>Enterococcus spec.</i>	(I) First choice: Ampicillin 3× 2 g/d Vancomycin 2× 1 g/d	(I) First choice: Ampicillin 3× 4 g/d Vancomycin 2× 1 g/d Teicoplanin 800 mg/d for the first 1–4 days, than 800 mg every 2 days
	(II) Alternatives: Linezolid	(II) Alternatives: Linezolid
<i>Escherichia coli</i>	(I) First choice: Ampicillin/Sulbactam 4× 3 g/d	(I) First choice: Ciprofloxacin 2× 500–750 mg/d Cefotaxime 3–4× 2 g/d Piperacillin/Tazobactam 3× 4 g/0.5g/d (II) Alternatives: Imipenem, Meropenem
	(II) Alternatives: Cefazolin, Fluoroquinolone (e.g. Ciprofloxacin), Gentamicin, Cotrimoxazole	
<i>Proteus mirabilis</i>	(I) First choice: Ampicillin 3× 2 g/d Fluoroquinolone (e.g. Ciprofloxacin 2× 500–750 mg/d)	
	(II) Alternatives: Cefazolin, Cotrimoxazole, Gentamicin	
<i>Proteus vulgaris</i> <i>Proteus rettgeri</i> <i>Morganella morganii</i>	(I) First choice: Cefotaxime 3–4× 2 g/d Imipenem 4× 500 mg/d Fluoroquinolone (e.g. Ciprofloxacin 2× 500–750 mg/d)	(I) First choice: Ceftazidime 3× 2 g/d + Fluoroquinolone (e.g. Ciprofloxacin 2× 500–750 mg/d) (II) Alternatives: Imipenem, Meropenem
	(II) Alternatives: Ampicillin, Gentamicin, free or fixed combination of beta-lactam/beta-lactamase inhibitor (e.g. combinations with Combactam or as Ampicillin/Sulbactam, Piperacillin/Tazobactam, Ticarcillin/Clavulanate)	
<i>Serratia marcescens</i>	(I) First choice: Cefotaxime 3–4× 2 g/d	
	(II) Alternatives: Fluoroquinolone (e.g. Ciprofloxacin) Gentamicin, Imipenem	
<i>Pseudomonas aeruginosa</i>	(I) First choice: Piperacillin 4× 3 g/d Imipenem 4× 500 mg/d	(I) First choice: Clindamycin 3× 600–900 mg/d Imipenem 4× 500 mg/d Metronidazole 3× 500 mg/d
	(II) Alternatives: Fluoroquinolone (e.g. Ciprofloxacin) Tobramycin, Amikacin	
Anaerobe infection	(I) First choice: Clindamycin 3× 600–900 mg/d Imipenem 4× 500 mg/d Metronidazole 3× 500 mg/d	(II) Alternatives: free or fixed combination of beta-lactam/beta-lactamase inhibitor (e.g. combinations with Combactam or as Ampicillin/Sulbactam, Piperacillin/Tazobactam, Ticarcillin/Clavulanate)

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2009;6(5):  
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10.7150/ijms.6.236



# Indication for open drainage

1. Large / Deep jt. Ex. Hip, shoulder, Sacroiliac (esp. childhood & elderly)
2. Underlying chronic inflammatory joint ex. RA
3. Medical failure
  - Loculation, fluid /pus
  - Persist PMN in SF
  - No clinical Response
4. Prosthetic joint infection

note: GC rarely O/D

# Prognosis

1. Elderly (>60 yrs)
2. Underlying joint disease (ex.RA)
3. Prosthetics septic arthritis
4. Deep / complicated jts (shoulder, hip)
5. Duration > 1 week since onset
6. Polyarticular septic arthritis (>4 joints)

- CBC **WBC** 11,740/mm<sup>3</sup> **Hb** 12.5g/dl MCV 90.2 fL  
PMN 9,932/mm<sup>3</sup> **lymp** 998/mm<sup>3</sup> **Plt**  
460,000/mm<sup>3</sup> no atypical lymp
- Serum iron 14 TIBC 162 ug/dL ferritin 237.8  
ng/ml
- Glucose, LFT, Cr, uric, CPK : all normal
- **ESR** 144.79 mm/hr **CRP** 94.56 mg/L
- ASO 200 IU/mL, HIV Ab-HBsAg-HCV Ab-Denque  
PCR-Chikungunya IgM-Mycoplasma IgM are all  
negative
- **Scrub typhus Ab** positive
- **Lyme disease** IgM positive, IgG indeterminate
- **RF** 80 iu/mL ANF FS 1:80
- Anti CCP Ab, Anti dsDNA, Sm, nRNP: all negative



- SF yellow/slightly turbid
  - Leucocyte 11,506 cells/mm<sup>3</sup>
  - Erythrocyte 3,000 cells/mm<sup>3</sup>
  - PMN 92 %
  - Mononuclear 8 %
  - Crystal not seen
- H/C \*III : all no growth
- SF gram's, culture aerobe, AFB, PCR for TB, culture TB: all negative



# LYME DISEASE



## Flu-Like Symptoms

- Headache
- Fatigue
- Fever
- Chills
- Sore Throat
- Muscle Aches



Hearing Loss

Paralysis of Face

Heart Complications  
Rapid or Slow Heart Rate  
Chest Pain

Syncope, Palpitations,  
Dyspnea

Insomnia

Hot, Swollen,  
Painful Joints

Psychological  
Complications  
(Long Term)

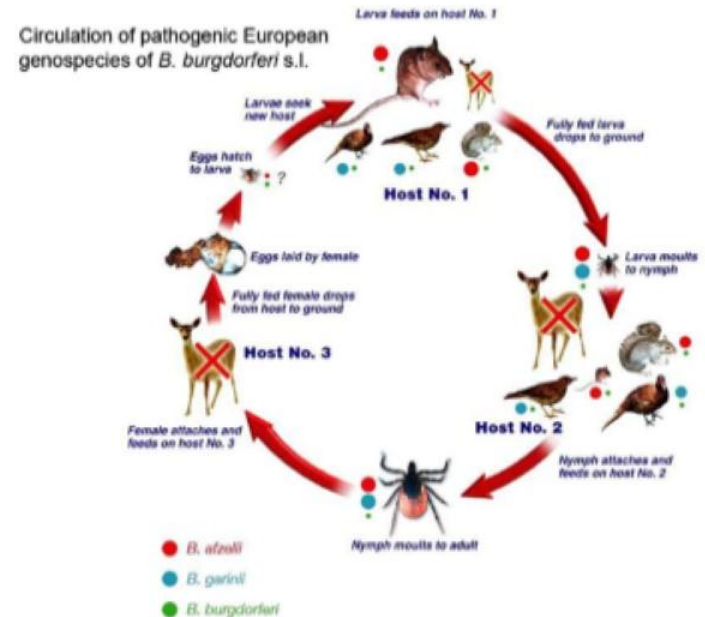
- Depression
- Dementia

Rash at the Site  
of the Tick Bite -  
Itching

C. MILLER



## Erythema migrans



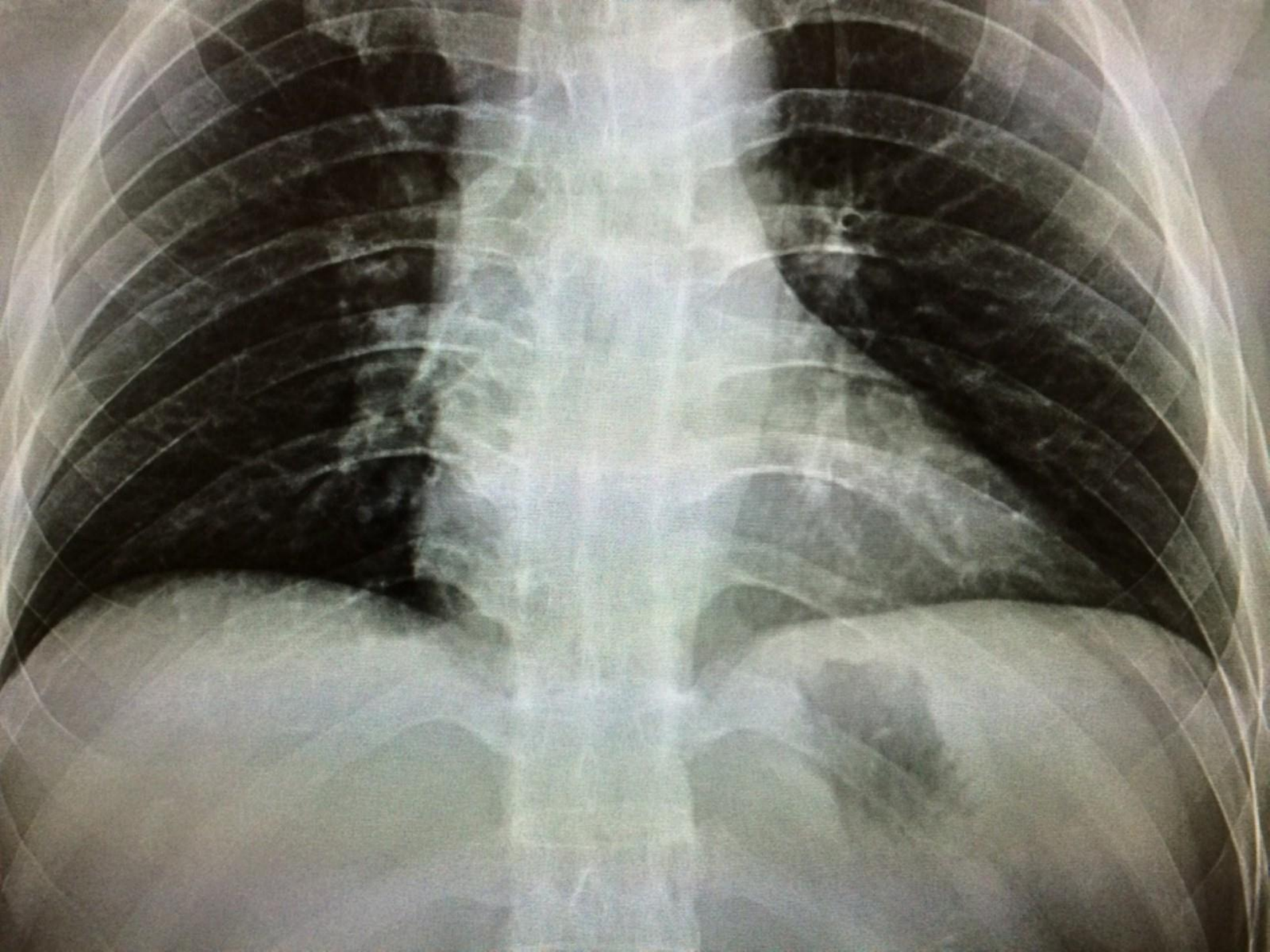
**ชาย 37 ปี**

**ปวดคอปวดหลัง เจ็บข้อเท้าขวาและฝ่าเท้า 2 ข้าง**

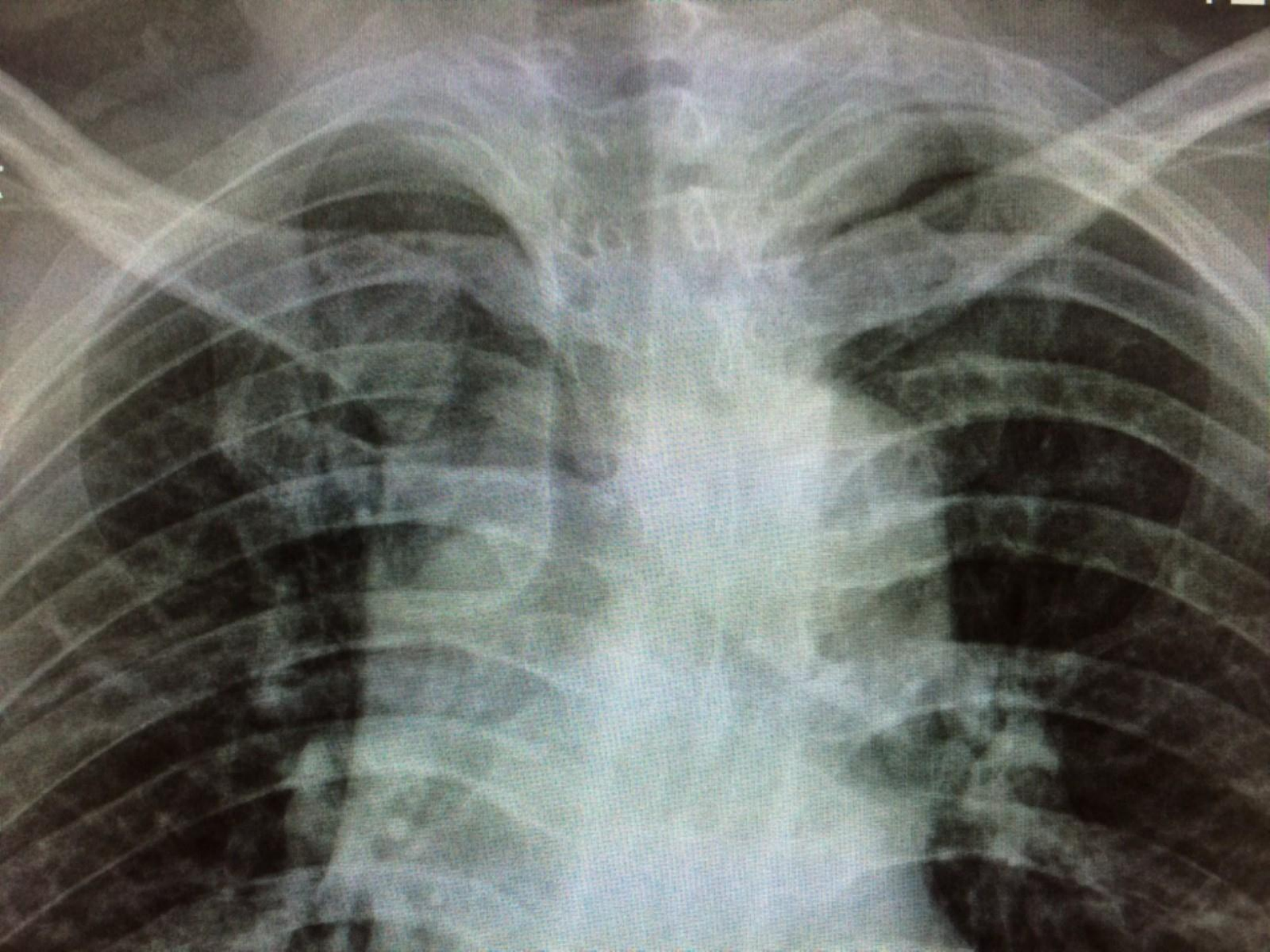
**เป็นๆหายๆ มา 18 ปี**

**หายใจเจ็บกระดูกอก มา 2 สัปดาห์**





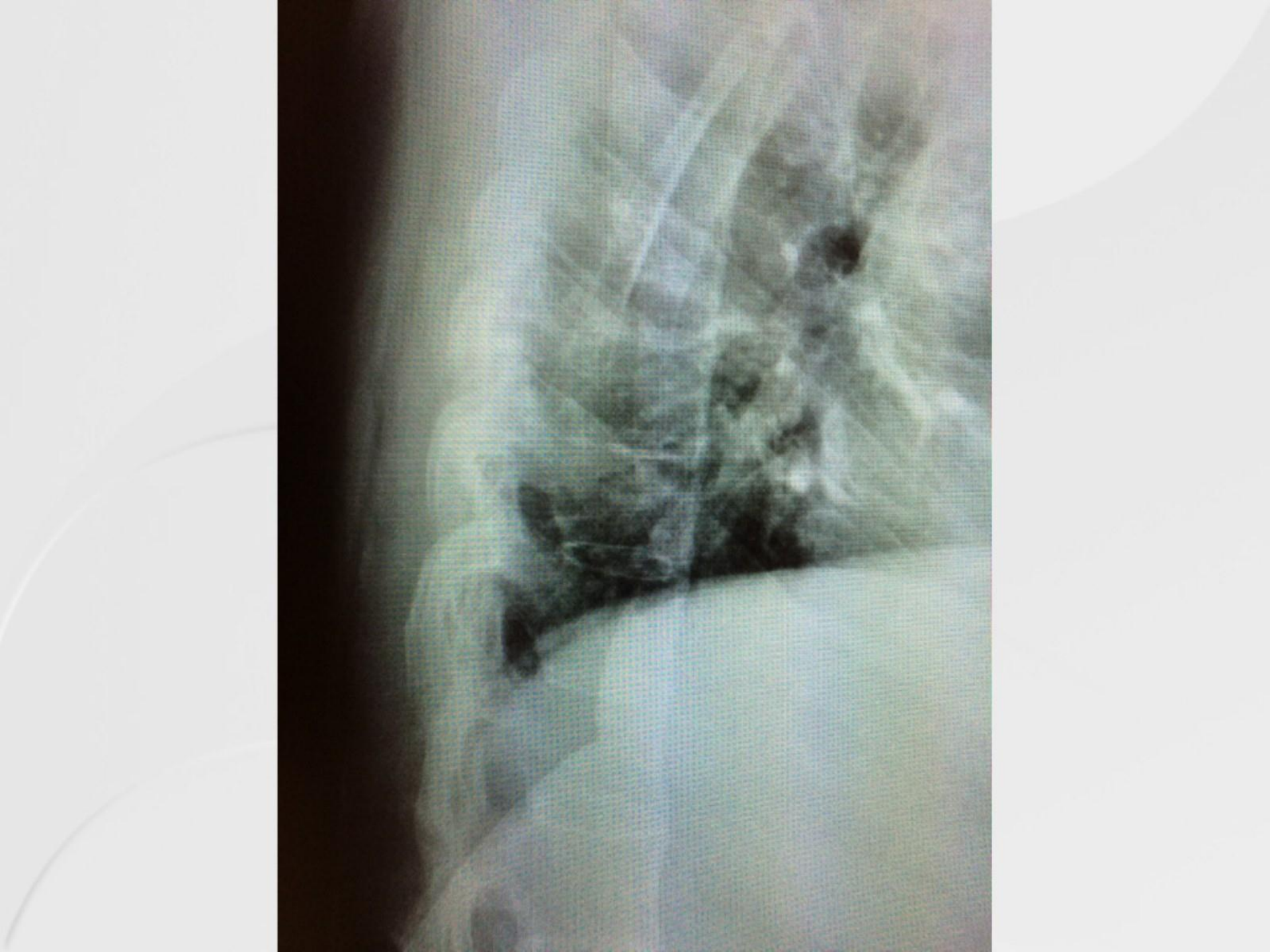


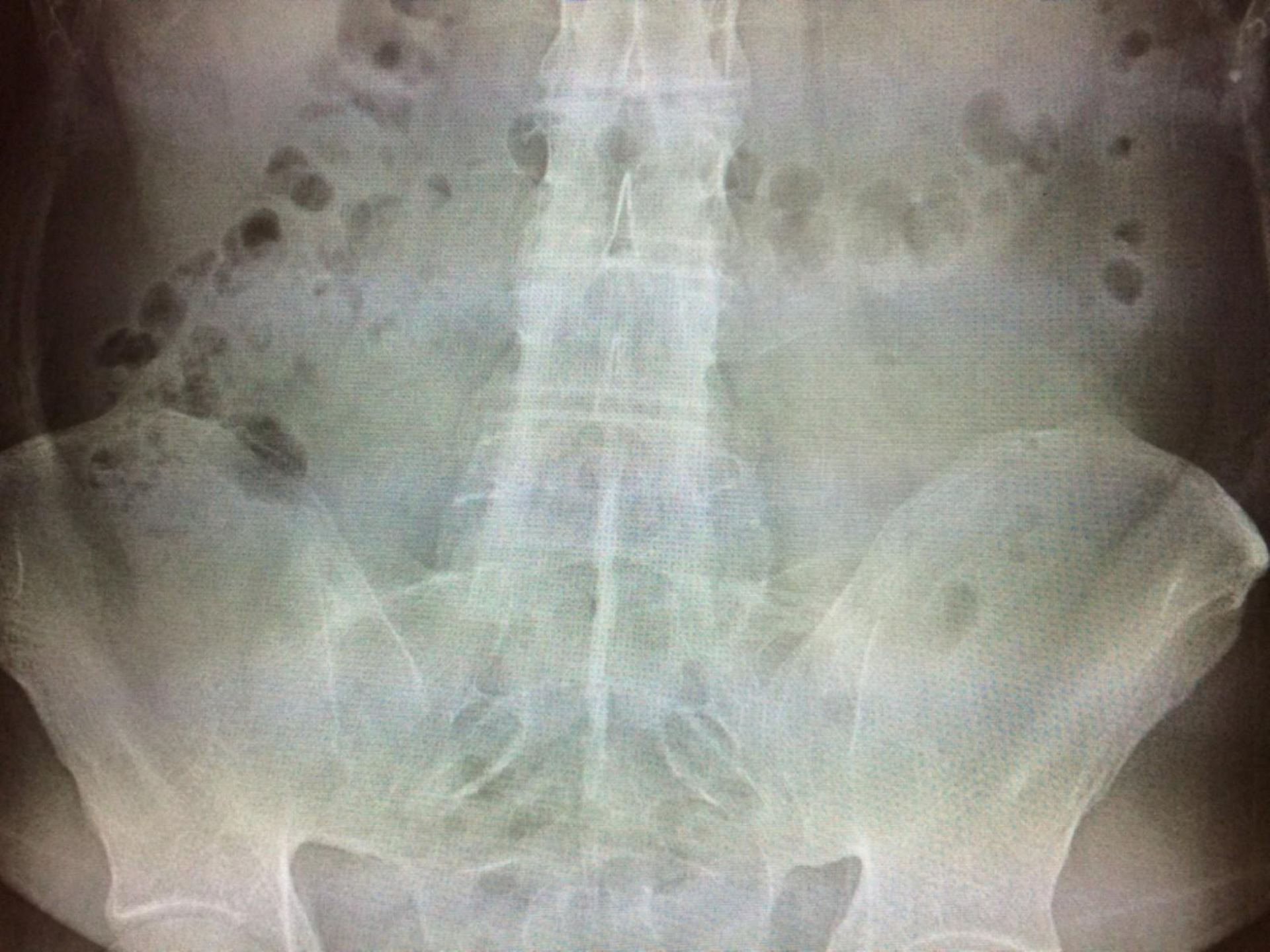


















## การวินิจฉัยของท่าน ?

1. TB spine
2. Spondyloarthritis
3. Diffuse Idiopathic skeletal hyperostosis (DISH)
4. Facet syndrome
5. Rickets

# Chronic Polyarthrititis

- RA
- CNTD
- SpA
- JCIA
- Chronic Tophaceous gout, CPPD-Pseudo RA
- Hypertrophic Osteoarthropathy
- Hypothyroidism/ Hyper PTH

# Ankylosing Spondylitis



Chronic LBP  
Flat LS spine  
LOM of Axial  
Gel phenomenon



Stoop  
shoulder



Extraarticular  
manifestation **Uveitis**





**Cervical flexion deformity in AS** The severity of cervical flexion deformity in ankylosing spondylitis can be assessed by measuring the occiput to wall distance (Flesche test). With the patient standing erect, the heels and the buttocks are placed against a wall. The patient is then instructed to extend his or her neck maximally in an attempt to touch the wall with the occiput. The distance between the occiput and the wall is a measure of the degree of flexion deformity of the cervical spine. Courtesy: Craig W Wiesenhuber, MD.

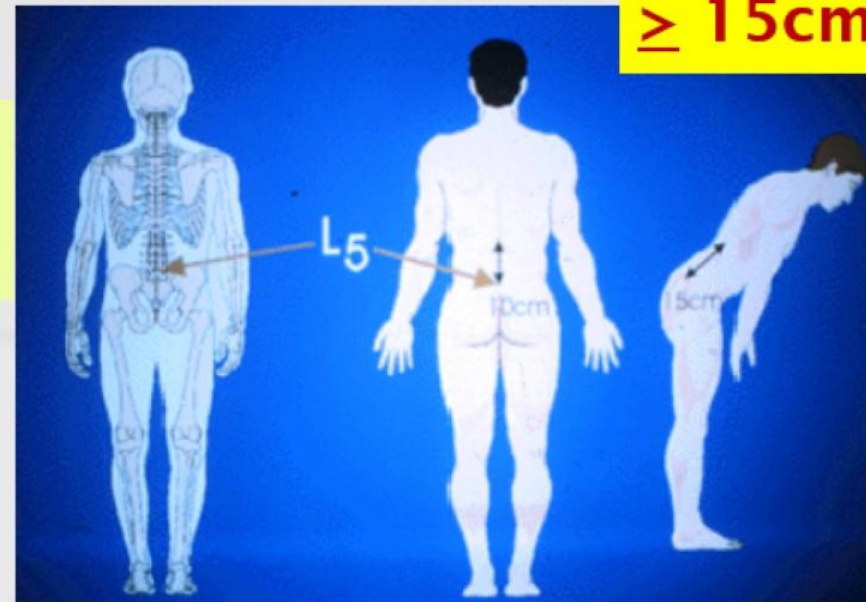
**OTW**



**Normal  
0 cm**

## Schober test

**$\geq 15\text{cm}$**



**Chest expansion**  
**Positive if  $\leq 5\text{ cm}$**

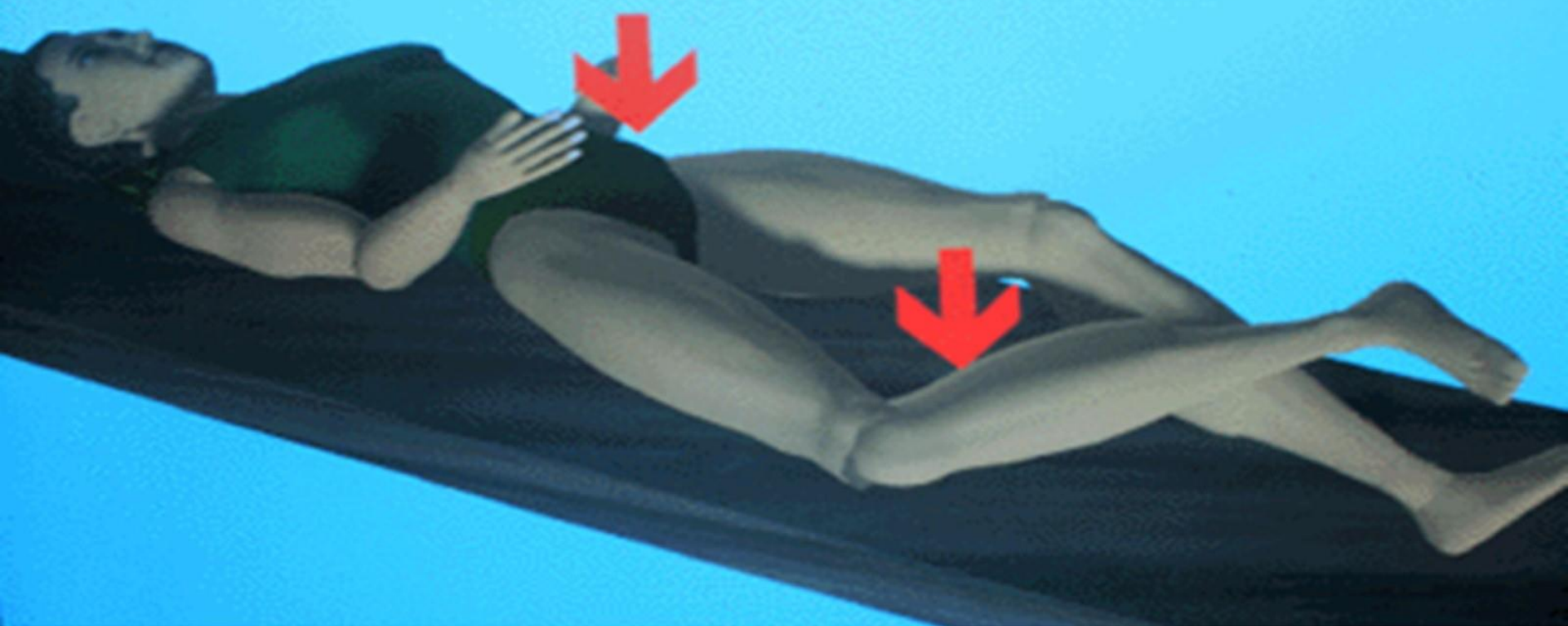
**FTF; finger to floor**  
**Patrick's**  
**Grensen's**

**Testing for low back flexion** Schober test to measure the forward flexion of the lumbar spine in a patient with suspected or proven ankylosing spondylitis. With the patient standing erect, make a mark over the spinous process of the 5th lumbar vertebra or on the imaginary line joining the posterior superior iliac spine. Make another mark 10 cm above it in the midline. When the patient bends maximally forward, the distance between the two points normally exceeds 15 cm. Courtesy of Craig W Wiesenhuber, MD.



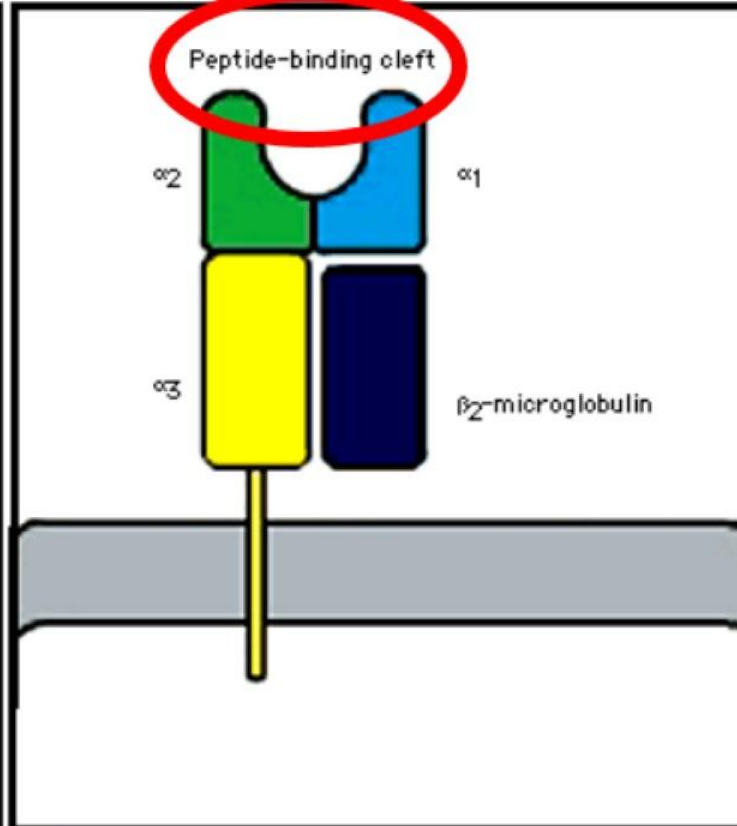
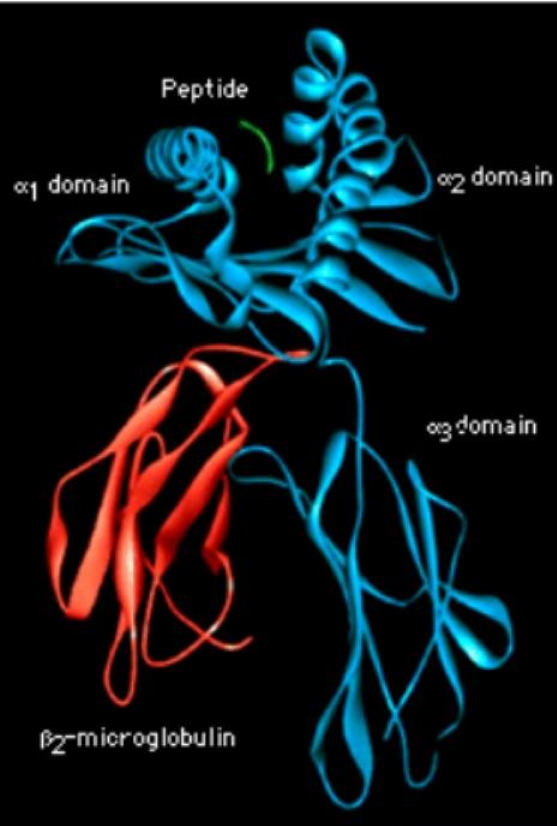
**Testing for sacroiliac tenderness** The patient can be examined for sacroiliac joint tenderness due to active sacroiliitis by applying direct pressure over each sacroiliac joint. Courtesy of Craig W Wiesenhuber, MD.





**Testing for sacroiliac pain** With the patient lying supine, he or she is instructed to flex one of the knees and then abduct as well as externally rotate the corresponding hip. Pressure on the flexed knee causes pain at the corresponding sacroiliac joint. Courtesy of Craig W Wiesenhutter, MD.





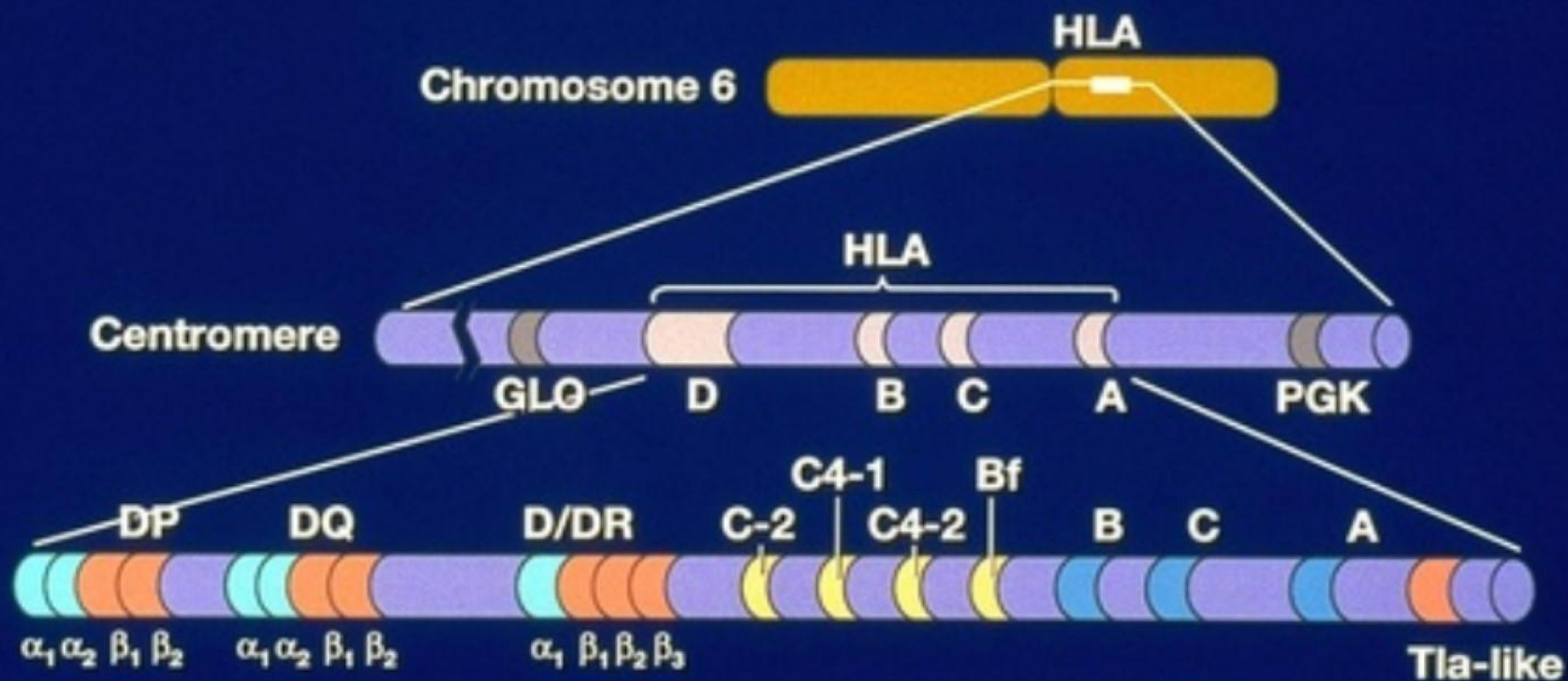
HLA-B27:

HLA-B allele  
of the MHC  
class I

Identical B  
pocket:  
arginine

**HLA class I molecule** Left panel: a ribbon diagram of the classical structure of HLA class I complex of alpha chain and beta 2-microglobulin is presented. The alpha chain is represented in blue and the non covalently bound beta 2-microglobulin in red. Right panel: schematic representation of the . indicates that the peptide binding region is comprised of portions of the alpha-1 and alpha-2 domains of the molecule. The alpha-3 domain is illustrated as being closely associated with beta 2-microglobulin. An extension from the alpha-3 domain penetrates the cell membrane and has a short cytoplasmic region. Reproduced with permission from: Lopez-Larrea, C, Gonzalez, S, Martinez-Borra, J. Molecular Medicine Today 1998; 4:450. Copyright © 1998 Elsevier Science. AND Copyright 1999 From: Janeway, C, (Ed), Immunobiology: The Immune System in Health and Disease, Garland Publishing, Elsevier Science, 1999. Reproduced with permission of Routledge, Inc., part of the Taylor & Francis Group.

# HLA Gene Complex



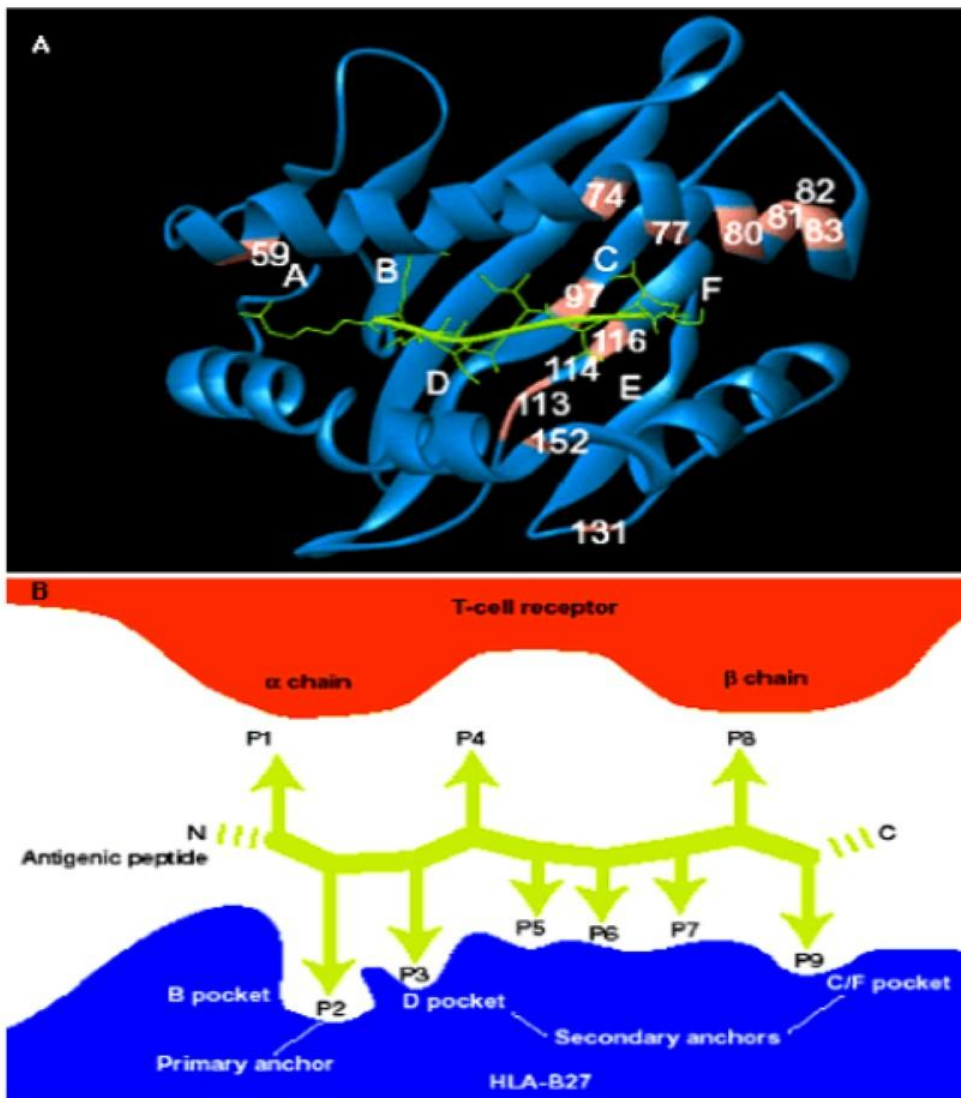
## HLA-B27: Disease Associations

---

Disease	Association
Ankylosing Spondylitis	> 90%
Reiter's Syndrome	80%
Reactive Arthritis	85%
Inflammatory Bowel Disease	50%
Psoriatic Arthritis	
With Spondylitis	50%
With Peripheral Arthritis	15%
Whipple's Disease	30%



- Subtypes of HLA-B27
  - 25 subtypes (HLA-B\*2701 to B\*2705)
  - HLA-B\*2705 : northern Europeans, Siberia, and North Americans
  - HLA-B\*2704 : Asian
  - HLA-B\*2706 : not associated
- Other genetic factors
- Non-HLA gene
- Twins study: Non-HLA-B27 genetic susceptibility
- Polygenic inheritance



## ✓ Endogenous proteins

Arthritogenic peptide hypothesis

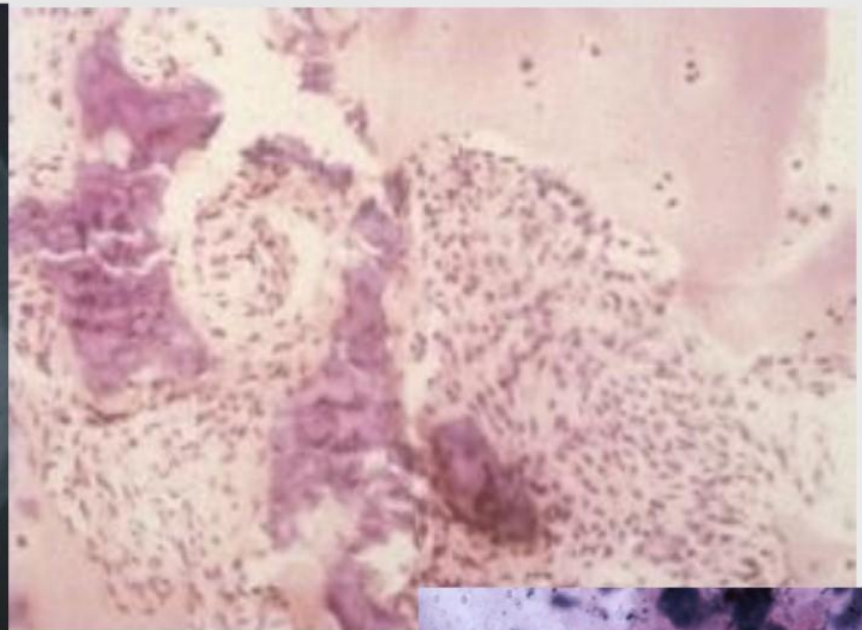
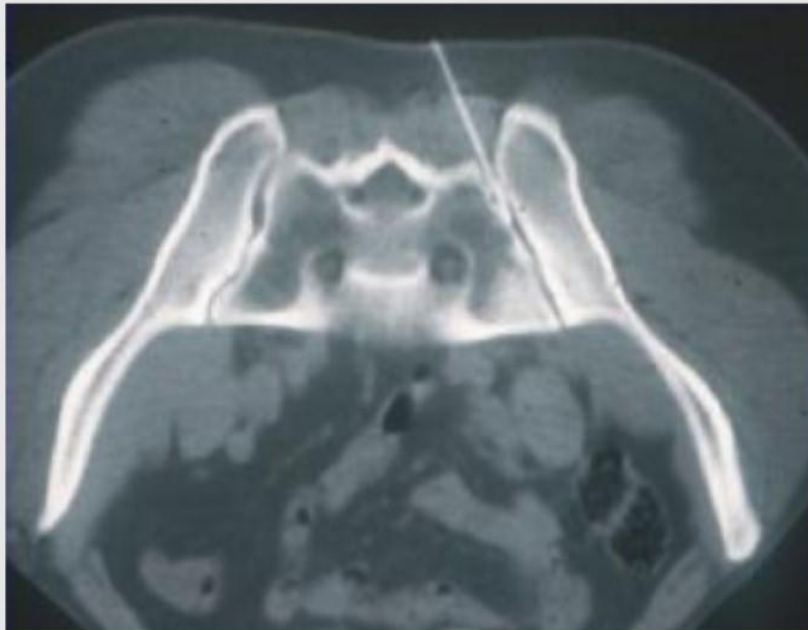
External Ag >> T cells >> endogenous peptides presented by HLA-B27

## ✓ Proteins of *viruses* and *bacteria*

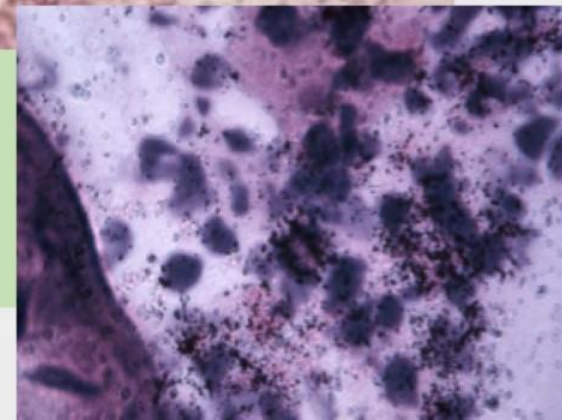
That have invaded the cells ex. *Klebsiella pneumoniae* polysaccharides

IgG, IgA antibodies were increased in AS pts

# Sacroiliac Biopsy in Ankylosing Spondylitis



- Immunohistologic study:  
CD4+, CD8+ T cells, and macrophages  
mRNA of TNF- $\alpha$ , TGF- $\beta$



Bollow M, Braun J. *Ann Rheum Dis*. 2000.

Braun J et al. *Arthritis Rheum*. 1995.

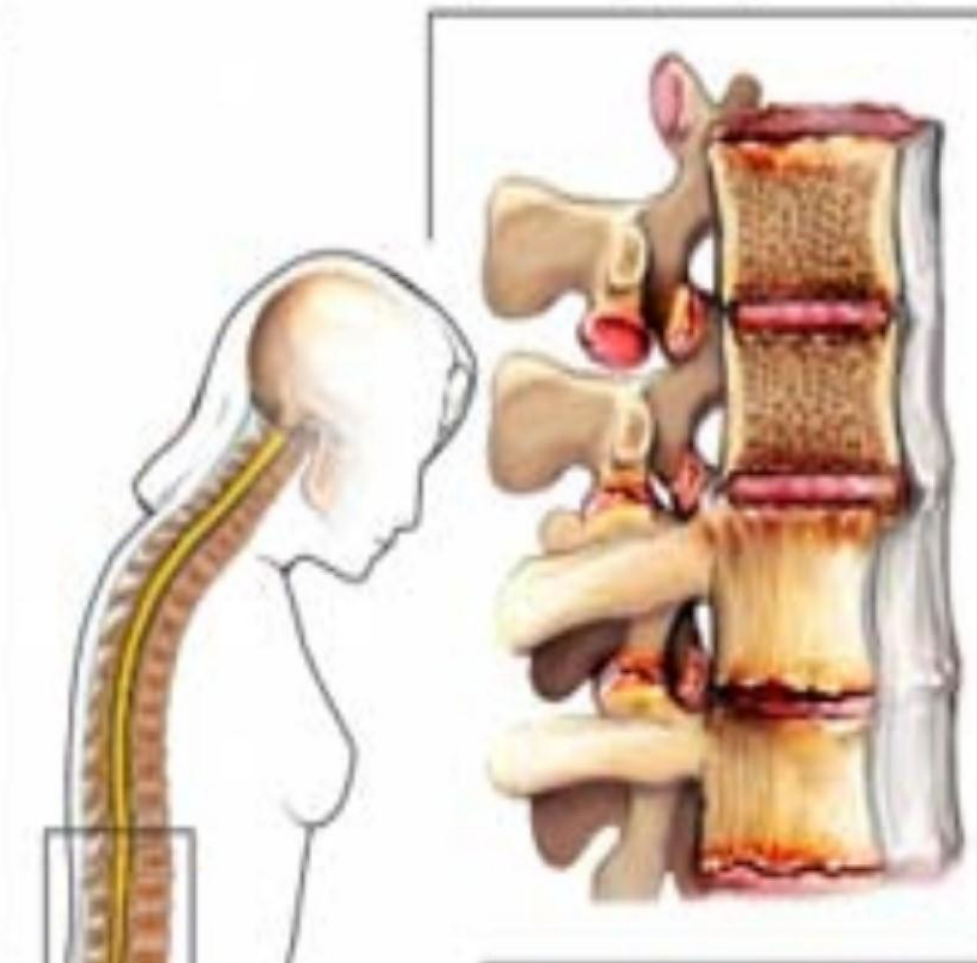


Normal anatomy



Normal  
S-curve  
of spine

Ankylosing spondylitis

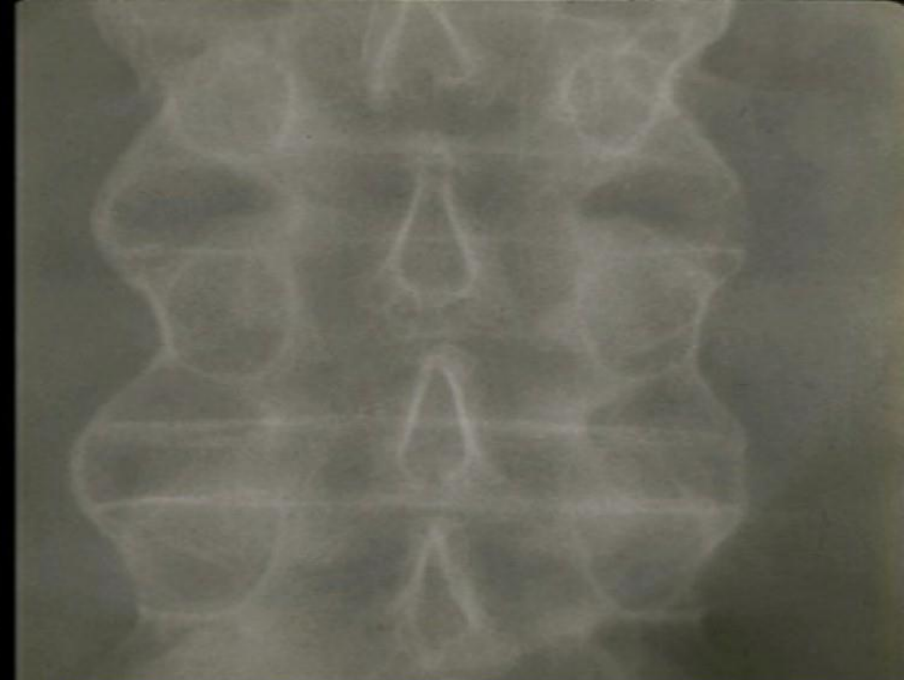


Loss of  
normal  
curvature

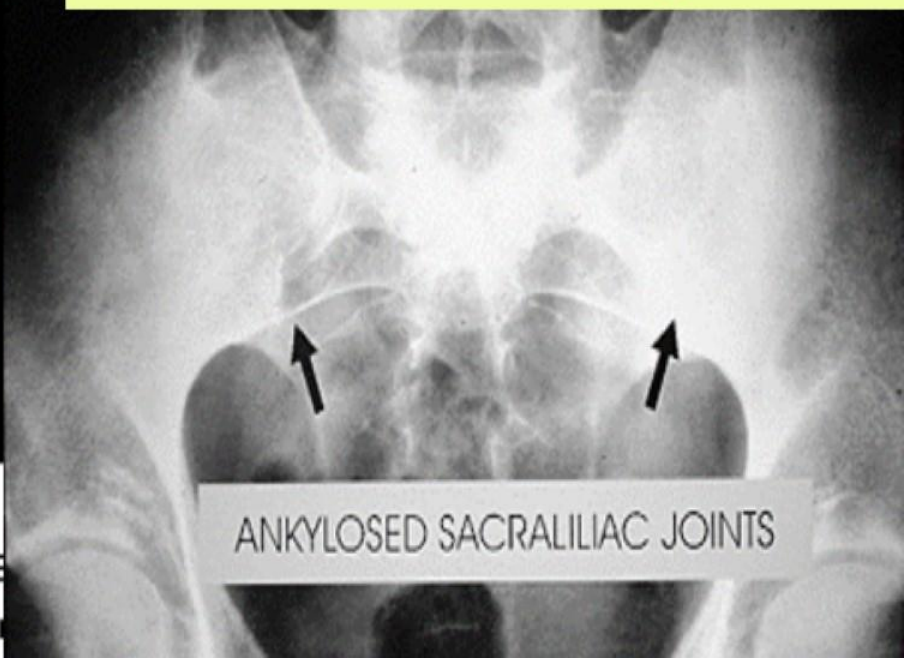


**Bamboo Spine**

**AS** Radiograph of the lumbar sacra  
 ced ankylosing spondylitis showing a  
 ion (arrows). Courtesy of Craig W Wi



**Bilat. Fusion SI joints**



**ANKYLOSED SACRALILIAC JOINTS**



**Thin syndesmophyte**

**Romanus lesion**

**Shiny corner**

**Squaring vertebrae**



# Delay in diagnosis from symptom onset

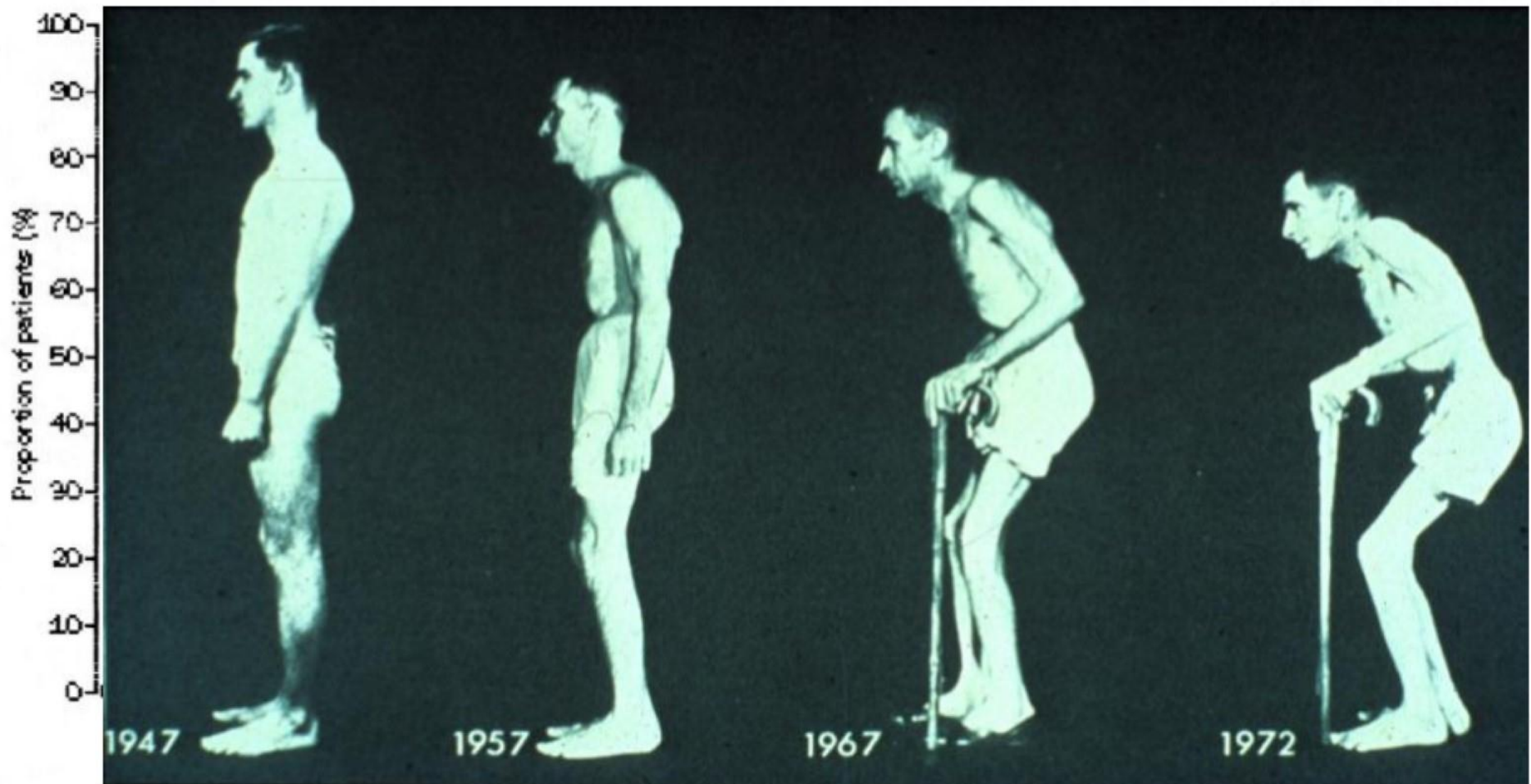


Figure 1: Frequency distribution of age of onset and age of diagnosis of ankylosing spondylitis (actual data)

**Table 4. ASAS classification criteria for axial SpA (in patients with back pain  $\geq 3$  months and age at onset  $< 45$  years).**

<p><b>Sacroiliitis on imaging*</b></p> <p>plus</p> <p><b><math>\geq 1</math> SpA feature**</b></p>	OR	<p><b>HLA-B27</b></p> <p>plus</p> <p><b><math>\geq 2</math> other SpA features**</b></p>
<p><b>**SpA features:</b></p> <ul style="list-style-type: none"> <li>• Inflammatory back pain</li> <li>• Arthritis</li> <li>• Enthesitis (heel)</li> <li>• Uveitis</li> <li>• Dactylitis</li> <li>• Psoriasis</li> <li>• Crohn's disease/ulcerative colitis</li> <li>• Good response to NSAIDs</li> <li>• Family history for SpA</li> <li>• HLA-B27</li> <li>• Elevated CRP<sup>†</sup></li> </ul>		<p><b>*Sacroiliitis on imaging:</b></p> <ul style="list-style-type: none"> <li>• Active (acute) inflammation on MRI highly suggestive of sacroiliitis associated with SpA</li> <li>or</li> <li>• Definite radiographic sacroiliitis according to modified. New York criteria</li> </ul>

<sup>†</sup>Elevated CRP is considered a SpA feature in the context of chronic back pain.

ASAS: Assessment of SpondyloArthritis international Society; CRP: C-reactive protein; HLA-B27: human leukocyte antigen-B27; IBP: inflammatory back pain; MRI: magnetic resonance imaging; NSAID: nonsteroidal anti-inflammatory drug; SpA: spondyloarthritis.

Redrawn with permission from [41].

Image courtesy of Remedica Journals

<http://www.remedicajournals.com/International-Journal-of-Advances-in-Rheumatology-Issues/Volume-8-Issue-1/Article-New-Classification-Criteria-for-Spondyloarthritis>

# Physiotherapy

- Hydrotherapy
- Back Exercises
- Sporting activities
  - Improved overall Health
  - Stiffness was reduced
- Lying prone for 15 to 30 min
- Sleep on firm mattress



# Medication

- NSAIDs
  - No NSAIDs has documented superiority in terms of efficacy
  - COX-2 inhibitor Showed similar efficacy to conventional NSAIDs
  - Long term advantages
    - continuous Rx with NSAIDs & intermittent Rx
    - functional ability
    - prevention of structural damage

# Medication

DMARDs: disease-modifying antirheumatic drug

- Methotrexate 10-25 mg/week
- Leflunomide 20 mg/day
- Sulfasalazine 2-3 gm/day

## Corticosteroids

May be effective for local intra-articular Rx in AS including the sacroiliac joints

Systemic steroid work less well than in RA

A small subgroup of AS patients seems to response, in particular those with peripheral arthritis or associated IBD

# Medication

## Bisphosphonates

- Spinal pain, functioning, and global assessment
- 60 mg IV monthly

## Thalidomide

- Open 1-year study in China
- 200 mg/day
- 30 male pts with refractory disease
- 80% of 26 completers achieved 20 % improvement in clinical measures



# Medication

## Anti-TNF-alpha

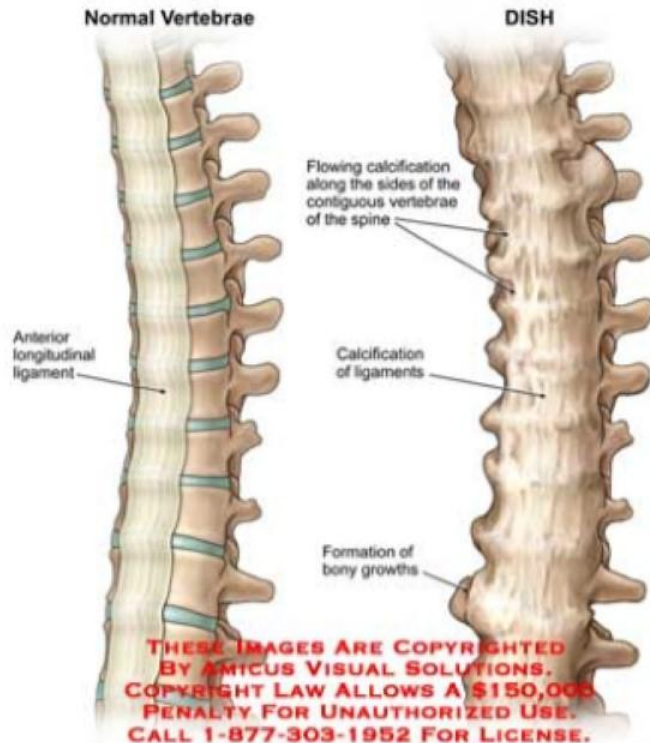
- **Infliximab** chimeric IgG1 monoclonal antibody
  - IV 5mg/kg induction then 2-8 weekly intervals
- **Etanercept** 75 kDa IgG1 fusion protein
  - SC 25mg twice weekly
- **Adalimumab**
- **Golimumab**

# Mortality

- Spinal trauma
- Aortic insufficiency
- Respiratory failure
- Amyloid nephropathy
  
- Complication of therapy

# DISH

## Diffuse Idiopathic Skeletal Hyperostosis (DISH)



Diffuse idiopathic skeletal hyperostosis (DISH) is a spondyloarthropathy also known as Forestier's disease and ankylosing hyperostosis. It is a noninflammatory disease, with the principal manifestation being calcification and ossification of spinal ligaments and the regions where tendons and ligaments attach to bone.

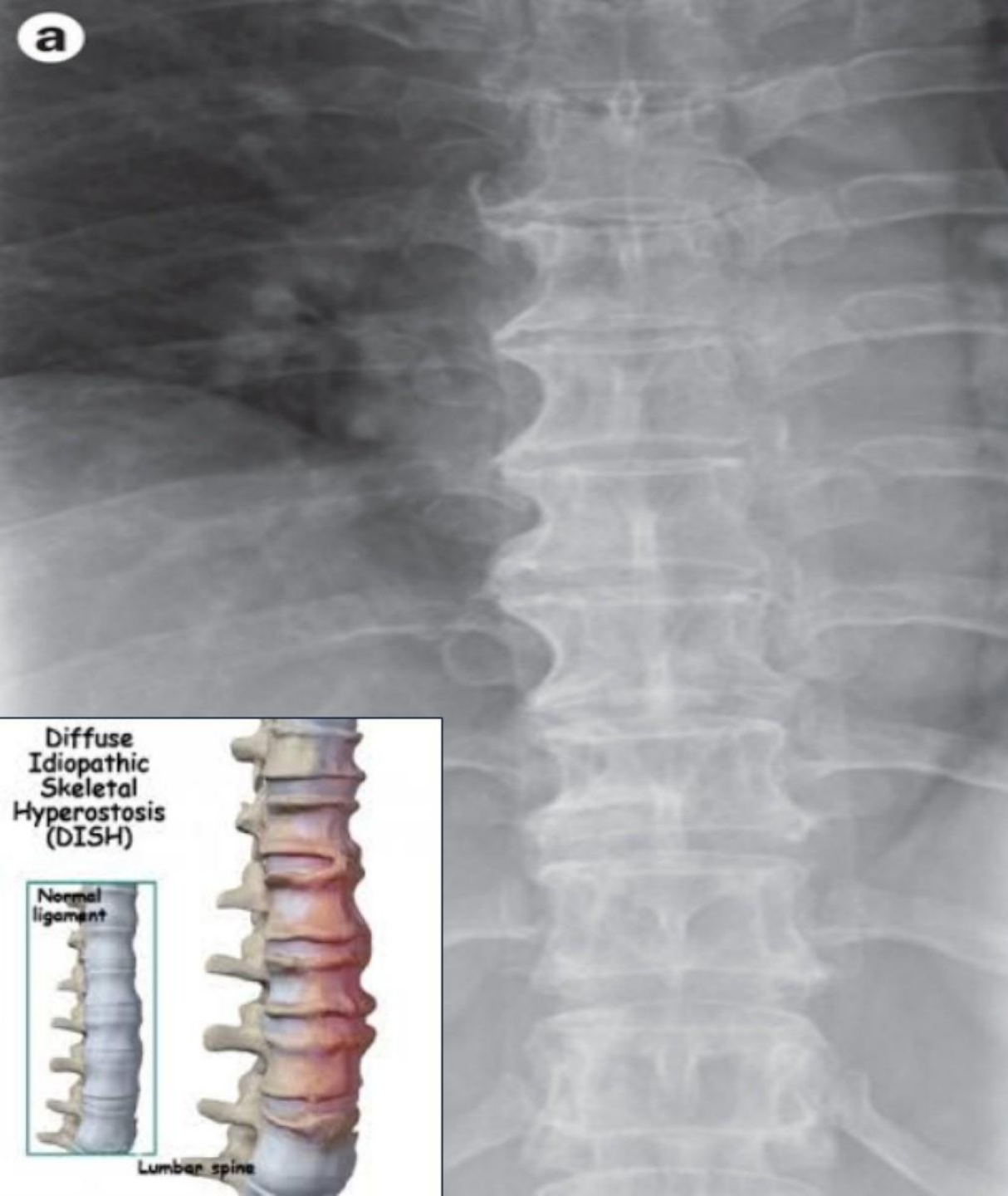
In advanced stages, DISH is characterized by unique, flowing calcification along the sides of the contiguous vertebrae, with an appearance similar to melted candle wax. The whole spine may be involved, and bony ankylosis (stiffness) occurs, although the disc spaces and facet joints remain unaffected.

© 2012 A/S. Case Imagery

## DISH: Diffuse Idiopathic Skeletal Hyperostosis

- Calcification and later ossification of ALL of four or more vertebrae.
- Flowing wax sign.
- Disc space is preserved

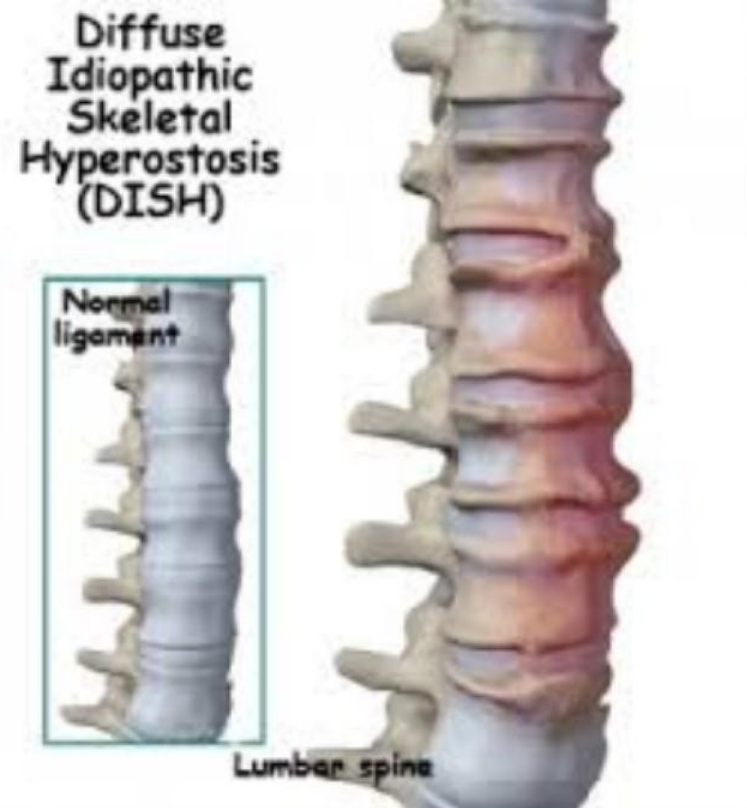


**a****b**

Diffuse  
Idiopathic  
Skeletal  
Hyperostosis  
(DISH)



Lumbar spine



## DISH vs Ankylosing spondylitis ??

- Points favoring DISH-
  - No backache, morning stiffness
  - low ESR & CRP
  - Typical “flowing wax” appearance of osteophytes
  - No sacroiliitis,
  - Intervertebral disc relatively preserved
- Points favoring Ankylosing spondylitis
  - HLA B27 positivity





ชาย 36 ปี มีประวัติปวดเข้า 2 ข้างเป็นๆหายๆมา 24 ปี มีนิ้วป้อม







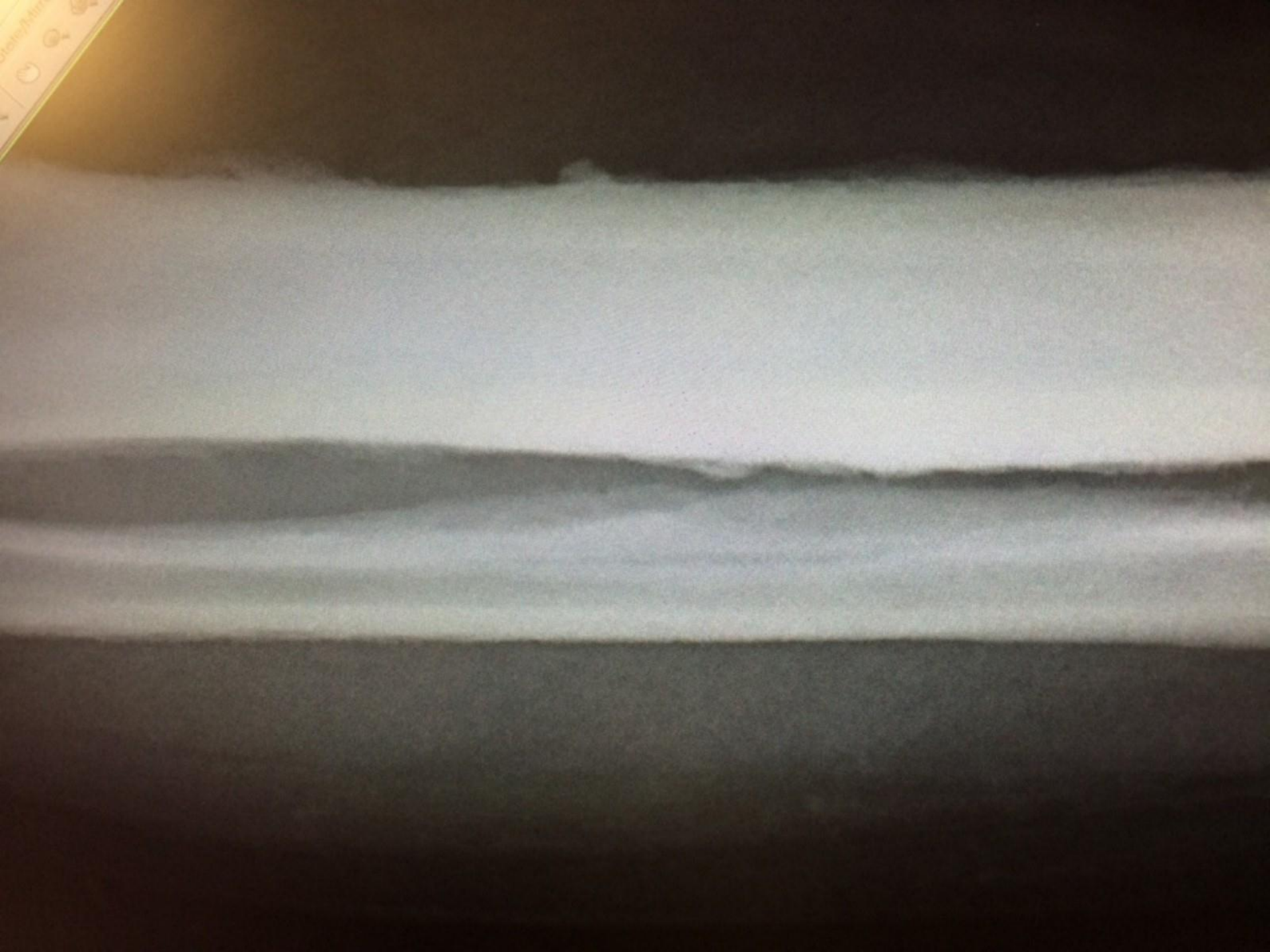






R

114062941 Na...





R  
RIGHT



L  
UPRIGHT

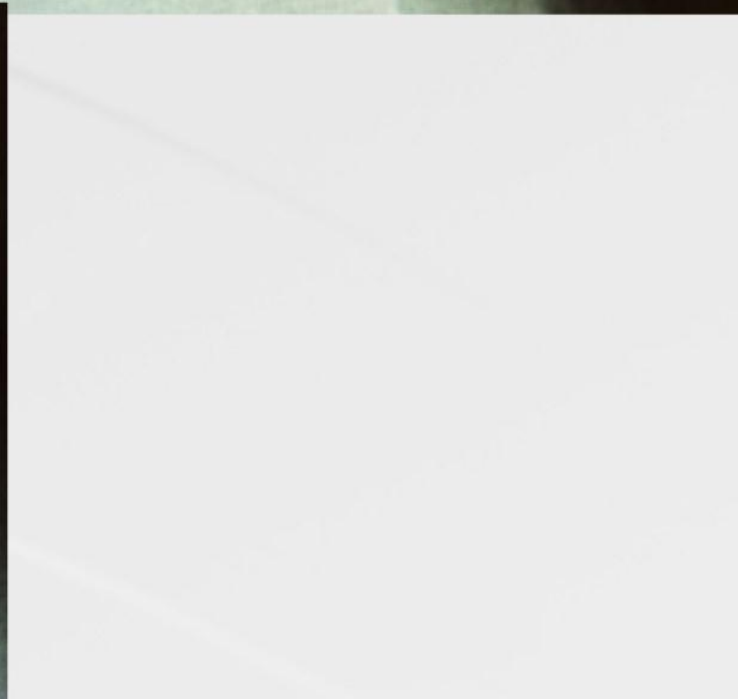




R  
UPRIGHT



L  
UPRIGHT







## การวินิจฉัยของท่าน ?

1. TB spine
2. Spondyloarthritis
3. Diffuse Idiopathic skeletal hyperostosis (DISH)
4. Acromegaly
5. Hypertrophic osteoarthropathy (HOA)

# Chronic Mono-/Oligoarthritis

## Non-Inflammatory

- Chronic Jt.structure
- Degenerative
- Osteonecrosis
- Tumor
- RSD
- Neuropathic joint

## Inflammatory

- Chronic Infection; TB, Fungus, Lyme
- Crystal
- SpA, JClA, Atypical RA
- Pigmented Villonodular



# Chronic Polyarthrititis

- RA
- CNTD
- SpA
- JCIA
- Chronic Tophaceous gout, CPPD-Pseudo RA
- Hypertrophic Osteoarthropathy
- Hypothyroidism/ Hyper PTH

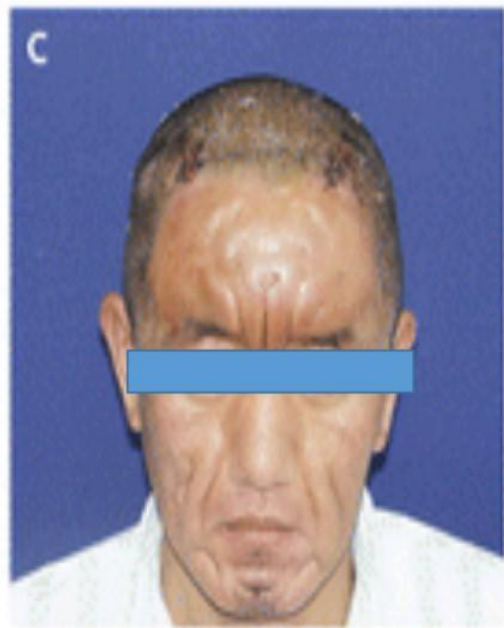
A



B



C



D





Cutis verticis  
gyrata





**A****B****C****D**

## CASE REPORT

Tomoko Matsumoto · Toshiyuki Tsurumoto  
Hiroyuki Shindo

# A case of pachydermoperiostosis associated with arthritis

Received: February 8, 2003 / Accepted: June 11, 2003

**Abstract** Pachydermoperiostosis (PDP) is characterized by clubbing fingers, furrowing of the facial skin, and periosteal hypertrophy. We report a case of a patient with PDP associated with severe arthritis of the knee and ankle joints. His serum C-reactive protein (CRP) levels were increased, and an analysis of serum and synovial fluid showed high levels of interleukin-6. These findings mean that there is some difficulty in distinguishing the disease from rheumatoid arthritis. While treatments such as nonsteroidal anti-inflammatory drugs, steroids, and colchicine were not particularly effective, the severe arthralgia was gradually relieved over a few years.

**Key words** Arthritis · Clubbing fingers · Pachydermoperiostosis (PDP)

Pachydermoperiostosis (PDP) was first described in 1935.<sup>1</sup> The symptoms were digital clubbing, periostosis, and hypertrophic skin changes. Although the disease is sometimes a complication of arthritis, few abnormal inflammatory signs have been demonstrated in serum and synovial fluids. It has been reported that the arthralgia in PDP does not originate from synovitis, but rather is caused by active inflammation of the periosteum.<sup>2</sup> However, some cases show swelling of the joints with synovitis and joint effusion, suggesting non-specific arthritis. In this study, we report a case of a patient with PDP complicated by severe arthritis, and describe the inflammatory markers in the serum and synovial fluid of the patient.

## Case report

An 18-year-old man who had been affected with severe pain in both knee and ankle joints for 3 months visited the hospital. There was no relevant family history. On physical examination, clubbing of the fingers and toes was found, and there was marked furrowing of the skin on the scalp (cutis verticis gyrata) and face, as well as seborrhea on the face (Fig. 1). These abnormal findings had developed from about 17 years old. Swelling and local joint heat were seen in both knees and ankles. Radiological examination showed that periostosis of the diaphysis of the radius, ulna, tibia, and fibula was present, while no abnormal findings were shown in the knee or ankle joints or in the hands (Fig. 2). A chest X-ray film was normal. At the first examination, his hemoglobin was 14.7 g/dl, leukocyte count  $8.4 \times 10^3/\text{mm}^3$ , and platelets  $3.85 \times 10^5/\text{mm}^3$ . Serum calcium, phosphorus, alkaline phosphatase, and uric acid were normal. Rheumatoid factors, antinuclear factors, and lupus erythematosus cells were negative, and C-reactive protein (CRP) was 2.33 mg/dl (normal <0.23 mg/dl). Growth hormone level in serum was 2.1 ng/ml (normal <5 ng/ml). Because of these characteristic findings, we diagnosed this patient as a complete type pachydermoperiostosis. Despite treatment with a nonsteroidal anti-inflammatory drug (NSAID), his arthralgia did not improve. Three months later, we aspirated a small amount of joint effusion from the knee, which was clear and yellowish. We then measured interleukin-6 (IL-6) levels in serum and synovial fluid with an enzyme-linked immunosorbent assay (ELISA) kit (BioSource International, CA, USA). There were 8.61 pg/ml and 455 pg/ml, respectively. At the same time, the CRP level in serum was also measured and found to be 4.71 mg/dl. NSAID, prednisolone, and colchicine were not particularly effective. The arthralgia continued for a few years, and then subsided gradually.

## Prostaglandin E<sub>2</sub> and bone turnover markers in the evaluation of primary hypertrophic osteoarthropathy (pachydermoperiostosis): a case report

A. Martínez-Ferrer · P. Peris · L.I. Alós ·  
M. Morales-Ruiz · N. Guañabens

Received: 5 March 2009 / Accepted: 29 April 2009 / Published online: 21 May 2009  
© Clinical Rheumatology 2009

**Abstract** Primary hypertrophic osteoarthropathy, or pachydermoperiostosis (PDP), is an infrequent genetic condition characterized by digital clubbing, periostosis, and pachydermia and is distinct from a more common form, secondary hypertrophic osteoarthropathy, which always associates with an underlying cause (frequently pulmonary or cardiac disease). The diagnosis of this disorder as well as its clinical evaluation can be difficult. We report a 15-year-old boy presenting with intermittent arthralgias and clubbing of fingers and toes for the previous 2 years. The ankles and knees were enlarged, and X-rays showed periosteal apposition. The search for a secondary cause was negative. The skin appearance was normal, but a skin biopsy was indicative of pachydermia, further confirming the diagnosis of PDP. Bone turnover markers were increased at diagnosis and progressively decreased during follow-up; prostaglandin E<sub>2</sub>, a recently implicated mediator of this disorder, was markedly elevated. In the present case, carrying out a skin

biopsy helped us to diagnose this condition. In addition, bone turnover markers were useful for monitoring the disease activity; whereas, increased prostaglandin E<sub>2</sub> levels seems to confirm the role of this mediator in the etiopathogenesis of this disorder.

**Keywords** Bone markers · Digital clubbing · Pachydermoperiostosis · Primary hypertrophic osteoarthropathy · Prostaglandin E<sub>2</sub>

### Introduction

Clubbing is a descriptive term referring to the bulbous uniform swelling of the tissue of the terminal phalanx with subsequent loss of the normal angle between the nail and the nail bed [1]. It has been associated with various underlying pulmonary, cardiovascular, neoplastic, infectious, hepatobiliary, mediastinal, endocrine, and gastrointestinal diseases. Finger clubbing may also occur, without evident underlying disease, as an idiopathic form. Pachydermoperiostosis (PDP), or primary hypertrophic osteoarthropathy (PHO), is an infrequent genetic disease affecting both skin and bones, with positive family history reported in about one third of the cases [2], a marked male predominance, and a disease onset often at puberty [3]. The major diagnostic criteria include digital clubbing, hypertrophic skin changes (pachydermia), and periostosis; other clinical findings such as arthralgias and arthritis, gastric hypertrophy, hyperhidrosis of the feet and hands, seborrhea with sebaceous hyperplasia and folliculitis, or acne, among others, have also been observed [1]. However, incomplete forms with isolated bone involvement and limited skin changes have also been reported [4], all of these causing a diagnostic confusion not only with secondary forms of

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**Table I****Secondary Hypertrophic Osteoarthropathy Etiology**

Pulmonary	Bronchogenic carcinoma
	Pulmonary abscesses
	Bronchiectasis
	Pulmonary emphysema
	Hodgkin's disease
	Metastases
	Cystic fibrosis
Pleural and diaphragm	Mesothelioma
Cardiac	Congenital cyanotic heart disease
Abdominal	Portal or biliary cirrhosis
	Ulcerative colitis
	Crohn's disease
	Gastrointestinal polyps
	Neoplasm
	Biliary atresia
Others	Nasopharygeal carcinoma
	Esophagus carcinoma
	Aortic or axillary artery graft infection

#### Suppurative intra-thoracic diseases

- Lung abscess
- Empyema thoracic
- Bronchiectasis
- Cystic fibrosis
- Chronic cavitary mycobacterial or fungal infection

#### Intrathoracic neoplastic disease

- Bronchogenic carcinoma
- Metastatic cancers<sup>[14]</sup>
- Malignant mesothelioma<sup>[15]</sup>
- Other miscellaneous malignancies
- Hodgkin lymphoma, thymoma,<sup>[16]</sup> pulmonary artery
- Sarcoma,<sup>[17]</sup> nasopharyngeal carcinoma<sup>[18,19]</sup> usually after distant metastases, pleural fibroma,<sup>[20]</sup> rhabdomyosarcoma,<sup>[21]</sup>
- Primary lymphosarcoma of lung<sup>[22]</sup>

#### Diffuse pulmonary diseases

- Idiopathic pulmonary fibrosis
- Asbestosis
- Pulmonary arterio-venous malformations

#### Cardiovascular diseases

- Cyanotic congenital heart disease
- Infective endocarditis
- Aortic aneurysm
- Atrial myxoma

#### Gastrointestinal diseases

- Inflammatory bowel disease
- Celiac disease
- Lymphoma of the gastrointestinal tract, colonic and gastric carcinoma
- Infestations (amoebiasis, ascariasis)

#### Hepatobiliary disorders

- Chronic active hepatitis
- Cirrhosis—particularly biliary and juvenile

#### Endocrine disorders

- Thyroid acropathy
- Severe secondary hyperparathyroidism
- Laxatives overuse,<sup>[23,24]</sup> interferon alfa-2A<sup>[25]</sup>

# Pachydermoperiostosis

Author: Robert A Schwartz, MD, MPH; Chief Editor: William D James, MD [more...](#)

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Updated: May 05, 201

[Background](#)

## Background

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Hypertrophic osteoarthropathy is divided into primary and secondary forms. Pachydermoperiostosis (PDP), the primary form, accounts for 5% of all cases of hypertrophic osteoarthropathy. Secondary hypertrophic osteoarthropathy, also called pulmonary hypertrophic osteoarthropathy, is associated with underlying cardiopulmonary diseases and malignancies.<sup>[1]</sup> This latter condition is not discussed here but may be found in the article [Dermatologic Manifestations of Pulmonary Disease](#).

Pachydermoperiostosis or primary hypertrophic osteoarthropathy is a rare hereditary disorder that was first described in 1868. It is characterized by digital clubbing, pachydermia (thickening of the facial skin and/or scalp), and periostosis (swelling of periarticular tissue and subperiosteal new bone formation). Pachydermoperiostosis or primary hypertrophic osteoarthropathy is associated with pain, polyarthritis, cutis verticis gyrata,<sup>[2]</sup> seborrhea, eyelid ptosis,<sup>[3, 4]</sup> and hyperhidrosis. Touraine et al<sup>[5]</sup> described 3 forms of pachydermoperiostosis or primary hypertrophic osteoarthropathy: (1) a complete form with pachydermia and periostitis, (2) an incomplete form with evidence of bone abnormalities but lacking pachydermia, and (3) a forme fruste with prominent pachydermia and minimal-to-absent skeletal changes.



# Pachydermoperiostosis Clinical Presentation



Author: Robert A Schwartz, MD, MPH; Chief Editor: William D James, MD [more...](#)

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Updated: May 05, 2015

[History](#)

## History

Patients may report the following signs or symptoms:

- Enlargement of the fingers and the toes
- Swelling or pain of the large joints
- Coarsening of facial features
- Grooves or depressions in the scalp
- Oily, scaly facial skin
- Excessive sweating of the palms, soles, or other areas
- A sensation of warmth or burning in the hands and feet

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# Pachydermoperiostosis Differential Diagnoses

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## Diagnostic Considerations

Rosenfeld-Kloepfer syndrome, a variant of pachydermoperiostosis or primary hypertrophic osteoarthropathy, is characterized by enlargement of the mandible and/or the maxilla; large hands, feet, nose, lips, and tongue; prominence of the upper part of the forehead; cutis verticis gyrata; and corneal leukoma.

Currarino idiopathic osteoarthropathy is a juvenile incomplete form of pachydermoperiostosis or primary hypertrophic osteoarthropathy characterized by eczema and wide cranial sutures.<sup>[35]</sup>

A variant form of pachydermoperiostosis or primary hypertrophic osteoarthropathy restricted to the lower extremities in the absence of digital clubbing or typical skin changes has been described. It affected 3 members of a single family and was characterized by pain, swelling, and hyperhidrosis of both feet. Radiographs revealed bony changes consistent with pachydermoperiostosis or primary hypertrophic osteoarthropathy.<sup>[36]</sup>

Secondary hypertrophic pulmonary osteoarthropathy must be excluded.

Thyroid acropachy may cause diagnostic confusion. Unlike pachydermoperiostosis or primary hypertrophic osteoarthropathy, thyroid acropachy is not painful.

Syphilitic periostosis can result in bony changes and symptoms similar to those seen in pachydermoperiostosis or primary hypertrophic osteoarthropathy.

# Pachydermoperiostosis Workup



Author: Robert A Schwartz, MD, MPH; Chief Editor: William D James, MD [more...](#)

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Updated: May 05, 201

Laboratory Studies ▶
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## Laboratory Studies

Thyrotropin and growth hormone levels should be examined to exclude thyroid acropachy and acromegaly. Reactive plasma reagent and Venereal Disease Research Laboratory testing should be performed to check for syphilitic periostosis.

[Next Section: Imaging Studies](#) ➤



# Pachydermoperiostosis Treatment & Management



Author: Robert A Schwartz, MD, MPH; Chief Editor: William D James, MD [more...](#)

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Medical Care



Medical Care

Surgical Care

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Nonsteroidal anti-inflammatory drugs (NSAIDs) or corticosteroids may alleviate the polyarthritis associated with pachydermoperiostosis or primary hypertrophic osteoarthropathy.

In isolated cases, pamidronate and tamoxifen citrate have been reported as effective therapies for the painful osteoarthropathy associated with pachydermoperiostosis or primary hypertrophic osteoarthropathy.<sup>[42, 43, 44, 45]</sup>

In a single case report, pachydermoperiostosis or primary hypertrophic osteoarthropathy associated arthritis was treated with the combination of oral administration of risedronate sodium and arthroscopic synovectomy.<sup>[46]</sup>

# Pachydermoperiostosis Medication



Author: Robert A Schwartz, MD, MPH; Chief Editor: William D James, MD [more...](#)

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## Medication Summary ►

### Medication Summary

The goals of pharmacotherapy are to reduce morbidity and to prevent complications.

Nonsteroidal anti-inflammatory drugs

Antidote,  
Hypercalcemia

Bisphosphonate  
Derivative

Antineoplastic Agent,  
Hormone Antagonist

[Next Section: Nonsteroidal anti-inflammatory drugs](#) ►

# Pachydermoperiostosis Follow-up



Author: Robert A Schwartz, MD, MPH; Chief Editor: William D James, MD [more...](#)

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Updated: May 05, 2017

[Complications](#)

## Complications

Patients with pachydermoperiostosis or primary hypertrophic osteoarthropathy may develop severe kyphosis, restricted motion, and neurologic manifestations.

[Next Section: Prognosis](#) ➤

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# MULTIDISCIPLINARY APPROACH

- Patient Education
- Symptomatic Treatment
- Specific Treatment
- Prevent complications
- Primary care, Dermatology, Neurology, Ophthalmology
- Rehabilitation, Occupational therapy
- Surgery role

# Take home message

- Treatable
- Early diagnosis and Early treatment; better outcome
- Aim of treatment: control inflammation, restore function, prevent disable, triggers control or removal
- Regular follow-up and coordination of treatment are very important



*Thank You*

A close-up photograph of two hands, palms up, holding a small, torn piece of white paper. The paper has the words "Thank You" written in a black, elegant cursive script. The hands are light-skinned and positioned against a dark, solid background. The lighting is soft, highlighting the texture of the skin and the edges of the torn paper.