

# Inflammatory low back pain

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Back pain is an extremely common symptom, occurring in as much as 80% of the general population



## Aspects of Inflammatory Back Pain

- Onset of symptoms before age 45 years
- Duration of symptoms more than 3 months (chronic pain)
- Located at the lower back
- Alternating buttock pain
- Awakening due to back pain during the second half of the night

## Aspects of Inflammatory Back Pain

- Morning stiffness for at least 30 minutes
- Insidious onset of complaints
- No improvement of back pain with rest
  
- Improvement with exercises
- Improvement with use of nonsteroidal agents

## Spondylarthritis

- ▶ Spondyloarthritis (SpA) refers to a group of overlapping disorders that share clinical features, genetic associations, and pathogenic mechanisms

## Clinical Characteristics of Spondyloarthritis

- Axial spondyloarthritis (sacroiliac-spine)
- Enthesitis
- Dactylitis
- peripheral arthritis—predominantly of lower limb, asymmetric
- Absence of rheumatoid factor
- Extra-articular features characteristic of the group (anterior uveitis)
- Significant familial aggregation
- Association with HLA-B27

## Forms of Axial Spondyloarthritis

- Radiographic ankylosing spondylitis (AS) and nonradiographic AS/axial spondyloarthritis (axial spondyloarthritis)
- Reactive arthritis
- Arthropathy of inflammatory bowel disease (Crohn's disease, ulcerative colitis)
- Psoriatic arthritis
- Juvenile-onset ankylosing spondylitis

## Clinical Manifestations of Ankylosing spondylitis

- **Skeletal Manifestations:**
- Low Back Pain and Stiffness
- The pain is initially felt primarily deep in the gluteal region and is insidious in onset
- it localizes in the SI joints but is occasionally referred toward the iliac crest or greater trochanteric region

## Skeletal Manifestations

- The pain is often unilateral or intermittent at first
- It usually becomes persistent and bilateral, and the lower lumbar area becomes stiff and painful
- worse in the morning and may awaken the patient from sleep, particularly during the second half of the night

## Skeletal Manifestations

- ▶ Many patients do not differentiate between low back pain and stiffness
- ▶ The morning stiffness may last as long as 3 hours
- ▶ Stiffness and the pain tend to be **eased** by a hot **shower**, an **exercise** program, or physical activity; they do not improve with rest
- ▶ Fatigue and stiffness may be an important problem and can be accentuated by **sleep disturbances**

## Chest Pain

- ▶ Thoracic spine:  
costovertebral , costotransverse joints
- ▶ Enthesitis : costosternal , manubriosternal joints,
- ▶ Accentuated by coughing or sneezing,
- ▶ Pleuritic
- ▶ Mild to moderate reduction of chest expansion

## Joints

- ▶ The girdle or “root” joints (hips and shoulders) are the most frequently involved extra-axial joints in AS

- Constitutional symptoms  
fatigue, weight loss, and low grade fever
- Other extraskeletal manifestations are more localized

## Extramusculoskeletal Manifestations

- ▶ **Eye Disease:**
- ▶ Acute anterior uveitis or iridocyclitis
- ▶ Occurring in 25% to 30%.
  
- ▶ No relationship between activity articular disease and extra-articular manifestation

## Extramusculoskeletal Manifestation

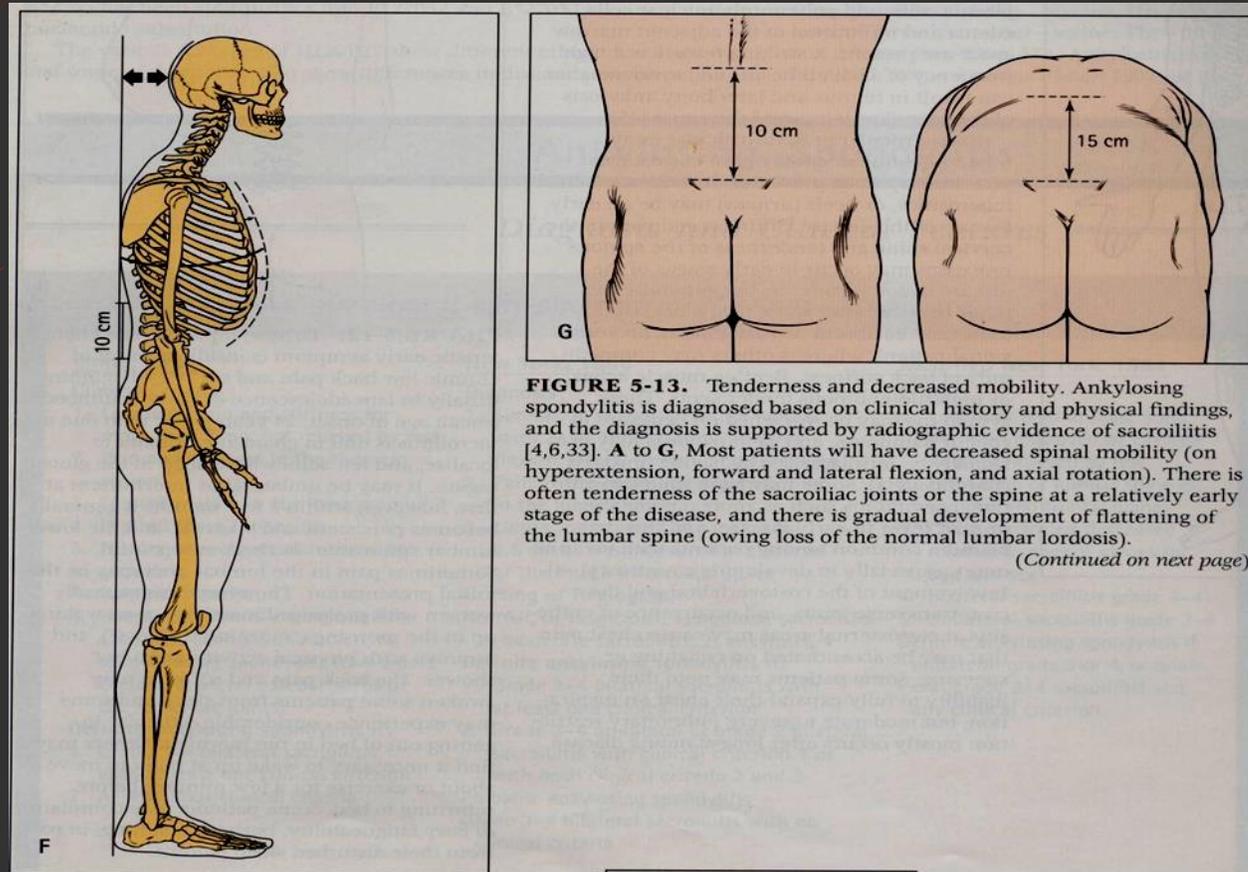
- Cardiovascular Disease
- Pulmonary Disease
- Neurologic Involvement
- Renal Involvement

## Physical Examination

### Spinal Mobility:

- Some limitation of motion of the lumbar spine :
- Forward flexion
- Hyperextension
- Lateral flexion
- Early loss of the normal lumbar lordosis is often the first sign and is easily assessed on inspection
  
- Lateral flexion may also be diminished
- Spinal rotation may cause pain

# Schober test



## Schober test

- ▶ Patient stands erect

1- One mark is placed overlying the **fifth lumbar spinous** :

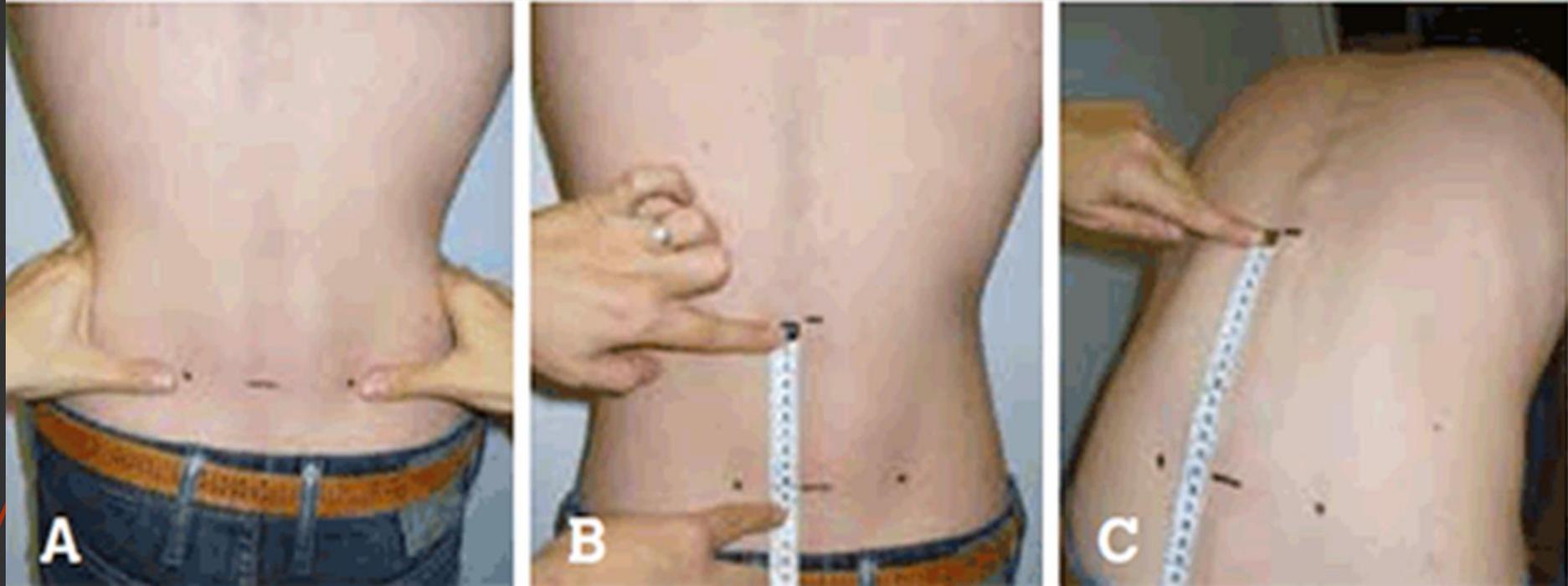
Level of the posterosuperior iliac spine

2- Another mark is placed 10 cm above in the midline

3- Bend forward maximally, without bending the knees

Distance : less than 15 cm

This indicates reduced lumbar spine mobility



## Chest Expansion

- Early stages :mild to moderate Reduction
- Normal values are age and sex dependent
- Reduction below 5 cm
  
- Measured on:
  - Maximal inspiration ,after forced maximal expiration
  - At the level of the **fourth** intercostal space in **males**
  - Just **below the breasts** at the xiphosternal level in **females**

## Spinal Mobility – Chest Expansion



- Hands resting on - or behind the head
- Measure at 4th intercostal level anteriorly
- Difference between maximal inspiration (1) and expiration (2) in cm (eg 4.3 cm) is recorded
- Report the best of two tries

## Physical Examination

- Sacroiliitis:

Direct pressure over the SI joints may elicit pain

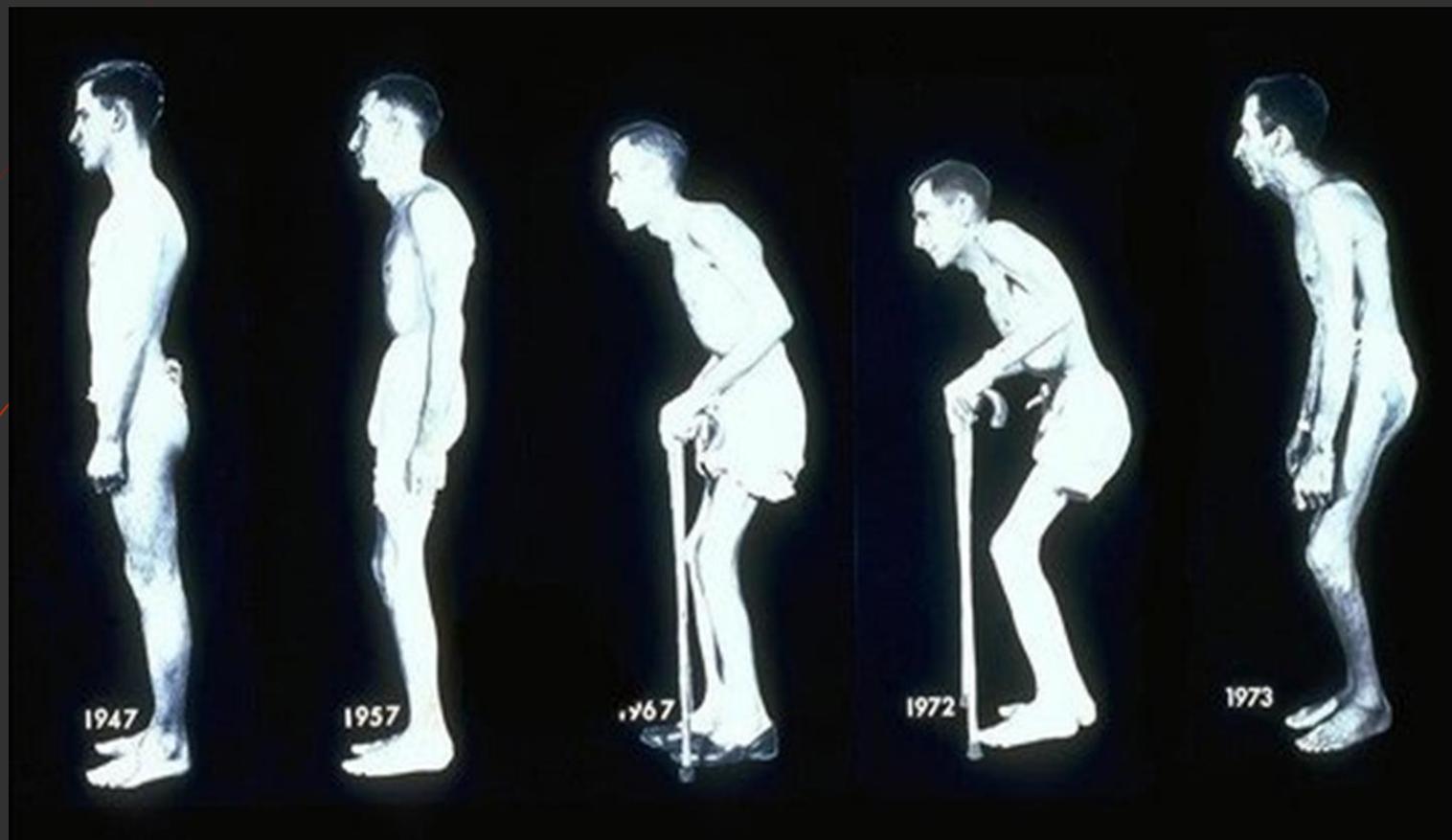
Negative in early disease

Negative in late stages >>>> fibrosis or bony ankylosis

## Posture

- hyper kyphosis
- Within the first 10 years of disease

- Typical stooped posture of AS with advanced disease combination of:
  - Flexion deformity of the neck
  - Thoracic hyper kyphosis
  - Loss of normal lumbar lordosis
  - Flexion deformities of the hips



## LABORATORY TESTS

Routine blood tests are not helpful

- Elevated ESR or CRP 75%, no correlate disease activity
- Mild normochromic anemia : 15% of patients
- Elevation ALP (bone) unrelated to disease activity or duration
- Elevation of serum IgA : correlates with acute phase reactants

## IMAGING STUDIES

### ➤ Conventional Radiography

The typical radiographic changes seen in the axial skeleton:

- SI
- Discovertebral
- Apophyseal
- Costovertebral
- Costotransverse joints

## Radiographic findings of sacroiliitis

- ▶ Blurring of the subchondral bone plate, erosions and sclerosis
- ▶ The changes in the synovial portion of the joint (the lower one-third of the joint)
- ▶ Progression of the subchondral bone erosions can lead to pseudowidening of the SI joint space

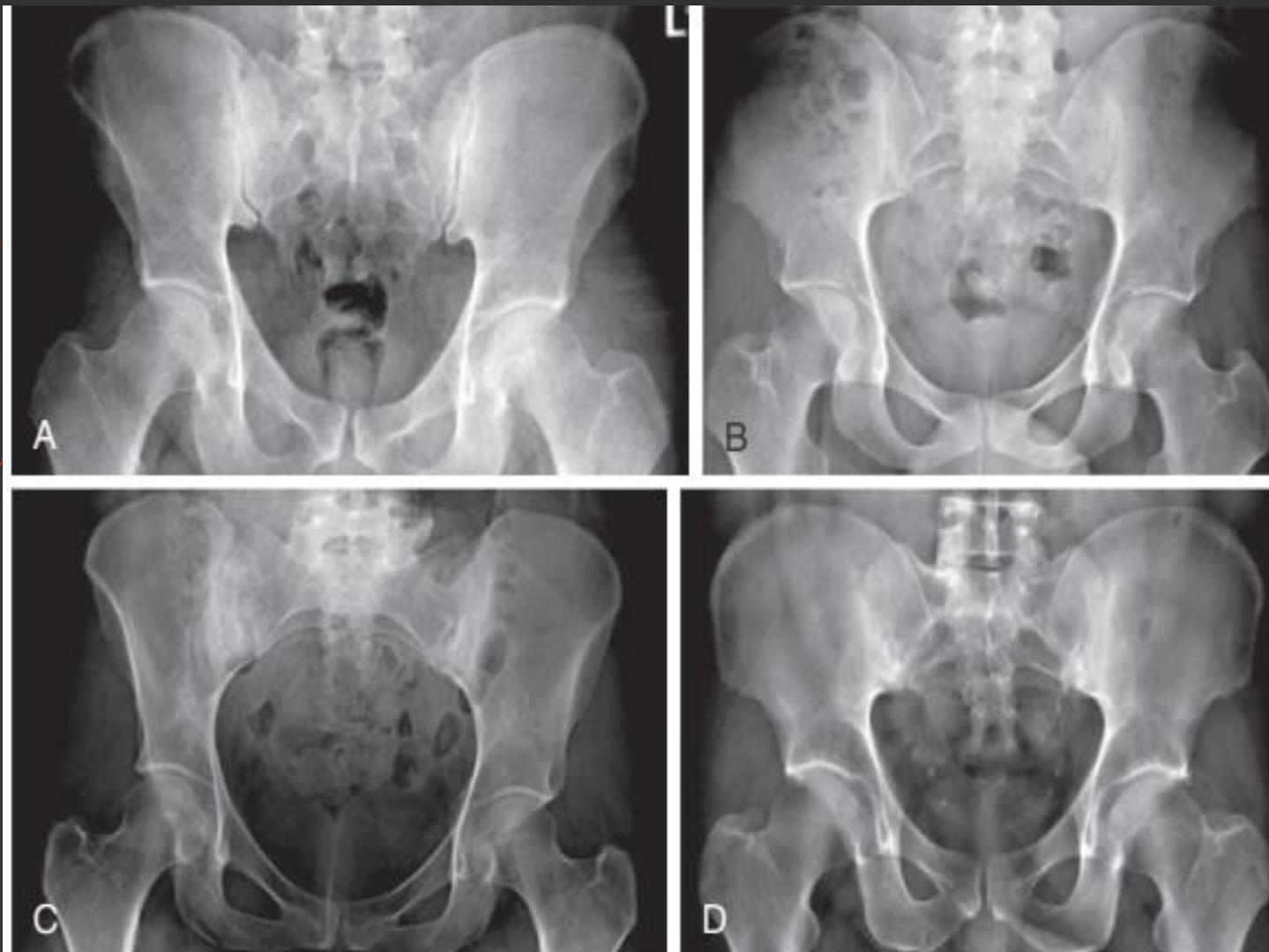
# Radiographic findings of sacroiliitis

- Normal : Grade 0
- Slight blurring of cortical margins of the lower third of each joint (Grade 1)
- Erosion and sclerosis (Grade 2)
- Extensive erosion with pseudowidening (Grade 3)
- Joint ankylosis (Grade 4)

## Radiographic findings of sacroiliitis

With time:

- Gradual fibrosis
- Calcification
- Interosseous bridging
- Bony ankylosis occur





Grade 4: Total ankylosis of joints

# Syndesmophytes

In the early stages

- ▶ Inflammation : superficial layers annulus fibrosus

Erosion corners of vertebral bodies

- ▶ Tissue repair >>>> “squaring” vertebral bodies
- ▶ Gradual ossification of the annulus fibrosus may lead to complete bony “bridging” between vertebrae



Concomitant ankylosis : apophyseal joints

Ossification of the adjacent ligaments

Complete fusion : **bamboo spine**

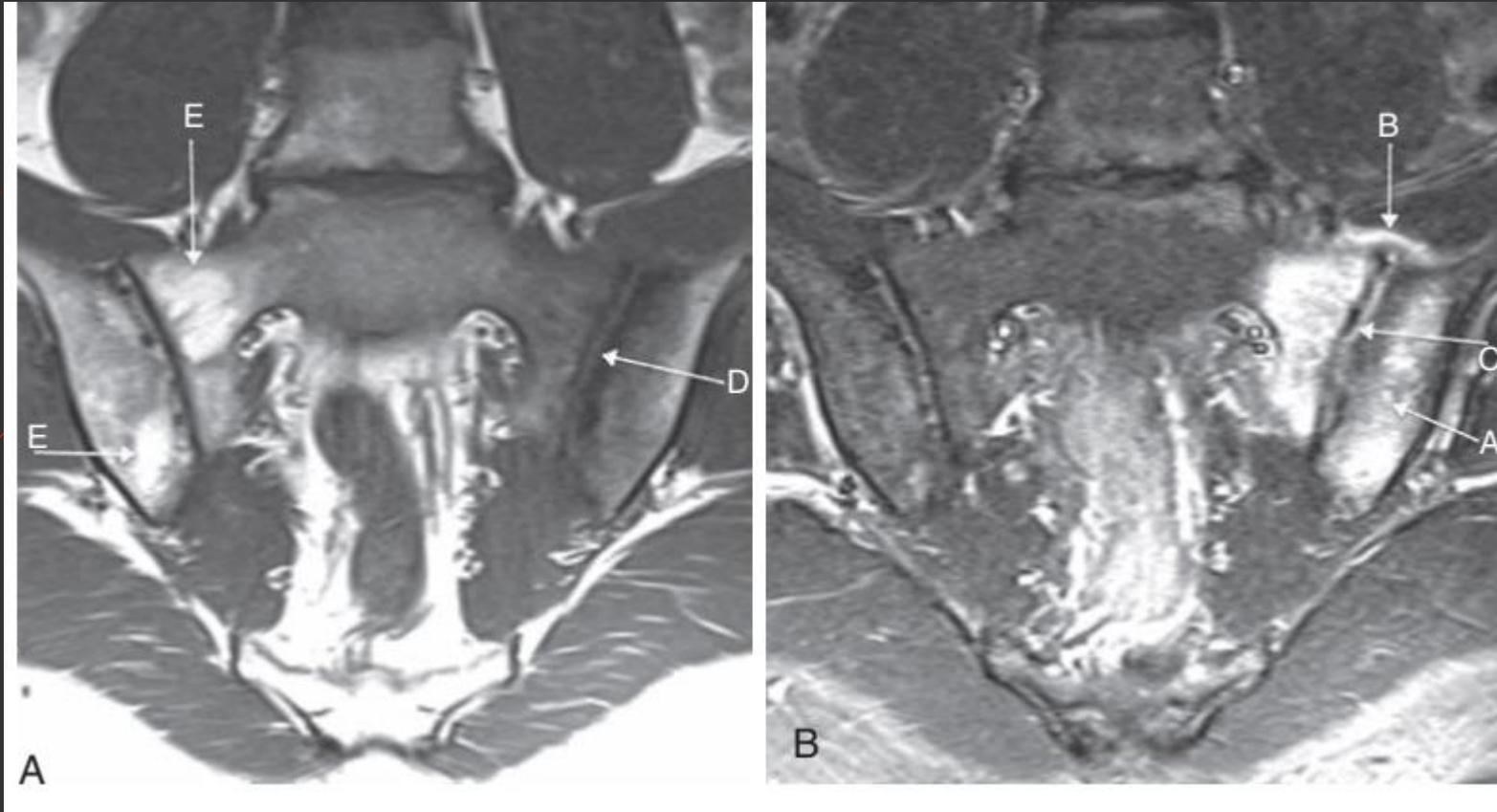


## MRI

- Used in routine practice : SI joint
- Detect sacroiliitis in at least 50% nonradiographic SpA

## MRI

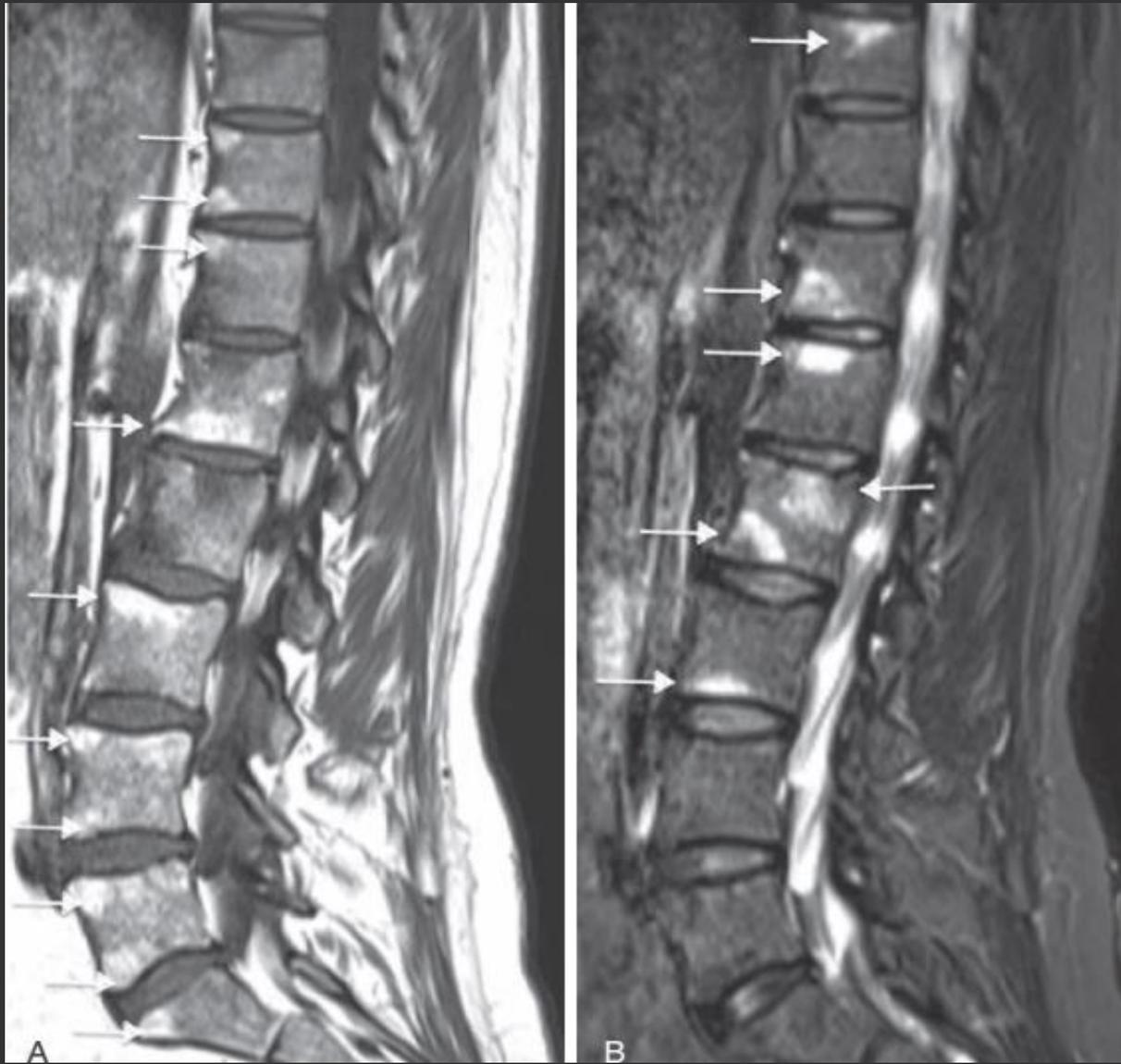
- ▶ Short-tau inversion recovery (STIR)
- ▶ Very sensitive in detection of bone marrow edema
- ▶ The T1-weighted (T1W)
  - Detection of erosions and fat metaplasia
- ▶ Diagnostic MRI should include both sequences



T1-weighted (A) and short-tau inversion recovery sequence MRI (B) of a 23-year-old male with inflammatory back pain

## Spinal inflammation

- Spinal inflammation can only be visualized by MRI
- It is typically seen as bone marrow edema in the vertebrae at both anterior and posterior vertebral corners, as well as around the intervertebral disk



(A) T1-weighted sequence. (B) Short tau inversion recovery sequence

# DIAGNOSIS

**Clinical manifestations** of AS usually appear in:

- Patients in late adolescence or early adulthood
- Diagnosis AS at an early stage :Careful history and P/E.
  
- Two features of the history are critical:
  - (1) The presence of inflammatory low back pain ,stiffness
  - (2) Positive family history for AS

## ASAS Classification Criteria in Patients With Back Pain 3 Months or More and Age at Onset Younger Than 45 Years

Sacroiliitis On Imaging Plus $\geq 1$ SpA Feature	OR	HLA-B27 PLUS $\geq 2$ Other SpA Features
<p><b><u>SpA Features</u></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>a</sup></li> </ul>		<p><b><u>Sacroiliitis on Imaging</u></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>

## MANAGEMENT

- The primary goal :
- Maximize long-term **health-related quality** of life through control of :
  - Symptoms
  - Inflammation
  - Prevention of progressive structural damage
  - Preservation/normalization of function
  - Social participation

- The optimal management combination of nonpharmacologic and pharmacologic treatment modalities

## Exercises

- ▶ Exercises are a mainstay of treatment  
Preferably, they should be started after a hot shower or a hot bath
- ▶ Patients should avoid vigorous or contact sports **if the spine has become fused or osteoporotic** because such a spine is susceptible to fracture.

## Pharmacologic Therapy

- ▶ In patients with active AS/axSpA, first-line therapy is typically a full dose of an **NSAID**
- ▶ Tumor Necrosis Factor inhibitors

# Psoriatic Arthritis

- ▶ Psoriatic arthritis  
asymmetric joint distribution pattern
- ▶ Dactylitis, enthesitis, or inflammatory-type back pain, and negative for rheumatoid factor

## Clinical Features

- ▶ Plaque psoriasis, or psoriasis vulgaris, is the most common skin phenotype
- ▶ Psoriatic nail changes, such as pitting, ridging, or onycholysis are very common in patients with psoriasis and pitting is a risk factor for the development of PsA
- ▶ Dactylitis  
sausage-shaped swelling of the fingers or toes

## Enthesitis

- Inflammation at the site of tendon and ligament insertion into bone, is a feature of all of the spondyloarthropathies and may be a presenting feature in PsA

## clinical patterns

- ▶ Patients with PsA **present** with symptoms and signs of joint, enthesal, or spinal inflammation.
- ▶ Wright and Moll described **five clinical patterns**:
  - ▶ 1. Asymmetric oligoarthritis
  - ▶ 2. Symmetric polyarthritis
  - ▶ 3. (DIP) joint involvement
  - ▶ 4. Predominant spondyloarthritis
  - ▶ 5. Destructive (mutilans) arthritis

- Predominant spondyloarthritis is uncommon
- Although spinal involvement may be found in 40% to 70% of PsA cases, depending on whether or not radiographs are taken
- Risk factors for spinal involvement include **severe peripheral arthritis** and human leukocyte antigen (HLA)-B\*27

## IMAGING

- Sacroiliitis on plain radiograph or MRI may be unilateral
- The spinal changes on plain radiography may be more asymmetric in PsA than with classic ankylosing spondylitis/axial spondyloarthritis (AS)

# Diagnosis and Classification Criteria

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**TABLE  
82.2**

## **CASPAR Classification Criteria for Psoriatic Arthritis**

Inflammatory articular disease (joint, spine, or enthesal) with  $\geq 3$  points from the following:

1. Evidence of psoriasis (one of a, b, or c)
  - a. Current psoriasis<sup>a</sup>: psoriatic skin or scalp disease present today as judged by a rheumatologist or dermatologist
  - b. Personal history of psoriasis: history of psoriasis that may be obtained from patient, family physician, dermatologist, rheumatologist, or other qualified healthcare provider
  - c. Family history of psoriasis: history of psoriasis in a first-degree or second-degree relative according to patient report
2. Psoriatic nail dystrophy: typical psoriatic nail dystrophy, including onycholysis, pitting, and hyperkeratosis observed on current physical examination
3. Negative test for rheumatoid factor: by any method except latex, but preferably by enzyme-linked immunosorbent assay or nephelometry, according to the local laboratory reference range
4. Dactylitis (one of a or b)
  - a. Current swelling of an entire digit
  - b. History: history of dactylitis recorded by a rheumatologist
5. Radiologic evidence of juxta-articular new bone formation: ill-defined ossification near joint margins (but excluding osteophyte formation) on plain radiographs of hand or foot

Current psoriasis scores 2, whereas all other items score 1

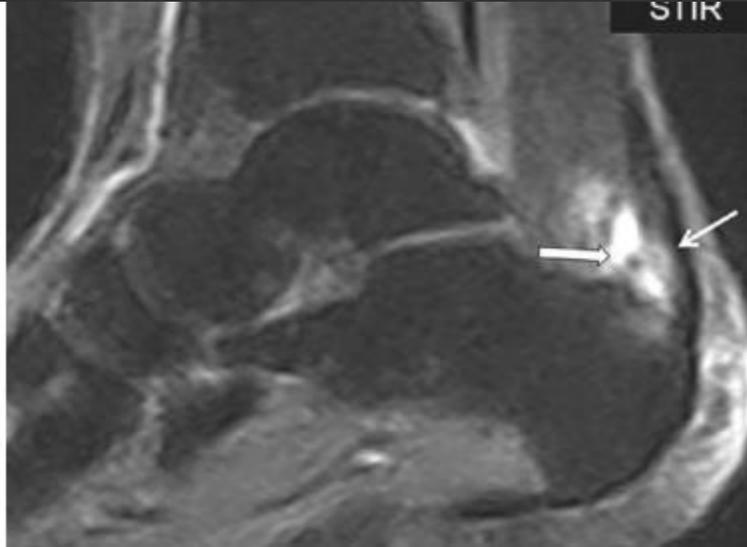
## Treatment

- NSAIDs drugs are often the agents first used in PsA, whatever the clinical phenotype
- csDMARDs
  - All csDMARDs may have small to moderate beneficial effects on peripheral joints, enthesitis, and dactylitis  
Axial features and nail disease do not seem to respond
- Biologic therapies

# Reactive Arthritis

- ▶ Reactive arthritis (ReA) is an inflammatory syndrome that can result from certain gastrointestinal or genitourinary infections
- The patient must have the typical peripheral arthritis (asymmetric oligoarthritis predominately of the lower limbs)
- Evidence of a preceding infection (clinical diarrhea or urethritis within the preceding 4 weeks)

- Nearly all patients with ReA have peripheral symptoms at presentation, with **about half** showing **axial symptom** (low back pain)
- Enthesitis, and dactylitis
- The most common extra-articular features mucocutaneous and ocular (conjunctivitis and anterior uveitis)





Early (A) and chronic (B) keratoderma blennorrhagicum showing thickened, psoriasiform papules and plaques on the foot of a patient with reactive arthritis

## Laboratory Findings

- The ESR and acute-phase reactants are usually elevated
- Mild anemia
- 30–50% of the patients are HLB27-positive

## Radiographic, and Advanced Imaging Findings

- ▶ Plain radiographic axial changes include sacroiliitis and **nonmarginal syndesmophytes**
- ▶ This is an important distinction from ankylosing spondylitis (AS) and inflammatory bowel disease (IBD)-related arthritis





## MRI

- ▶ MRI, has been advocated recently to detect changes early in nonradiographic SpA.
- ▶ Bone marrow lesions, sclerosis, and erosions typically asymmetric, on the sacroiliac joints
- ▶ The “**shiny corner sign**” and nonmarginal syndesmophytes may be evident on the spine

## DIAGNOSIS

- ▶ ReA is a clinical diagnosis with no definitively diagnostic laboratory test
- ▶ Attempts to isolate the causative organism should be performed, but a negative test does not rule out ReA.
- ▶ Recognition of an underlying SpA and one of the triggering infections

## Treatment

- ▶ Most cases of ReA are self-limiting, so the initial treatment is often conservative

## Inflammatory Bowel Disease–Associated Arthritis

- ▶ A member of the spondyloarthritis (SpA) family of disorder
- ▶ IBD-associated arthritis has similar manifestations to other spondyloarthritis family disorders
- Dysbiosis in the gut may lead to systemic inflammation

- ▶ Because both IBD and SpA often have an insidious onset, it can sometimes be difficult to determine which process started first
- ▶ in AS patients, the highest risk of developing IBD was within the first year of diagnosis

## Enteropathic Arthritis

- Ulcerative colitis(UC)
- Crohn's disease(CD)
- Asymptomatic sacroiliitis
- Inflammatory low back pain

## Spinal involvement in IBD

- ▶ 15-20%, M=F
- ▶ Often asymptomatic
- ▶ Not correlate with intestinal symptoms
- ▶ Surgical bowel resection has no impact on axial disease
- ▶ HLA B27+( 50-70%)

## Clinical Manifestations

- ▶ Inflammatory arthritis (peripheral, axial, or both), enthesitis, and dactylitis
- ▶ Extra-articular manifestations of SpA, such as uveitis, erythema nodosum, and pyoderma gangrenosum, can be seen in affected patients

## Diagnosis

- ▶ IBD-associated arthritis should be suspected when a patient with IBD develops joint pain, stiffness, or symptoms of inflammatory back pain

## Treatment

- ▶ Steroids and DMARDs and Anti TNF medications that control intestinal inflammation are also helpful for joint involvement
- ▶ Depends on which axial or peripheral joints predominate
- ▶ NSAID :  
Maybe exacerbated intestinal symptom in UC



Thanks