

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

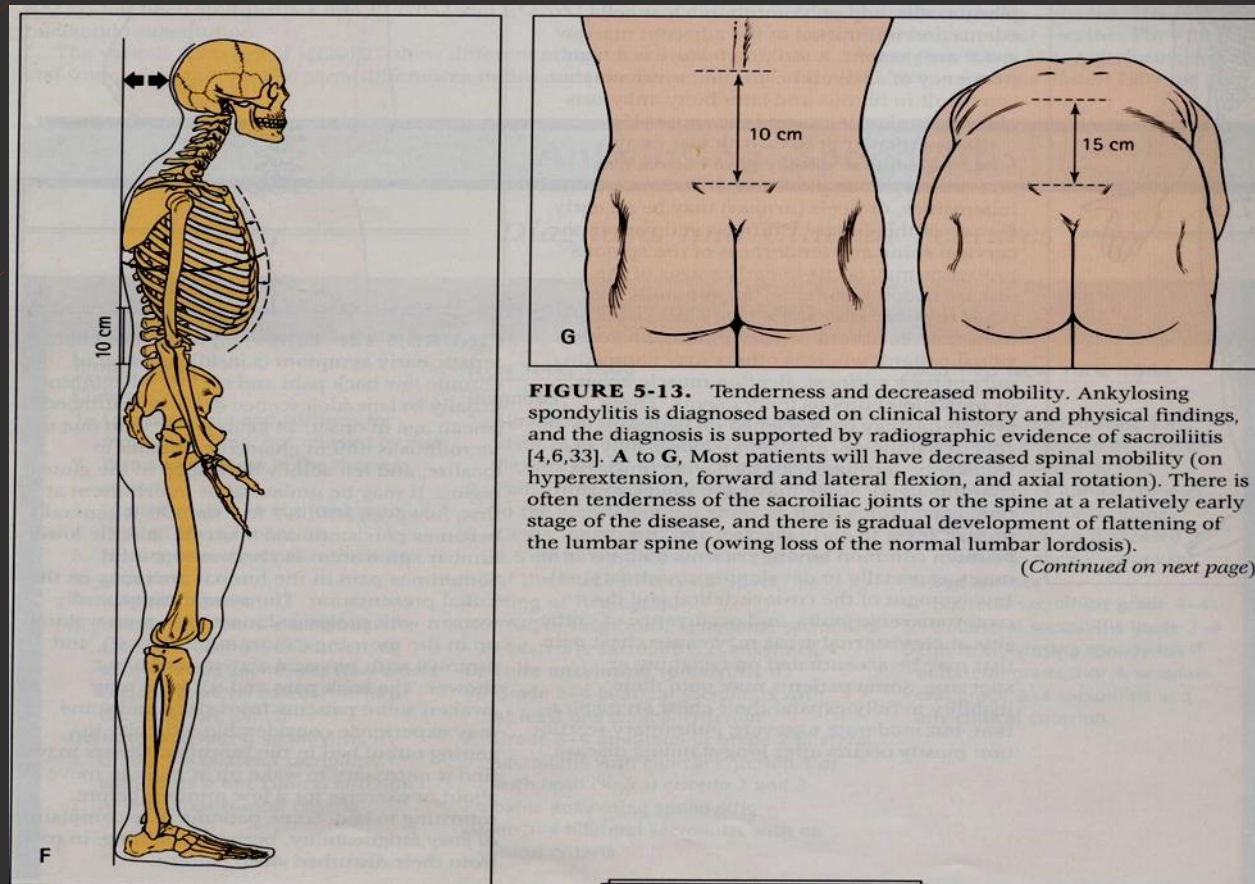
- Cardiovascular Disease
- Pulmonary Disease
- Neurologic Involvement
- Renal Involvement

Physical Examination

Spinal Mobility:

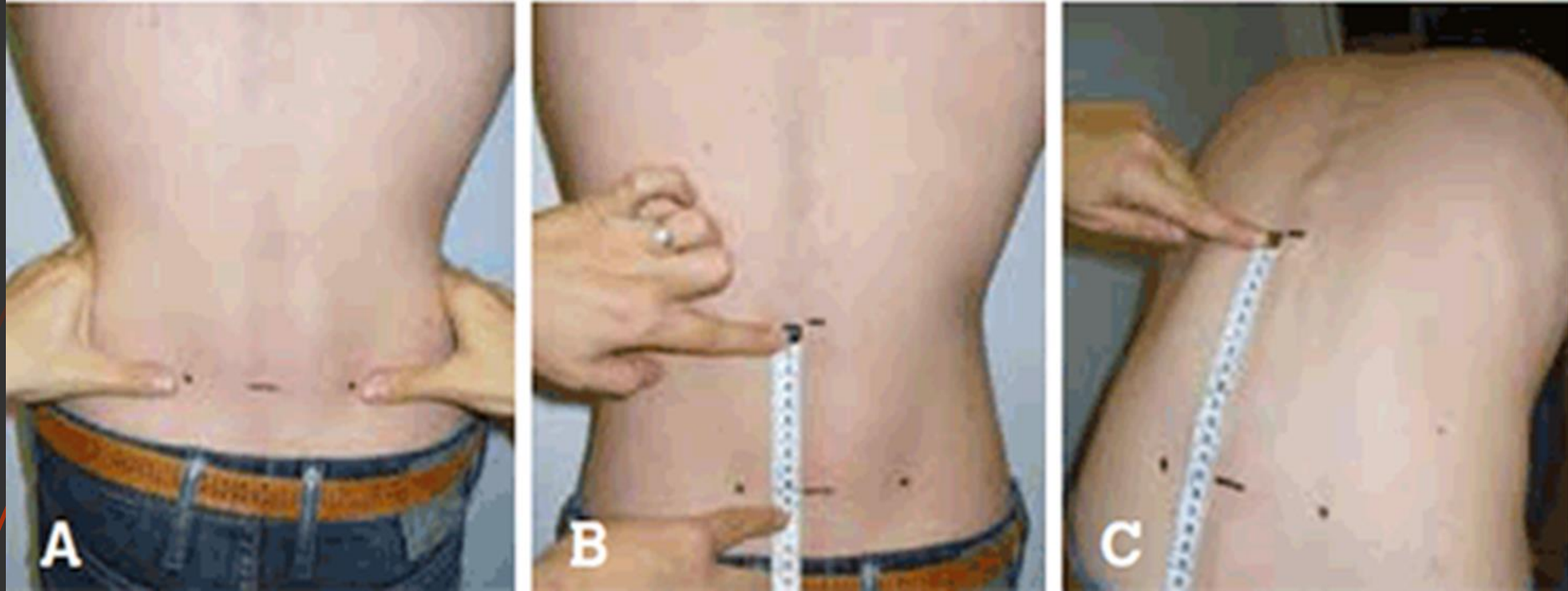
- Some limitation of motion of the lumbar spine :
- Forward flexion
- Hyperextension
- Lateral flexion
- Early loss of the normal lumbar lordosis is often the first sign and is easily assessed on inspection
- Lateral flexion may also be diminished
- Spinal rotation may cause pain

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 modarete 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 4.2 cm) is recorded
- Report the best of two tries

Physical Examination

- Sacroiliitis:

- Direct pressure over the SI joints may elicit pain

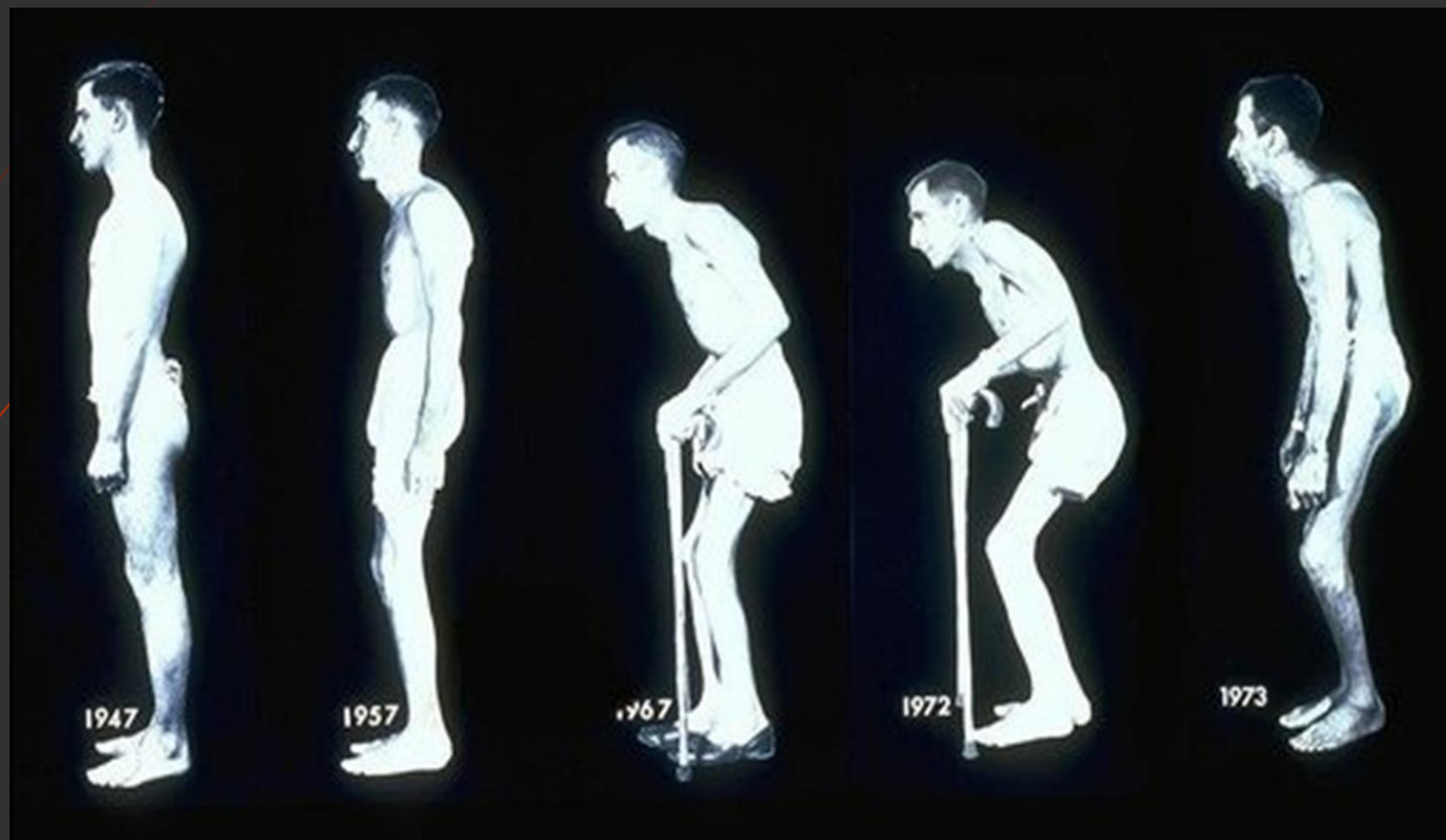
- Negative in early disease

- 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

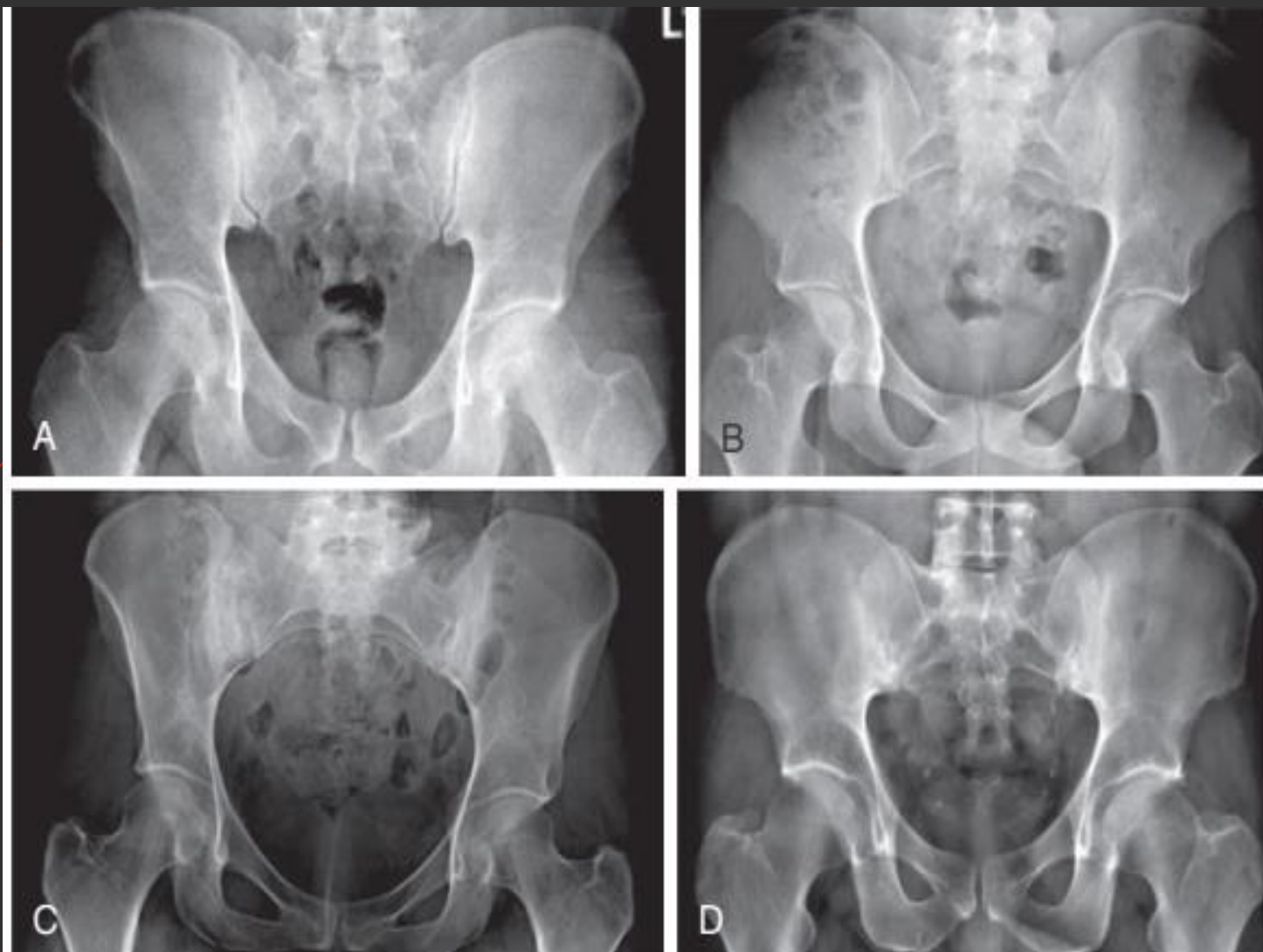
Radiographic findings of sacroiliitis

- 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**

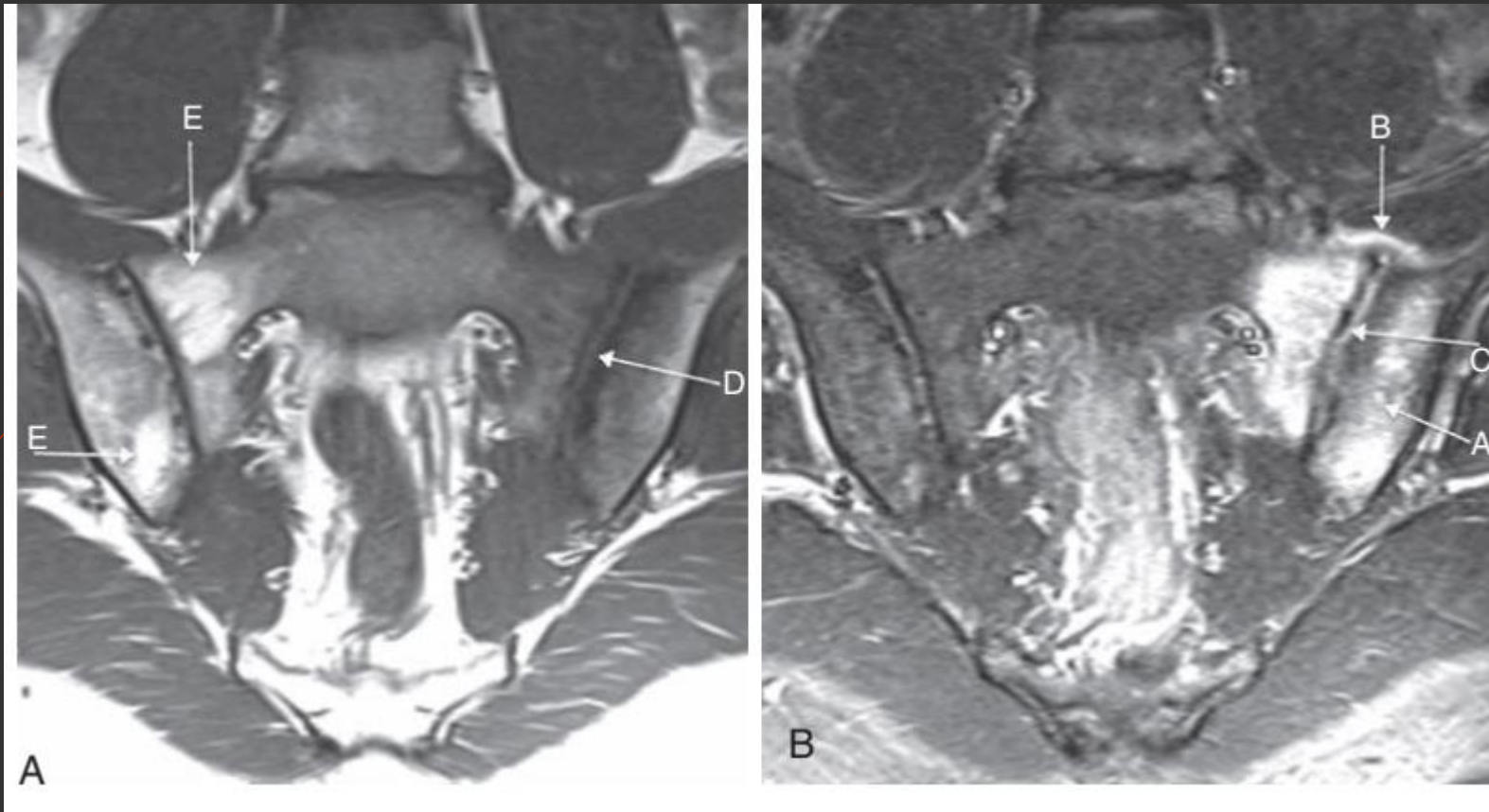


MRI

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

MRI

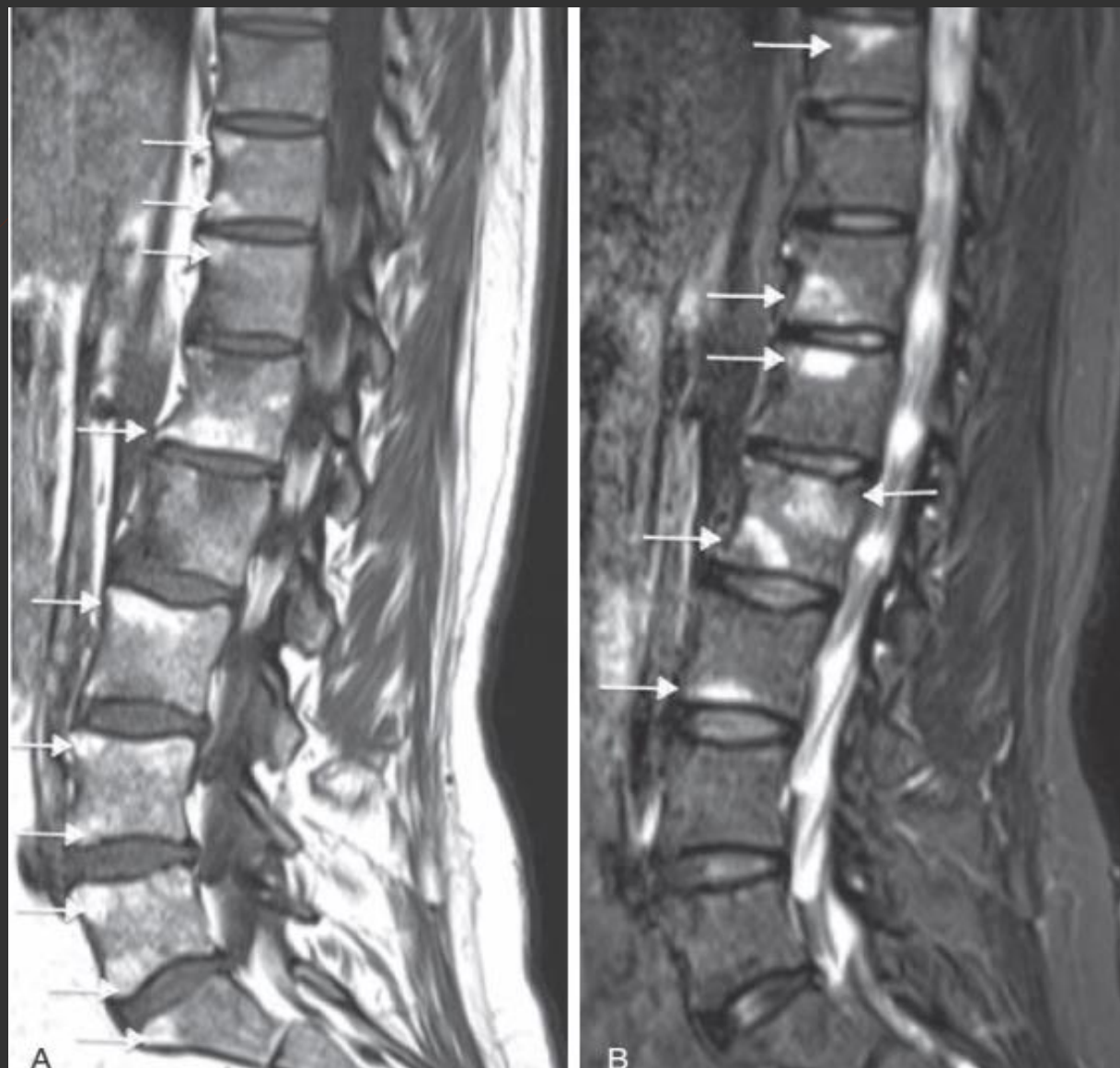
- Short-tau inversion recovery (STIR)
- Very sensitive in detection of bone marrow edema
- The T1-weighted (T1W)
 - Detection of erosions and fat metaplasia
- Diagnostic MRI should include both sequences



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 ≥ 1 SpA Feature	OR	HLA-B27 PLUS ≥ 2 Other SpA Features
<u>SpA Features</u> Inflammatory back pain Arthritis Enthesitis (heel) Uveitis Dactylitis Psoriasis Crohn's disease/ ulcerative colitis Good response to NSAIDs Family history for SpA HLA-B27 Elevated CRP ^a		<u>Sacroiliitis on Imaging</u> Active (acute) inflammation on MRI highly suggestive of sacroiliitis associated with SpA OR Definite radiographic sacroiliitis according to modified New York criteria

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

**TABLE
82.2**

CASPAR Classification Criteria for Psoriatic Arthritis

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

1. Evidence of psoriasis (one of a, b, or c)
 - a. Current psoriasis^a: 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

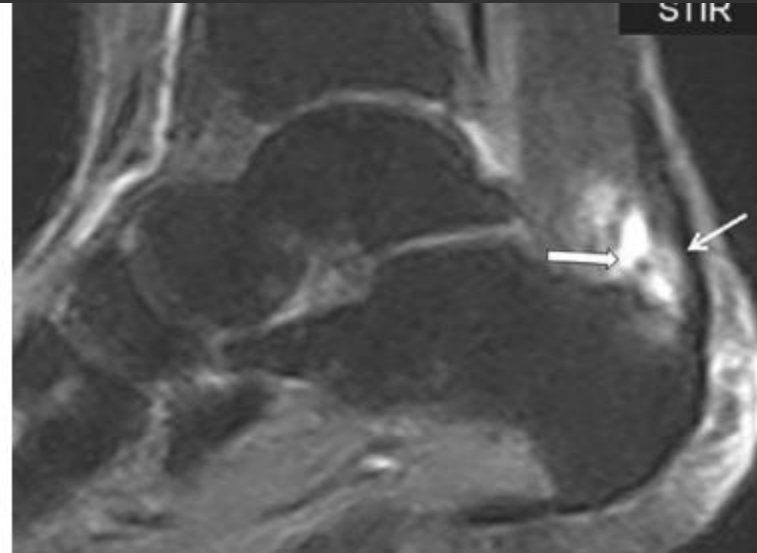
Treatment

- 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

