ANKYLOSING SPONDYLITIS

DR.HIMANSHU BISHNOI

Assistant Professor, Dept of Orthopedics

MIMER Medical college Talegaon Dabhade, Pune

Inflammatory disorder of unknown cause that primarily affects the axial skeleton; peripheral joints and extra-articular structures may also be involved

- Idiopathic
- Rheumatoid factor absent
- HLA-B27 present in > 90% cases
- Disease usually begins in the second or third decade.
- M:F= 3:1

PATHOGENESIS

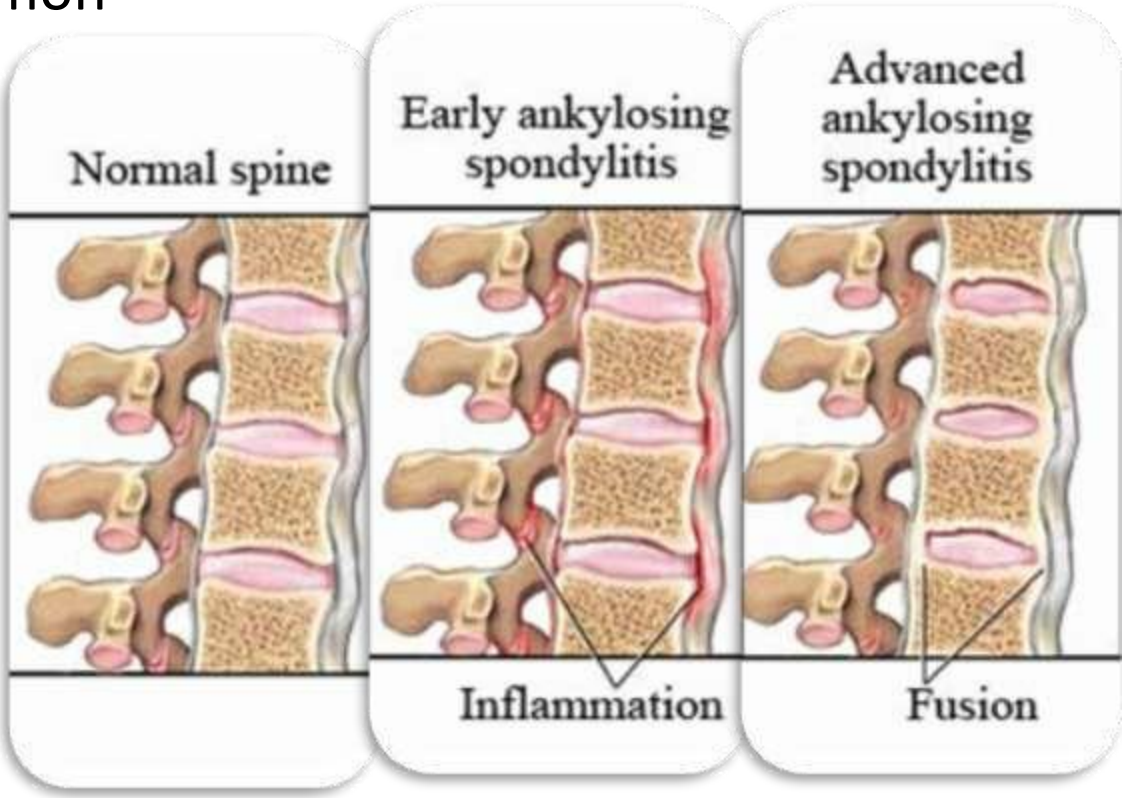
- Immune mediated. In some cases, the disease occurs in these predisposed people after exposure to bowel or urinary tract infections.
- Autoimmunity to the cartilage proteoglycan aggrecan.

PATHOLOGY

- The **enthesis,** the site of ligamentous attachment to bone, is thought to be the primary site of pathology
- **Enthesitis** is associated with prominent edema of the adjacent bone marrow and is often characterized by *erosive lesions* that eventually undergo ossification.
- **Sacroiliitis** is usually one of the earliest manifestations.

- The early lesions consist of **subchondral granulation tissue,** infiltrates of lymphocytes and macrophages in ligamentous and periosteal zones, and subchondral bone marrow edema.
- **Synovitis** follows and may progress to **pannus formation** with islands of new bone formation.
- The eroded joint margins are gradually replaced by **fibrocartilage regeneration** and then by **ossification**. Ultimately, the joint may be totally obliterated.

- Axial Arthritis (Eg, Sacroiliitis And Spondylitis)
- Arthritis Of ‘Girdle Joints’ (Hips And Shoulders)
- Peripheral Arthritis Uncommon
- Others:
  - ❑Enthesitis
  - ❑Osteoporosis
  - ❑Vertebral Fractures
  - ❑Spondylodiscitis
  - ❑Costochondritis



The outer annular fibers are eroded and eventually replaced by bone → bony **syndesmophytes**, which then grows by continued enchondral ossification, ultimately bridging the adjacent vertebral bodies = **“bamboo spine”**.

PRESENTATION

- Variable
- From intermittent episodes of back pain that occur throughout life to a severe chronic disease.
- Attacks the spine, peripheral joints and other body organs, resulting in severe joint and back stiffness, loss of motion and deformity as life progresses.

CLINICAL FEATURES

Initial symptom-

- Insidious onset dull pain in the lower lumbar or gluteal region
- Low-back morning stiffness of up to a few hours' duration that improves with activity and returns following periods of inactivity.
- Pain usually becomes persistent and bilateral. Nocturnal exacerbation +.
- Predominant complaint- Back pain or stiffness.
- Bony tenderness may present at- costosternal junctions, spinous processes, iliac crests, greater trochanters, ischial tuberosities, tibial tubercles, and heels.

- Neck pain and stiffness from involvement of the cervical spine : late manifestations
- Arthritis in the hips and shoulders (“root” joints) : in25 to 35% of patients.
- Arthritis of other peripheral joints: usually asymmetric.
- Pain tends to be persistent early in the disease and then becomes intermittent, with alternating exacerbations and quiescent periods.
- In a typical severe untreated case- the patient's posture undergoes characteristic changes, with obliterated lumbar lordosis, buttock atrophy, and accentuated thoracic kyphosis. There may be a forward stoop of the neck or flexion contractures at the hips, compensated by flexion at the knees.
- Complication of the spinal disease is spinal fracture, which can occur with even minor trauma to the rigid, osteoporotic spine; cervical spine is most commonly involved.

TEST and MEASUREMENT for AS

Cervical mobility

- **Occiput-to-wall distance**
- **Tragus-to-wall distance**
- **Cervical rotation**

Thoracic mobility

- **Chest expansion**

Lumber mobility

- ❑**Modified schober index**
- ❑**Finger-to-floor distance**
- ❑**Lumber lateral flexion**

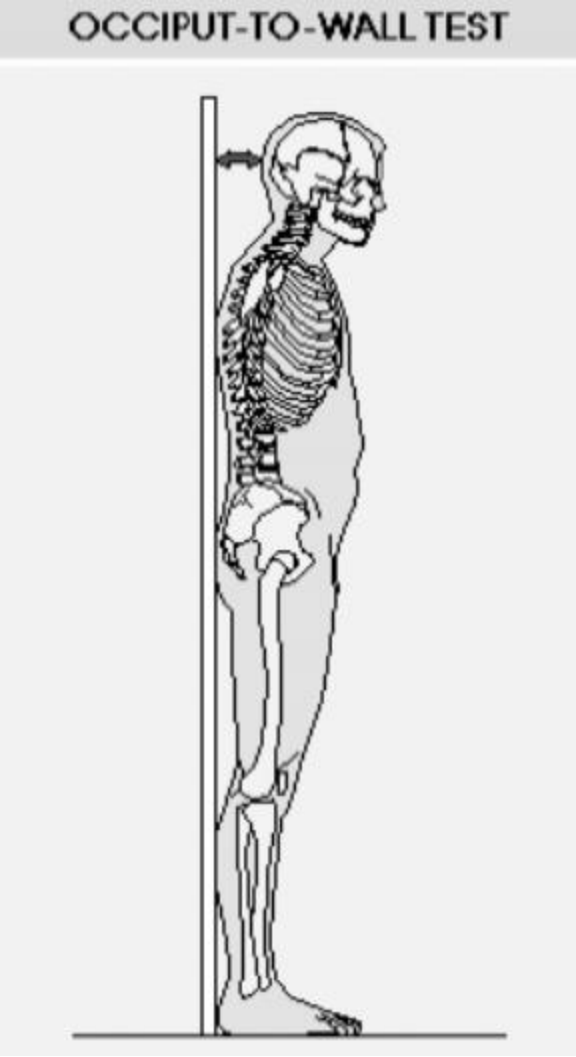
Occiput To Wall Distance / Flesche Test

❑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.

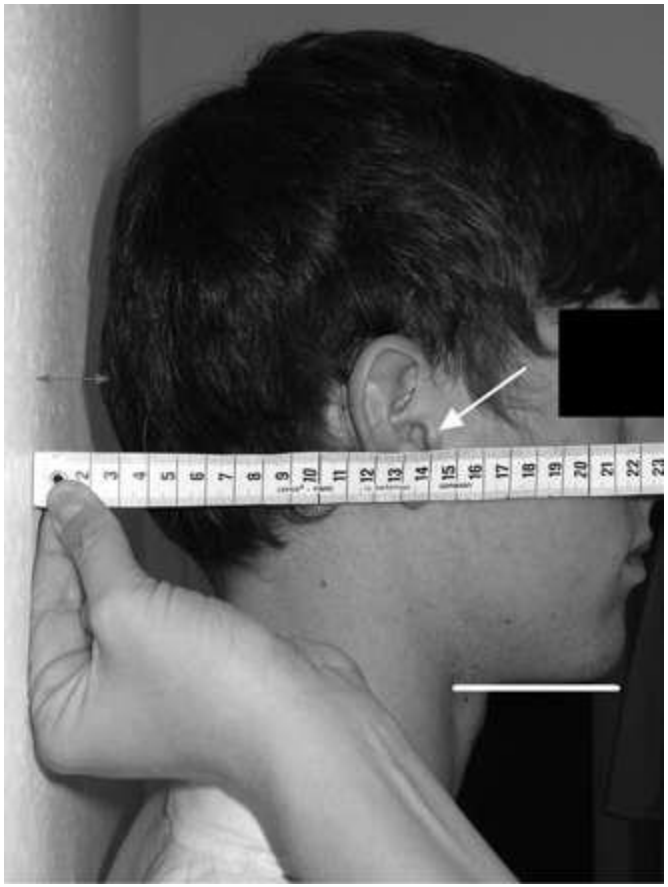
❑The distance between the occiput and the wall is a measure of the degree of flexion deformity of the cervical spine.

- The occiput to wall distance should be zero



Tragus-to-wall distance

- Maintain starting position i.e. ensure head in neutral position (anatomical alignment), chin drawn in as far as possible. Measure distance between tragus of the ear and wall on both sides, using a rigid ruler. Ensure no cervical extension, rotation, flexion or side flexion occurs.



Cervical rotation

- Patient supine, head in neutral position, forehead horizontal (if necessary head on pillow or foam block to allow this, must be documented for future reassessments).
- Gravity goniometer / bubble inclinometer placed centrally on the forehead. Patient rotates head as far as possible, keeping shoulders still, ensure no neck flexion or side flexion occurs.

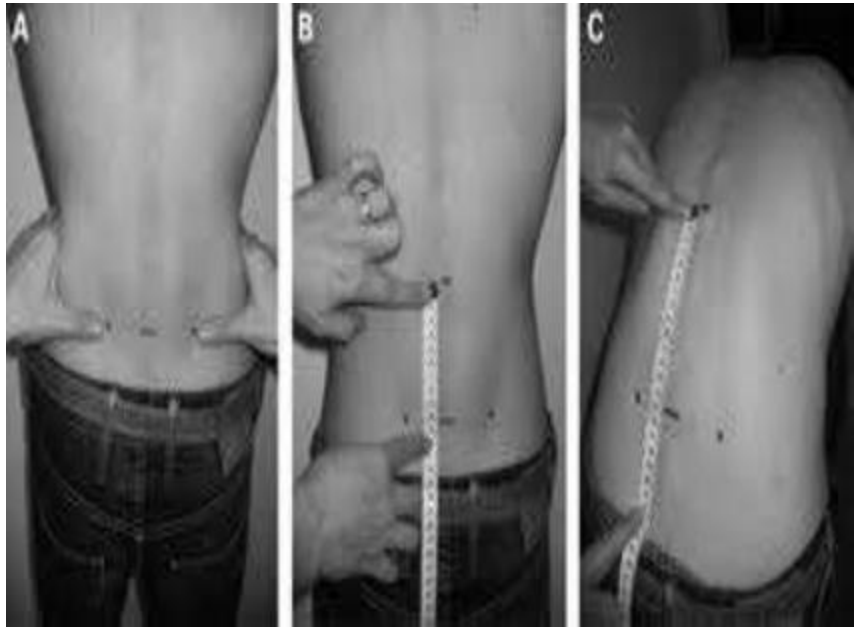
Normal ROM: 70-90^0

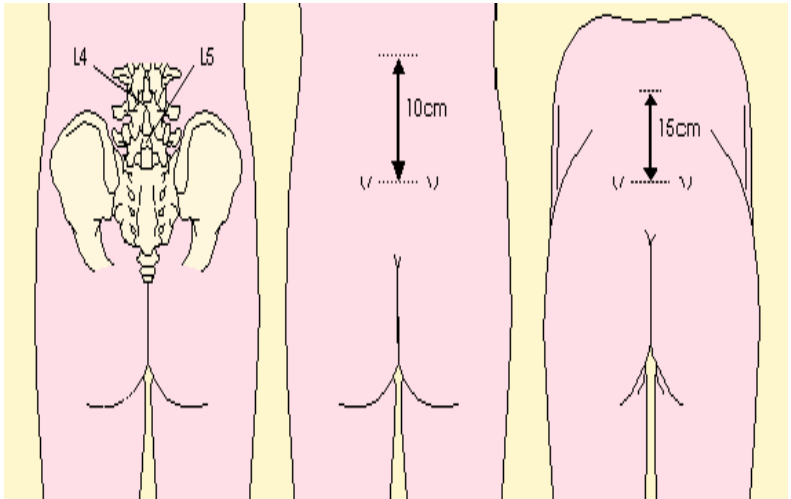
Chest expansion

- Measured as the difference between maximal inspiration and maximal forced expiration in the fourth intercostal space in males or just below the breasts in females. Normal chest expansion is ≥5 cm.

Lumbar flexion (modified Schober)

- With the patient standing upright, place a mark at the lumbosacral junction (at the level of the dimples of Venus on both sides). Further marks are placed 5 cm below and 10 cm above. Measure the distraction of these two marks when the patient bends forward as far as possible, keeping the knees straight





The distance less than 5 cm is abnormal

Finger to floor distance

- Expression of spinal column mobility when bending over forward; the dimension that is measured is the distance between the tips of the fingers and the floor when the patient is bent over forward with knees and arms fully extended.

Lateral spinal flexion

Patient standing with heels and buttocks touching the wall, knees straight, shoulders back, outer edges of feet 30 cm apart, feet parallel.

Measure minimal fingertip-to-floor distance in full lateral flexion without flexion, extension or rotation of the trunk or bending the knees.

Greater than 10cm is normal.

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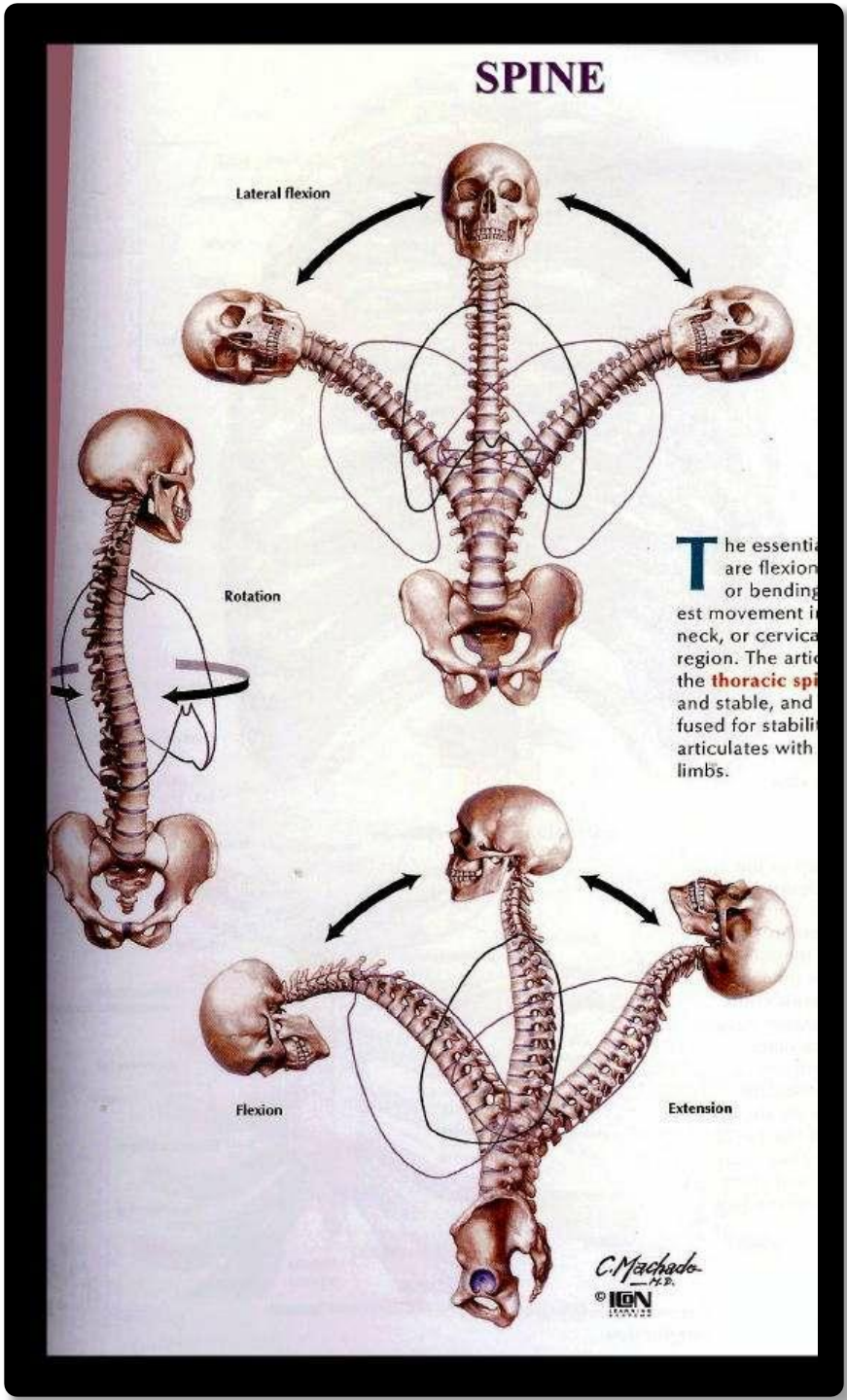
Range of motion

Cervical Spine

- Forward flexion: 0 to 45 degrees
- Extension: 0 to 45 degrees
- Left Lateral Flexion: 0 to 45
- Right Lateral Flexion: 0 to 45
- Left Lateral Rotation: 0 to 80
- Right Lateral Rotation: 0 to 80

Thoracolumbar spine

- Forward flexion: 0 to 90 degrees
- Extension: 0 to 30 degrees
- Left Lateral Flexion: 0 to 30
- Right Lateral Flexion: 0 to 30
- Left Lateral Rotation: 0 to 30
- Right Lateral Rotation: 0 to 30

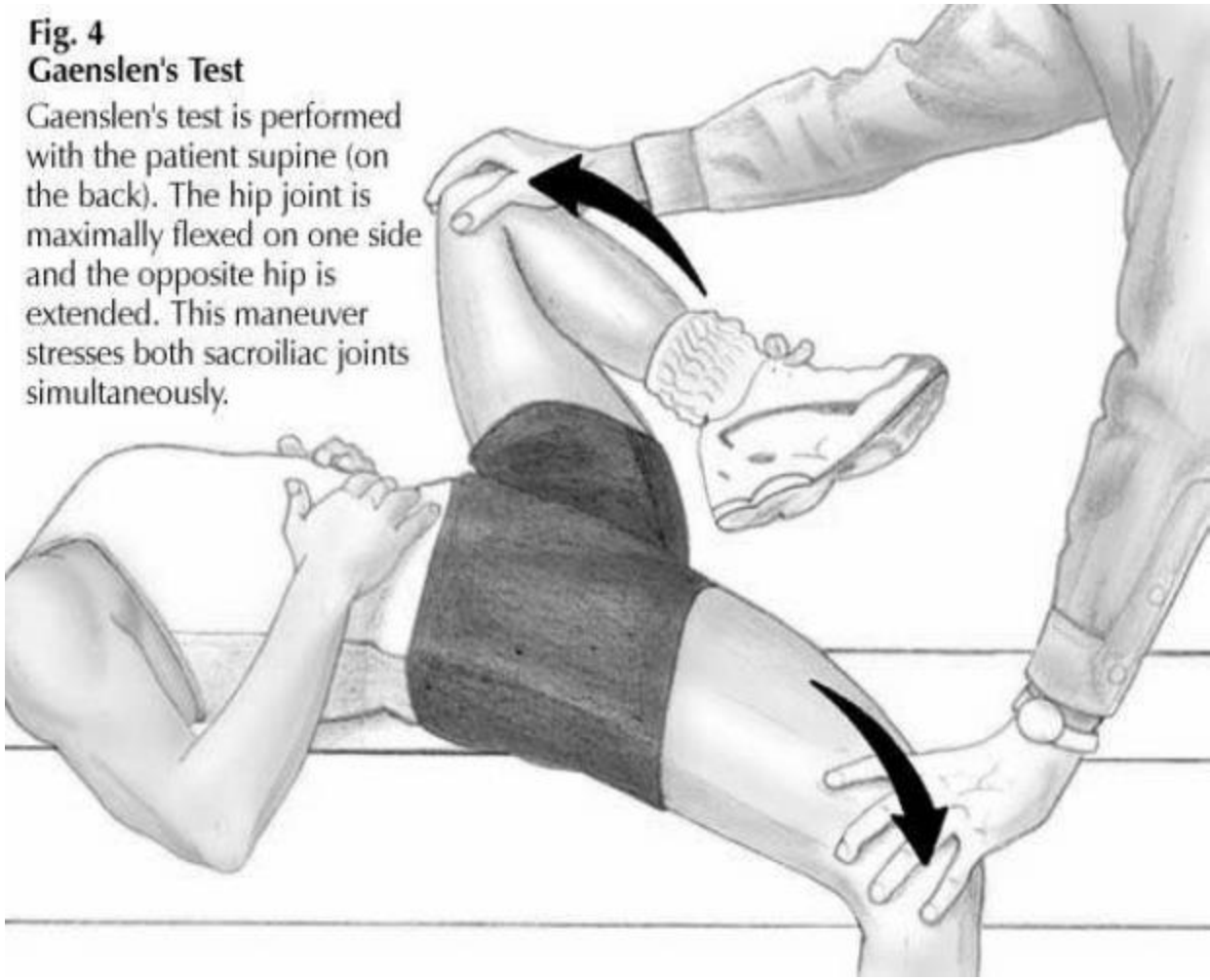


TESTS FOR SACROILITIS

- Pelvic compression test
- Faber test
- Gaenslen Test
- Pump Handle test

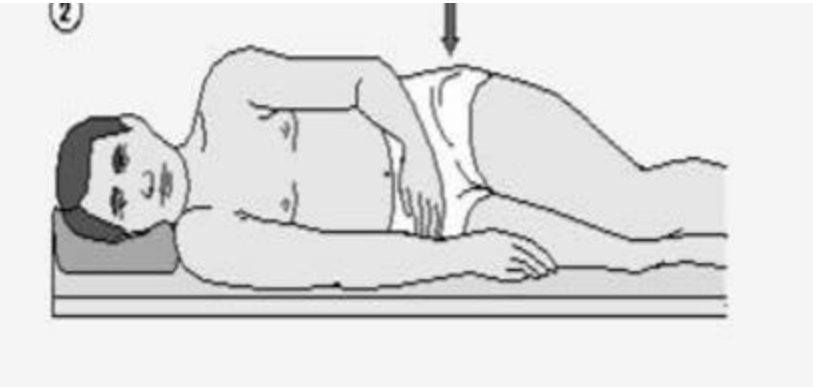
GAENSLEN TEST

Gaenslen test stresses the sacroiliac joints, Increased pain during this test could be indicative of joint disease.



PELVIC COMPRESSION TEST

- Test irritability by compressing the pelvis with the patient prone. Sacroiliac pain will be lateralised to the inflamed joint.



Patrick's test or **FABER test**

- The test is performed by having the tested leg flexed, abducted and externally rotated. If pain results, this is considered a *positive Patrick's test*.

EXTRASKELETAL MANIFESTATION

- Most common is **acute anterior uveitis**- typically unilateral, causing pain, photophobia, and increased lacrimation.
- Cataracts and secondary glaucoma are not uncommon sequelae.
- Inflammation in the colon or ileum.
- Aortic insufficiency.
- Third-degree heart block.
- Subclinical pulmonary lesions.
- Slowly progressive upper pulmonary lobe fibrosis.
- Retroperitoneal fibrosis.
- Prostatitis.

LAB. TESTS

- HLA B27: present in ≈ 90% of patients.
- ESR and CRP – often elevated.
- Mild anemia.
- Elevated serum IgA levels.
- ALP & CPK raised.

X-RAY

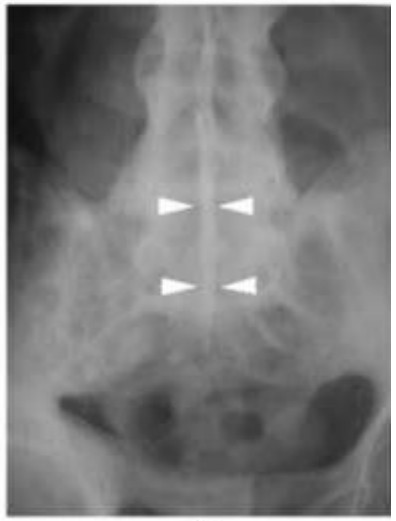
Sacroiliitis-

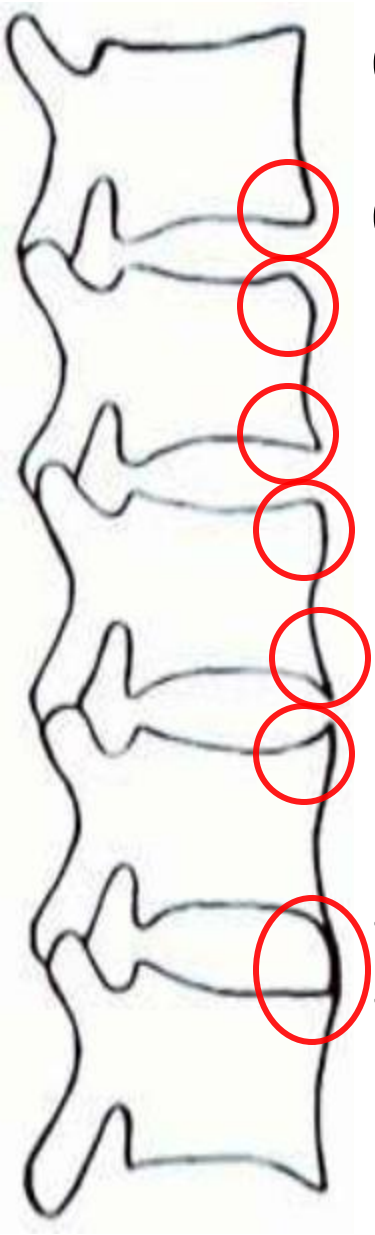
- Early: blurring of the cortical margins of the subchondral bone
- Followed by erosions and sclerosis.
- Progression of the erosions leads to "**pseudo widening**" of the joint space
- As fibrous and then bony ankylosis supervene, the joints may become obliterated.
- The changes and progression of the lesions are usually symmetric.
- Seen in **Ferguson's View** (specialized sacroiliac view).
- **Dynamic MRI** is the procedure of choice for establishing a diagnosis of sacroiliitis.

Lumbar spine:

- Loss of lordosis/ straightening
- Diffuse osteoporosis
- Reactive sclerosis- caused by osteitis of the anterior corners of the vertebral bodies with subsequent erosion (**Romanus lesion**), leading to "**squaring" of the vertebral bodies**.
- Ossification os supraspinous & interspinous ligaments " **dagger Sign**".
- Formation of marginal
- **syndesmophytes**,

  Later **Bamboo spine appearance**
- when ankylosis of spine occurs.
- **Odontoid erosion.**





0 normal

0 normal
1 erosion

1 sclerosis
1 squaring

2 syndesmophyte
2 syndesmophyte

3 complete bridging
3 complete bridging

DIAGNOSIS

- **Modified Newyork Criteria (1984)** – 4 + any of 1/2/3

  1. Inflammatory low back pain > 3 months
  (Age of onset < 40, Insidious onset, Duration longer than 3 months, Pain worse in the morning, Morning stiffness lasts longer than 30 minutes, Pain decreases with Exercise, Pain provoked by prolonged inactivity or lying down, Pain accompanied with constitutional Symptoms- Anorexia, Malaise, Low grade fever)
- 2. Limited motion of lumbar spine in sagittal & frontal planes
- 3. Limited chest expansion (<2.5cm at 4^{th} ICS)
- 4. Definite radiologic sacroiliitis

Disease Specific Instruments For The Measurement In Ankylosing Spondylitis

Instrument	Measures
Bath ankylosing spondylitis disease activity index (BASDAI)	Disease activity
Bath ankylosing spondylitis functional index (BASFI)	Function
Dougados functional index (DFI)	Function
Bath ankylosing spondylitis metrology index (BASMI)	Function
Modified stoke ankylosing spondylitis spinal score (m-sasss)	Structural damage

TREATMENT

1. Regular physical therapy-Posture maintenance, Yoga, heat therapy
2. NSAIDS **Indomethacin** (up to maximum of 50 mg PO tid)
   COX-2 inhibitors
3. **Sulfasalazine,** in doses of 2 to 3 g/d- Effective for axial and peripheral arthritis
4. **Methotrexate,** in doses of 10 to 25 mg/wk- primarily for peripheral arthritis
5. **Local Corticosteroids injection-** for persistent synovitis and enthesopathy 6. Medications to avoid- Long term Systemic Corticosteroids, gold and Penicillamine
7. **Anti-TNF-α therapy -** heralded a revolution in the management of AS.
   Infliximab (chimeric human/mouse anti-TNF-α monoclonal antibody)
   Etanercept (soluble p75 TNF-α receptor–IgG fusion protein)
   have shown rapid, profound, and sustained reductions in all clinical and laboratory measures of disease activity.
8. Pamidronate, thalidomide, α-emitting isotope ^{224}Ra
9. Most common indication for surgery - severe hip joint arthritis, total hip arthroplasty.

THANK YOU