Ankylosing spondylitis

- 0.1% prevalence
- ↑ prevalence in some Native American populations
- Less prevalent in African Americans than Caucasians
- M > F (M:F = 2.5-5:1)
- Peak age of onset: 15-30 years

Ankylosing spondylitis

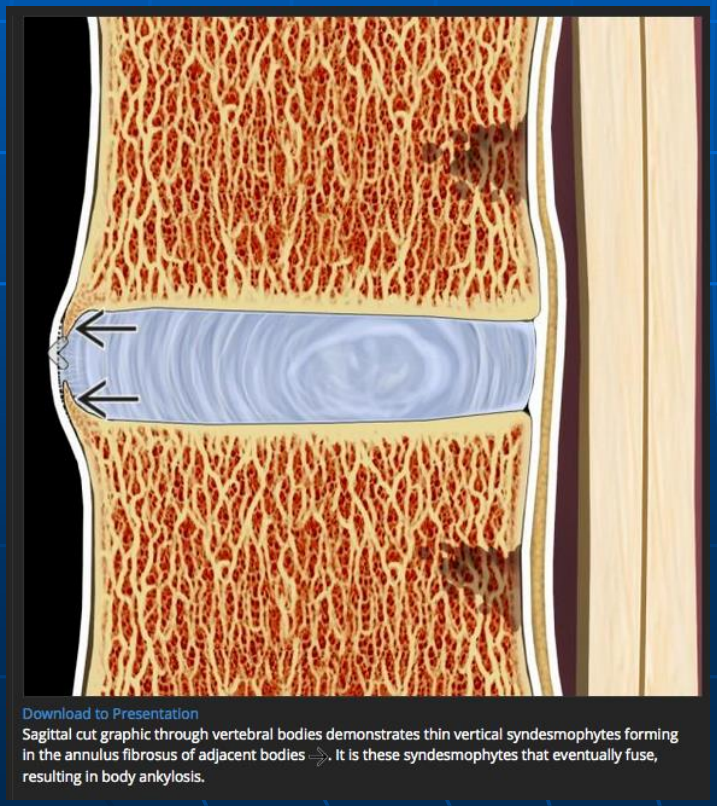
- Etiology
  - Unknown
  - Possible molecular mimicry: Hypothesized that AS results from exposure to arthritogenic bacteria that resemble HLA-B27
- Diagnosis
  - Strict diagnosis based on New York criteria
  - Probable diagnosis can be made on basis of clinical findings, before radiographic changes occur
    - May institute therapy earlier
  - Official criteria have not yet taken advantage of early signs on MR to secure diagnosis

Imaging

- **T1WI**
  - Romanus lesions: Low signal triangular edema at corners of vertebral bodies
  - SI joint marrow edema (low signal)
  - More chronic Romanus and SI joint lesions develop fatty marrow changes (high signal)
  - Once anterior syndesmophytes are mature and thick, high signal marrow is seen within them
- Fluid-sensitive sequences
  - Early high signal enthesopathy may be earliest sign
    - Watch interspinous ligaments, iliac spines, greater and lesser trochanters, pubic rami
  - Romanus lesions: Inflammatory change (high signal) at vertebral body corners
    - Often seen prior to syndesmophyte formation and heralds their formation
    - Easily overlooked or presumed to be degenerative
    - Chronic lesions replaced by fat
      - Similar to Modic changes
  - Anderson lesions: Same as Romanus but located more centrally at discovertebral junction
    - Contribute to vertebral body fusion
  - Low signal syndesmophytes themselves are difficult to see on MR until thickened significantly
  - Watch for transverse fracture in fused column
    - High signal ligament and cord damage
  - Synovial portions of SIJs show high signal
    - Coronal oblique sequences most useful
- T1 FS post contrast shows enhancement of
  - Active Romanus and Anderson lesions
  - Active enthesopathy
  - Early SIJ synovitis best seen post contrast

Ankylosing spondylitis

- Young pts (20-40), M > F
- "Bamboo spine"
- Flowing syndesmophytes,
- Bilateral sacroiliitis
- ligament/disc calcification



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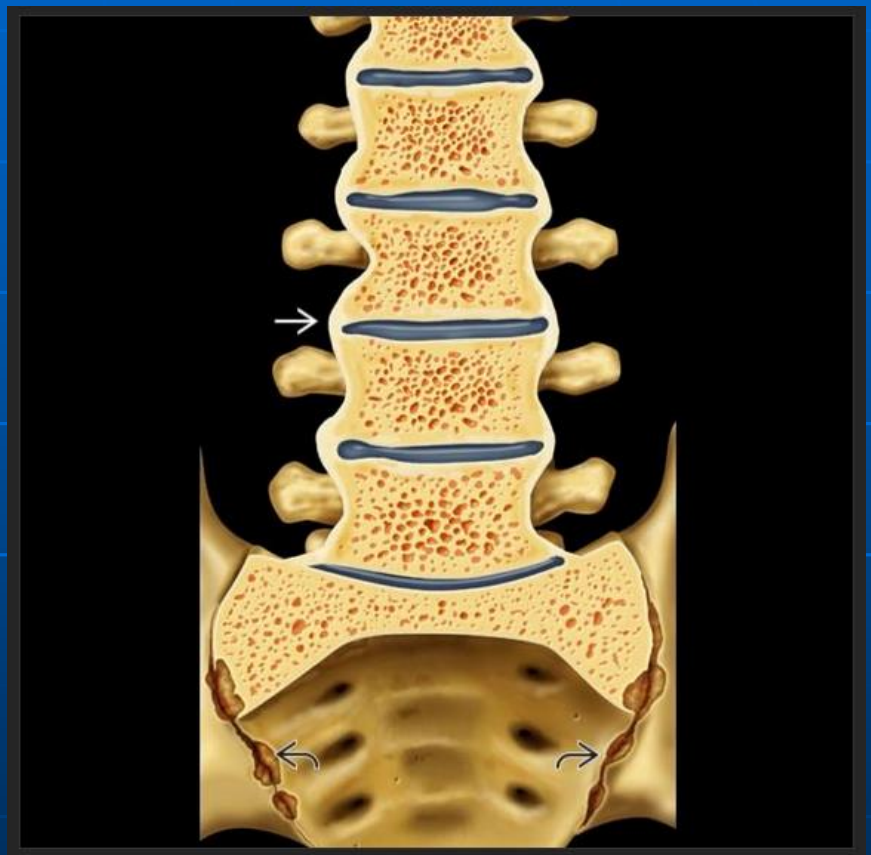
Sagittal cut graphic through vertebral bodies demonstrates thin vertical syndesmophytes forming in the annulus fibrosus of adjacent bodies. It is these syndesmophytes that eventually fuse, resulting in body ankylosis.



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Coronal graphic illustrates the findings of advanced ankylosing spondylitis. The vertical syndesmophytes appear to undulate, and there is a solid column fusion ("bamboo spine"). The sacroiliac (SI) joints show symmetric erosive disease.

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Lateral radiograph shows more osteitis (or "shiny corner") at 2 vertebral bodies →. Note the squaring of the bodies. There is a vertical syndesmophyte seen at a lower level ↗; all are typical findings of ankylosing spondylitis.

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Sagittal T2WI FS MR in a different patient shows more subtle Romanus lesions at the anterior corners →. The radiographs were normal, and it may be easy to overlook these early abnormalities on MR. However, other hints may be present. In this case, there is edema within the intraspinous ligaments ↗, another early abnormality.

- High signal enthesopathy may be earliest sign
- Romanus lesions: Inflammatory change (high signal) at vertebral body corners

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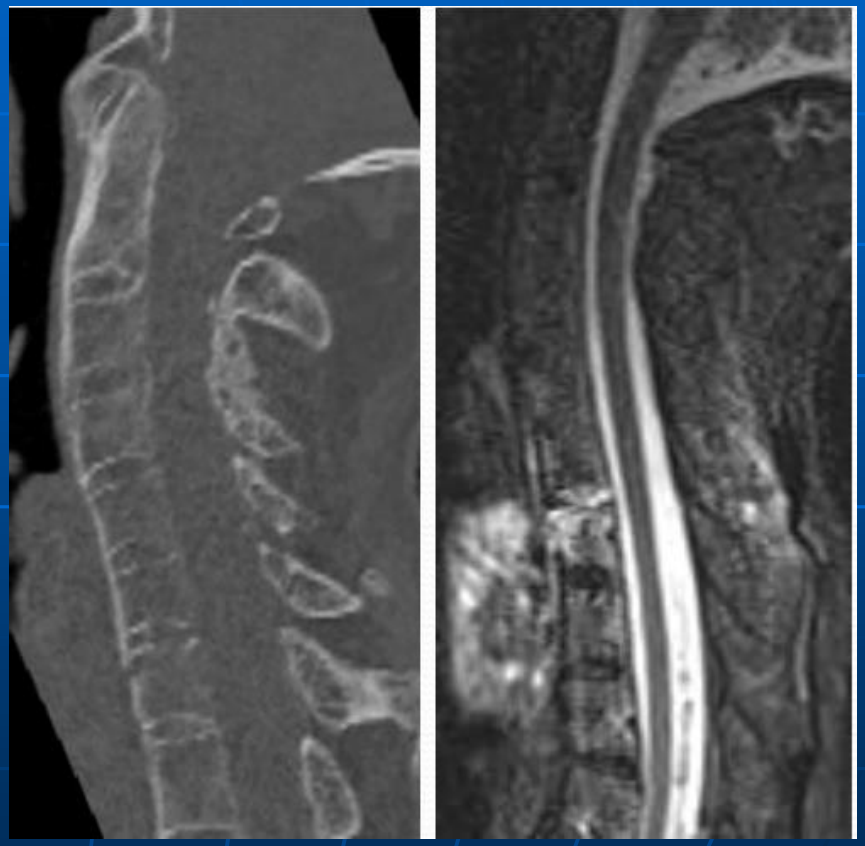
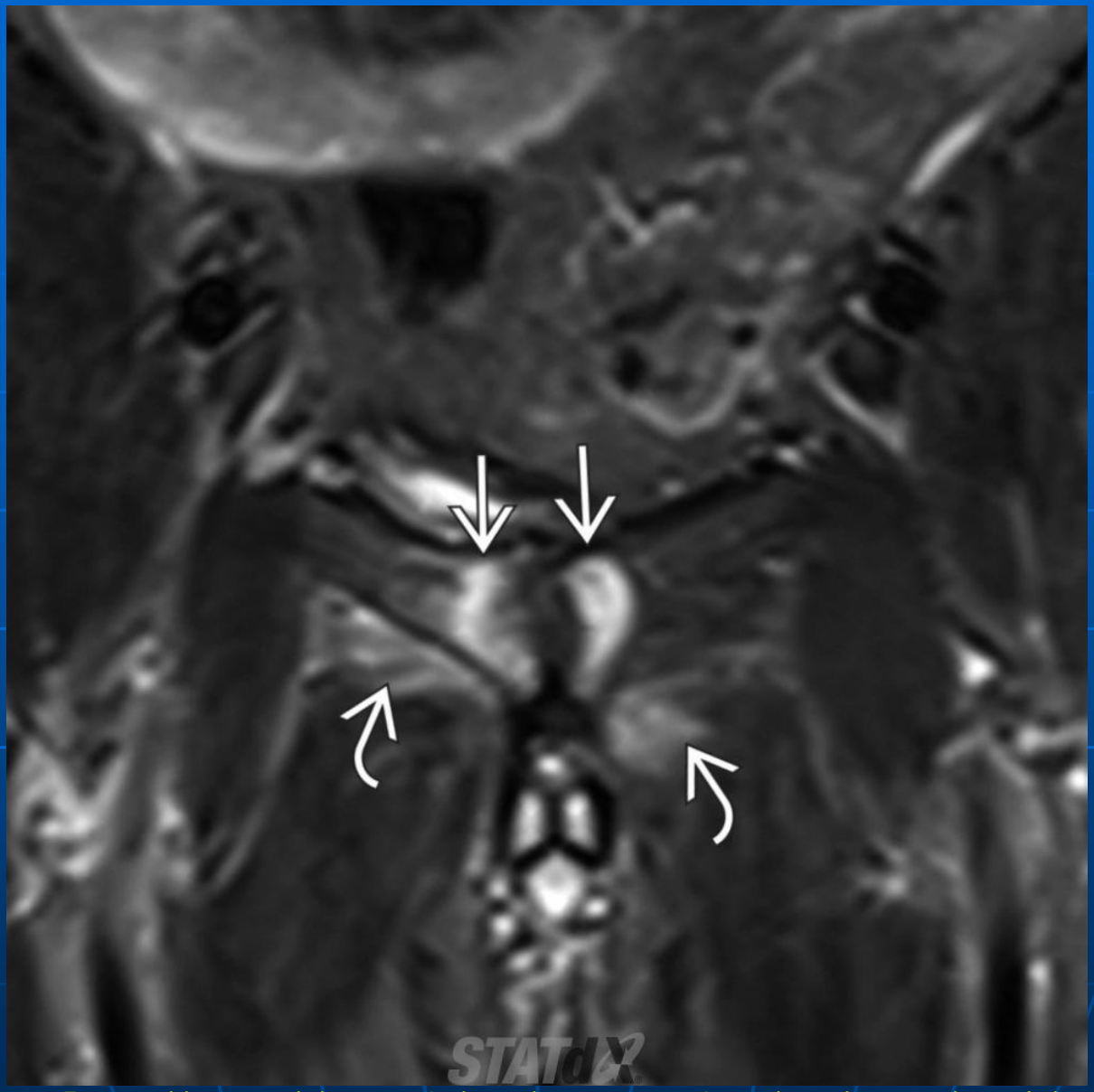
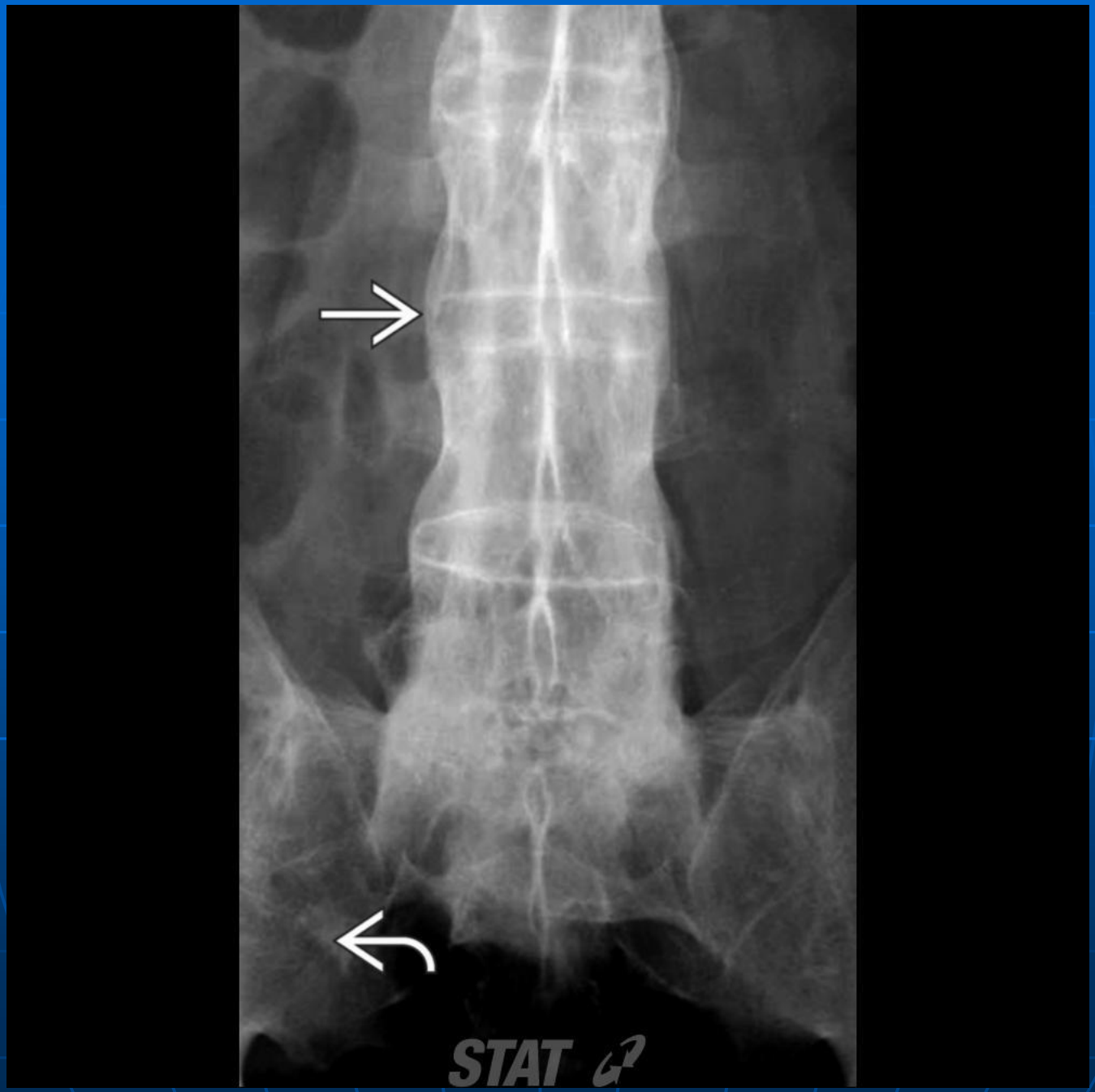
Axial STIR MR shows early, asymmetric sacroiliitis → involving the synovial portion of the joints; the x-rays were normal. Note also the Anderson lesion ⇨, analogous to a Romanus lesion but located in the central endplate.





Coronal T2 FS MR in a 45-year-old man with known AS shows hyperintense SI at the pubic symphysis (white solid arrow) as well as at the adductors bilaterally (white curved arrow). This appearance suggests an athletic pubalgia from sports injury; however, he did not exercise more vigorously than using an elliptical machine. Remember that AS may demonstrate enthesitis and periostitis, as seen here.



AP radiograph is immediately recognizable as a case of AS. The bridging vertical syndesmophytes (white solid arrow) show column fusion and associated diffuse osteoporosis. The inferior SI joints are eroded (white curved arrow) and undergoing early fusion.