ANPH 252:
Skeletal Pathology Inflammatory and Infectious Disorders

Inflammatory and Infectious Disorders

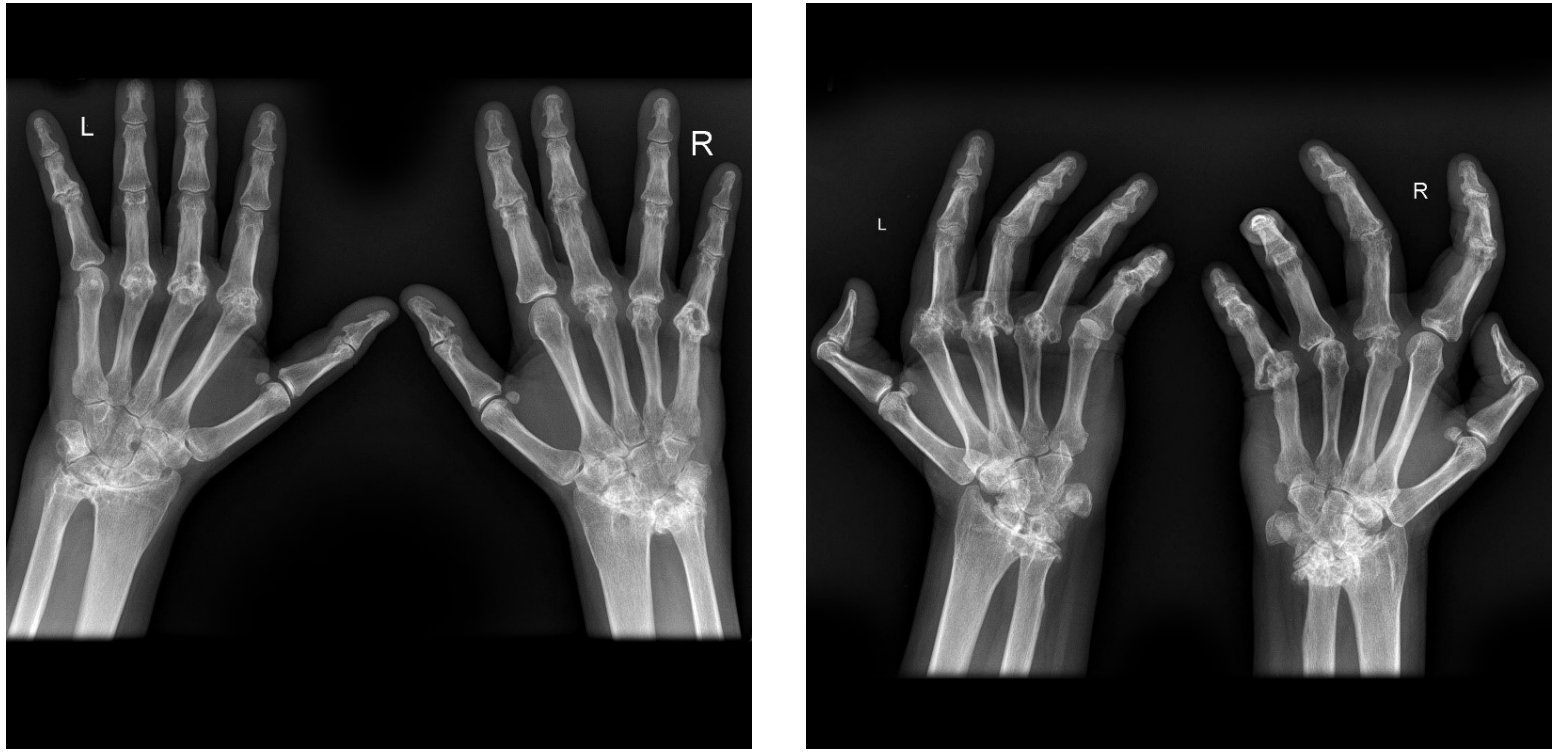
- Rheumatoid Arthritis
- Ankylosing spondylitis
- Osteoarthritis
- Osteomyelitis
- Osgoode-Schlatter disease

Rheumatoid Arthritis

- Non-infectious inflammatory arthritis of the small joints in hands and feet, but can affect large joints as well
- Considered an auto-immune disease
- 3x more common in women, with age of onset >40 years old
- Begins as inflammation of the synovial membrane
- Excessive synovial fluid causes the layer to thicken, leading to erosion of the articular cartilage and underlying bone
- As the disease progresses, it leads to narrowed joint spaces, fusion (ankylosing) and deformity



Case courtesy of Assoc Prof Craig Hacking, Radiopaedia.org, rID: 69224



Case courtesy of Assoc Prof Frank Gaillard, Radiopaedia.org, rID: 7245


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from Brown JC, Forrester DM: Arthritis. In Eisenberg RL, Amberg JR, editors: *Critical diagnostic pathways in radiology.* Philadelphia, 1981, Lippincott.

Eisenberg (7th ed.) Fig. 4-13, and 4-14, demonstrating ulnar deviation, periarticular osteoporosis, narrowing of joint spaces, inflammation of synovial capsules

Ankylosing Spondylitis

- A form of rheumatoid arthritis that involves the spine
- Causes vertebral bodies to fuse together
- Also known as bamboo spine or Marie-Strumpell disease
- Initially **manifests in the SI joints and moves up the spine**
- Spine becomes fused, and limited mobility causes generalized skeletal osteoporosis

Bamboo spine (ankylosing spondylitis)





Case courtesy of Radswiki, Radiopaedia.org, rID: 11189

Osteoarthritis (degenerative joint disease)

- Most common form of arthritis
- Most commonly caused by aging, but can also occur due to longstanding repetitive trauma, or to joint stress caused by orthopedic deformities
- Primarily affects weight-bearing joints: spine, hip, knee and ankle
- Over time, the cartilage thins and bony spurs (osteophytes) form along the articular edges of the bone
- The articular ends become dense due to periarticular sclerosis
- Subchondral cysts also form as well-defined lytic lesions
- Joint spaces narrow due to loss of cartilage, often in an asymmetric manner

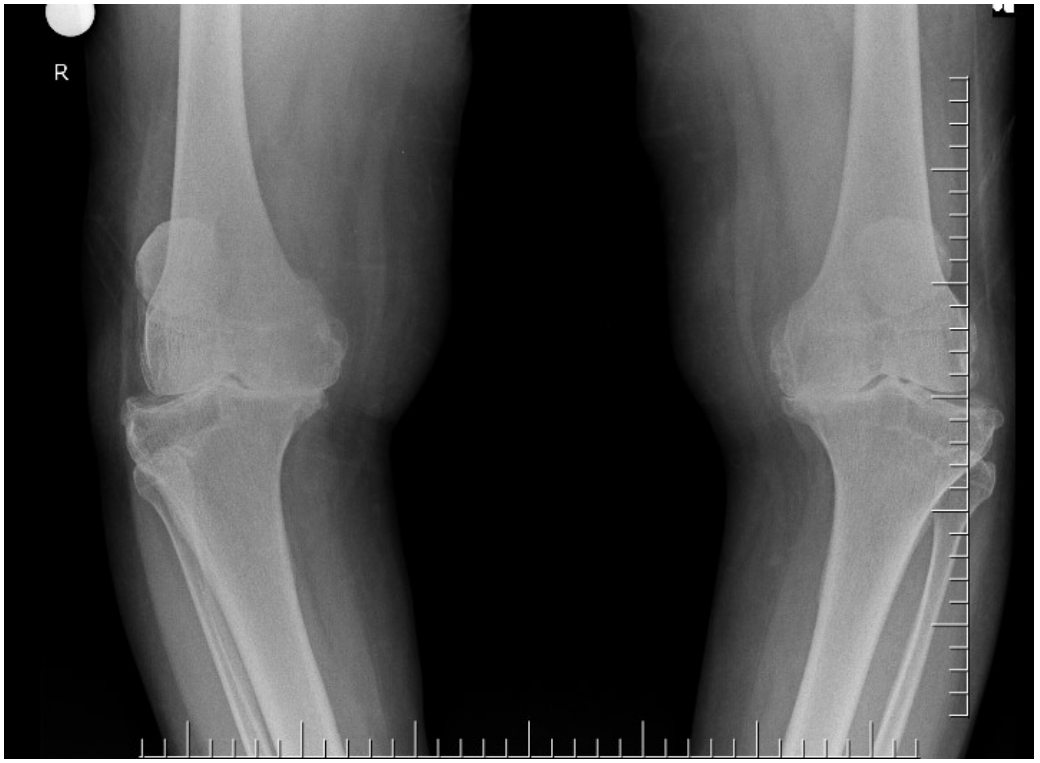
Osteoarthritis

- Main imaging signs exhibit on plain radiography as LOSS

- L: loss of joint space
- O: osteophytes
- S: subchondral cysts
- S: subchondral sclerosis



Case courtesy of Assoc. Prof. Craig Hacking, Radiopaedia.org, rID: 69224



Chief complaints of gradually progressive pain in both knees, increasing on activity, and a varus deformity.

Report:
AP projection of both the knees reveals severe loss of joint space in both (medial > lateral) compartments associated with osteophytes , subchondral sclerosis and an obvious varus deformity.

Case courtesy of Dr Vivek Pai, Radiopaedia.org, rID: 27042

Eisenberg (6th ed.) Fig. 4-23 and 4-25


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Osteomyelitis

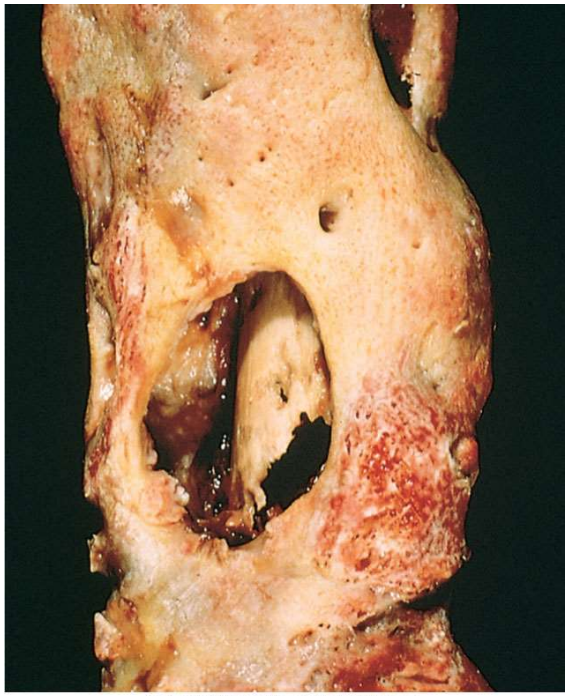
- A bacterial infection of the bone and bone marrow
- Can be either from another source of infection, or directly from surgery or trauma/ open wounds
- It begins as an abscess in the bone, and the pus formed by the inflammation spreads down the medullary cavity and outward
- Once it reaches the outer bony margin, it separates the periosteum from the bone. It can spread further along the bone in this manner

Osteomyelitis

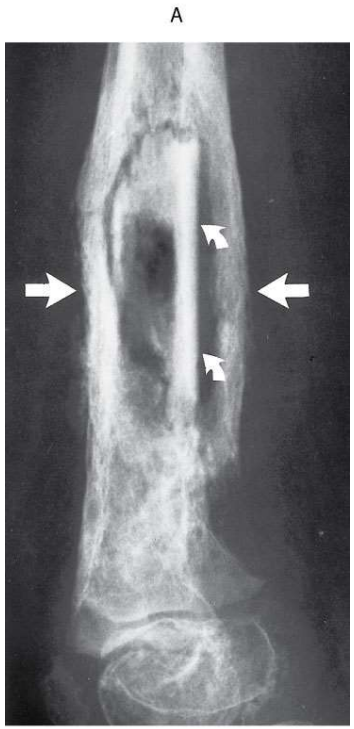
- Radiographic findings may not be seen or be very subtle in the early stages

- After the 5-7 day window in children or 10-14 day window in adults, changes become visible:
  - Regional osteopenia
  - Periosteal thickening, as new bone forms under the lifted periosteum
  - Soft tissue swelling
    - Nuclear medicine bone scans are best for diagnosing infection within hours of the onset of symptoms

Inflammation lifts the periosteum, and layers of new bone are deposited parallel to shaft of bone. Decreased blood supply to cortical bone causes necrosis



From Kumar V: *Robbins basic pathology*, ed 9, Philadelphia, 2013, Saunders.



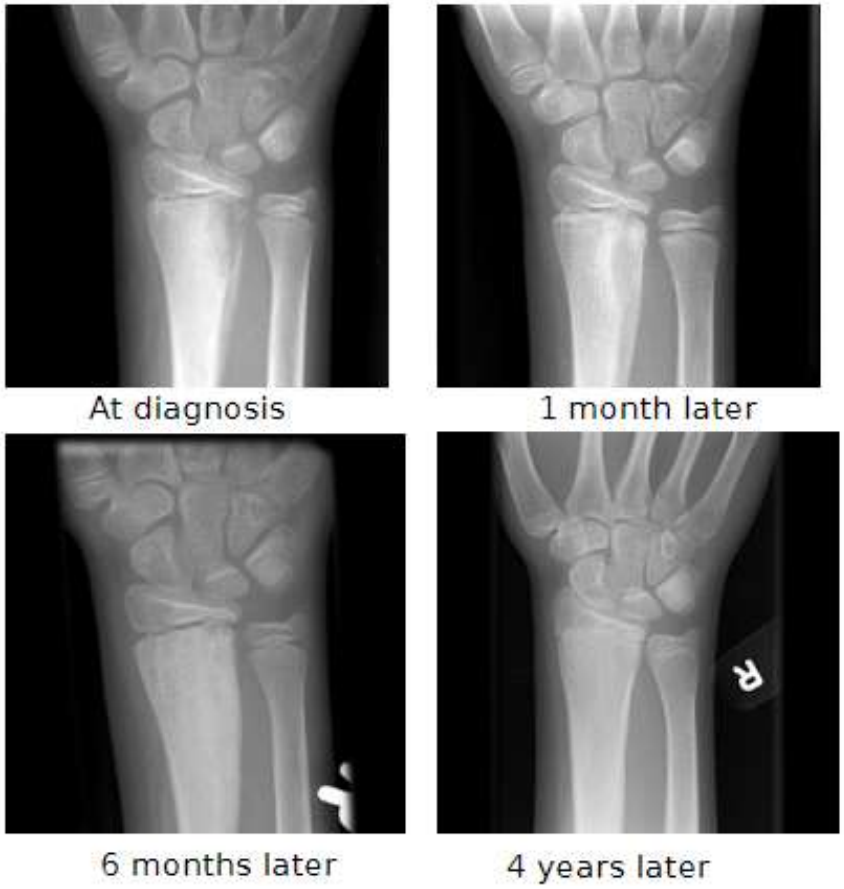
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Eisenberg (6th ed.) fig. 4-37 and 4-39

Osteomyelitis

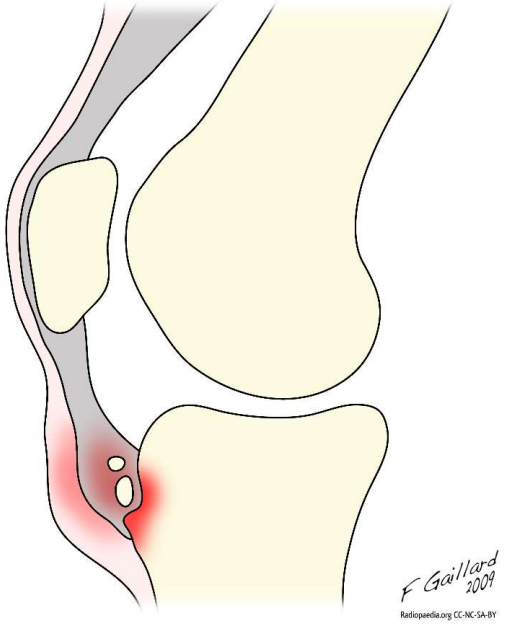


Case courtesy of Assoc Prof Frank Gaillard, Radiopaedia.org, rID: 7526

Osgood-Schlatter Disease

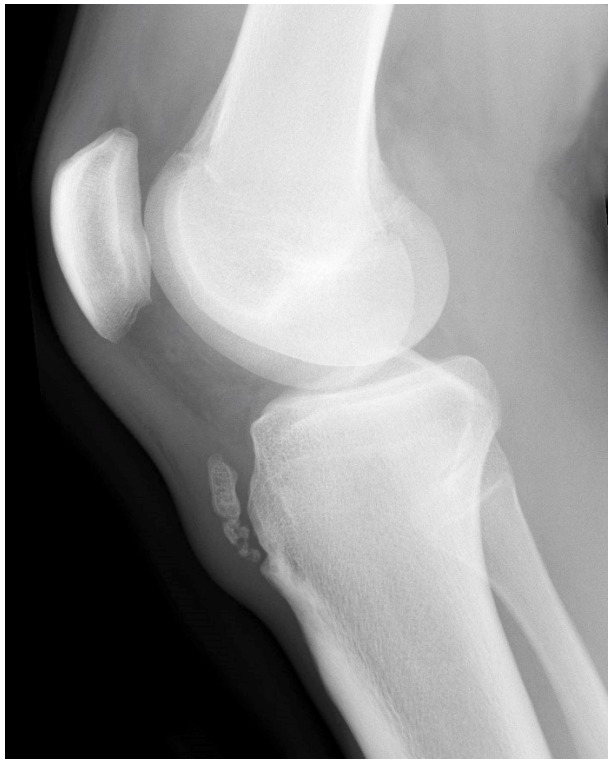
- A chronic fatigue injury at the patellar ligament insertion on the tibial tuberosity
- Most common in active adolescents, boys are most affected in25-50% of cases.
- Age of onset for boys is 10-15 years old, girls are younger at 8-12 years old
- Causes whole or partial separation of the epiphysis from the tibial shaft

Osgood-Schlatter Disease



Case courtesy of Assoc Prof Frank Gaillard, Radiopaedia.org, rID: 8146

Osgood-Schlatter Disease



Case courtesy of Assoc Prof Frank Gaillard,
Radiopaedia.org, rID: 7511



Case courtesy of Dr Mohammad Taghi Niknejad,
Radiopaedia.org, rID: 20861

THANKS