Imaging of Arthritis

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**Arthritis**

- Disease effecting the bones of both side of the joint and eventually narrow space between them.
  - Inflammatory.
  - Degenerative.
  - Metabolic, e.g. CPPD
- Xray is usually sufficient. However MRI can show early changes such as in sacroiliitis.
Osteoarthritis

- Affect the articular cartilage.
- Most common effect the hip and knee (weight bearing joints)
- X ray findings:
  - Joint narrowing (asymmetrical at weight bearing)
  - Subchondral sclerosis
  - Marginal osteophyte formation
  - Subchondral cysts

- Erosive osteoarthritis affect the hand DIP and PIP.
  - Affecting middle aged women 2:1
  - relatively acute or subacute onset of morning stiffness in the fingers of both hands.
  - Typical central location of the erosions produces the classic seagull appearance.
  - Asymmetrical in distribution.
Osteoarthritis

Abnormal OA
Osteoarthritis
Osteoarthritis
Rheumatoid Arthritis

- Usually arthritic symptoms first develop in the hands and wrists in a characteristic symmetric, proximal distribution.

- Feet and large joints may also be involved.

- The disease tends to involve the proximal joints in a bilaterally symmetrical distribution.
  - PIP and MCP joints (especially 2nd and 3rd MCP)
  - ulnar styloid
  - triquetrum

- Radiological findings:
  - Soft tissue swelling: fusiform and periarticular, early signs
  - Osteopenia: that is initially juxta-articular, and later generalised.
  - Joint space narrowing: symmetrical or concentric.
  - Marginal erosions: due to erosion by pannus of the bone
Late Changes

- Subchondral cyst formation: destruction of cartilage presses synovial fluid into the bone
- Subluxation causing:
  - ulnar deviation of the MCP joints
  - boutonierre and swan neck deformities
- Hitchhiker’s thumb deformity
Rheumatoid Arthritis

Marginal erosions predominantly proximal
Carpal
MCP
PIP
Gouty Arthritis

- Uric acid crystal deposition in soft tissues and articular structures.

- Acute gout
  - Soft tissue swelling, with no visible bony changes.

- Usually asymmetric in distribution and often monoarticular.

- Sites:
  - 1st MTPJ 70% (most common)
  - Ankle
  - Knee
  - Intertarsal

Radiological findings:

- **Bone erosions**: usually set back from the joint surface (para-articular) and overhanging edge.

- **Calcification of articular cartilages**, especially the menisci of the knee (Chondrocalcinosis).

- **Tophus**: soft tissue mass in the synovium of joints, the subcutaneous tissues of the lower leg, Achilles tendon and olecranon bursa at the elbow.

- Calcification of tophi is an uncommon feature.
Gouty Arthritis

Gout
Punched-Out Erosions

Gout
Sclerotic Overhanging Edges
Gouty Arthritis

Chondrocalcinosis
Approach

A: Alignment
B: Bone density
C: Cartilage
D: Distribution
E: Erosions.
S: Soft tissue
Examples
Rheumatoid arthritis.
Erosive OA
Gouty Arthropathy
Don’t forget

- In case of monoarthropathy septic arthritis should be excluded first.
  - Joint aspiration.