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An Approach to Arthritis

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Definition

- Disease that affects bones on both sides of the joint space and
- Narrows the space in between them

Arthritis or Not

DJD

AVN

Arthritis or Not

DJD

PVNS

Classification

- Hypertrophic
  - Hallmarks
    - Bone production
    - Sclerosis
- Infectious
  - Hallmark
    - Destruction of articular cortex
- Erosive
  - Hallmark
    - Erosions

Hypertrophic Arthritis

- Degenerative arthritis
  - Primary
  - Secondary
- Charcot arthropathy

1º Degenerative Arthritis

- Intrinsic degeneration of articular cartilage
- Excessive wear and tear
  - Most commonly hips and knees
  - Less commonly shoulders and elbows

1º Degenerative Arthritis

- X-ray Findings
  - Narrowing of joint space
  - Subchondral sclerosis
  - Marginal osteophyte formation
  - Subchondral cysts

1º DJD of knees affects medial, weight-bearing surface

1º DJD of hips affects superior, weight-bearing surface

1º Degenerative Arthritis
Hands

- Not due to mechanical stress
- F:M 10:1
- Most often involves DIP joints
  - Sclerosis
  - Marginal osteophyte formation
- 1st MCP joint of thumb

1º DJD of Hands

2º Degenerative Arthritis

- Another process destroys articular cartilage
- Degenerative changes supervene
- How to recognize
  - Atypical locations (CPPD and knee)
  - Atypical appearance (Marked DJD of 1 hip)
  - Atypical age (DJD in 20 year-old)

2º Degenerative Arthritis
Causes

- Trauma
- Infection
- Avascular necrosis
- CPPD
- RA
- Hemophilia

2º Degenerative Arthritis
More Causes

- Hemochromatosis
- Acromegaly
- Ochronosis
- Wilson's Disease
- **Bottom line:** Any arthritis can end as DJD

2º DJD of right ankle following fracture

Calcium Pyrophosphate Deposition Disease (CPPD)

- May be idiopathic or associated with
  - Hyperparathyroidism, hemochromatosis
- Symmetric involvement: knees (most common), wrists, MCPs
- Sudden onset of pain and fever
- Clinically
  - Tender, swollen, red, LOM

CPPD
Findings

- Calcification of articular cartilage
  - Knee, hip, shoulder
  - Triangular fibrocartilage of ulna
  - Symphysis
- Large subchondral cysts
- Preferential involvement of femero-patellar compartment

Chondrocalcinosis

Hypertrophic Arthritis
Classification

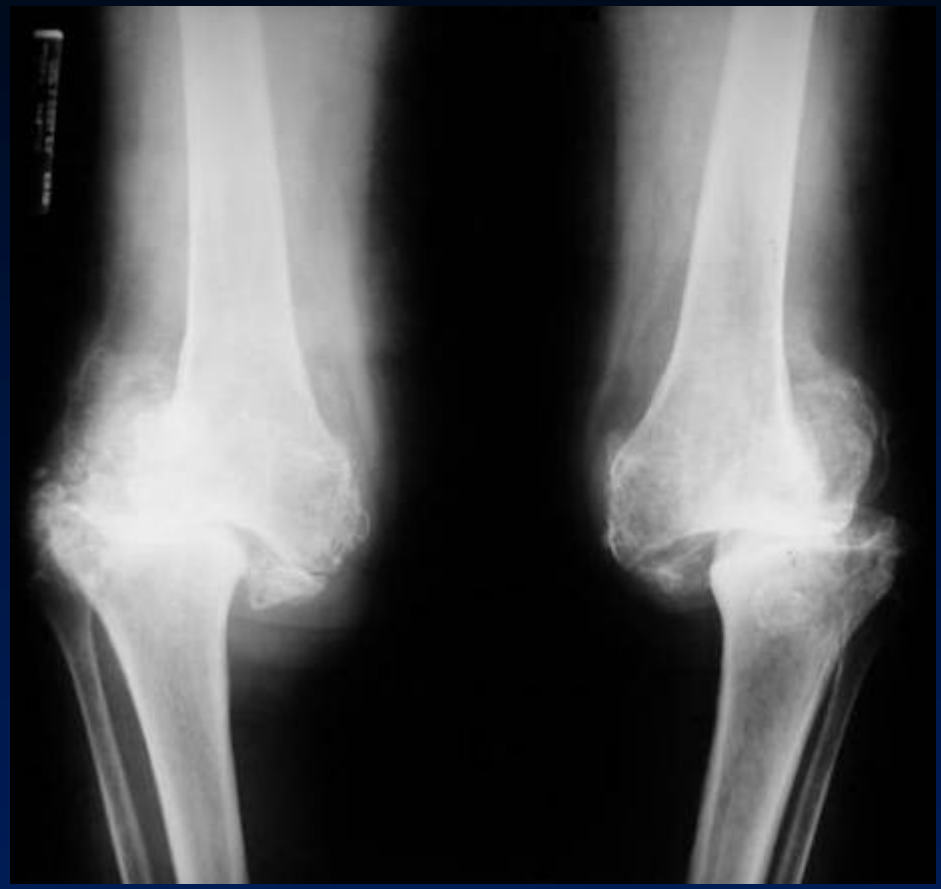
- Degenerative arthritis
  - Primary
  - Secondary
- Charcot arthropathy

Charcot's Arthropathy
General

- Disturbance in sensation leads to multiple microfractures
- Pain sensation intact from muscles and soft tissue
- Causes
  - Shoulders – syrinx, spinal tumor
  - Hips – tertiary syphilis, diabetes
  - Feet – diabetes

Charcot's Arthropathy
Findings

- X-ray findings
  - Fragmentation
  - Soft tissue swelling
  - Destruction of joint
  - Sclerosis
  - Osteophytosis



Charcot’s Knees-Diabetes

Charcot’s Shoulder - Syrinx

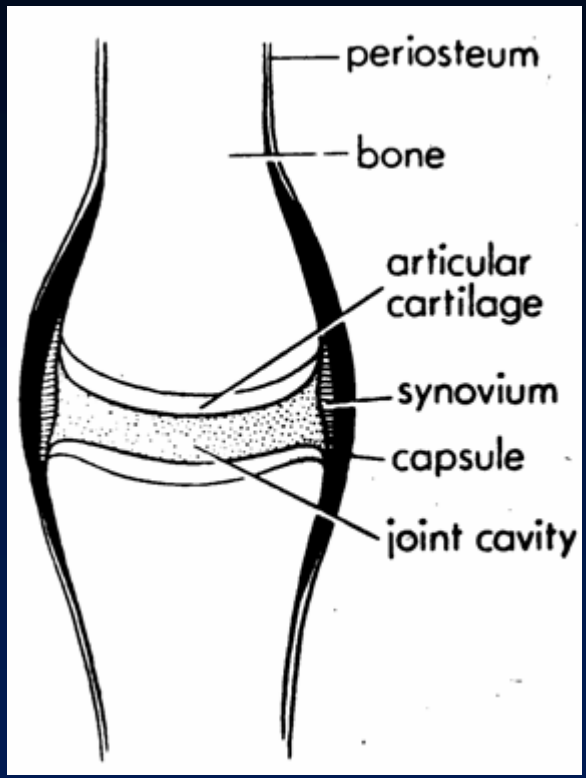
Charcot’s Arthropathy of Foot - Diabetes

Classification

- Hypertrophic
  - Hallmarks
    - Bone production
    - Sclerosis
- Infectious
  - Hallmark
    - Destruction of articular cortex
- Erosive
  - Hallmark
    - Erosions

Infectious Arthritis

- More common in adults
  - Usually from local trauma-surgery or accident
  - Children get osteomyelitis
- Destruction of articular cartilage & cortex
- Tends to affect one joint (DDx from gout)
  - Fingers from human bites
  - Feet from diabetes
  - Hips from THRs



Normal joint

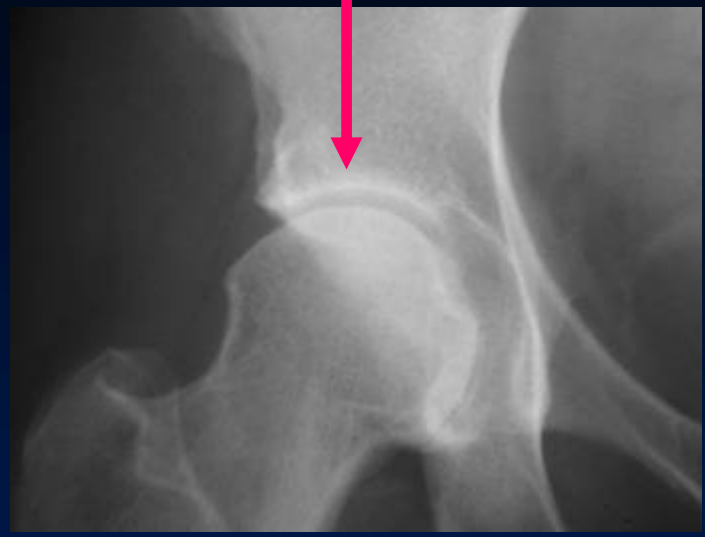
Normal articular cortex

Infectious Arthritis
Causes

- Usually staph - “early” destruction of articular cortex
  - Rapid course (unlike most arthritides)
- TB spreads via bloodstream from lung
  - More protracted course
  - In children, spine most common; in adults, knee
  - Severe osteoporosis
- Healing with ankylosis common in both

Septic arthritis of hip with pathologic fracture

Acetabular white line



Normal hip

Septic arthritis of toe

TB septic arthritis over 1 year

Classification
Erosive Arthritis

- Hypertrophic
  - Hallmarks
    - Bone production
    - Sclerosis
- Infectious
  - Hallmark
    - Destruction of articular cortex
- Erosive
  - Hallmark
    - Erosions

Erosive Arthritis
General

- Synovial proliferation (pannus formation)
- Inflammation
- Erosions seen in small joints (hands) better than large (hips)
  - Destroy portion of cortex

Erosive Arthritis
Types

- Rheumatoid arthritis
- Gout
- Hemophilia
- Erosive osteoarthritis
- Rheumatoid variants
  - Psoriatic arthritis
  - Reiter's
  - Ankylosing spondylitis
  - Inflammatory bowel disease

Erosive Arthritis
More Types

- Connective tissue disease
  - Scleroderma
  - SLE
  - Jaccoud's arthropathy
  - Sarcoidosis
- Rare
  - Amyloid

Rheumatoid Arthritis
General

- Bilaterally symmetrical
  - Earliest change: STS MCP, PIP, ulnar styloid
- Radiocarpal jt most commonly narrowed
- Periarticular demineralization
- Begins MCP jts of 1st and 2nd fingers
- Large joints usually no erosions

Rheumatoid Arthritis
General

- Can lead to 2º DJD
  - Marked narrowing of joint space with intact articular cortex, think of RA
    - Little or no sclerosis
    - Especially, hips and knees

RA of Hips – Marked narrowing, little sclerosis

RA Hands

RA usually involves 5th MT-P joint first

RA of Foot

Gout
General

- Long latent period between onset of symptoms and bone changes
- Asymmetric and monoarticular
- More common in males
- Most common at 1st MT-P joint
- Tophi rarely calcify
- Olecranon bursitis is common

Gout
Findings

- Juxta-articular erosions
  - Sharply marginated with sclerotic rims
  - Overhanging edges (rat-bites)
- No joint space narrowing until later
- Little or no osteoporosis
- Soft tissue swelling
- Tophi not calcified

Gout

Gout

Hemophilia
General

- Usually seen in large joints
- Hemorrhage produces synovitis which leads to pannus
  - Incites hyperemic response
  - Bone resorption and remodeling
    - Especially in open epiphyses
- DDx: JRA

Hemophilia
Findings

- Overgrowth of epiphyses
- Resorption of secondary trabeculae
  - Longitudinal striations
- Widening of interconylar notch of knee
- Joint effusion
- Hemosiderin deposit around joint

Hemophiliac Arthropathy

Erosive Osteoarthritis

- Post-menopausal females
- Changes like DJD but with marked inflammation and erosions
- IP joints of hands and carpal-MCP joint of thumb
- DDx: Psoriasis (skin changes)

Erosive Osteoarthritis

Rheumatoid Variants
General

- Negative Rheumatoid Factor
- Positive HLA-B27
- Differ from RA by
  - Osteoporosis usually absent in variants
  - Periostitis (whiskering) frequent
  - Ankylosis more common
  - Asymmetric peripheral joint changes

Psoriatic Arthritis

- Almost always accompanies skin disease, especially nail changes
- Involves DIP joints of hands > feet
  - Cup-in-pencil deformity
- Resorption of terminal phalanges
- No osteoporosis

Psoriasis of hands

Psoriatic Sacroiliitis
Like Inflammatory Bowel Dz and TB -
produces asymmetric SI joint involvement

Psoriasis of Spine
Non-marginal syndesmophytes

Reiter's Syndrome

- Urethritis, arthritis (50%) & conjunctivitis
- Periostitis at sites of tendinous insertion
  - Whiskering
  - Like DISH, ankylosing spondylitis
- Affects feet more than hands; also SI jt
- Resembles RA
  - Reiter's also has osteoporosis

Reiter's Syndrome

Ankylosing Spondylitis

- HLA-B27 positive
- B/L SI arthritis
- Squaring of vertebral bodies
- Bamboo-spine from continuous syndesmophytes
- Peripheral large joint erosive arthritis

Ankylosing Spondylitis

Inflammatory Bowel Disease

- Can occur with either Crohn's or UC
  - More common with UC
- Looks like AS in spine
- Asymmetric sacroiliitis
  - Like psoriasis, TB
- Peripheral joint STS without erosions

Overview

- Hypertrophic
  - Degenerative Arthritis
    - Primary
    - Secondary
  - Charcot Arthropathy
- Infectious
  - Pyogenic
  - Tuberculous

Overview

- Erosive
  - RA
  - Gout
  - Hemophilia
  - Erosive osteoarthritis
  - Psoriatic arthritis
  - Reiter’s Syndrome
  - Ankylosing Spondylitis

The End