ARTHRITIS
Osteoarthritis

- is a degenerative joint disease
- is the most common joint disorder.
- It is a frequent part of aging and is an important cause of physical disability in persons older than 65 years of age.
- The fundamental feature of osteoarthritis is degeneration of the articular cartilage
- structural changes in the underlying bone are secondary.
- It is not an inflammatory disease
- the chondrocytes respond to biomechanical and biologic stresses that results in breakdown of the matrix.
Types of osteoarthritis

- **Primary osteoarthritis** (95% of cases):
  - Old age
  - Usu. is *oligoarticular* (affecting only a few joints)
  - Joints of hands, knees, hips, and spine are most common

- **Secondary osteoarthritis** (less than 5% of cases):
  - Young people
  - There is a predisposing condition ➔ previous trauma; congenital deformity; systemic disease, or marked obesity.
  - It often involves one or several joints.
Clinical Course

- predominantly affects pts in their 50s and 60s.

- Characteristic symptoms and signs:
  - deep, aching pain exacerbated by joint use
  - morning stiffness
  - crepitus (grating or popping sensation in the joint)
  - limitation in range of movement.
  - nerve root compression with radicular pain
  - muscle spasms and atrophy.

- Commonly involved joints: Hips, knees, lower lumbar and cervical vertebrae, proximal and distal interphalangeal joints of the fingers, first carpometacarpal joints, and first tarsometatarsal joints of feet

- *Heberden nodes* in the fingers, represent prominent *osteophytes* at the distal interphalangeal joints, are characteristic in women.
Osteoarthritis-induced changes

- Bony spur
- Subchondral sclerosis
- Osteophyte
- No ankylosis
- Thinned and fibrillated cartilage
- Subchondral cyst
Osteoarthritis. **A**, Histologic demonstration of the characteristic fibrillation of the articular cartilage. **B**, Severe osteoarthritis, with eburnated articular surface exposing subchondral bone (1), subchondral cyst (2), and residual articular cartilage (3).
Rheumatoid arthritis (RA)

- is a systemic, chronic inflammatory autoimmune disease affecting many tissues, most commonly the joints.
- **non-suppurative** proliferative synovitis that destroy articular cartilage and underlying bone with resulting disability
- **Extra-articular** involvement: may include the skin, heart, blood vessels, muscles, and lungs.
- A common condition (prevalence 1%)
- (3 to 5)x more common in women than in men.
- The peak incidence 2\(^{\text{nd}}\)-4\(^{\text{th}}\) decades of life
Pathogenesis:

cytokine-mediated inflammation (e.g., IL-1, TNF), mainly produced by CD4+ T cells

80% of pts \( \Rightarrow \) serum IgM autoantibodies = rheumatoid factor that bind to the Fc portions of their own (self) IgG (form immune complexes in joints and other tissues, leading to inflammation and tissue damage)

Inflammation \( \Rightarrow \) activation of chondrocytes, fibroblasts and synovial cells \( \Rightarrow \) enzymes that destroy cartilage and cause fibrosis
Pathogenesis of rheumatoid arthritis

Susceptibility genes (HLA, other)

Failure of tolerance, unregulated lymphocyte activation

Environmental factors (e.g., infection, smoking)

Enzymatic modification (e.g., citrullination) of self protein

T and B cell responses to self antigens (including antigens in joint tissues)

- Th17 cell
- Th1 cell
- Antibodies

Fibroblasts
Chondrocytes
Synovial cells

Proliferation

Release of collagenase, stromelysin, elastase, PGE2, and other enzymes

Pannus formation; destruction of bone, cartilage; fibrosis; ankylosis

Kumar et al: Robbins Basic Pathology, 9e.
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Clinical features

- **symmetric arthritis, principally of small joints** of the hands and feet, ankles, knees, wrists, elbows, and shoulders.
- proximal IP and MCP joints are affected, but **distal** IP joints are **spared**.
- Axial and hip involvement is extremely rare
- Constitutional symptoms: weakness, malaise, and low-grade fever ➔ IL-1, TNF
- chronic, remitting-relapsing course
- Treatment: immuno-suppressive therapy, including biologic agents that antagonize TNF.

**Complications of RA:**
- Progressive joint destruction and disability
- Secondary amyloidosis (5% to 10% of cases, esp. with long-standing severe disease)
Infectious Arthritis

• **Routes of infection:**
  - hematogenous dissemination
  - direct inoculation
  - contiguous spread from osteomyelitis or a soft tissue abscess.

• Infectious arthritis is serious because it can cause rapid joint destruction and permanent deformities.
Suppurative Arthritis

- *Haemophilus influenzae* m/c in children <2 yrs
- *S. aureus* m/c in older children and adults
- *gonococcosus* is prevalent in older adolescents and young adults.
- Patients with sickle cell disease are prone to *Salmonella* infection at any age.
- gonococcal arthritis is symptomatic mainly in sexually active women.
- immunodeficiency of certain complement proteins (C5, C6, and C7) → disseminated gonococcal infections and hence arthritis.
The classic presentation:
1- sudden onset of pain, redness, swelling of the affected joint(s), with restricted range of motion.
2- Fever, leukocytosis, and elevated ESR.

- Gonococcal arthritis → more subacute course.
- 90% of non-gon. arthritis → a single joint
- Most common in knee, hip, shoulder, elbow, wrist, and StC joints (in descending order).
- Joint aspiration → a purulent fluid (culture +ve)

- Treatment: antibiotics and joint aspiration