

Lecture

8

SUPPURATIVE ARTHRITIS:

- **Bacterial infection**
- **Hematogenous spread**
- **< 2 years: *H. influenza*; older children & adults
S. aureus; gonococcus young adults**
- **Sickle cell disease: salmonella**
- **Clinically: sudden acute pain, swollen and warm joints, mainly knee with systemic manifestation (fever, leukocytosis, elevated ESR)**
- **Dx & Rx: aspiration of joint; antibiotics**

LYME ARTHRITIS

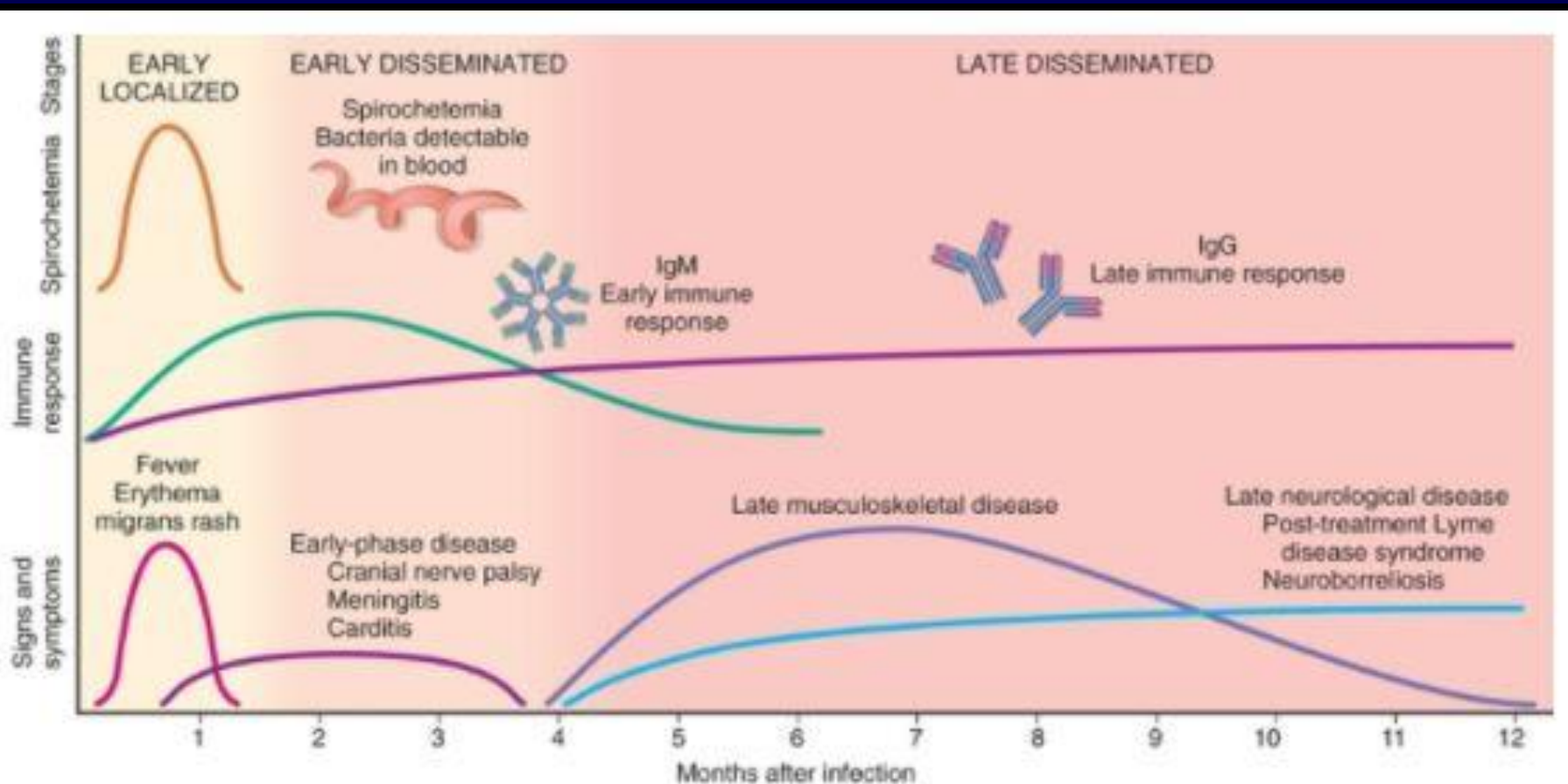



FIG. 21.40  Lyme disease progresses through three clinically recognizable phases: early...

CRYSTAL-INDUCED ARTHRITIS:

- **Crystals deposited in joints causing disease**
- **Crystals triggers inflammatory reaction that destroys cartilage**
- **Endogenous crystals:**
 - **Monosodium urate, MSU (GOUT)**
 - **Calcium pyrophosphate dehydrogenase, CPPD (PSEUDOGOUT)**

GOUT: النقرس

- **Transient attacks of arthritis, mainly big toe, triggered by deposition of MSU crystals**
- **Uric acid: purine metabolite; increased production or decreased excretion from kidney**
- **With hyperuricemia, risk increases with: 20-30 years of age, obesity, alcohol, genetic predisposition, drugs (thiazides)**

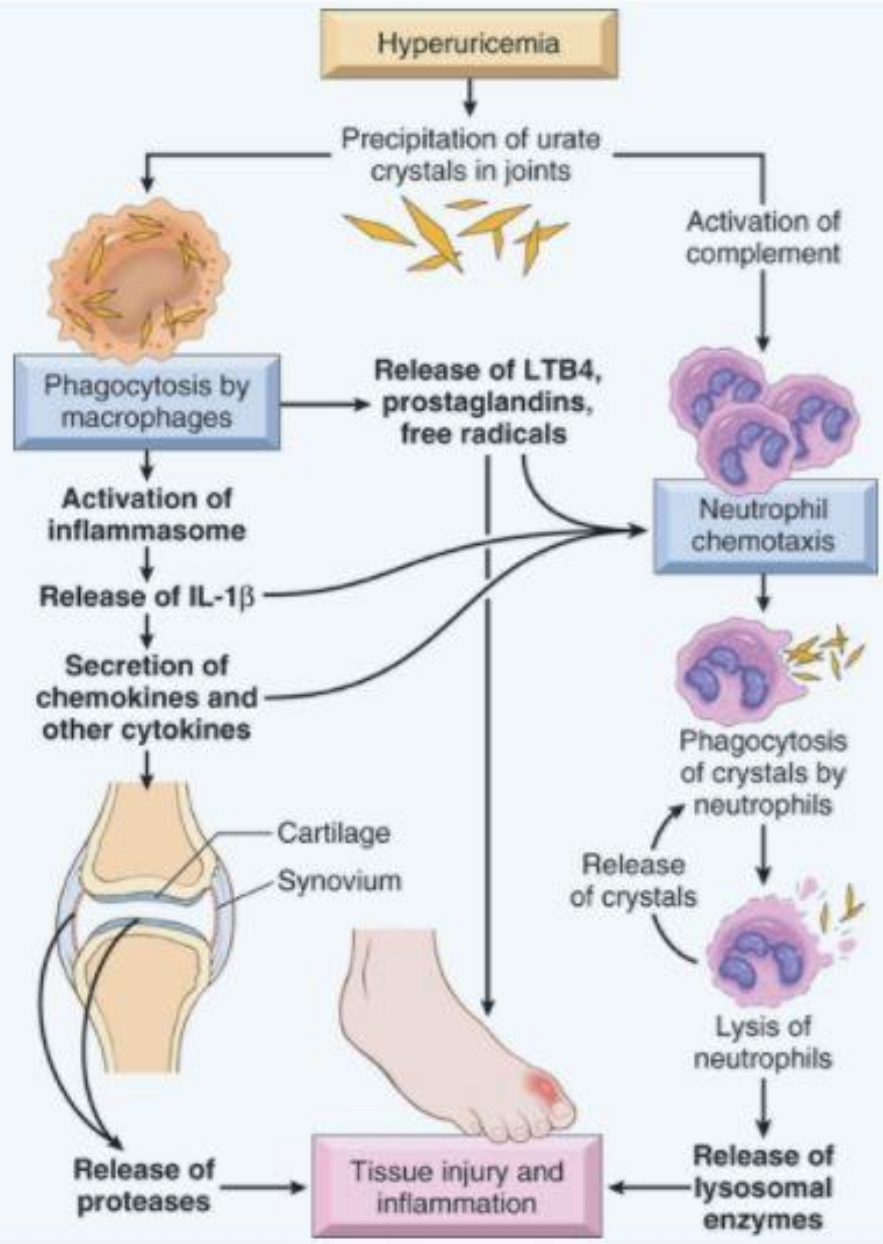
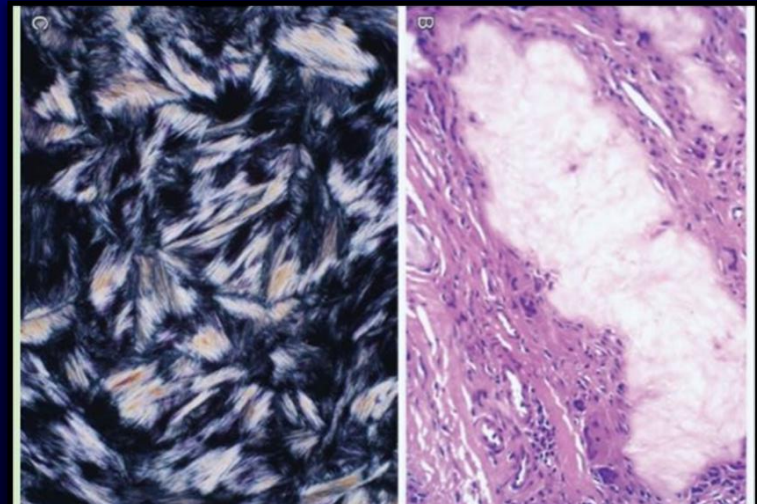


FIG. 21.41 Pathogenesis of acute gouty arthritis. Urate crystals are phagocytosed by m...

MORPHOLOGIC CHANGES OF GOUT:

Acute arthritis	Dense inflammation of synovium, MSU crystals in neutrophils, -ve birefringent
Chronic tophaceous arthritis	Repetitive attacks & crystals deposition in the joint; thick synovium, pannus
Tophi in various sites	Cartilage, ligaments, bursae and tendons
Gouty nephropathy	MSU crystals deposition in kidney; nephrolithiasis & pyelonephritis

Trx: life style modifications, NSAIDS & Colchicine in acute gout, Xanthine oxidase inhibitors (Allupurinol) in chronic and prevention

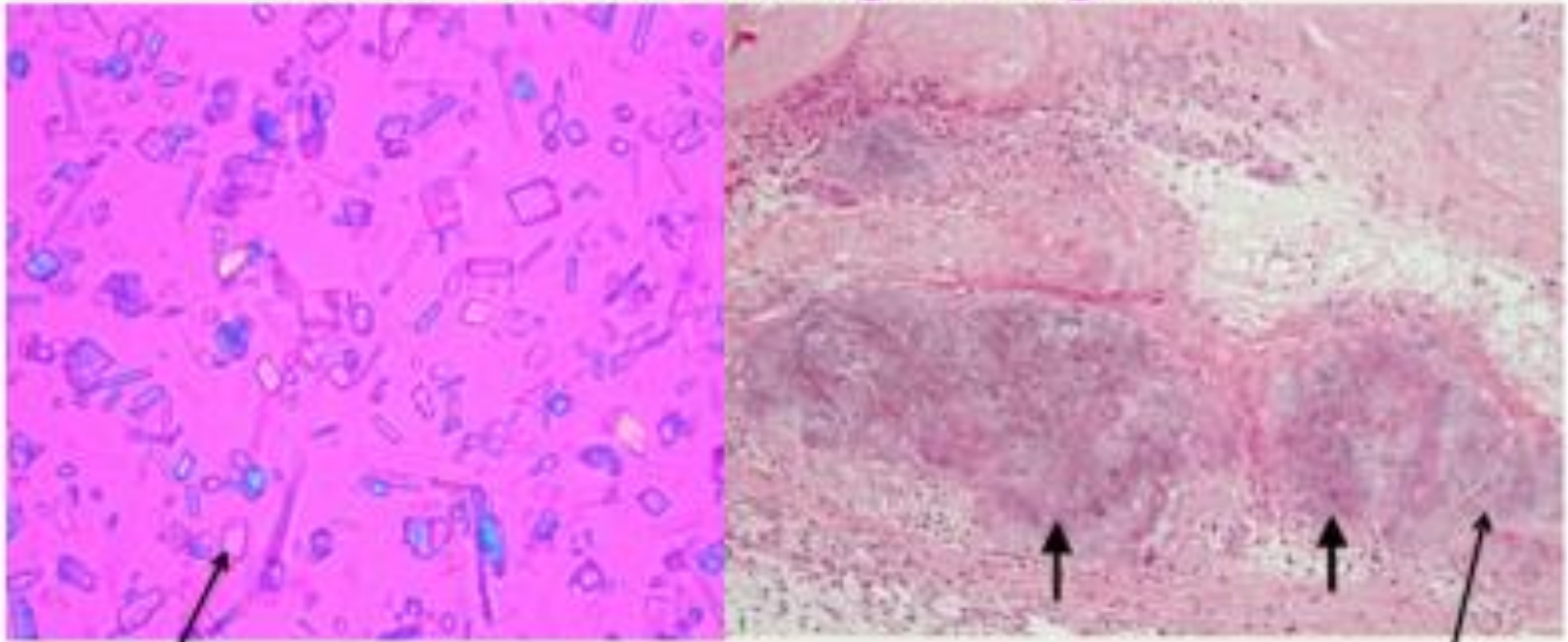


PSEUDOGOUT:

- **> 50 years; increase with age**
- **Idiopathic (genetic) or secondary**
- **CPPD crystal induced arthritis via triggering inflammatory reaction**
- **Secondary: DM, previous joint damage, HPTH, hemochromatosis**
- **Acute, subacute and chronic forms**
- **Trx: supportive, no preventive measures so far**

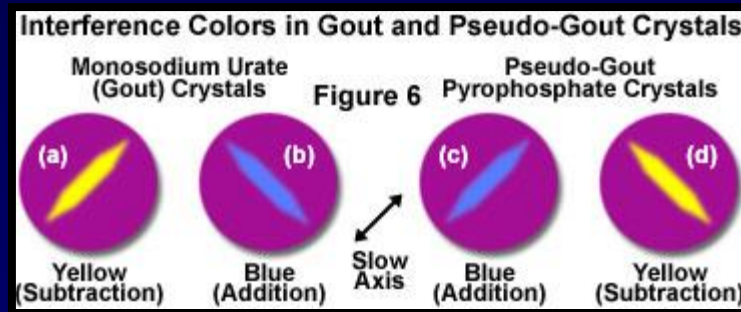
PSEUDOGOUT:

IIIb. CPPD: Pathologic Diagnosis

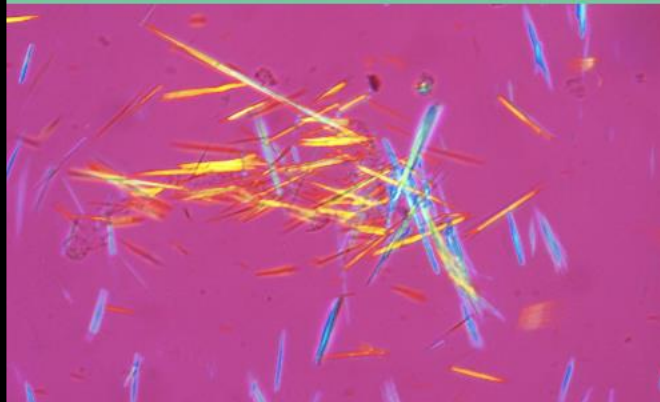


- Synovial Fluid: geometric or rhomboid-shaped crystals, weakly positively birefringent under polarized light
- Histopathology: amorphous purple deposits on H&E with *little inflammatory response*.

NEGATIVE VS POSITIVE BIREFRINGENCE

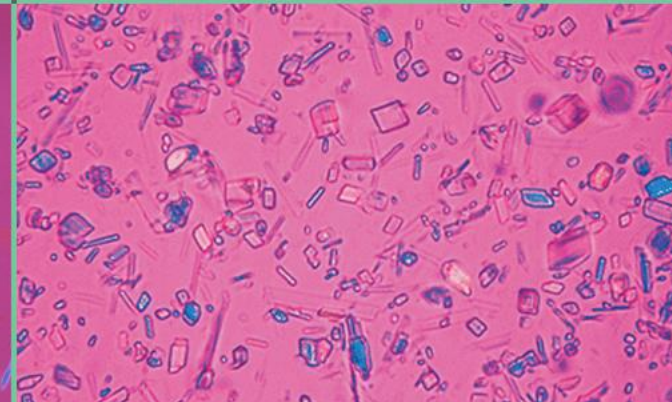


Monosodium Urate (MSU) Crystals



Needle shaped, strong negative birefringence
Yellow when parallel to compensator ray

Calcium Pyrophosphate Dihydrate (CPPD) Crystals



Rod or rhomboid, weak positive birefringence
Blue when parallel to compensator ray



Summary

Arthritis

- **Osteoarthritis (OA, degenerative joint disease)**, the most common disease of joints, is a degenerative process of articular cartilage in which matrix breakdown exceeds synthesis. Inflammation is minimal and typically secondary. Local production of inflammatory cytokines may contribute to the progression of joint degeneration.
- **Rheumatoid arthritis (RA)** is a chronic autoimmune inflammatory disease that affects mainly small joints, but can be systemic. RA is caused by a cellular and humoral immune response against self-antigens, particularly citrullinated proteins. TNF plays a central role and antagonists against TNF are of clinical benefit.
- **Seronegative spondyloarthropathies** are a heterogeneous group of likely autoimmune arthritides that preferentially involve the sacroiliac and vertebral joints and are associated with HLA-B27.
- **Suppurative arthritis** describes direct infection of a joint space by bacterial organisms.
- **Lyme disease** is a systemic infection by *Borrelia burgdorferi*, which manifests, in part, as an infectious arthritis, possibly with an autoimmune component in chronic stages.
- **Gout and pseudogout** result from inflammatory responses triggered by precipitation of urate or calcium pyrophosphate, respectively.