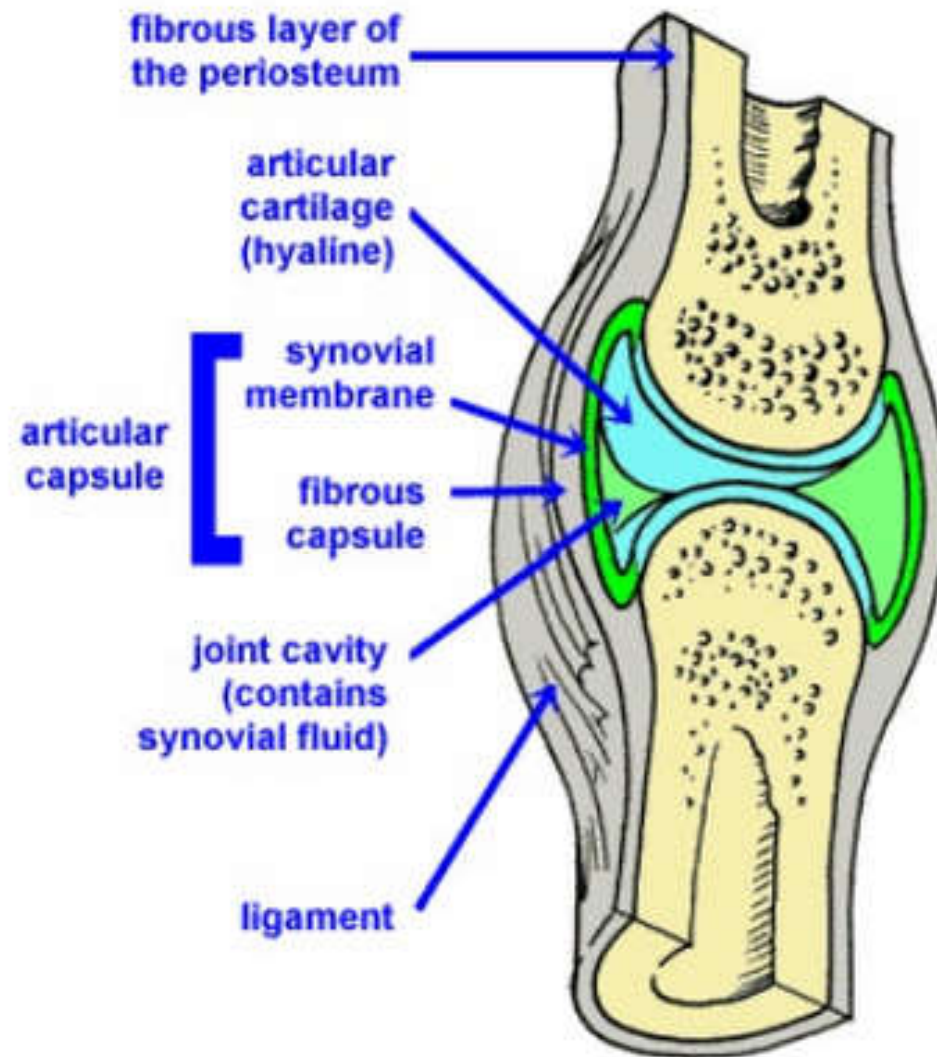


Bone & Joint pathology

Lab 3

Normal joint





Arthritis – Clinical features:

● Pain

- Inflammation - capsule, synovium, periosteum.

● Swelling:

- inflammation, effusion, proliferation.

● Restricted movement

- pain, fluid, synovial swelling, damage.

● Deformity

- mal-alignment, erosion, ankylosis

Polyarthrititis Classification:

●Autoimmune:

- Rheumatic, Rheumatoid, Ankylosing spondylitis, Reiter syndrome etc.

●Degenerative: Osteoarthritis

●Crystal Deposition:

- Gout – Monosodium urate
- CPPD - Pseudo Gout

●Infective - Septic, TB, Lyme etc. rare.

Osteoarthritis – OA (Degenerative Joint Disease)

= joint disease characterized by progressive erosion of articular cartilage:

- **Primary DJD** an aging phenomenon (wear-and-tear arthritis) & involve knees & hands in women, & hips in men.
- **Secondary DJD** appears at any age in a previously damaged (by trauma) or congenitally abnormal joint or in patients with systemic disorders such as diabetes.

Pathology of osteoarthritis

Joint cartilage flakes off and is eroded, exposing underlying bone;

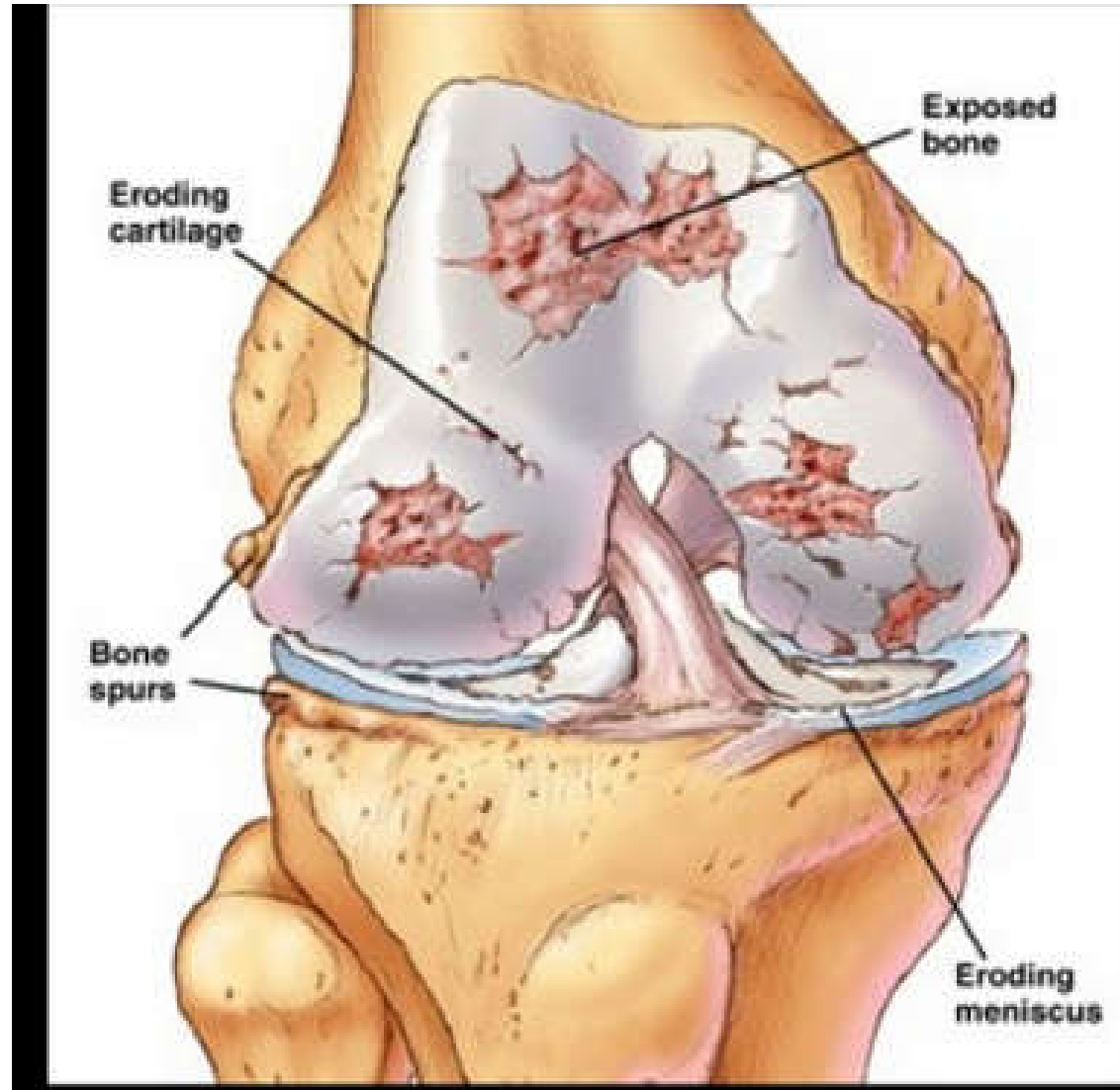
eburnation of bone (polishing of bone due to rubbing of bone with bone);

cystic degeneration beneath eburnated bone (subchondral cysts);

osteophyte formation (growth of new bone at articular edges);

joint mice (fractured osteophytes floating in synovial fluid)

OA

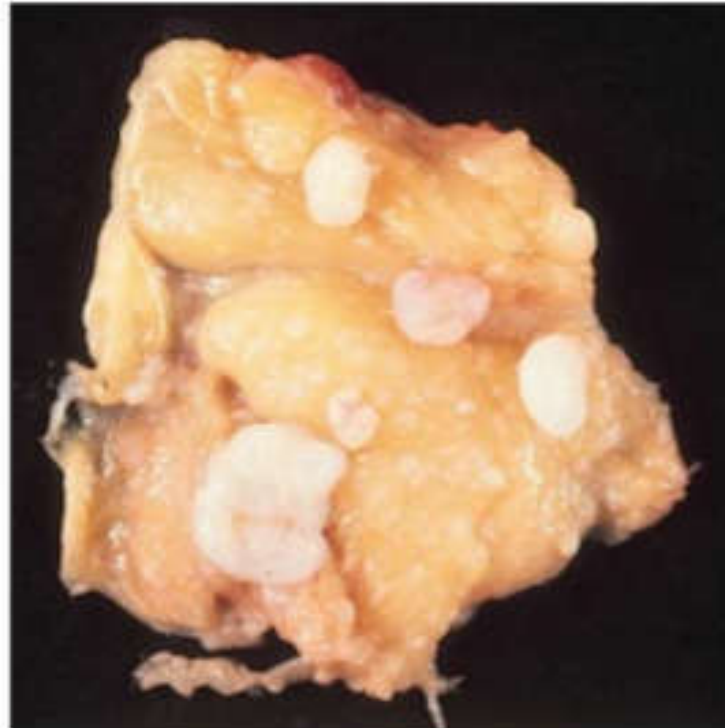




Advanced subchondral degenerative cyst in femoral head

MORPHOLOGY

- ✓ **joint mice**: Small fractures can dislodge pieces of cartilage and subchondral bone into the joint, forming **loose bodies**



Rheumatoid Arthritis

Rheumatoid arthritis

Chronic, systemic autoimmune disease, principally attacks joints, producing a non-suppurative proliferative synovitis that progresses to joint destruction & ankylosis; with involvement of blood vessels, skin, heart, lungs.

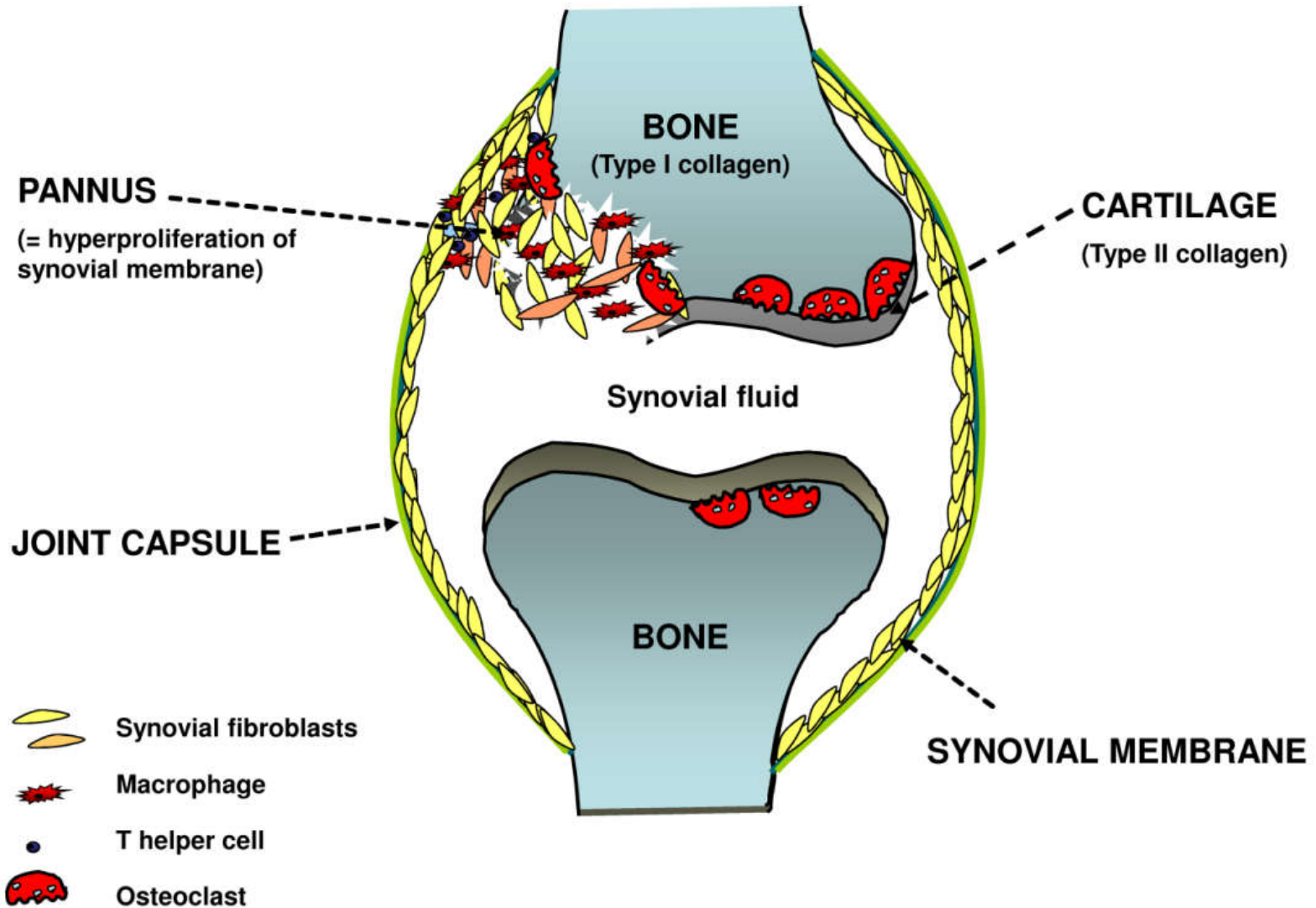
Etiology of rheumatoid arthritis is unknown; it is theorized that an acute arthritis is triggered in genetically susceptible people which causes a chronic **autoimmune reaction**

Most common in **women** between 30 & 50 years old.

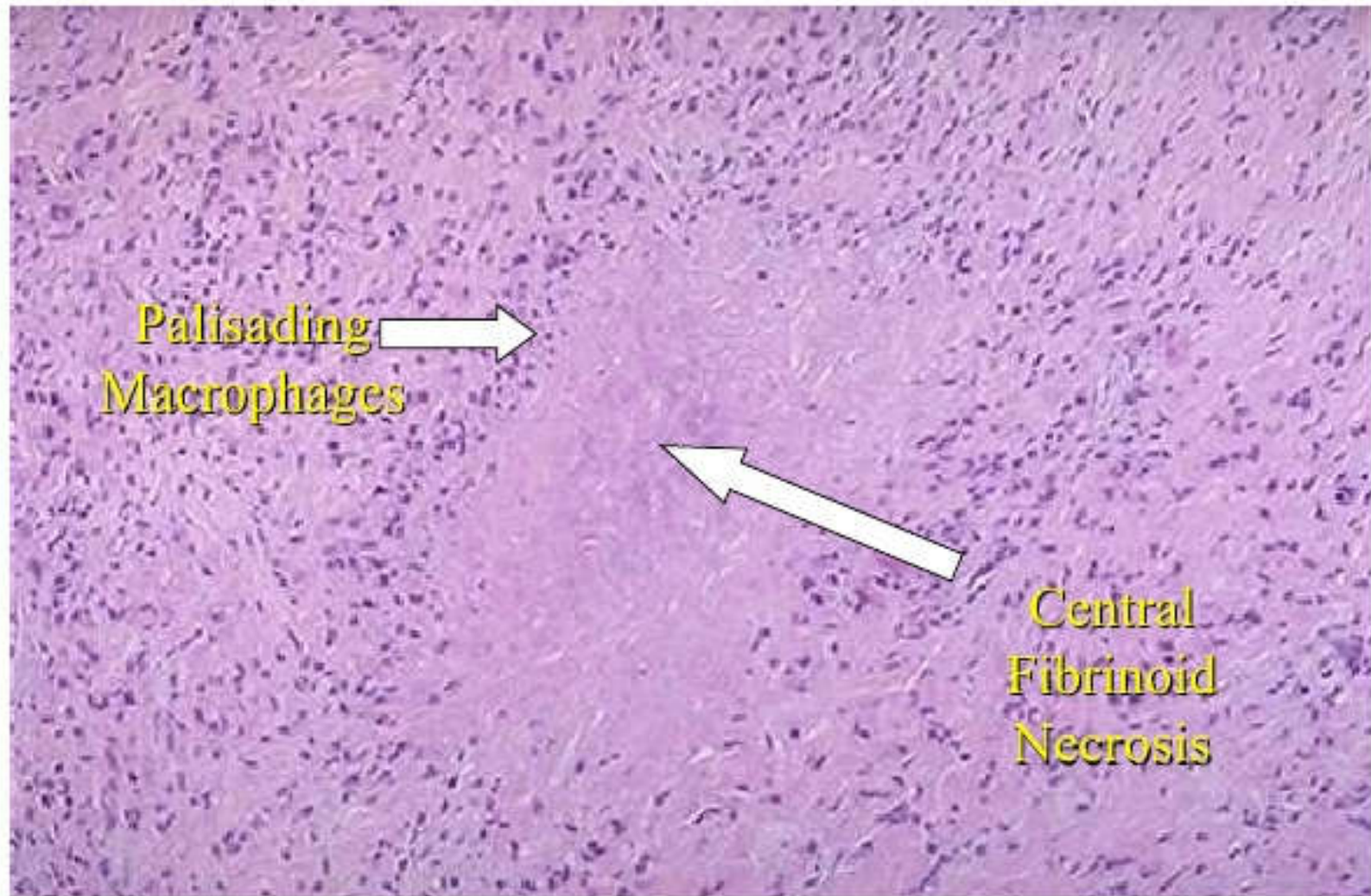
Joint Pathology in rheumatoid arthritis:

Initially, **lymphocytic infiltration** & edema in synovium with formation of villi composed of synovial lining cells; neutrophils in synovial fluid; ***later***, the **cartilage is destroyed** & replaced with a **pannus** (granulation tissue). Scarring after inflammation → **joint deformity**.

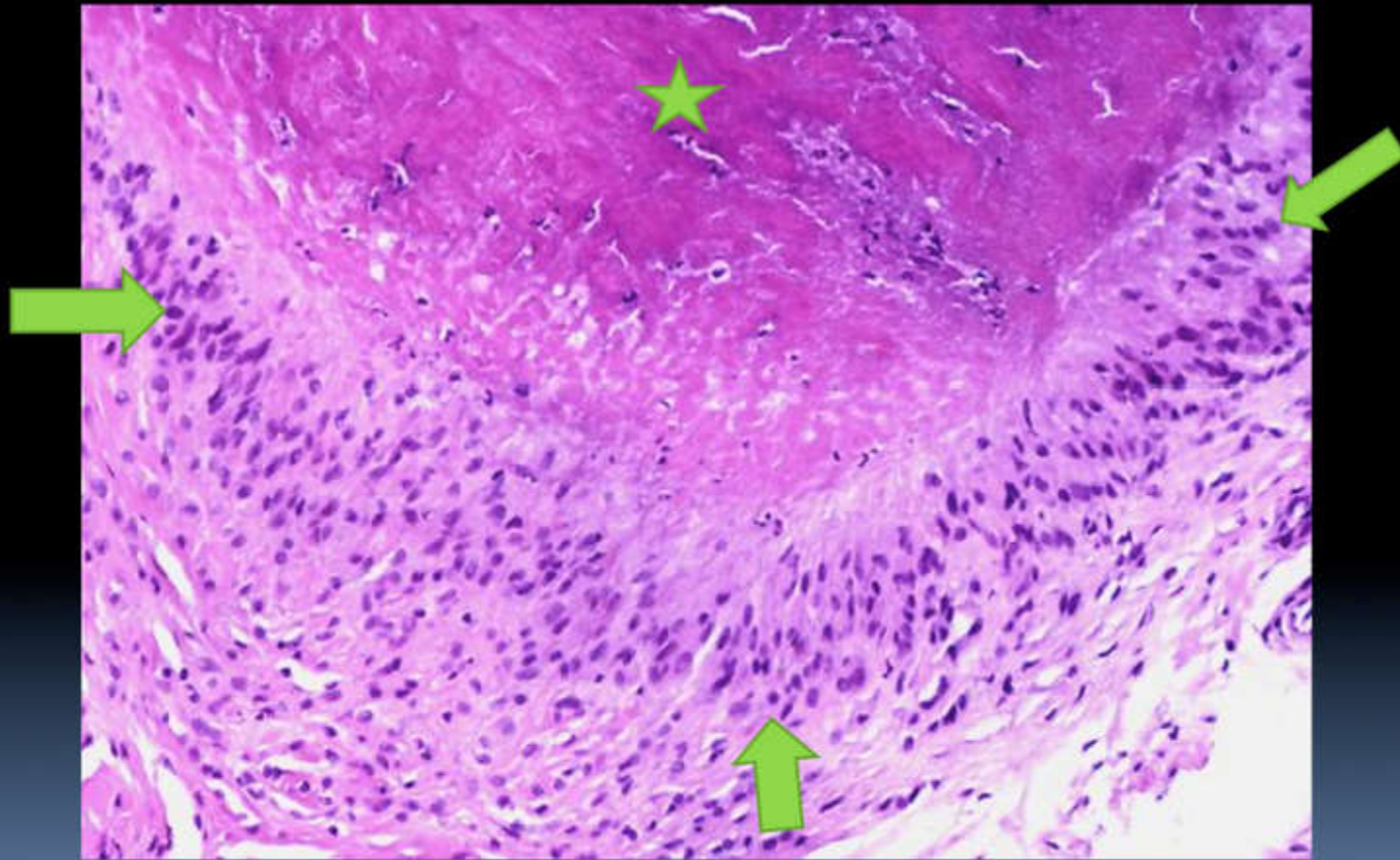
Rheumatoid nodule: Firm, non-tender, subcutaneous nodule; core of **fibrinoid necrosis** surrounded by **palisade of macrophages**, lymphocytes, & fibroblasts



Rheumatoid Nodule (skin):



This photomicrograph shows a typical rheumatoid nodule. There is a bright pink central area of necrosis (star) surrounded by a ring of "palisading" (picket fence-like) histiocytes/macrophages (arrow).







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Figure 28-2. Ulnar Deviation at the Metacarpophalangeal Joints in Advanced Rheumatoid Arthritis



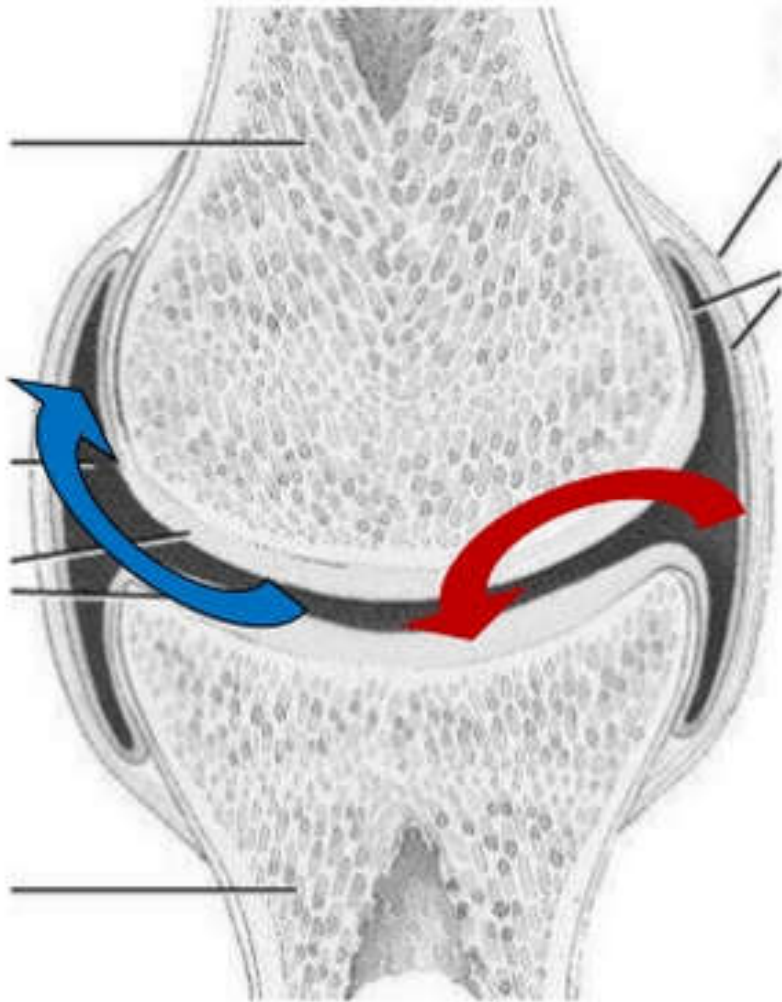
Differentiating Features:

Rheumatoid Arthritis:

- Young, small joints
- Autoimmune.
- Synovial Inflammation
- **synovium → Cartilage**

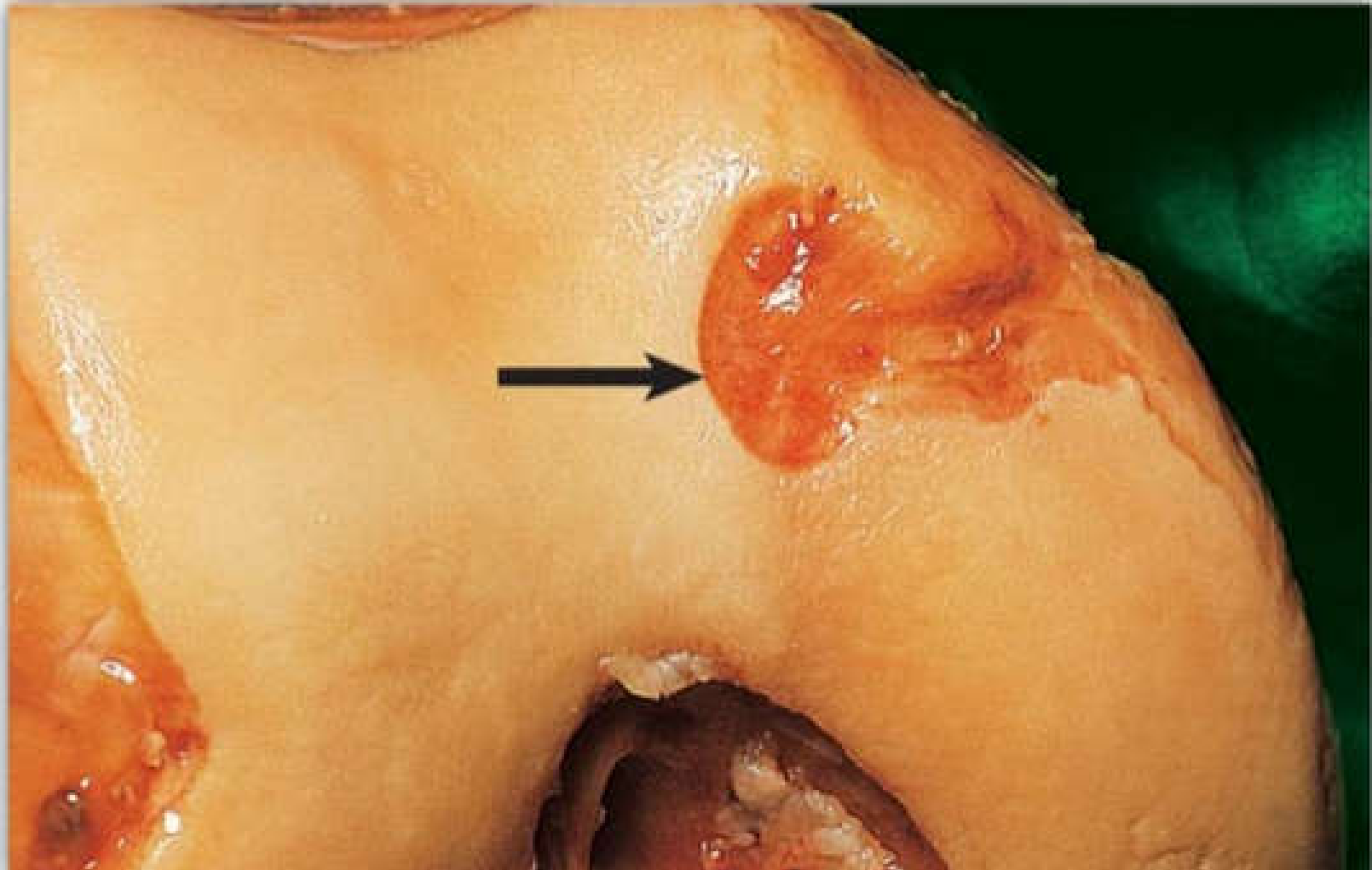
Osteoarthritis:

- Old age, Large joints
- Degenerative.
- Cartilage degeneration.
- **Cartilage → Synovium**

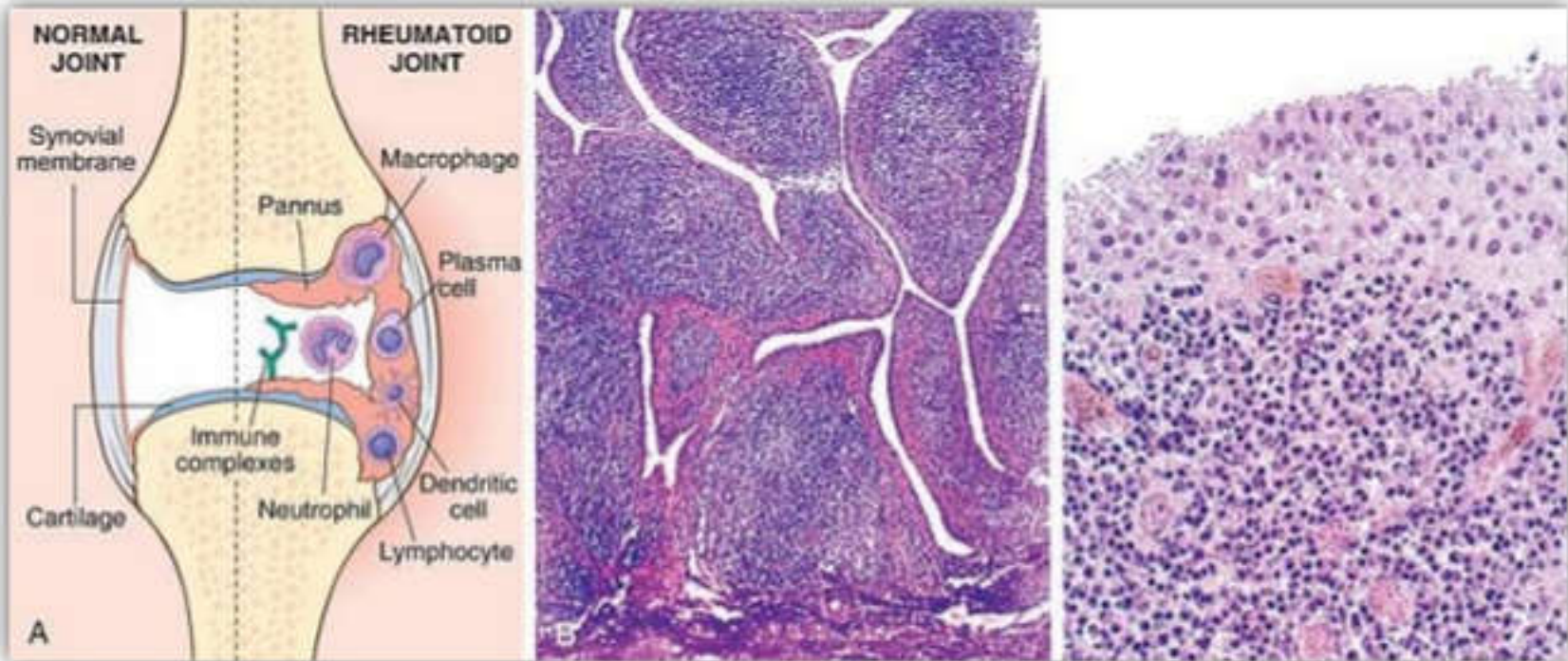




Early Destruction of cartilage in RA:

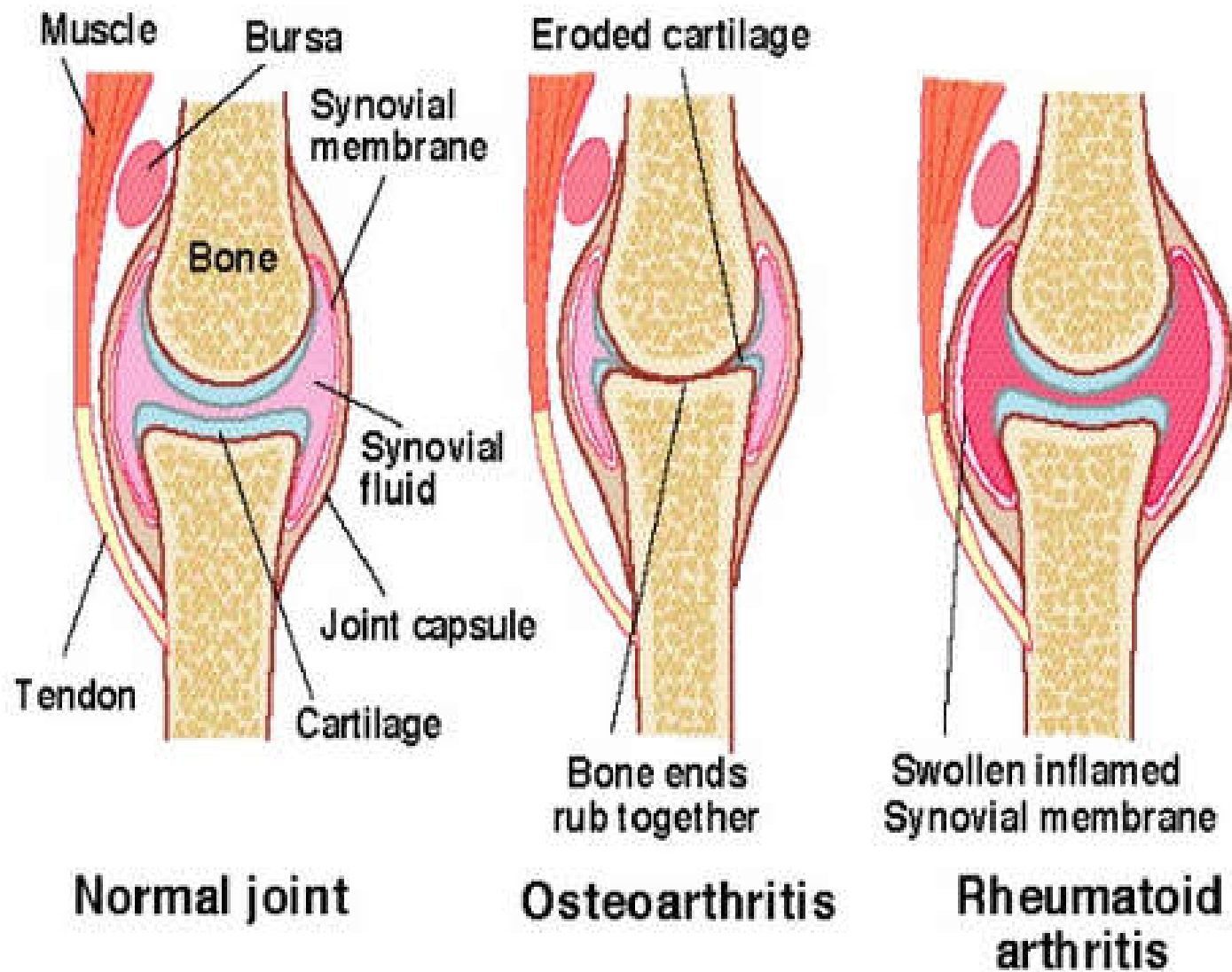


RA - Pathophysiology



Synovial Inflam & Proliferation with Papillary projections

Chronic Inflam. Lymphocytes & Lymphoid follicles



Bone tumors

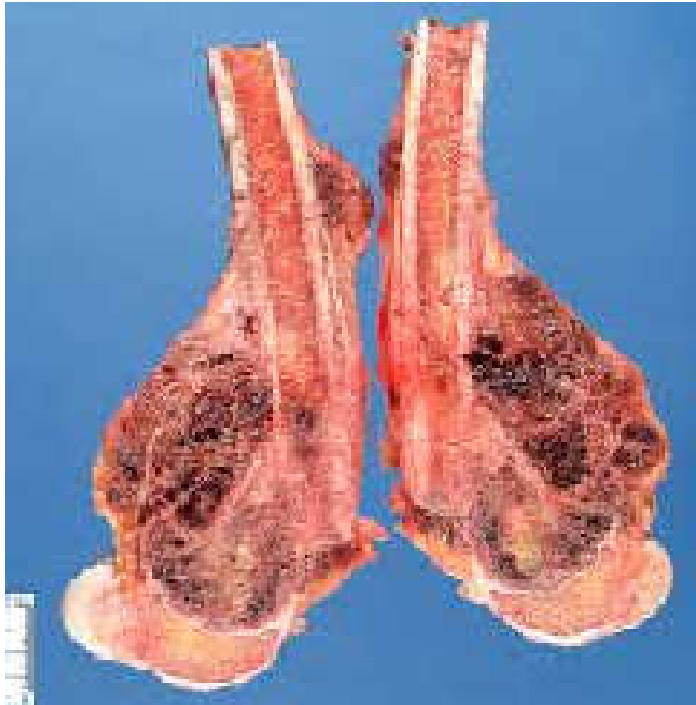
Benign tumors are more common than malignant ones.

Metastases to the bones are more common than primary malignant tumors. According to their cell of origin and histologic features, primary bone tumors can be classified as being composed of:

- ① **osteogenic tumors** (e.g., osteoma, osteosarcoma)
- ② **Chondrogenic tumors** (chordoma & chondrosarcoma etc)
- ③ **Osteoclastic tumors** (e.g., giant cell tumor)
- ④ **Fibroblastic tumors** (e.g., fibrosarcoma)
- ⑤ **Hematopoietic & lymphoid cells** (e.g., multiple myeloma, leukemia, & lymphoma)
- ⑥ **others** (e.g., Ewing sarcoma)

Osteosarcoma

- * Malignant bone-forming tumor.
- * **Peak incidence:** teenagers; less commonly in the elderly
- * **Site:** metaphysis of long bones, usually the distal femur or proximal tibia (region of the knee)
- * **Presents** as a pathologic fracture or bone pain with swelling
- * **X-ray:** show destructive mass with 'sunburst' appearance & lifting of the periosteum (Codman triangle)



**Osteosarcoma:
Pleomorphic spindle
cells produce lacy
(often basophilic)
osteoid**

