Team Medicine

30#

Rheumatoid Arthritis and Osteoarthritis

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- Doctor's notes
- Extra notes

431 Teams

Objectives:

By the end of this lecture student should know:

- Pathology of RA and OA
- Clinical features of RA and OA
- Laboratory and radiological changes of RA and OA
- Line of management of RA and OA

1. Rheumatoid Arthritis:

Systemic chronic inflammatory disease mainly affects the snyovium of the joints.

Epidemiology:

- Variable expression
- Prevalence about 3%
- Worldwide distribution
- Female:male ratio 3:1
- Peak age of onset: 25-50 years

Etiology:

- Unknown etiology
  - Genetics
  - Environmental
  - Possible infectious component
- Autoimmune disorder

Pathology: (http://www.youtube.com/watch?v=imR4hCwrGmQ a video that explains pathophysiology)

Rheumatoid arthritis is characterized by:

- Synovitis
  - Joint
  - Tendon sheaths
  - Bursae
- Nodules
- Vasculitis

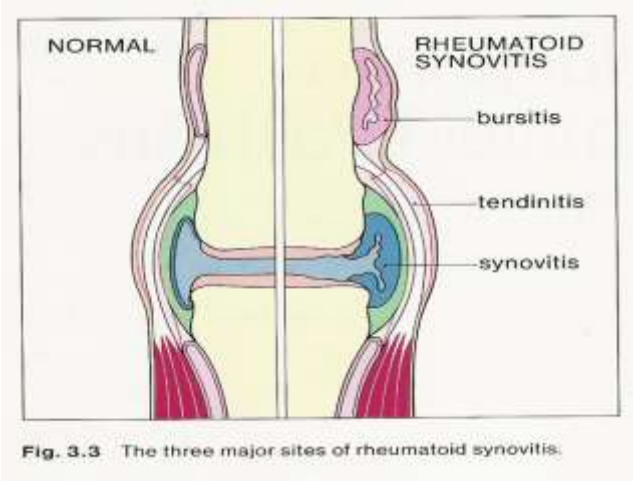
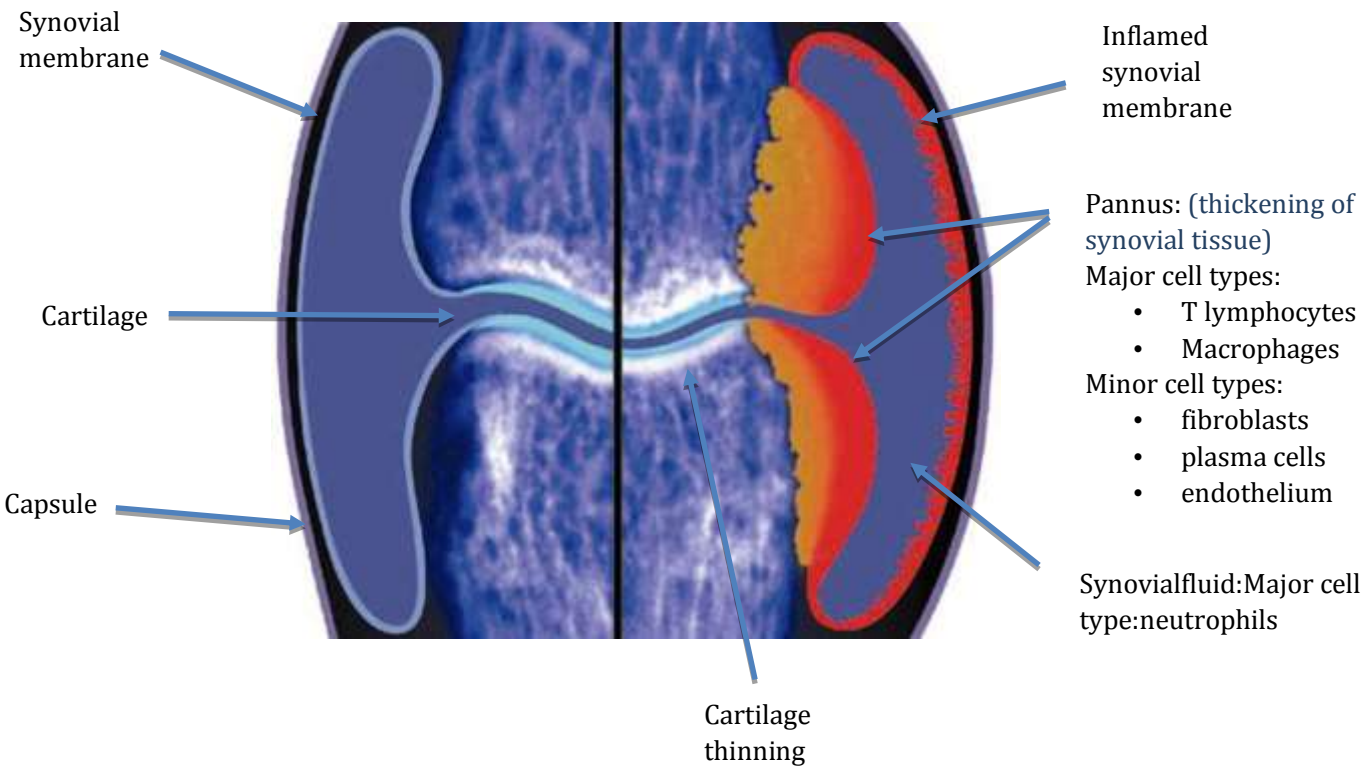


Fig. 3.3 The three major sites of rheumatoid synovitis.

NormalRA



Pannus: (thickening of synovial tissue)

Major cell types:

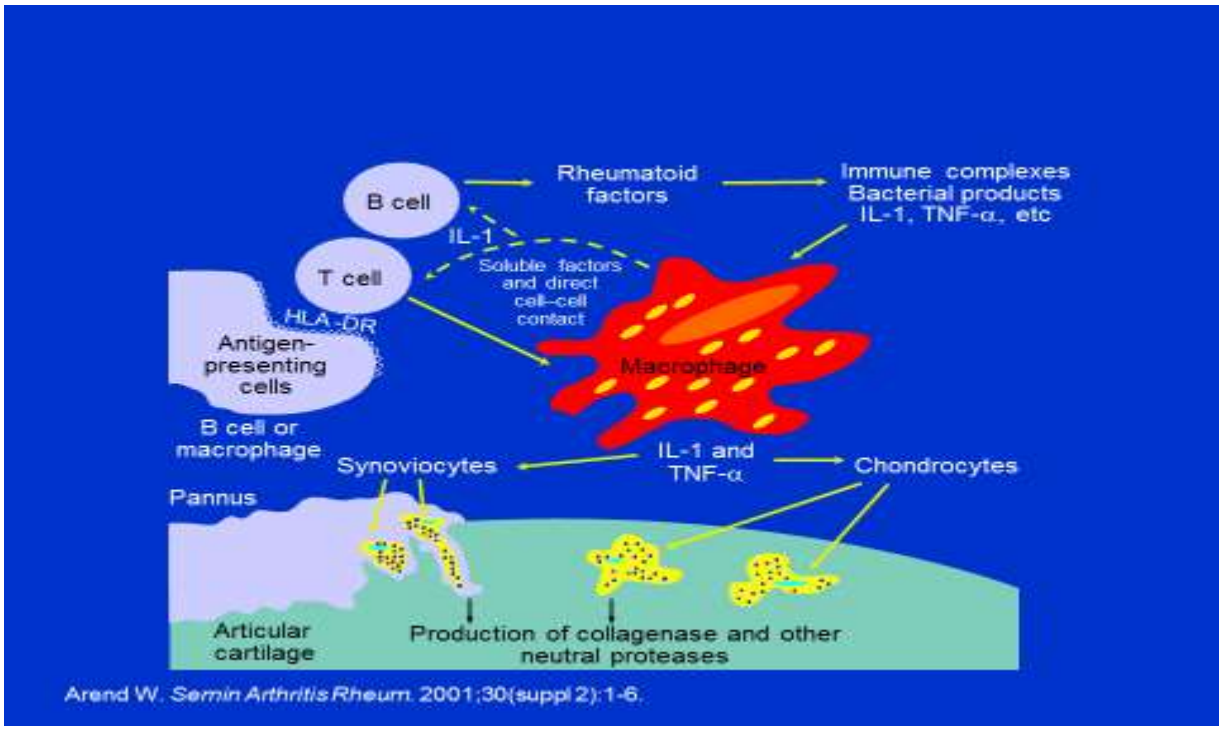
- T lymphocytes
- Macrophages

Minor cell types:

- fibroblasts
- plasma cells
- endothelium

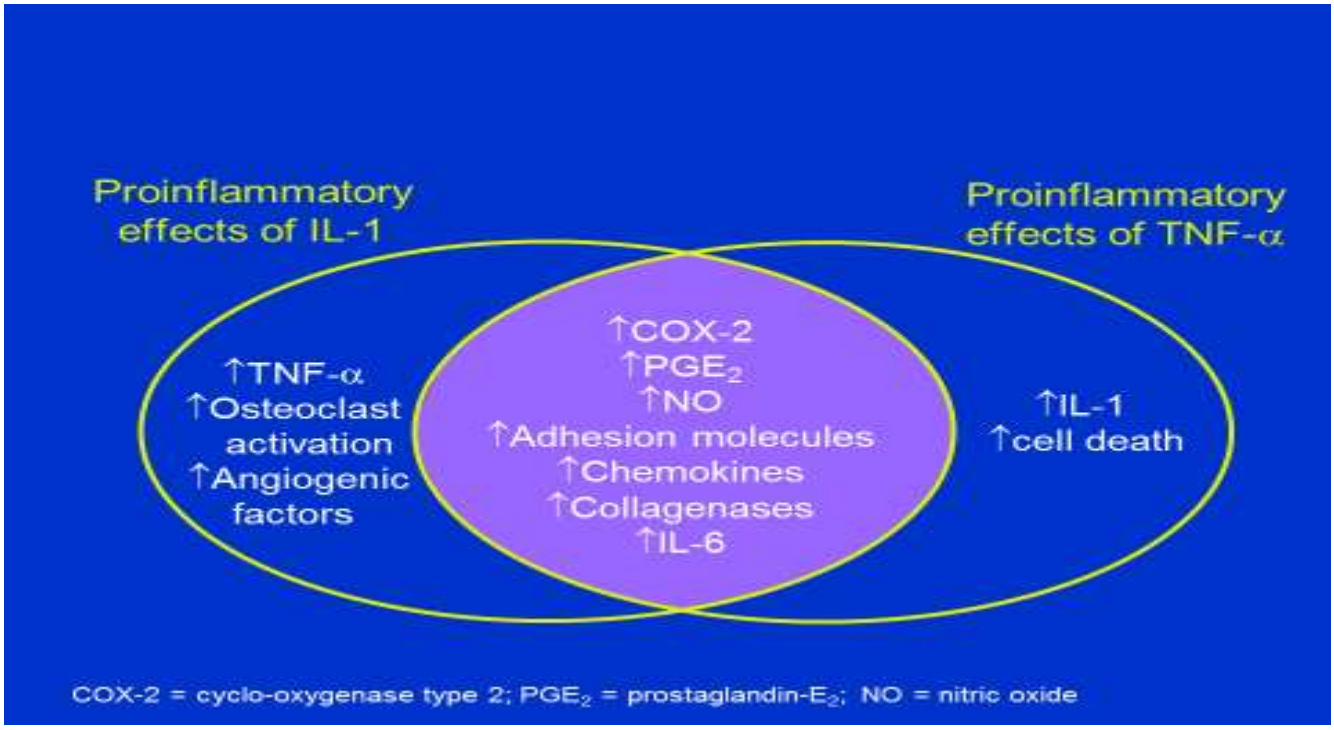
Synovialfluid:Major cell type:neutrophils

Numerous Cellular Interactions drive the RA Process:

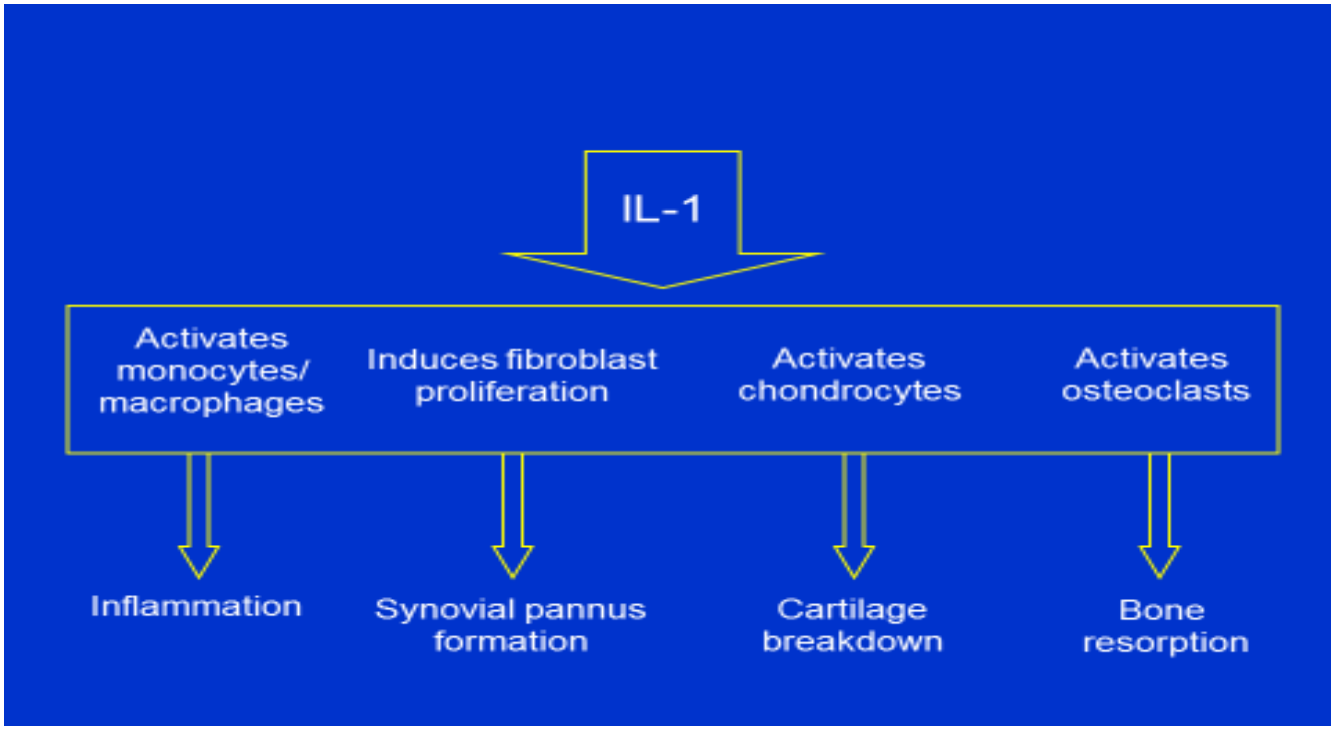


Trigger > activation of the T&B cells, Rheumatoid factor and autoantibodies >proteolytic enzymes, cytokines, ILs and TNF are produced> inflammation and synovial pannus formation, cartilage breakdown and bone resorption.

IL-1 and TNF-α Have a Number of Overlapping Proinflammatory Effects:



IL-1 Plays a Pivotal Role in the Inflammatory and Destructive Processes of RA:



Signs and symptoms:

- Joint inflammation
- Tender, warm swollen joints(soft tissue swelling)
- Symmetrical pattern
- Pain andmorning stiffness

- Symptoms in other parts of the body:
  - Subcutaneous nodules
  - Anemia (normocytic normochromic)
  - Fatigue, occasional fever, malaise

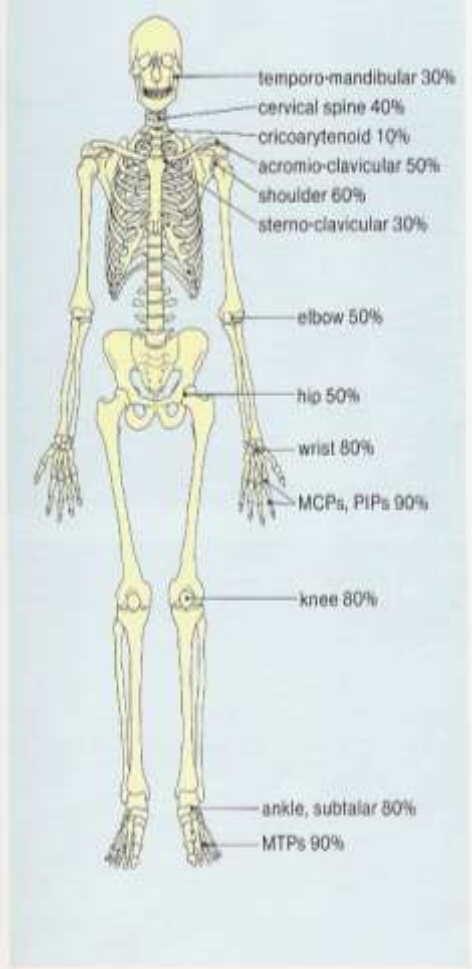


Fig. 3.6 Frequency of involvement of different joint sites in established RA.

JOINT INVOLVEMENT ON PRESENTATION OF RA:

Polyarticular (symmetrical) 75%	**Monoarticular 25%**
Small joints of hands and feet 60%	Knee 50%
Large joints 30%	Shoulder } Wrist } Hip } 50% Ankle } Elbow }
Large and Small joints 10%	

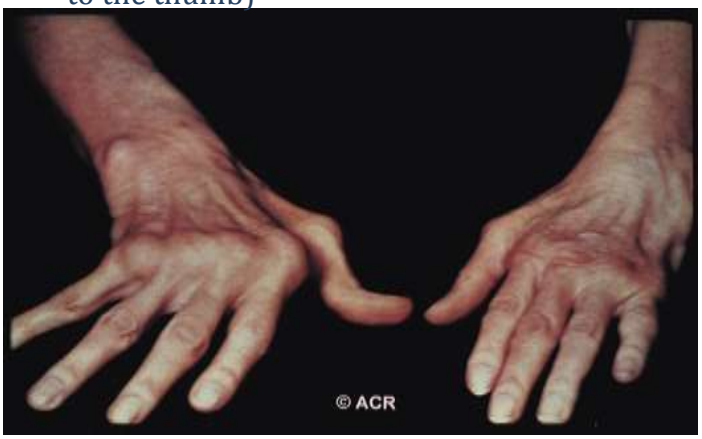
Articular features seen in the Rheumatoid Hand:

WRIST joints: Synovitis, Prominent ulnar styloid, Subluxation (Partial dislocation) and collapse of carpus, Radial deviation(the angle will be lost with the deviation).

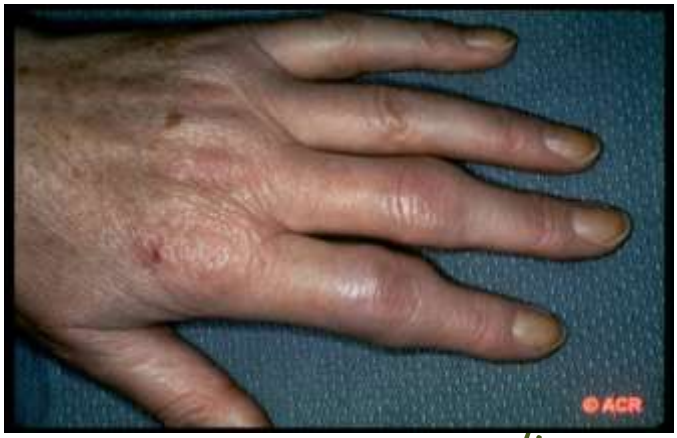
Metacapophalageal joints (MCP): Synovitis,Ulnar deviation, Subluxation.

Proxiamal interphalangeal joint (PIP): Synovitis, Swan neck (MCP flexed, PIP extended, DIP flexed), or boutonniere deformity(PIP flexed DIP extended)). (RA doesn't affect DIPs)

THUMBS: Synovitis, 'Z' deformity(hyperextension of the interphalangeal joint, fixed flexion and subluxation of themetacarpophalangeal joint and gives a "Z" appearance to the thumb)



Radial deviation at the wrist joint and muscle wasting

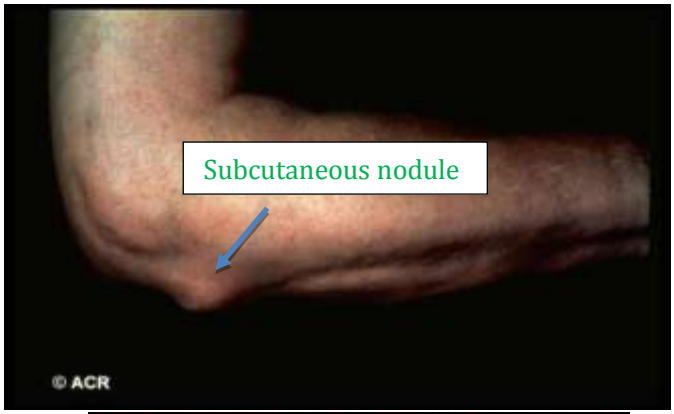


Swelling of interphalangeal joints

Extra-articular manifestations(it is usually common in patients with long standing seropositive disease)(seropositive means the presence of RA in serum)

- General(because it is systemic)
  - fever, lymphadenopathy, weight loss, fatigue.
- Dermatologic
  - Palmar erythema, subcutaneous nodules(usual site on bony prominence), vasculitis(causing rashes).
- Ocular
  - episcleritis/scleritis(frequently with seropositive), scleromalacia perforans(thinning and perforation of sclera), choroid and retinal nodules.
- Cardiac
  - Pericarditis, myocarditis, coronary vasculitis, nodules on valves.
- Neuromuscular
  - Entrapment neuropathy(compression like carpal tunnel syndrome), peripheral neuropathy, mononeuritis multiplex, cervical cord compression can result from atlantoaxial joint subluxation which makes procedure like endotracheal intubation contracindicated.
- Hematologic
  - Felty's syndrome(rheumatoid arthritis+ splenomegaly+ neutropenia), large granular lymphocyte syndrome, lymphomas.
- Pulmonary
  - pleuritis, nodules, interstitial lung disease(in the form of fibrosis), bronchiolitis obliterans, arteritis, effusions
- Others
  - Sjogren's syndrome (dryness of salivary and lacrimal glands), amyloidosis (deposition of amyloid in the tissue).

Small vessel vasculitis



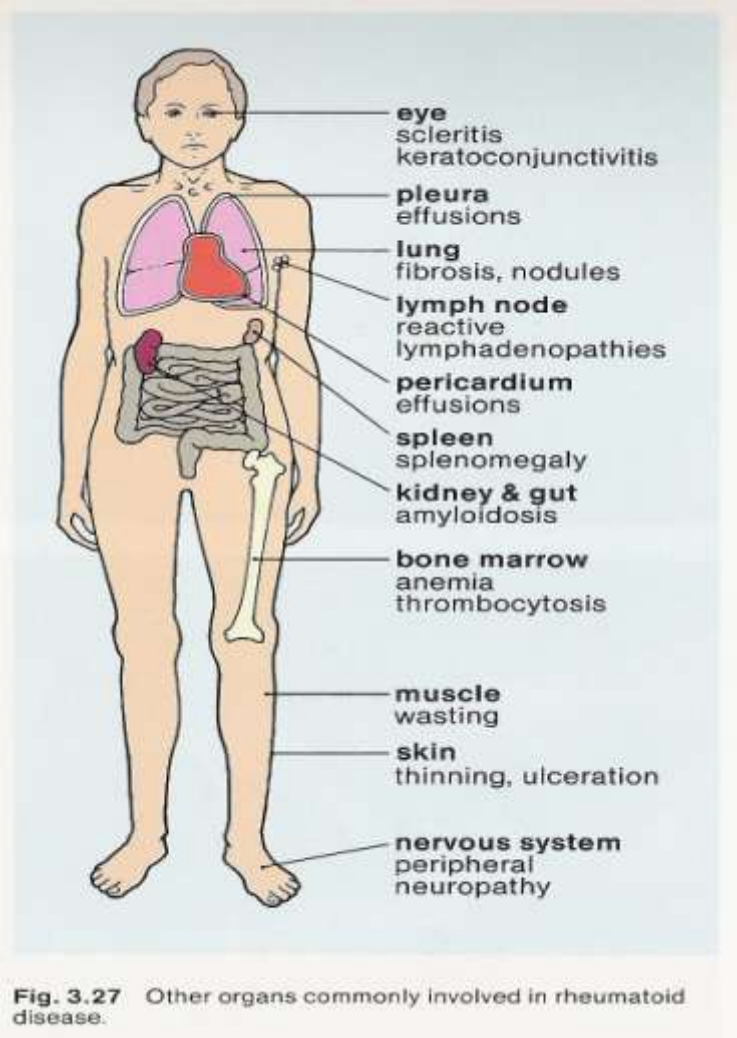
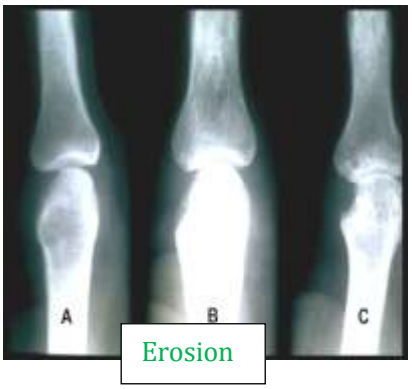


Fig. 3.27 Other organs commonly involved in rheumatoid disease.

Investigations:

- Hematology:CBC (anemia of chronic illness, thrombocytosis because of the active inflammation), ESR(high), Raised C- reactive protein.
- Biochemistry : LFT(before medication because some medications used in treatment may affect liver like methotrexate), Renal profile(as a baseline because NSAIDs may affect kidney function)
- Serology: Rheumatoid factor (RF) (IgM that is done routinely in lab, It is not specific) (if it's high it's associated with more severe diseases), Anti-CCP(anti cyclicciterenated peptide. Very specific to RA but not that sensitive)
- Radiography : Joints , Spines ,Chest



Erosion

Joint destruction and periarticular osteopenia

Cervical spine involvement (Atlantoaxial subluxation)

Diagnosis:

ACR(American college of rheumatology)1987 Classification criteria for rheumatoid arthritis:

Patients must have 4 of 7 criteria:

- Morning stiffness lasting at least 1 hour (must be present at least 6weeks)
- Swelling in 3 or more joints (must be present at least 6 weeks)
- Swelling in hand joints (must be present at least 6 weeks)
- Symmetric joint swelling (must be present at least 6 weeks)
- Erosions or decalcifications on x-ray of hand
- Rheumatoid nodules
- Abnormal serum rheumatoid factor

The 2010 ACR / EULAR classification criteria for rheumatoid arthritis:
Target population (Who should be tested?): Patients who:

1) Have at least 1 joint with definite clinical synovitis (swelling)
2) With the synovitis not better explained by another disease

Add **A–D**; a score of **6/10 is needed to classify patient as having definite RA**:

A. Joint involvement:

1 large joint.	**0**
2-10 large joints	**1**
1-3 small joints (with or without involvement of large joints)	**2**
4-10 small joints (with or without involvement of large joints)	**3**
3-10 joints (at least 1 small joint)	**5**

B. Serology (at least 1 test result is needed for classification):

Negative RF *and negative ACPA*	***0***
Low-positive RF *or low-positive ACPA*	***2***
High-positive RF *or high-positive ACPA*	***3***

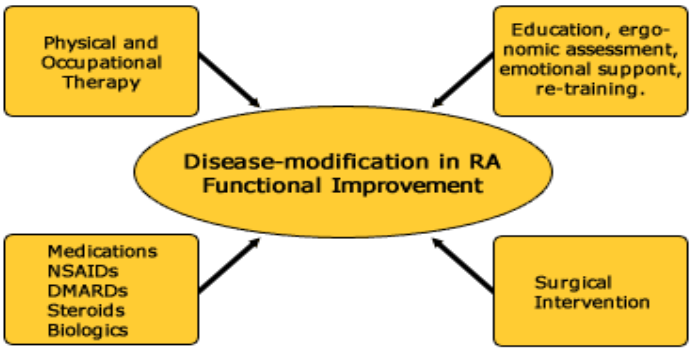
C. Acute-phase reactants (1 test result is needed for classification):

Normal CRP *and normal ESR*	***0***
Abnormal CRP *or abnormal ESR*	***1***

D. Duration of symptoms:

6 weeks	**0**
>6 weeks	**1**

Treatment:



Goals:

- Relieve pain
- Reduce inflammation
- Prevent/slow joint damage
- Improve functioning and quality of life

Approach:

- Lifestyle modifications(example patient with RA living in third or fourth floor he has to move)
- Rest
- Physical and occupational therapy
- Medications
- Surgery

Rationale for the Early Treatment of R.A:

- Erosions develop early in the disease course
- Destruction is irreversible
- Disease activity is strongly associated with joint destruction later in the disease course
- Early treatment can slow down radiographic progress
- Disease activity must be suppressed maximally in its early stages to prevent destruction and preserve function

Drug Treatments:

1. Nonsteroidal anti-inflammatory drugs (NSAIDs)(first line treatment)
   - Why? To relieve pain and inflammation
   - Traditional NSAIDs: Aspirin, Ibuprofen, Ketoprofen, Naproxen
   - COX-2 Inhibitors: Celecoxib, Rofecoxib(less side effects on GI)
   - Side effects: gastrointestinal
2. Disease-modifying antirheumatic drugs (DMARDs)(second line)
   - Characteristics: No immediate analgesic effects. Effects generally not seen until a few weeks to months
   - Why? Control symptoms and Can delay progression of the disease (prevent/slow joint and cartilage damage and destruction)

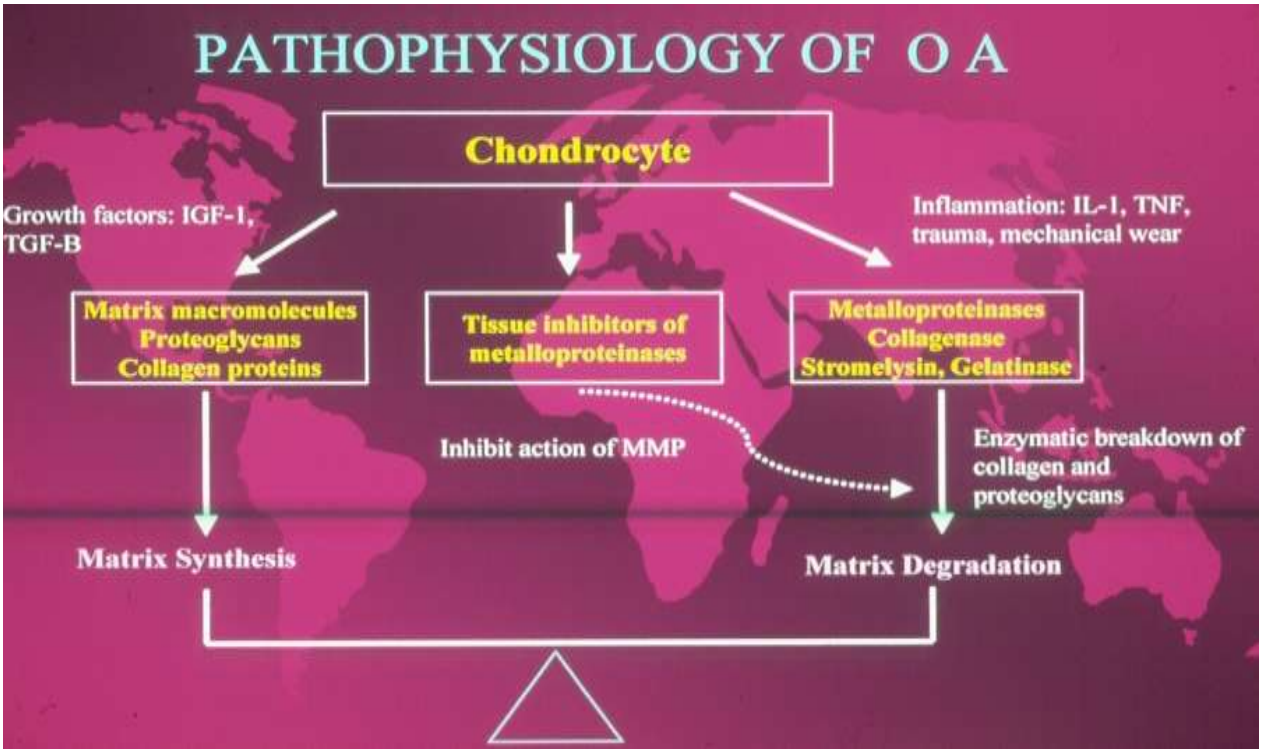
- Hydroxychloroquine: (immunomodulator)
  - Slow agent
  - mild non-erosive disease
  - combinations
  - 200 mg bid
  - **eye exam**every 6 months(because it causes deposition in the sclera)
- Sulfasalazine:(immunomodulator)
  - 1 gm bid - tid
  - **CBC, LFTs**
  - onset 1 - 2 months

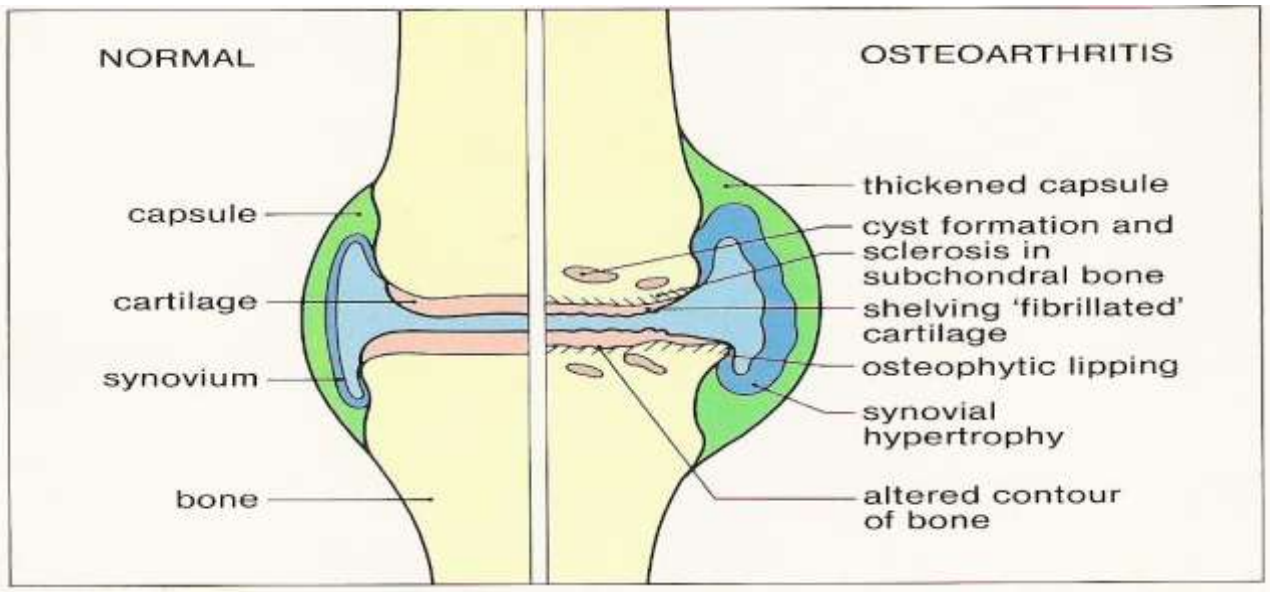
- Methotrexate: (immunosuppressive)
    - **most commonly used drug**
    - **fast acting (4-6 weeks)**
    - po, SQ - weekly
    - Monitor **CBC, LFTs**(because it can cause hepatocellular injury)
- Other DMARDS: Leflunomide, Gold(not used anymore), Azathioprine.

3. Biologic response modifiers:
    - Etanercept, Infliximab, Adalimumab, Tocilizumab
4. Corticosteroids

2. Osteoarthritis: (it's a degenerative disease of the cartilage)

Pathology:

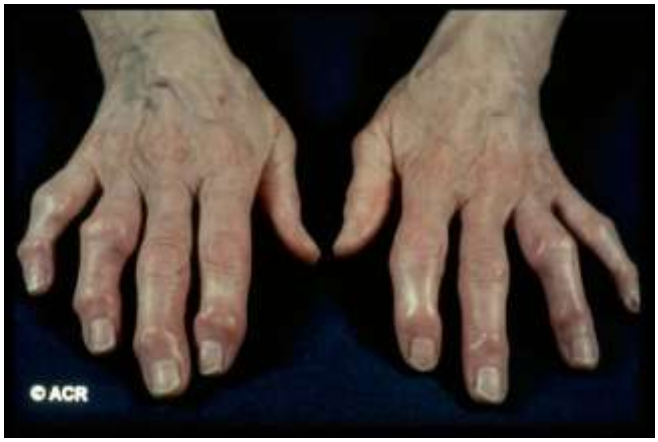




Etiology: (it is not known but there are biomechanical factors)

MULTIFACTORAL

- Joint instability
- Age
- Hormonal factors
- Trauma
- Altered biochemistry(like hemochromatosis)
- Inflammation
- Genetic predisposition
- ? Others
- Secondary osteoarthrtitis:
  - Congenital or developmental diseases
  - Trauma
  - Inflammatory joint disease(RA)
  - Endocrinopathies
  - Metabolic disease
  - Neuropathic disorders
  - Avascular necrosis
  - Paget's disease



Heberden'snodes which are bony swelling on distal interphalangeal joints, and Bouchard's Nodes in the proximalinterphalangeal joint.

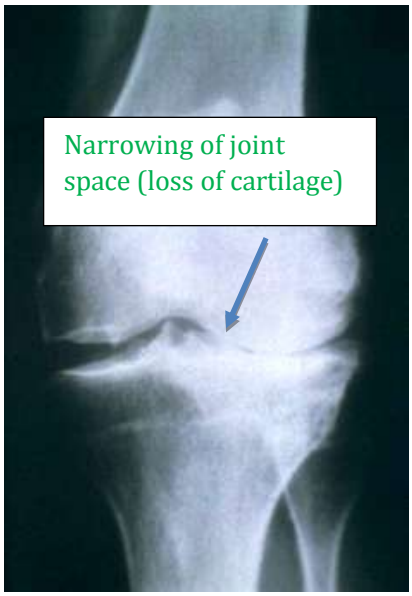
Signs and symptoms:

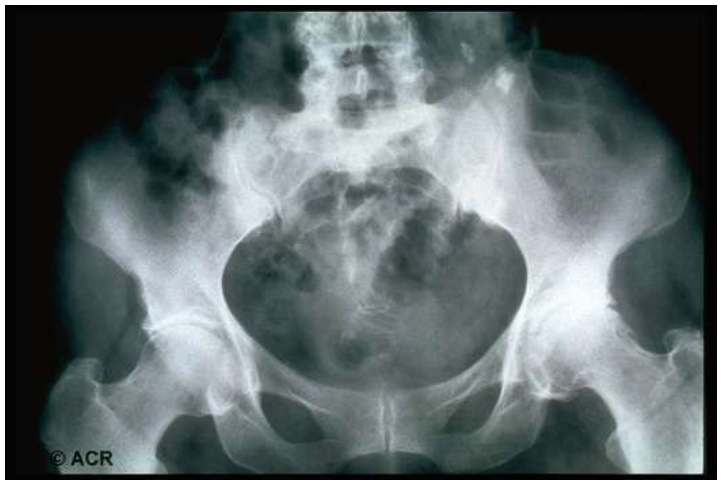
- Pain – worse on use of joint
- Stiffness – mild after immobility
- Loss of movement
- Pain on movement/restricted range
- Tenderness (articular or periarticular)
- Bony swelling
- Soft tissue swelling
- Joint crepitus

To differentiate between OA and RA: In OA there are no systemic manifestations like fever and weight loss.

Radiological features:

- Narrowing of joint space(Because the cartilage is loss)
- Osteophytosis(osteophyte formation as part of repair)
- Altered bone contour
- Bone sclerosis and cysts
- Periarticular calcification
- Soft-tissue swelling





Management:

Confirm the diagnosis

Initial Therapy:

1. Pysiotherapy
2. Weight loss
3. Local therapy(like local nonsteroidal creams)
4. Paracetamol

Second-line approach:

1. NSAIDS
2. Intra-articular therapy: steroids(we try to avoid in osteoarthritis because it's not a primary inflammatory disease but the degeneration can lead to inflammation so we use it),hyalurinate(it's lubrication to help with movement and reduce pain)
3. Opioids(very rare because it may lead to addiction)
4. ?glucosamines(some studies said it helps maintain the matrix of the cartilage but it's not proven)
5. Arthroscopy(we use arthroscopy because sometimes osteophytes break and dislodge and we use it to remove the osteophytes)
6. Surgery

Summery:

Rheumatoid arthritis

Symmetrical deforming peripheral POLYarthritis/ HLA-DR4 linked disease/ peak onset at 5th-6th decade.

Presentation: symmetrical swollen painful and stiff small joints of hands. Extra articular symptoms are fatigue, weight loss pericarditis, pleurisy.

Signs: early→ swollen MCP, PIP, Wrist or MTP joints (often symmetrical)

Later→ joint damage and deformity → ulnar deviation of fingers and dorsal wrist subluxation. Boutonnniere and swan neck deformity or Z deformity of the thumbs occur. Atlantoaxial subluxation may threaten the spinal cord. Extra-articular:nodules-elbows and lungs; lymphadenopathy, vasculitis, fibrosing alveolitis, oblitertive bronchiolitis, pleural and pericardial effusion, Raynaud's carpal tunnel syndrome, peripheral neuropathy, splenomegaly(5% and 1% have felty's syndrome: RA+splenomegaly+ neutropenia) episcleritis, scleritis, scleromalacia, keratoconjunctivitis sicca, osteoporosis, amyloidosis. Investigations: RhF + in 70% → and high titer indicates a severe disease, erosions and extra-articular disease. Anti-ccp highly specific (~98%) for R. there's often anemia with chronic disease . inflammation causes ^ platlets^ ESR ^ CRP. X-raysoft tissue swelling, bony erosions, juxta-articular osteopenia, decreased joint space, later there maybe bony erosions, subluxation or complete carpal destruction. Diagnostic criteria: 4 out of 7: morning stiffness (>1 hour lasting > 6 weeks) arthritis >= 3 joints, arthritis of hand joints, symmetrical arthritis, rheumatoid nodules, +ve rheumatoid factor and radiographic changes. Management: page 8.

Osteoarthritis is the commonest joint condition

Female:male ratio 3:1

Onset typically >50 yrs. Usually primary (generalized), could be secondary to joint disease or other conditions (hemarthrosis, obesity, occupational)

Signs and symptoms: localized disease (usually knee or hip) pain on movement and crepitus, worse at end of day, background pain at rest; joint jelling- stiffens after rest upto 30mins; joint instability. Generalized disease (primary OA): with heberden's nodes (seen mainly post-menopausal) commonly affected joints are the DIP joints, thumb, CMC joints and knees. There maybe joint tenderness, derangement and bony swelling (heberden's nodes at DIP., bouchard's nodes at PIP) decreased range of movement and mild synovitis

Investigations: plain radiographs show loss of joint space, subchondral sclerosis and cysts and marginal osteophytes. CRP slightly elevated

Management: exercise to improve muscle strength and joint stability.

Regular paracetamol for pain→ consider NSAIDS if paracetamol is ineffective

Weight loss if BMI >28 walking Aids, supportive footwear, ohysio, topical NSAIDS and capsaicin (derived form chillies). Joint replacement is the best wat to deal with severe OA

Questions:

A 60-year-old, mildly obesewoman presents complaining ofbilateral medial right knee pain thatoccurs with prolonged standing.The pain does not occur with sittingor climbing stairs but seems to beworse with other activity and at theend of the day. The patient deniesmorning stiffness. Examination ofthe knees reveals no deformity, butthere are small effusions. Some mildpain and crepitus is produced withpalpation of the medial aspect of theknees. Which of the following is themost likely diagnosis?

a. Rheumatoid arthritis
b. Gouty arthritis
c. Chondromalacia patellae
d. Osteoarthritis
e. Psoriatic arthritis

The answer is d.**Osteoarthritis** most often affects the weight-bearing joints and is associated
with obesity or other forms of mechanical stress. It has no systemic manifestations. It is more common in women and onset is usually after the age of 50. Pain often occurs on exertion and is relieved with rest, after which the joint may become stiff. Distal interphalangeal joints may be involved with the production of **Heberden nodes. Bouchard nodes** are often found at the proximal interphalangeal joint. **Crepitus** (the sensation of bone rubbing against bone) is often felt on examination of the involved joint. **Rheumatoid arthritis** is a systemic disease of women under the age of 40. Joint involvement is usually symmetric, involving the proximal interphalangeal and metacarpophalangeal joints. Ninety-five percent of gouty arthritis occurs in men and often involves the great toe.
Chondromalacia
patellae or chondromalacia means softening of the cartilage.
Patients present with anterior knee pain and tenderness over the undersurface
of the patella. Pain is worse when sitting for long periods of time or when climbing stairs. Psoriatic arthritis is an asymmetric oligoarthritis that
involves the knees, ankles, shoulders, or digits of the hands and feet and occurs in 50% of patients with psoriasis.

A 25-year-old man presents with morning back pain and stiffness and tenderness over the sacroiliac joints. The patient denies any previous history of eye or genitourinary problems. On physical examination, there is diminished chest expansion with breathing. Which of the following is the most likely diagnosis?
a. Rheumatoid arthritis

b. Ankylosing spondylitis
c. Sjögren syndrome
d. Systemic lupus erythematosus
e. Reiter syndrome

The answer is b. **Ankylosing spondylitis** (Marie-Strümpel l arthritis) is a chronic and progressive inflammatory diseasethat most commonly affects the spinal, sacroiliac, and hip joints. Allpatients have symptomatic **sacroiliitis.** Other symptoms may include uveitisand aortitis. Men in the third decade of life are most frequently affected andthere is a strong association with HLA-B27 (90%) in white patients. Patientswith advanced disease present with a **bent-over posture.** A positive **Schober test** indicates diminished anterior flexion of the lumbar spine. Involvementof the costoveretebral joints limits chest expansion and eye involvement maycause an iritis. Patients with **Reiter syndrome** may present with a history ofconjunctivitis, urethritis, arthritis, and enthesopathy (Achilles tendinitis).