

## **Osteoarthritis:**

**Osteoarthritis (OA)** also known as **degenerative arthritis** or **degenerative joint disease** or **osteoarthrosis**, is a group of mechanical abnormalities involving degradation of joints, including articular cartilage and subchondral bone. Although its name suggests otherwise, osteoarthritis is not considered an inflammatory disease. Symptoms may include joint pain, tenderness, stiffness, locking, and sometimes an effusion. A variety of causes—hereditary, developmental, metabolic, and mechanical deficits—may initiate processes leading to loss of cartilage. When bone surfaces become less well protected by cartilage, bone may be exposed and damaged. As a result of decreased movement secondary to pain, regional muscles may atrophy, and ligaments may become more lax.

## **Signs and symptoms:**

The main symptom is pain, causing loss of ability and often stiffness. "Pain" is generally described as a sharp ache or a burning sensation in the associated muscles and tendons. OA can cause a crackling noise (called "crepitus") when the affected joint is moved or touched and people may experience muscle spasms and contractions in the tendons. Occasionally, the joints may also be filled with fluid.

OA commonly affects the hands, feet, spine, and the large weight bearing joints, such as the hips and knees, although in theory, any joint in the body can be affected. As OA progresses, the affected joints appear larger, are stiff and painful, and usually feel better with gentle use but worse with excessive or prolonged use, thus distinguishing it from rheumatoid arthritis.

In smaller joints, such as at the fingers, hard bony enlargements, called Heberden's nodes (on the distal interphalangeal joints) and/or Bouchard's nodes (on the proximal interphalangeal joints), may form, and though they are not necessarily painful, they do limit the movement of the fingers significantly. **Fig(1)**.



**fig(1) OA showing Bouchard's nodes at proximal IFJ and Heberden's node at distal IFJs may form in osteoarthritis**

## Causes:

### 1-Primary (idiopathic):

A number of studies have shown that there is a greater prevalence of the disease among siblings and especially identical twins, indicating a hereditary basis.

### 2-Secondary

This type of OA is caused by other factors but the resulting pathology is the same as for primary OA:

- Alkaptonuria
- Congenital disorders of joints
- Diabetes
- Ehlers-Danlos Syndrome
- Hemochromatosis and Wilson's disease
- Inflammatory diseases (such as Perthes' disease), and all chronic forms of arthritis (e.g. gout, and rheumatoid arthritis). In gout, uric acid crystals cause the cartilage to degenerate at a faster pace.
- Injury to joints or ligaments (such as the ACL), as a result of an accident or orthopedic operations.
- Ligamentous deterioration or instability may be a factor.
- Marfan syndrome
- Obesity
- Septic arthritis (infection of a joint)

## **Diagnosis:**

Diagnosis is made with reasonable certainty based on history and clinical examination. X-rays may confirm the diagnosis. The typical changes seen on X-ray include **fig(2)**: joint space narrowing, subchondral sclerosis (increased bone formation around the joint), subchondral cyst formation, and osteophytes. Plain films may not correlate with the findings on physical examination or with the degree of pain..



**Fig (2) AP view showing OA of the Knee Joint**

## Management :

**-Lifestyle modification (such as weight loss and exercise) and analgesics** are the mainstay of treatment. Acetaminophen (also known as paracetamol) is recommended first line with NSAIDs being used as add on therapy only if pain relief is not sufficient.

The analgesic acetaminophen is the first line treatment for OA. For mild to moderate symptoms effectiveness is similar to non-steroidal anti-inflammatory drugs (NSAIDs), though for more severe symptoms NSAIDs may be more effective. NSAIDs such as naproxen while more effective in severe cases are associated with greater side effects such as gastrointestinal bleeding. Another class of NSAIDs, COX-2 selective inhibitors (such as celecoxib) are equally effective to NSAIDs with lower rates of adverse gastrointestinal effects but higher rates of cardiovascular disease such as myocardial infarction. They are also more expensive than non-specific NSAIDs. Oral opioids, including both weak opioids such as tramadol and stronger opioids, are also often prescribed.

There are several NSAIDs available for topical use including diclofenac. Topical and oral diclofenac work equally well with topical having a greater risk of mild skin reactions but no greater risk of gastrointestinal adverse effects. Transdermal opioid pain medications are not typically recommended in the treatment of osteoarthritis. Many dietary supplements are solid as treatments for OA and some of them have been found to be effective. Since glucosamine is a precursor for glycosaminoglycans, and glycosaminoglycans are a major component of cartilage, some have hoped that supplemental glucosamine could beneficially influence cartilage structure

**-Joint injections** of glucocorticoids (such as hydrocortisone) leads to short term pain relief that may last between a few weeks and a few months. Injections of hyaluronic acid have not been found to lead to much improvement compared to placebo but have been associated with harm.]

- **Joint arthroplasty** If disability is significant and more conservative management is ineffective, joint arthroplasty is recommended. Evidence supports joint replacement for both knees and hips as it is both clinically effective, and cost-effective. Osteotomy may be useful in people with knee osteoarthritis but has not been well studied.

**-Arthroscopic surgery** is largely not recommended as it does not improve outcomes in knee osteoarthritis.

## Heamompilic Arthritis :

- A condition characterized by repetitive hemarthroses and ultimately joint deformation in patients with bleeding disorders
  - demographics
    - young males
    - affects patients between 3-15 years old
  - location
    - **knee is most commonly affected**
      - elbow, ankle, shoulder and spine are also involved
- **Pathophysiology**
  - mechanism of injury ---→persistent minor trauma
  - root bleeding disorder may be
    - **hemophilia A**
      - X-linked recessive
      - decrease factor VIII
    - **hemophilia B - Christmas disease**
      - X-linked recessive
      - decreased factor IX
    - **von Willebrand's disease**
      - rare cause of joint bleeds
      - autosomal dominant
      - abnormal factor VIII with platelet dysfunction
  - **pathoanatomy**
    - synovitis ---- >cartilage destruction (enzyme based)  
----->joint deformity
  - ***orthopaedic manifestations***
    - 1-hemarthrosis
    - 2-intramuscular hematoma (pseudotumor)
      - may lead to nerve compression
        - femoral nerve palsy may be caused by iliacus hematomas
    - 3-leg length discrepancy
    - 4-fractures due to generalized osteopenia or normal healing chronology.

## Prognosis :

- prognostic variables
  - degree of factor deficiency
    - determines severity of disease
      - mild: 5-25%
      - moderate: 1-5%
      - severe: 0-1%
  - presence of factor VIII inhibitors (including IgG antibodies)

## Presentation

- Symptoms
    - *painful range of motion of joints.*
    - *hemarthrosis:*
      - the knee is most commonly affected
- 1-acute ->presentation will show a painful and tense joint effusion
- 2-subacute ->occurs after two prior bleeds
- 3-chronic ->presentation will demonstrate contractures or arthritis
- *paresthesias* in the L4 distribution ;caused by iliacus hematoma that compress femoral nerve.

## Imaging

- Radiographs
  - knee → squaring of patella and femoral condyles (Jordan's sign),ballooning of distal femur ,widening of intercondylar notch, joint space narrowing ,patella appear long and thin on lateral
  - ankle →joint arthritis
  - elbow →joint arthritis
  - epiphyseal overgrowth
  - generalized osteopenia
  - fractures
- MRI
  - can be used to identify early degenerative joint disease 📷
- Ultrasound →often helpful to follow intramuscular hematomas

### Differential diagnosis:

- Septic arthritis
  - concomitant infection should be ruled out by physical exam and joint aspiration

### Treatment

- Nonoperative
  - **compressive dressings, analgesics, short term immobilization followed by rehabilitation, factor administration, desmopressin therapy .**
- Operative
  - **Synovectomy**
  - **total joint arthroplasties**
  - arthrodesis

## Neuropathic Joint:

**Neuropathic arthropathy** (or **neuropathic osteoarthropathy**), also known as **Charcot joint** (often "Charcot foot"), refers to progressive degeneration of a weight bearing joint, a process marked by bony destruction, bone resorption, and eventual deformity. Onset is usually insidious. Any condition resulting in decreased peripheral sensation, proprioception, and fine motor control:

- Diabetes mellitus.
- Alcoholic neuropathy
- Cerebral palsy
- Leprosy
- Syphilis (*tabes dorsalis*), caused by the organism *Treponema pallidum*
- Spinal cord injury
- Myelomeningocele
- Syringomyelia
- Intra-articular steroid injections
- Congenital insensitivity to pain
- Peroneal muscular atrophy

## Joint Involvement :

Diabetes is the foremost cause for neuropathic joint disease, and the foot is the most affected region. In those with foot deformity, approximately 60% are in the tarsometatarsal joints (medial joints affected more than lateral), 30% Metatarsophalangeal joints and 10% have ankle disease. Patients with neurosyphilis tend to have knee involvement, and patients with syringomyelia of the spinal cord may demonstrate shoulder deformity.

## Symptoms and signs :

The clinical presentation varies depending on the stage of the disease from mild swelling to severe swelling and moderate deformity. Inflammation, erythema, pain and increased skin temperature (3–7 degrees Celsius) around the joint may be noticeable on examination. X-rays may reveal bone resorption and degenerative changes in the joint. These findings in the presence of intact skin and loss of protective sensation are pathognomonic of acute Charcot arthropathy.



Oblique view X-ray in a 45-year-old male diabetic

## Treatment :

Once the process is recognized, immobilization with a total contact cast will help ward off further joint destruction. Pneumatic walking braces are also used. Surgical correction of a joint is commonly successful in the long-term in these patients.

