

1-Osteoarthritis

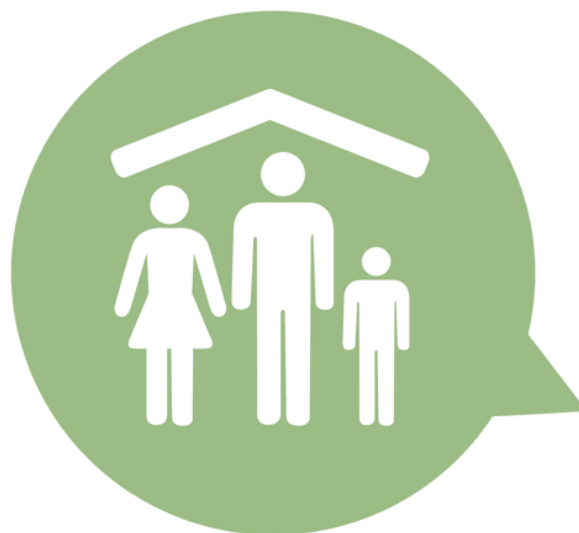
Objectives:

1-Risk Factors/Etiology

2-Clinical Features

3-Approach (history, physical examination, investigation plain x-ray, updated management level of primary care/ intra-articular injection, physiotherapy)

4-Criteria of Referral to Orthopedics



Introduction

-Osteoarthritis is the most common form of arthritis, affecting millions of people worldwide. It occurs when the protective cartilage that cushions the ends of your bones wears down over time.

-osteoarthritis can damage any joint, the disorder most commonly affects joints in your hands, knees, hips and spine.

-Osteoarthritis symptoms can usually be managed, although the damage to joints can't be reversed. Staying active, maintaining a healthy weight and some treatments might slow progression of the disease and help improve pain and joint function.

Etiology

OA has no single cause, rather, it is due to a variable combination of several risk factors.

- OA results from a disparity between the stress applied to articular cartilage and the ability of the cartilage to withstand that stress. This could be due to one or a combination of **two processes**:
 - **Weakening of the articular cartilage** (due to a genetic defect or enzyme activities).
 - **Increased mechanical stress** in some part of the articular surface. Which can be caused by overuse or joint instability.

Cause	Example
Trauma:	osteochondral, malunion, sport injury
Inflammatory:	RA mainly, SLE, Reiter's syndrome
Metabolic:	crystalline deposition disease (gout, CPPD (ca pyrorophosphate dehydrate crystal deposition disease)), Paget's disease.
Congenital/developmental:	Hip dysplasia, multiple epiphyseal dysplasia.
Osteonecrosis:	Perthe's disease, idiopathic osteonecrosis, sickle cell anemia, hemophilia, steroids.

Risk factors

- ⇒ Age
- ⇒ Obesity
- ⇒ Excessive joint loading (manual labor, athletes, etc)
- ⇒ Trauma
- ⇒ Genetic predisposition.
- ⇒ Altered joint anatomy or instability
- ⇒ **Family history** IMP factor

Clinical features

It has an intermittent course, with period of remission sometimes lasting for months, affecting one or two of the weight bearing joints (hip and knee).

Symptoms:

➤ **Pain:**

- ⇒ Localized to affected part of joint or rarely referred to distant site (for example: pain in the knee from osteoarthritis)
- ⇒ insidious in onset/ aggravated by exertion and relieved by rest/ in advance stage there will be night pain or pain at rest
- ⇒ causes of the pain:
 - ✚ bone pressure due to vascular congestion and intraosseous
 - ✚ mild synovial inflammation
 - ✚ capsular fibrosis with pain on stretching the shrunken tissue
 - ✚ muscular fatigue

- **Stiffness** it's initially after periods of inactivity, but later on it will be constant and progressive

- **Loss of function**



BOTH knees are affected by varus , but right knee is severely affected and left is moderately affected.

Signs:

- **Swelling:** intermittent (because of effusions) continuous (large osteophytes)
- **deformity** severe
- **tenderness**
- **limited** range of **movement**
- **crepitus** rubbing of bone against bone, you can both hear and feel
- **instability** because of Loss of cartilage and bone, asymmetrical capsular contracture and/or muscle weakness and imbalance between flexor and extensor mechanism



Approach

History:

C/O: Joint pain, stiffness, and /or functional limitation.

➤ **Look for risk factors:**

- **Age**
- **Obesity**
- **Trauma**
- Genetics (significant family history)
- Reduced levels of sex hormones (menopause)
- Muscle weakness
- **Repetitive use** (i.e., jobs requiring heavy labor and bending)
- **Infection**
- Crystal deposition
- Previous inflammatory arthritis (eg, burnt-out rheumatoid arthritis)
- Heritable metabolic causes (eg, alkaptonuria, hemochromatosis, Wilson disease)
- Hemoglobinopathies (eg, sickle cell disease and thalassemia)
- Neuropathic disorders leading to a Charcot joint (eg, syringomyelia, tabes dorsalis, and diabetes)
- Underlying morphologic risk factors (eg, congenital hip dislocation and slipped femoral capital epiphysis)
- Disorders of bone (eg, Paget disease and avascular necrosis)
- Previous surgical procedures (eg, meniscectomy)

Physical Examination:

- **It is important to compare both sides when examining a joint.**
- **Gait:**
 - ⇒ antalgic (usually if there is pain).
 - ⇒ Trendelenburg (weak hip abductors or painful hip joint).
- **Inspection:**
 - ⇒ scars (previous surgery).
 - ⇒ Erythema (suggests an underlying inflammation).
 - ⇒ Joint deformities (e.g. genu valgum, genu varum).
 - ⇒ Alignment (mal-alignment suggests subluxation or dislocation).
 - ⇒ Wasting of muscles (e.g. quadriceps wasting in knee osteoarthritis).
- **Palpation:**
 - ⇒ Temperature (a warm joint indicates inflammation).
 - ⇒ Tenderness (of the joint itself or of the surrounding tissues).
 - ⇒ Swelling (e.g. effusion or osteophyte formation).
- **Check Range of motion:** active then passive if there is limitation of movement

- Special tests:

Knee:

○ LACHMAN'S TEST:

- **Purpose:** Assess for ACL laxity
- **Position:** Supine with knee in 0-30° of flexion (hamstrings relaxed)
- **Technique:** Stabilize distal femur & translate proximal tibia forward on the femur.
- **Interpretation:** + test = >5 mm of displacement or a mushy, soft end-feel.
- **Beware:** of false (-) test due to hamstring guarding, hemarthrosis, posterior medial meniscus tear.



○ ANTERIOR DRAWER TEST:

- **Purpose:** Assess for ACL laxity
- **Position:** Supine with foot stabilized on table, knee flexed to 80°–90° & hamstrings relaxed
- **Technique:** Translate proximal tibia anterior on the femur.
- **Interpretation:** + test = >5mm of anterior displacement; snap or palpable jerk with anterior drawer indicates meniscus px.
- **Beware:** Translation may appear excessive with PCL injury if tibia starts from a more posterior position.



○ POSTERIOR DRAWER TEST:

- **Purpose:** Assess for PCL laxity.
- **Position:** Supine with knee flexed to 90° & foot on table.
- **Technique:** Translate proximal tibia posteriorly on distal femur.
- **Interpretation:** + test = >5 mm of posterior displacement.



○ VARUS TEST:

- **Purpose:** Assess for LCL laxity.
- **Position:** Supine; knee in full extension & then repeat at 30° flexion.
- **Technique:** Cup knee with heel of clinician's hand at medial joint line; use fingers of other hand to palpate lateral joint line; apply a varus stress to the knee through the palm of the medial hand & the forearm/elbow of the lateral hand.
- **Interpretation:** + test = pain or excessive gapping of the joint when compared with the contralateral side.



○ VALGUS TEST

- **Purpose:** Assess for MCL laxity.
- **Position:** Supine; knee in full extension & then repeat at 30° flexion.
- **Technique:** Cup knee with heel of clinician's hand at lateral joint line; use fingers of other hand to palpate medial joint line; apply a valgus stress to the knee through the palm of the lateral hand & the forearm/ elbow of the medial hand.
- **Interpretation:** + test = pain or excessive gapping of the joint when compared to the contralateral side.



Hip:

○ THOMAS TEST

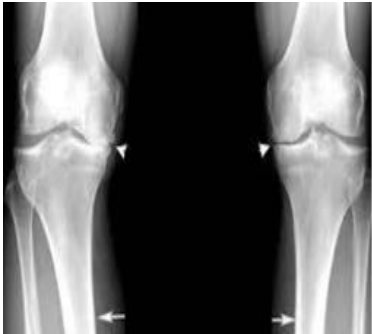



- **Purpose:** Assess for tight hip flexors.
- **Position:** Supine with lumbar spine stabilized & involved LE extended.
- **Technique:** Flex contralateral hip to the abdomen.
- **Interpretation:** + test = flexion of the involved hip or lumbar spine indicates tight.

○ TRENDLENBURG'S TEST

- **Purpose:** Assess for weakness of gluteus medius.
- **Position:** Standing on involved lower limb.
- **Technique:** Flex the contralateral lower limb; iliac crest on weight bearing side should be lower than the non-weight bearing side.
- **Interpretation:** + test = dropping of the non-weight bearing limb is 2° to abductor weakness (common in epiphyseal problem, Legg-Calve-Perthes, MD)

Imaging: plain x-ray:

- **Asymmetrical** loss of cartilage (narrowing of the 'joint space')
 - **Subchondral bone sclerosis**
 - **Cysts close to the surface**
 - **osteophytes at the margins of the joint**
- Late features: Malalignment, Joint subluxation, Bone loss, Loose bodies.

Subchondral bone sclerosis	Subchondral cyst	osteophyte formation	Bone loss
 <p>white sclerotic lesion in the medial side of knee</p>	 <p>cysts at the dome of acetabulum (superolateral part)</p>		



Management:

-Depends on several factors:

- ⇒ Joint (or joints) involved
- ⇒ Stage of the disorder
- ⇒ Severity of the symptoms
- ⇒ Age of the patient

(Conservative or Pharmacological): we apply the following principles:

- **Maintain movement and muscle strength (increasing joint mobility):** by **physiotherapy** which will help in:
 - 1- pain relief (either by massage or application of warmth)
 - 2- Prevents contractures
 - 3- Muscle strengthening
 - 4- Enhancing the range of motion



- **Protect the joint from overload (load reduction):** by using a (walking stick, **unloading brace**, wearing Shock- absorbing shoes, avoiding prolonged stressful activity and by **weight reduction** (if the pt. is obese)



Walking stick



Shock absorbing shoes



Unloading brace

- **Relieve pain**
 - ⇒ **Using medication** which could be systemic or local
 - ✚ systemic such as: paracetamol, NSAIDs (local (injection) is not recommended in general)
 - All types of injections are not proven to be beneficial except for corticosteroid injection which can give only 1-month relief of pain.
 - Intra-articular **HYALURONIC ACID, mast cell, stem cell (nothing can reproduce the cartilage after it is damaged) injections are not proved and will not be proved in doctor opinion.**
 - steroids injections are given in acute pain its effect decreases with each use.
 - ⇒ **Modify daily activities and rest period:** avoiding activities like climbing stairs, squatting and praying on the floor **pray on chair instead**, application of warmth, massage.

Patients should be referred in these situations:

- 1- Joint infection
- 2- Acute inflammation
- 3- Joint is giving way despite therapy
- 4- Symptoms rapidly deteriorate and are causing severe disability
- 5- Symptoms impair quality of life. Like severe pain, disability, sleeplessness, loss of independence, inability to undertake normal activities, reduced functional capacity or psychological upset.
- 6- Drug treatment causing severe side effects
- 7- Failure of conservative treatment
- 8- Uncertain diagnosis

We should focus on patients' complaints not the x-ray and their willingness for referral. If we have a patient with moderate symptoms who is not interested in a referral then we don't need to refer them but if they are interested, we refer them. In Mild symptoms referral is usually not appropriate and they can be managed in primary care clinics.