OSTEOARTHRITIS

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Osteoarthritis (OA)

- is a chronic disorder of synovial joints in which there is
- 1- progressive softening and disintegration of articular cartilage
- 2- accompanied by new growth of cartilage and bone at the joint margins (osteophytes)
- 3- cyst formation
- 4- sclerosis in the subchondral bone, mild synovitis and capsular fibrosis.
In its most common form, it is unaccompanied by any systemic illness and, although there are sometimes local signs of inflammation, it is not primarily an inflammatory disorder.

It is also not a purely degenerative disorder, and the term ‘degenerative arthritis’ – which is often used as a synonym for OA – is a misnomer. So,

Osteoarthritis is a dynamic phenomenon; it shows features of both destruction and repair.
- the most common type of arthritis
- high prevalence, especially in the elderly
- major cause of pain and disability in the elderly
- ↑ in frequency with age.
- M:F 1:3

Cartilage does ‘age’, showing
1- diminished cellularity
2-reduced proteoglycan concentration
3-loss of elasticity and a decrease in breaking strength with advancing years.

It is significant that the progressive changes are restricted to certain joints, and to specific areas of those joints, while other areas show little or no progression with age.
5.3 Osteoarthritis: non-progressive and progressive

(a) Non-progressive OA changes are common in older people; here we see them along the inferomedial edge of the femoral head, while the articular cartilage over the rest of the head looks perfect. (b) Progressive OA changes are seen characteristically in the maximal load-bearing area; in the hip this is the superior part of the joint. Articular cartilage has been destroyed, leaving a bald patch on the dome of the femoral head.
- **Causes**
  - **Primary: when no cause is obvious:**
    - Age related.
    - Genetic.
    - Sex.
  - **Secondary: when it follows a demonstrable abnormality:**
    - Congenital hip subluxation.
    - Abnormally formed joint “hip dysplasia.”
  - Diabetes.
  - **Trauma” sports injuries”**
  - Gout.
  - Pregnancy.
  - Infection.
  - Obesity.

In most cases the precipitating cause of OA is **increased mechanical stress** in some part of the articular surface. This may be due to **increased load** (e.g. in deformities) **or to a reduction of the articular contact area** (e.g. with joint incongruity or instability).
PATHOLOGY:

1. Progressive loss of cartilage thickness.
2. Subarticular cyst formation + sclerosis.
3. Remodeling of the bone ends + osteophyte formation.
4. Synovial irritation.
5. Capsular fibrosis.

* Initially the cartilaginous and bony changes are confined to one part of the joint – the most heavily loaded part.
Figure 25.18 Pathological changes in osteoarthritis.
OSTEOARTHRITIS

DEGENERATIVE DISEASE

MORNING STIFFNESS LASTING LESS THAN 30 MINUTES

HEBERDEN'S NODES

CARTILAGE LOSS

ASYMMETRICAL

RHEUMATOID ARTHRITIS

AUTOIMMUNE DISEASE

MORNING STIFFNESS LASTING MORE THAN 30 MINUTES

INFLAMED SYNOVIAL

SYMMETRICAL

EXTRA-ARTICULAR INVOLVEMENT
Patients usually present after middle age, Joint involvement follows several different patterns either on one or two of the weightbearing joints (hip or knee), on the interphalangeal joints (especially in women) or on any joint that has suffered a previous affliction (e.g. congenital dysplasia, osteonecrosis or intra-articular fracture).

**Pain** is the usual presenting symptom. It is often quite widespread, or it may be referred to a distant site – for example, pain in the knee from OA of the hip. It starts insidiously and increases slowly over months or years. It is aggravated by exertion and relieved by rest. In the late stage the patient may have pain in bed at night.

**Swelling** may be intermittent (suggesting an effusion) or continuous (with capsular thickening or large osteophytes).

**Deformity** may result from capsular contracture or joint instability, but deformity may actually have preceded and contributed to the onset of OA.

**Loss of function**


**SIGNS**

*Local tenderness* is common, and in superficial joints fluid, synovial thickening or osteophytes may be felt.

*Limited movement* in some directions but not others is usually a feature, and is sometimes associated with pain at the extremes of motion.

*Crepitus* may be felt over the joint (most obvious in the knee) during passive movements.

*Instability* is common in the late stages of articular destruction, but it may be detected much earlier by special testing. Instability can be due to loss of cartilage and bone, asymmetrical capsular contracture and/or muscle weakness.
Function in everyday activities must be assessed. X-ray appearances do not always correlate with either the degree of pain or the patient’s actual functional capacity.

Imaging: - plain X-ray.
- MRI.

Arthroscopy may show cartilage damage before x-ray changes appear.
- **X-ray**: are the basic diagnostic procedure for the disease.
- Mnemonic (loss)

- **asymmetrical loss of cartilage** (Narrowing of joint space)
- **Osteophytes formation**
- **Subarticular cyst formation**
- **Subarticular sclerosis**
- (evidence of previous disorders like old fractures, RA may be present)
Pathological changes in osteoarthritis

- Normal synovial joint
- Early change in osteoarthritis

Eburnation & osteophytes formation

Heberden's nodes (osteophytes on the interphalangeal joints of the fingers)
(Left) In this x-ray of a normal knee, the space between the bones indicates healthy cartilage (arrows). (Right) This x-ray of an arthritic knee shows severe loss of joint space.
Differential Diagnosis

A number of conditions may mimic OA, some presenting as a monoarthritis and some as a polyarthritis affecting the finger joint.

1. Avascular necrosis ‘Idiopathic’ osteonecrosis causes joint pain and local effusion
2. Inflammatory arthropathies Rheumatoid arthritis, ankylosing spondylitis and Reiter’s disease may start in one or two large joints
3. Polyarthritis of the fingers
4. Diffuse idiopathic skeletal hyperostosis (DISH)
*Clinical variant of OA:-

1- Mono articular + pauciarticular OA

- dysfunction in 1 or 2 of large weight bearing joints
- Obvious underlying abnormality

2-OA in an unusual sites:

- Uncommon in shoulder, elbow, wrist, ankle

3-polyarticular (generalized) OA: - most common form

- the typical pt is middle-aged women ē pain swelling + stiffness of the finger joints

- most obvious in hands with interphalangeal joints become swollen + tender + appear to be inflamed

- heberden’s nodes - DIP

- bouchard’s nodes - PIP
**Complications**

**Baker's cyst** is flow of the synovial fluid into the gastrocnemius bursa. It can be asymptomatic or can cause restriction of movement. It is painful when ruptured.

**Rotator cuff dysfunction** Osteoarthritis of the acromioclavicular joint may cause rotator cuff impingement, tendinitis or cuff tears.

**Spinal stenosis** Longstanding hypertrophic OA of the lumbar apophyseal joints may give rise to acquired spinal stenosis. The abnormality is best demonstrated by CT and MRI.
Treatment:

a) Early:

- Relieve pain: analgesics: The most commonly used analgesic is acetaminophen + NSAIDs Ibuprofen is the most prescribed medication.
- Movement: regular normal exercise to improve muscle strength and induce condroplasts.
- Reduced load.

b) Intermediate:

- OA of knee: debredment of joint (remove osteophytes, cartilage tags, loose bodies).
- Corrective osteotomy may prevent or delay progression of the cartilage damage.
c) Late:

- Arthroplasty is indicated in unrelieved pain + progressive disability.
- Pt > 60 arthroplast total joints replacement
- For the hip and knee
- Similar operations for the shoulder, elbow and ankle are less successful

- Arthrodesis
  a reasonable choice if stiffness is not a draw back and neighbouring joints are not likely to be prejudiced. This is most likely to apply to small joints that are prone to OA, e.g. the carpal and tarsal joints and the large toe metatarsophalangeal joint. Can be done to large joints in rare conditions as failure of the replacement therapy or joint infection.
TREATMENT (QUICK REVISION)

- Conservative: life style modification, physiotherapy and drugs

- Surgical:
  - 1 corrective osteotomy
  - 2 arthroplasty
  - 3 arthrodesis
Joint aligned properly

Arthritic knee

Joint not aligned due to arthritis

Wedge from arthritic joint
Thank you