

# An approach to osteoarthritis

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## Summary

*Osteoarthritis is the most common joint disease, but the pattern differs somewhat in different race and sex groups. Classification, distribution and clinical findings, as well as a few treatment modalities are given.*

Osteoarthritis is the most common joint disease encountered. The disease has often been regarded as a "wear and tear" process of the joint, leading to cartilage loss in later life. In fact, the condition is much more complicated. Osteoarthritis should rather be seen as a slowly evolving disorder of cartilage and subchondral bone, occurring over decades, but only becoming symptomatic in later life. It may be defined as a mechanical loss of joint cartilage accompanied by subchondral bony changes.

The macroscopic features of osteoarthritis start with focal areas of softening of the articular cartilage. This is followed by pitting and fissures forming in the superficial areas of the cartilage. These fissures or cracks will with time penetrate through the full thickness of the cartilage to the underlying bone.

## *Osteoarthritis is the most common joint disease encountered*

Flakes of cartilage break off from the surface, leading to thinning of the cartilage. Ultimately large areas of cartilage are eroded away, exposing the underlying

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bone. At the same time changes in the subchondral bone are taking place. Sclerosis of the underlying bone takes place as well as cyst formation in the bone. At the edge of the joint new bone is laid down to form the well-known osteophytes.

There is little, if any, primary synovitis associated with osteoarthritis, but episodes of inflammation do periodically occur, probably due to minor trauma to the already damaged joint.

Osteoarthritis is found in all racial groups, although the pattern of joint involvement does differ somewhat in different race groups. For example, osteoarthritis of the knees, while occurring in all races, is more prevalent in black women. Hip osteoarthritis is more prevalent in the white male. Heberden nodes from osteoarthritis of the distal interphalangeal joints are

## *Most patients will do well with conservative therapy*

much more prevalent in the white race, and in particular in the female.

If all age groups are considered together the incidence of osteoarthritis is about the same in both males and females.

By the age of 40 many patients exhibit asymptomatic radiological evidence of osteoarthritis. By the age of 70 most will have evidence of osteoarthritis in one or more joints, many of whom will have become symptomatic.

## Classification

Osteoarthritis may be classified into primary or secondary osteoarthritis. Primary osteoarthritis is considered when no cause for the osteoarthritis has been found. Secondary osteoarthritis is considered when an underlying cause is identified, e.g. a dysplasia of the joint, previous sepsis or any other cause for structural damage to the joint.

Primary osteoarthritis may be further classified into a number of different clinical types. Based on radiological and clinical findings, four types have been recognised:

- primary generalised osteoarthritis
- erosive osteoarthritis
- diffuse idiopathic skeletal hyperostosis, and
- chondromalacia of the patella.

### Distribution of joint involvement

The most commonly involved joints in osteoarthritis are the distal interphalangeal (DIP) joints, proximal interphalangeal (PIP) joints, the first carpometacarpal (CMP) joint (the thumb), hips, knees, first metatarsophalangeal (MTP) joints, and the apophyseal joints of the cervical and lumbar spine. Most individuals have only a few joints involved, but in the primary osteoarthritis types many of the joints listed above may become involved.

### Clinical findings

There is a poor correlation between the clinical findings and the radiological findings. Many patients with even fairly advanced radiological changes may be asymptomatic or have very mild symptoms. Even in those with symptoms the degree of pain may vary considerably with time. Painful episodes may be interspersed with long pain-free periods. It seems that mild trauma is responsible for triggering flare-ups of pain.

There is a gradual increase in the degree of pain felt. The pain is a deep-boring pain, often poorly localised. The pain is worse with use of the joint and better with rest. In the more advanced stages pain is felt with every movement of the joint, and night pain becomes a problem.

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### *In primary osteoarthritis many of the joints may become involved*

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Examination of the joint often reveals tenderness upon palpation. Hard, bony enlargement of the joint may be palpated due to the formation of osteophytes at the edge of the joint.

Mild secondary synovitis may occur, probably due to the presence of irritating debris in the joint. This may cause mild effusions.

Crepitus may be elicited by passive joint motion. The range of motion of the joint may also be limited.

Joint deformities may be observed in advanced cases due to cartilage loss and subchondral bony changes. Valgus or varus deformities of the knees are seen in advanced disease, usually accompanied by atrophy of the quadriceps muscles. The hard, bony osteophytes palpated at the distal interphalangeal joints in osteoarthritis are called Heberden nodes. The same osteophytes at the proximal interphalangeal joints are called Bouchard nodes.

Occasionally the osteoarthritis presents with a sudden onset in multiple joints, often with an inflammatory element. This may cause confusion with rheumatoid arthritis, but with time the true nature of the arthritis will be seen with radiological

changes typical of osteoarthritis and lack of systemic involvement.

Further confusion can occasionally occur when on rare occasions some small erosions may be seen on X-ray. No other evidence of rheumatoid arthritis will be found and can thus be differentiated from rheumatoid disease.

### Laboratory findings

There are no specific laboratory features of osteoarthritis. There is no systemic inflammatory response and as such no acute phase reactants. Thus the sedimentation rate is normal as is the full blood count. All other laboratory investigations are also within normal limits.

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### *Mild trauma seems to be a major precipitator of painful episodes*

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Analysis of the synovial fluid usually shows a clear fluid although at times it may be blood-stained, usually due to some mild trauma on an already damaged joint. If a drop of 5% acetic acid is added to a test tube full of synovial fluid aspirated from an osteoarthritic joint a good mucin clot is formed. This mucin clot is a well-formed whitish clot that forms in all normal and non-inflammatory synovial fluids when acetic acid is added. Inflammatory fluids, for example rheumatoid arthritis, form only very poor, if any, mucin clots. The leucocyte count is usually less than 750/cu m.m.

### Therapy

Optimal management of the osteoarthritic patient requires the use of several treatment modalities.

#### 1. Education

It is of paramount importance that the patient is fully informed as to the nature of the disease. All too often he has read some lay article on 'arthritis' and has a picture of himself crippled and in a wheelchair. Osteoarthritis does not have the invariably bad prognosis that many think. Epidemiological studies have

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### *Hip osteoarthritis is more prevalent in white males*

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shown that probably the majority of osteoarthritis patients have periods of pain followed by long periods either pain-free or of very mild discomfort. Mild trauma seems to be a major precipitator of painful episodes. Many patients consult their doctors but 'disappear' after a few months of therapy, only to reattend months or even years later. Studies have

shown that these patients went into a remission; it was not lack of effective therapy that led to their 'disappearance'.

It is thus of paramount importance that an optimistic attitude is adopted when counselling the patient. Most patients will do well with conservative therapy and it is the unfortunate small percentage that will come to more aggressive therapy, for example surgery.

## 2. Physical and occupational therapy

The judicious use of exercise, orthoses and adaptive devices can prevent - to a large degree - the serious loss of joint mobility and function that otherwise could occur. Exercise should aim to obtain the maximum range of movement possible without causing pain. Repetitive exercises aimed at building up the joints and supporting musculature should be given. The particular type of exercise given will, of

## *Hot packs and ultrasound can be of value*

course, depend on which joint is damaged as well as the degree of damage. Hydrotherapy is probably one of the best forms of exercise available. If a heated pool is available so much the better, as the heat helps relieve muscle spasm and pain. In the summer months an outdoor pool is quite adequate. Many municipalities, particularly in the larger cities, have at least one heated swimming pool. Many of the exercises can also be carried out in a hot bath.

Exercises in water should aim to move the joint through its full range of movements. If some resistance is required a small piece of polystyrene foam can be tied to the limb or a piece of plank held in the hand. The aim is to offer resistance to the movement of the limb. The advantage of exercises in water is that all eight is displaced from the joint, thus exercise can be carried out without loading weight onto the joint cartilage as would occur if the exercise was carried out in a weight bearing position.

Quadriceps exercises are very important to the patient with osteoarthritis of the knee, as is abdominal exercises for patients with osteoarthritis of the paravertebral joints of the lumbar spine.

With an acute exacerbation of osteoarthritis hot packs and ultrasound can be of value. A soft collar can be of great help for acute exacerbations of cervical spondylitis. A lumbar support may also be used as a temporary support for flare-ups of pain in the lumbar spine. Knee supports may also be of use particularly in those patients not fit enough to be considered for a total knee replacement.

## 3. Drug therapy

Drug therapy plays an important part in the therapy of osteoarthritis. In the early stages when

pain is mild and mainly related to usage of the joint, simple analgesics will be quite adequate. The anti-inflammatory drugs, which also have analgesic properties are important, particularly when there is an element of secondary inflammation. It must be remembered that an exercise programme will be carried out far better if adequate relief of pain is obtained before the exercises are started.

Often only intermittent courses of medication are required to tide the patient over an exacerbation of pain.

There is no place for oral steroids in osteoarthritis, but steroids injected intra-articularly can be of considerable benefit. An acute exacerbation of pain often responds well to an injection of intra-articular steroid. This must be done under strict asepsis and should not be repeated more than twice a year as repeated injections can result in further damage to the cartilage.

## 4. Surgery

Although many if not the majority of patients may be adequately controlled with conservative therapy there are many who will require more aggressive therapy. In general there are three indications for considering surgery:

- a) pain not relieved by conservative means and in particular, night pain that wakens the patient
- b) progressive loss of joint function
- c) functional loss, particularly loss of activities of daily living.

**Table 1:**

### Classification of osteoarthritis

#### *Primary*

- Generalised osteoarthritis
- Erosive osteoarthritis
- Diffuse idiopathic skeletal hyperostosis (D.I.S.H. Synd)
- Chondromalacia of the patella.

#### *Secondary*

- Trauma
- Development defects
- Secondary damage from inflammation
  - Gout
  - Septic arthritis
  - Rheumatoid arthritis
  - Seronegative arthritides

#### *Endocrine disorders*

- Acromegaly
- Diabetes

#### *Metabolic disorders*

- Haemochromatosis
- Ochronosis