

Osteoarthritis



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Osteoarthritis is one of the most common disorders effecting joints. It has a higher incidence in the older age group, but in a number of cases it can occur earlier in life. In the Maltese Islands this disorder is very common and this may be partly attributed to the higher incidence of obesity in the islands.

As the condition occurs mainly in the old, it is believed to be due to a degenerative process of the joints, or in other terms a wear and tear process within the joints. In fact, if a joint were never put under stress, osteoarthritis would not develop. In conjunction with this it is evident that those joints which are more under stress, are more prone to develop osteoarthritis. Thus in most cases it is the joints of the lower limbs which develop the disorder first.

Pathology of Osteoarthritis.

Osteoarthritis may be defined as being a *Degenerative Arthropathy*. It is the commonest form of chronic joint disease. Despite its more common name — osteoarthritis, the disease is *not* an inflammatory process but results from the destructive and degenerative processes which occur in the joint cartilage in old age and in a number of joint disorders. As already mentioned the disease may affect any of the joints but is more common in those joints under stress.

This form of osteoarthritis in the elderly is called *primary* to distinguish it from the *secondary* type that occurs earlier in life.

Structural changes in the joints.

The changes which occur in the joint affects the various components of the joint differently. The following changes may be seen.

(a) Articular cartilage:

The major changes seen in the joint are found in the hyaline articular cartilage which is the primary site of the osteoarthritic changes. On microscopic examination one can see metachromasia of the surface layers probably resulting from rupture of the upper collagen network. Once this occurs the upper surface of the cartilage undergoes tangential flaking resulting in the characteristic fibrillation of the cartilage. As the changes progress the underlying subchondral bone is exposed, and the articular surface becomes irregular.

(b) Bone changes:

The exposed bone beneath the fibrillated cartilage eventually dies and becomes moulded to the shape of the joint. Cysts may also form in this part of the bone. The most characteristic changes which are found in the bones in the

vicinity of the joint, are osteophyte formation. These osteophytes are formed by the cartilage at the edges of the joint and eventually undergo calcification. These outgrowths give rise to joint deformity and, at a later stage, they may detach and form loose bodies in the joint space.

(c) Synovium changes

In the early stages of osteoarthritis the synovial membrane does not show any particular changes. At an advanced stage however, the membrane may show fibrosis and eventually thickening. The joint may be swollen due to an effusion as a result of the synovitis that occurs as a reaction to debris within the joint.

Clinical Features of O.A.

As already mentioned most patients with osteoarthritis are elderly, that is they are suffering from the Primary form of the disease. In those cases where the disorder develops at an earlier stage, there is usually an underlying disorder, that is Secondary O.A.

The changes occurring in the joint do so slowly, thus the onset of the condition is generally insidious.

The main features are two:

(I) PAIN.

(II) GRADUAL LOSS OF FUNCTION.

The pain of osteoarthritis develops very insidiously over a few years. At the beginning it is only mild and does not disturb the patient. As the condition progresses however, the intensity of the pain increases and eventually becomes disabling.

The gradual loss of function like the pain, also occurs very slowly. It usually starts as a slight restriction of movement but as the condition progresses the function of the joint is more and more impaired.

Other signs and symptoms in the joint include;

- effusion within the joint.
- thickening of the capsule.
- palpable or audible crepitations on movement.
- deformity of the joint, or inability of the joint to assume the anatomical position.

As it was pointed out previously the joints which are affected mostly are those which are under the most stress during life. For this reason it is not surprising to find that in most cases the first joints to be involved are the knees and ankles, followed by the hip joints. The joints of the vertebral column are also quite commonly involved. On the contrary those joints of the upper limbs such as the elbow, wrist and shoulder are not commonly involved, except when there is some underlying cause.

The diagnosis of osteoarthritis is usually evident from the history and examination of the joint, however it has to be confirmed by x-rays of the joint. Thus radiological examination of the joint should always be performed.

Radiological Changes in osteoarthritis.

The changes which may be seen in a joint affected by O.A. are quite characteristic of the condition. In general the following changes may be seen:

Narrowing of the joint space as a result of the destruction of the articular hyaline cartilage.

Subchondral sclerosis in the bone underlying the damaged part of the cartilage. This sclerosed bone appears denser than the surrounding bone.

Spurring or lipping of the joint margins. This, together with the narrowing of the joint space, is the most important change seen on the X-Rays. These characteristic "lips" of bone are due to the marginal osteophytes. Occasionally one of these marginal structures may dislodge and form a loose body within the joint.

Joint deformity which may develop after many years of the disease is also visible on the X-rays.

Aetiology of Secondary Osteoarthritis

As we pointed out earlier when O.A. occurs at an early stage in the life of the patient, there is generally some predisposing cause. This is, in the majority of cases, some form of injury to the joint either by trauma or disease.

On the whole there is mainly one form of trauma but there are many forms of disease which may damage the joint.

The following are the most common predisposing causes of secondary osteoarthritis:

(1) **TRAUMA.** Injury to a joint or the bones forming the joint is a common cause of secondary O.A. Thus it is not uncommon to find patients that return, after a variable amount of time from their injury, complaining of progressive joint pain and restriction of movements. Deformity of bones following fractures may also give rise to derangements in the adjacent joints leading to the formation of Secondary O.A.

(2) **JOINT INFECTION.** Suppurative arthritis although not very common nowadays, frequently leads to Secondary O.A., especially in those cases where complete resolution fails to occur.

(3) **RHEUMATOID ARTHRITIS.** This disorder of joints very frequently leads to damage of the articular cartilage in the joint, thus O.A. is quite common.

(4) **JOINT and BONE DEFORMITIES.** Deformities of joints or bone may be either congenital or acquired. Whatever the cause, unless corrected early, the deformity will lead to joint derangement and damage with consequent osteoarthritis.

(5) **BLEEDING DISORDERS.** Haemophilia and other bleeding disorders in which there is repeated haemorrhages into the joint may lead to permanent damage with fibrous ankylosis and secondary osteoarthritis.

(6) **OBESITY.** This may be considered to be one of the most important predisposing causes of O.A. The mechanism is well known. The increased weight leads to more stress on the joint thus, the wear and tear process is accelerated. This is the most common predisposing cause of O.A. on the Island, considering the very high incidence of this condition in the population.

(7) Other less common causes of secondary O.A. include Congenital Hip Dislocation not diagnosed in time, unresolved Perthe's disease, Osteochondritis, and other rare disorders of joints.

Management of Osteoarthritis

Generally speaking the management of O.A. is difficult for the simple reason that the changes that occur in the joint are all irreversible.

There are mainly three forms of therapy for O.A. two of which are conservative and the other operative.

(a) Conservative Measures.

(I) No treatment except for reassurance is all that is required in a good number of cases.

(II) When the condition of the patient is more advanced some form of treatment will usually be required. There are mainly two forms of treatment for these cases. The first is by various forms of physiotherapy employing assisted exercises of the affected joints under the guidance of a physiotherapist. This method is beneficial in a good number of cases and apart from improving function it also helps to prevent rapid changes due to prolonged immobilization. The other form of treatment is by the use of the traditional NSAID (non steroidal anti-inflammatory drugs). There are various drugs in use including aspirin, indomethacin, butazolidine, naproxen, ketoprofen and others. The role of the NSAID in O.A. is rather limited and after prolonged use a number of complications may arise. On the whole the best drug for O.A. seems to be indomethacin.

(b) Surgical Measures in O.A.

There are a variety of surgical procedures which are in current use in the management of O.A.

The aims of surgery in this disease are the following:

(I) Abolition of pain which is of severe intensity and which is refractory to the conservative forms of treatment.

(II) To correct deformities both for functional as well as for cosmetic reasons.

(III) To improve the function in the deranged joint.

(IV) To improve stability in the affected joint.

Any one of these criteria may be an indication for reconstructive surgery. Another important point is the progression of the disease. In those cases where the condition is rapidly deteriorating even in the absence of symptoms, surgery is usually indicated.

The basic features of the various operations in

current use are summarised below:

(1) OSTEOTOMY

- good pain relief.
- joint left intact.
- further procedure still possible.
- no improvement in joint stability.
- long term results uncertain.
- slow post operative recovery.

Complications:

- non union of osteotomy with instability.
- makes later arthroplasty difficult.

(2) ARTHRODESIS.

- pain relief guaranteed.
- maximum joint stability.
- long term results good.

Complications:

- total loss of joint movement, and extra strain on other joints.
- slow post-op recovery.
- non fusion or fusion in bad position.

(3) TOTAL JOINT REPLACEMENT

- pain relief is usually excellent especially the hip joint
- mobility retained or improved
- quick post operative recovery.
- normal function restored in good number of cases.

Complications:

- loosening of the components.
- infection during joint replacement.

Although the total joint replacement is the ideal operation, there are other forms of arthroplasty which may be used and these include the Half-Joint replacements and the excision arthroplasty.

In the last few years there has been a great improvement in the techniques of joint prosthesis, however the only considerably good results are those for the Hip Joint. The use of prosthesis in other joints such as the knee, elbow and shoulder are still in the experimental stage and the evidence for this is the large number of prosthesis which appear on the market each year, many of which have nothing to offer.

In general one may say that the great advances in Anaesthesia and general surgical techniques the option of surgery is being offered to a large number of patients, many of which are elderly.

In conclusion one may say that the overall incidence of osteoarthritis seems to be decreasing due to the better treatment of those conditions which may potentially cause osteoarthritis in later life. Another reason for the decline is the fact that the greater part of the population is now-a-days aware of all the complications that may result from obesity amongst which is osteoarthritis.

As regards the progress in the forms of treatment, these are bound to continue as many of these procedures are in current use for other forms of arthropathies.

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