

UNIT NO. 2

OSTEOARTHRITIS OF KNEE AND HIP

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ABSTRACT

Osteoarthritis of the knee and hip joint are among the more common musculo-skeletal disorders in the older adult. In most instances the diagnosis is readily made. Pain that is mechanical in character and stiffness of a brief duration on ambulation following periods of immobilization are the two more prominent symptoms. Differential diagnoses include inflammatory joint diseases and osteonecrosis of the knee or hip joint. Management must emphasize education and containment measures and when necessary analgesics. When these measures do not provide relief surgical intervention may be appropriate.

OBJECTIVES

This unit discusses the pathology, prevalence, clinical presentation and management of osteoarthritis (OA) of the knee and hip. The objectives are to assist participants to:

- κ diagnose and manage medically OA of the knee and hip and
- κ recognize conditions that may simulate the clinical presentation of OA of the knee or hip.

PATHOLOGY

OA is a degenerative disease of the joint characterized by loss of articular cartilage and eburnation of the underlying subchondral bone, as well as formation of peripheral bony outgrowths (osteophytes) and subchondral cysts. Radiologically the loss of articular cartilage is seen as a loss of joint space in weight bearing radiographs of the affected joint. The pathogenesis of these changes remains obscure. It is postulated that the wear in the articular cartilage is due either to 1) a primary defect in the articular cartilage where cumulative wear results from inadequate repair with age or from programmed apoptosis of chondrocytes or to 2) an increasing stiffness of the subchondral bone which exposes the overlying cartilage to increased wear. It is also relevant to know that the articular cartilage lacks blood supply and obtains its nutrients by diffusion from synovial fluid and hence healing of an injured articular cartilage is gradual or incomplete.

In the knee, the wear is characteristically seen in the patello-femoral articulation and or in the medial compartment of the tibio-femoral articulation. In the hip joint the wear is restricted to the superior surface of the femoral head and the corresponding acetabular surface. In inflammatory processes

eg. rheumatoid arthritis the wear is non-mechanical and is uniform across all of the articulation. This uniform wear is evident radiologically in inflammatory arthritis as generalized narrowing of the joint space. This is in contrast to osteoarthritis where the narrowing of joint space tends to be in the medial compartment of the knee or on the superior aspect of the femoral head.

PREVALENCE

Knee osteoarthritis is far more common in Singapore than hip osteoarthritis. The clinical incidence at age 60 is approximately 30% and the prevalence continues to increase by approximately 1% each year as the cohort ages. The prevalence of hip osteoarthritis is significantly less. The prevalence ratio of hip OA compared to knee OA is approximately 1 to 5 or less as evidenced by our surgical intervention for these conditions.

CLINICAL PRESENTATION

The patient is generally an older adult or an elderly individual. There is a preponderance of females.

The young adult is not exempt. In these instances the OA is secondary to previous joint injury, developmental disorders such as acetabular dysplasia, or other childhood disorders such as perthes disease and slipped upper femoral epiphysis.

The more important presenting symptoms include pain and stiffness. Pain is characteristically mechanical in nature, brought on by activity and relieved by rest. The location of the pain in knee OA may be anterior (OA of patello-femoral joint) or medial (OA of medial compartment of tibio-femoral joint). It is rarely lateral (OA of lateral compartment). Pain from the patello-femoral joint OA is aggravated by activities such as ascending or descending stairs.

In hip OA, the pain is felt in the groin or the trochanteric region or in both areas. In up to a third of patients the pain may be felt anteriorly in the thigh radiating to the knee. In this latter group of patients when clinical examination of the knee does not reveal significant pathology it is mandatory to examine the hip to exclude a hip pathology.

Stiffness, which is a common accompanying clinical presentation of osteoarthritis is characteristically noted when ambulating after prolonged periods of rest and can last for up to a few minutes. It diminishes or disappears once the patient begins activity. This stiffness must be distinguished from morning stiffness, which is characteristic of inflammatory arthritis such as rheumatoid arthritis, and is present on awakening in the morning and lasts for an hour or more.

Other symptoms associated with OA of the knee and hip include a limp, swelling and deformity. The limp is due to either an antalgic gait or a trendelenberg gait. The

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characteristic trendelenberg gait is more commonly associated with OA of the knee with varus deformity than with OA of the hip.

Swelling and deformity is more obvious and apparent to the patient with OA of the knee. Swelling and deformity is less apparent in the deep seated hip joint and hence patients generally do not complain of these symptoms. The common deformity at the knee that patients complain of is the bowing of the leg.

The patients are well and have no constitutional symptoms such as fever.

EXAMINATION

The general assessment of a patient presenting with OA of the knee or hip should be normal. Any evidence of loss weight or lethargy or fever should suggest a diagnosis different from that of OA.

Knee Joint – Local Examination

Examination of the knee would reveal a normal or varus alignment with or without a mild degree of flexion deformity. Rarely, would the deformity be valgus. The overlying skin is normal and the contour of the joint may be distorted by swelling due to an effusion or localized swellings due to osteophytes. Minimal or no muscle wasting is the norm. Medial joint line tenderness will be noted in medial compartment OA and retropatellar tenderness in patello-femoral OA. The range of movement would be restricted to varying degrees depending on the severity of the OA. If the gait of the patient is observed it may vary from one that is normal to one that is antalgic or trendelenburg in nature.

Hip Joint – Local Examination

Because the hip is a deep seated joint, swelling or deformity if present would not be apparent. However, shortening or an external rotation deformity of the ipsilateral limb may be present. Palpation too generally does not reveal significant findings. The assessment of the range of movement would in particular reveal restriction of internal rotation, abduction and flexion. The assessment of the gait may reveal an antalgic gait, a short leg gait or a trendelenburg gait.

DIFFERENTIAL DIAGNOSIS

1. Inflammatory Arthritis

Inflammatory arthritis may manifest as a monoarticular or pauci-articular disease in an older adult and simulate OA. The arthritis is characterized by early morning stiffness. Investigations such as ESR, CRP and rheumatoid factor will help distinguish this condition from osteoarthritis of the hip or knee joint. (*The ESR, CRP and rheumatoid factor are elevated in inflammatory arthritis but not in OA*). In the late stage of inflammatory arthritis radiographs would show evidence of a pan-arthritis with uniform narrowing of the joint space.

2. Osteonecrosis /Avascular necrosis of the Femoral Head or Knee Joint (femoral and or tibial condyle)

Secondary osteonecrosis is due to steroids, decompression sickness, alcoholism etc. and generally affects the younger adult. Little is known of the pathogenesis of primary osteonecrosis. Primary osteonecrosis of the femoral and or tibial condyle is far more prevalent than primary osteonecrosis of the head of the femur. Primary osteonecrosis occurs in the older adult or elderly individual and the clinical presentation can simulate OA. However the pain is usually severe and tends to be constant in the early weeks following its onset. Radiological investigations generally reveal minimal or no changes. In the instance of the knee incidental patello-femoral osteoarthritic changes may occasionally be seen. Patients require further investigations including magnetic resonances imaging and bone scintigram. It would therefore be preferable for these patients to be referred to a specialist for management.

INVESTIGATIONS

Antero-posterior weight bearing, lateral and patello-femoral radiographs of the affected joint is adequate. However, as the contra-lateral joint may also show evidence OA, although not necessarily symptomatic, it is useful to at least do the antero-posterior radiographs of the contra-lateral joint. Hematological or biochemical investigations are generally not ordered unless the differential diagnosis of an inflammatory disorder such as rheumatoid arthritis is entertained. In these instances, an ESR, CRP or rheumatoid factor will be appropriate.

MANAGEMENT

Medical management is adequate for the majority of patients. A lesser number will benefit from surgery

Medical Management

This will be discussed under 4 sub-headings:

- κ Education
- κ Containment
- κ Analgesics
- κ Other measures

1. Education

The appearance of pain in the knee or in the groin associated with stiffness or a limp may cause varying degrees of fear and apprehension in the patient. Information regarding the nature of the condition and expected outcome will reassure most patients and allow them to continue activities of daily living with minor modifications.

2. Containment

It is generally not possible to reverse OA. However containment or significantly retarding the process of wear of the articular cartilage can be made by simple measures. Modifications of recreational activities (switching from jogging to low impact activities such as training on a cross trainer), reduction of body

weight and the use of walking aid may significantly reduce the rate of deterioration. Supplements such as glucosamine also contribute towards the containment of the process and relieve symptoms. Simple physical activities such as stretching the affected joints, strengthening the surrounding muscles and walking help stimulate a healing response and retain or improve function.

3. Analgesics

A host of analgesics including paracetamol and NSAIDs are available for relief of pain. Although most are used in the oral form, parenteral and topical preparations of some of these medications are available. In instances of acute exacerbation which does not respond to conventional analgesics, intra-articular injection of steroids would provide the much needed relief. Intra-articular steroids must not be repeated often.

4. Other measures

Other measures that may provide relief of symptoms include physical modalities such as heat therapy. In certain situations intra-articular injections of hyalagan may also prove useful.

SURGICAL MANAGEMENT OF OSTEOARTHRITIS

Knee Osteoarthritis

- κ Arthroscopic procedures to remove an offending mechanical impediment such as a loose body or torn meniscus
- κ Osteotomy to realign the limb and off load the affected compartment and redistribute the load to the normal or

near normal compartment of the joint. The high tibial osteotomy is a classic procedure that exemplifies this principle and remains a useful procedure in younger patients with a varus deformity

- κ In the older patients generally above 60 years of age, total joint replacement or occasionally, a uni-compartment replacement, would be the preferred surgical procedure when the osteoarthritis is severe and does not respond to the medical measures discussed earlier.

Hip Osteoarthritis

- κ The preferred surgical management for the treatment of severe osteoarthritis of the hip that does not respond to medical measures is a total hip replacement
- κ In the very young individual an arthrodesis of the hip joint may be considered as an alternative to a joint replacement.

LEARNING POINTS

- Osteoarthritis of the knee and hip joint are among the more common musculo-skeletal disorders in the older adult
- In most instances the diagnosis is readily made. Pain that is mechanical in character and stiffness of a brief duration on ambulation following periods of immobilization are the two more prominent symptoms
- Differential diagnoses include inflammatory joint diseases and osteonecrosis of the knee or hip joint
- Management must emphasize education and containment measures and when necessary analgesics. When these measures do not provide relief surgical intervention may be appropriate.