Osteoarthritis of the Hip
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-The hip joint is one of the commonest sites of osteoarthritis
In the past the traditional approach has been to consider hip OA as either primary or secondary
Primary hip osteoarthritis was thought to occur when no underlying cause was apparent, and, when an obvious underlying cause was identified, the term secondary osteoarthritis was applied
This system of classification is outdated, as is the use of the term ‘wear-and-tear’ arthritis...
A much more modern approach to the classification of hip OA is to consider the causes as *mechanical or non-mechanical in origin*. 
Causes

**Box 19.6 Mechanical and Non-Mechanical Causes of Hip OA**

**Mechanical**
- Developmental dysplasia of the hip (under-coverage)
- Femoroacetabular impingement (over-coverage)
- Perthes disease, slipped capital femoral epiphysis (loss of sphericity)
- Post-traumatic (loss of congruency)

**Non-mechanical**
- Avascular necrosis of the femoral head
- Ankylosing spondylitis
- Inflammatory arthritis (e.g. rheumatoid arthritis, psoriatic arthritis and systemic lupus erythematosus)
- Primary disorders of cartilage and the synovium (e.g. synovial chondromatosis)
Mechanical causes

The hip is a ball-and-socket joint; as such, when there is ‘matched sphericity’ between the two articulating surfaces, a mechanical problem with the joint is unlikely. When there is loss of sphericity, then the articular surface is exposed to abnormal loads and contact forces that can initiate and then cause progressive hyaline cartilage damage.
The common mechanical causes of hip OA include developmental dysplasia of the hip (DDH) where acetabular under-coverage leads to a loss of sphericity, and femoroacetabular impingement (FAI) where acetabular over-coverage or abnormal femoral shape leads to a loss of sphericity.
Non-mechanical causes

These are conditions or processes that can affect the hip joint in isolation or indeed be part of a more widespread musculoskeletal disorder with the common end-stage effect being the destruction of hyaline cartilage.
Clinical presentation

The classic presentation of hip joint OA is groin pain associated with progressive stiffness and limp. Initially this pain may be activity-related but later it is more persistent and can cause disturbed sleep. Antalgic gait is most common, loss of internal rotation of the hip is one of the most consistent clinical findings. As loss of movement progresses, the patient may develop both a fixed external rotation contracture and fixed flexion deformity.
Radiological investigations

The *plain film radiograph represents* the most common radiological investigation that is used to confirm the clinical suspicion of OA. The **four important classical signs** of OA equally apply to the hip joint:

The earliest sign is
1) typically decreased joint space that represents loss of hyaline
This is usually maximal in the superior weight bearing pole

The later X-ray signs of OA are
2) Subarticular sclerosis,
3) subchondral cysts and
4) osteophyte formation
Figure 19.32 Hip osteoarthritis  The four cardinal radiographic features of OA are demonstrated. Note the loss of joint space due to hyaline cartilage loss and osteophyte formation, and subchondral sclerosis and subchondral cysts. In this example there is a large acetabular subchondral cyst that is termed a geode.
It is commonplace that the first presentation of a mechanical precipitating cause is end-stage OA. In younger women it is common to find the hallmarks of more subtle dysplasia that did not present earlier in life whereas in men in particular radiological hallmarks of femoroacetabular impingement (FAI) are often present.
TREATMENT OF HIP OA

As the main presenting symptom is most often pain, the cornerstone of non-operative management of hip OA focuses on effective pain management

Simple oral pharmacological agents such as (NSAIDs)

Life-style modification

TOTAL HIP ARTHROPLASTY: Total hip arthroplasty (THA) has established itself as one of the most successful operations performed across all surgical specialties and is the definitive treatment of end-stage OA of the hip.
Hip fracture

fractures that occur between the articular margin of the femoral head to 5 cm below the lesser trochanter

They are subdivided

into *intracapsular and extracapsular fractures*

The blood supply to the femoral head is typically damaged in intracapsular fractures and rarely in extracapsular Fractures.

Extracapsular fractures are further subdivided into *pertrochanteric and subtrochanteric fractures*
Mechanism of injury:
In the elderly patient the fracture usually results from a simple fall from standing height. In severe osteoporosis a fracture may occur from simple twisting moments and it is the hip fracture itself which causes the reported fall
Pathological anatomy and classification

INTRACAPSULAR HIP FRACTURES
The most commonly used classification is the *Garden classification, which is based on the amount of displacement* apparent on X-rays of the hip.
Stage I – an incomplete impacted fracture, including the so-called ‘abduction fracture’ in which the femoral head is tilted into valgus in relation to the neck

- Stage II – a complete but undisplaced fracture
- Stage III – a complete fracture with moderate displacement
- Stage IV – a severely displaced fracture.
Figure 30.5 Garden classification of femoral neck fractures

(a) **Stage I**: incomplete (so-called abducted or impacted hip fracture) – the femoral head in this case is in slight valgus.

(b) **Stage II**: complete without displacement.

(c) **Stage III**: complete with partial displacement – the fragments are still connected by the posterior retinacular attachment; the femoral head trabeculae are no longer in line with those of the innominate bone.

(d) **Stage IV**: complete with full displacement – the proximal fragment is free and lies correctly in the acetabulum so that the trabeculae appear normally aligned with those of the innominate bone.
EXTRACAPSULAR HIP FRACTURES

Intertrochanteric fractures These are divided into stable and unstable varieties.

**Reverse oblique intertrochanteric fractures**
These are a particularly unstable variant of this fracture pattern. As the plane of the fracture line is different from the usual pattern, the support offered by the medial column is lost
Figure 30.6 Intertrochanteric fractures – Kyle classification  Types 1 to 4 are arranged in increasing degrees of instability and complexity. Types 1 and 2 account for the majority (nearly 60%). The reverse oblique type of intertrochanteric fracture represents a subgroup of type 4; it causes similar difficulties with fixation.
Subtrochanteric hip fractures: These fractures occur between the inferior margin of the lesser trochanter and 5 cm below this point. Fractures more distal than this are considered to be femoral shaft fractures.

Figure 30.9 Subtrochanteric fractures of the femur – warning signs on the X-ray. X-ray findings that should caution the surgeon: (a) comminution, with extension into the piriform fossa; (b) displacement of a medial fragment including the lesser trochanter; and (c) lytic lesions in the femur.
Figure 30.7 Subtrochanteric fracture  The typical ‘beaking’ seen at the site of an impending bisphosphonate-mediated subtrochanteric fracture.
Treatment

Initial treatment consists of pain-relieving measures including analgesia and a femoral nerve block. In the young patient every effort should be made to preserve the femoral head and fix the fracture; in contrast, reduction and fixation of fractures in the elderly patient is not recommended due to the associated high rates of subsequent re-operation (46%), nonunion (30%) and osteonecrosis of the femoral head (14%).

**Internal fixation** An anatomical reduction is mandatory as a fracture fixed in a displaced position is at high risk of failure. Prosthetic replacement Both displaced and undisplaced femoral neck fractures in the elderly patient should be treated by prosthetic replacement due to the high failure rates of open reduction and internal fixation in this group.
Figure 30.11 Femoral neck injuries – treatment  

(a,b) This Garden stage II fracture has been stabilized with three cannulated screws. 

(c,d) An optimum position for the screws is: one to support the inferior portion of the neck (centrally); and another two, central in level, skirting the anterior and posterior cortices of the femoral neck on the lateral X-ray. It is important that the most inferior screw enters the lateral cortex of the femur proximal to the level of the inferior margin of the lesser trochanter.
Figure 30.12 Fracture of the femoral neck – treatment (a) A fracture as severely displaced as this (stage IV), if treated by reduction and internal fixation, will probably end up needing revision surgery; instead, it could be treated by performing a hemiarthroplasty using a cemented femoral prostheses (b). A total hip replacement (c) provides a better outcome for active independent patients with this type of fracture.