Total Hip Arthroplasty

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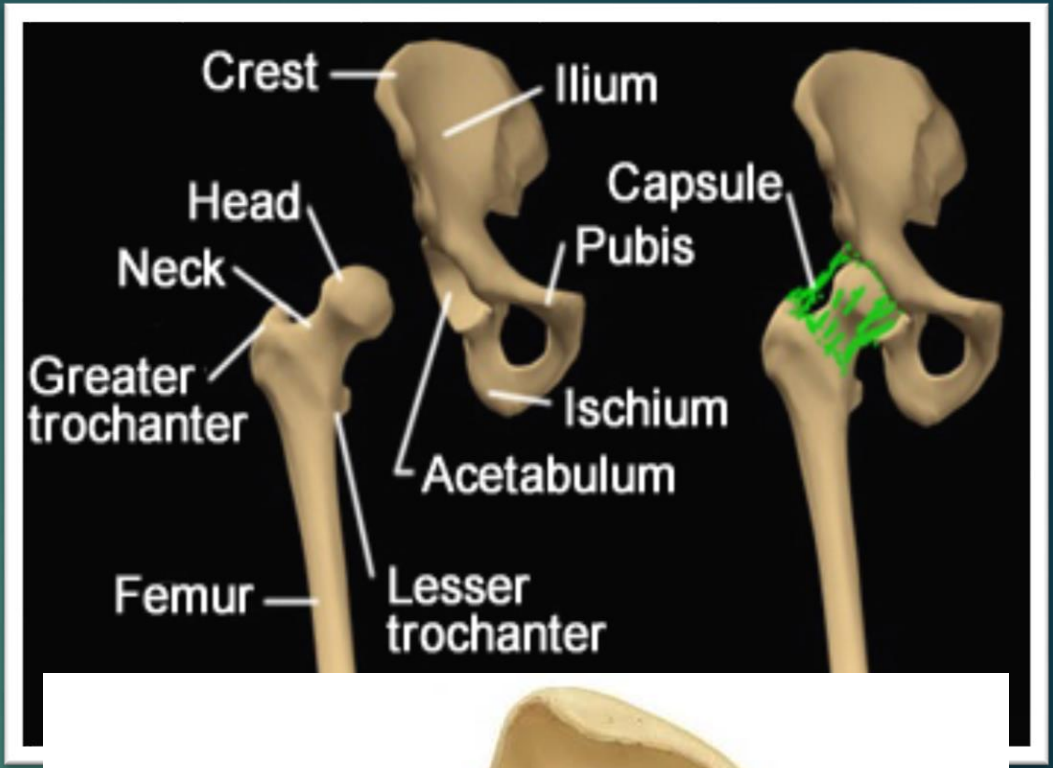
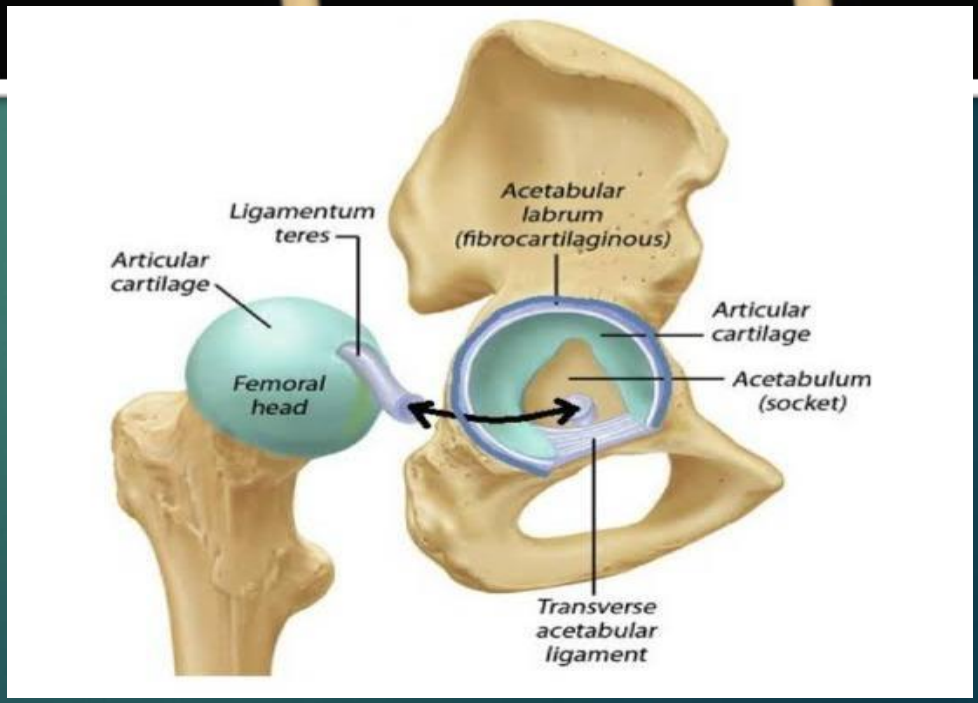
Hip Joint

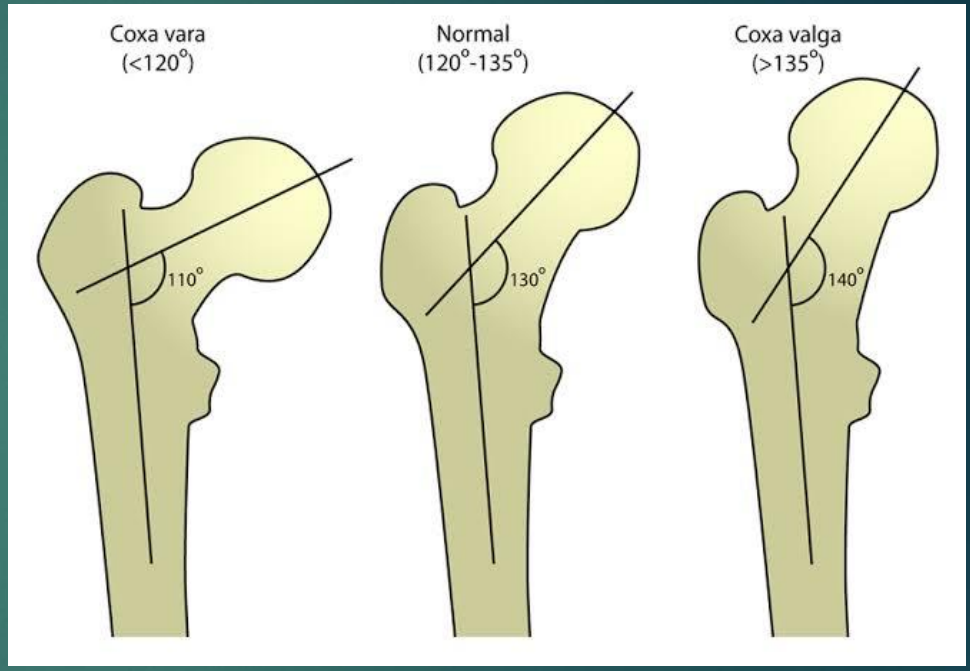
- **Ball and socket**
  - Ball is the femoral head
  - Socket is Acetabulum
    - Half sphere depression
    - Lined with cartilage
      - Horseshoe shape



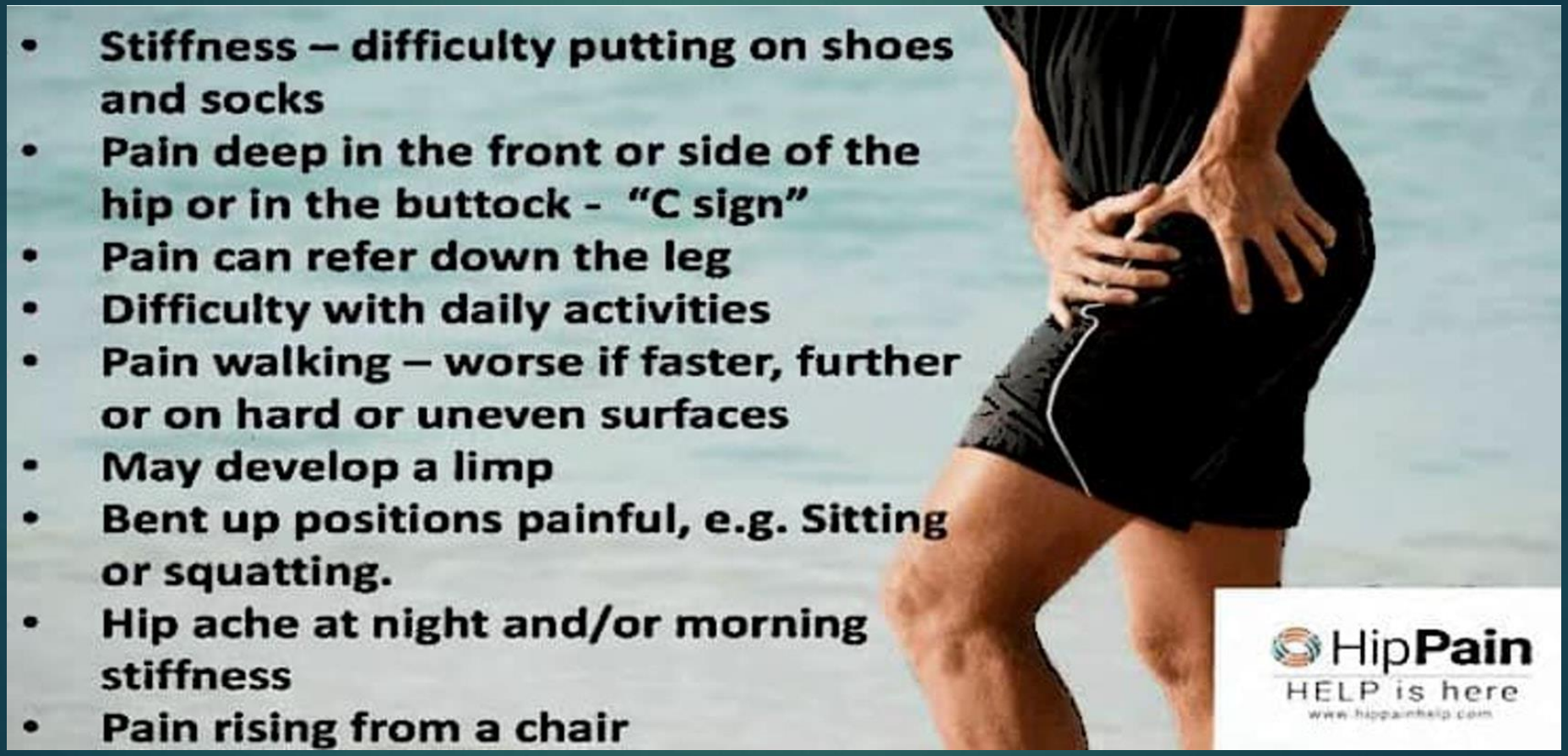


Hip Joint

- Femur
  - Neck-shaft angle ~ 135^0
  - 2/3 rd of head is covered with cartilage
  - Head fits into acetabulum
    - Suction effect

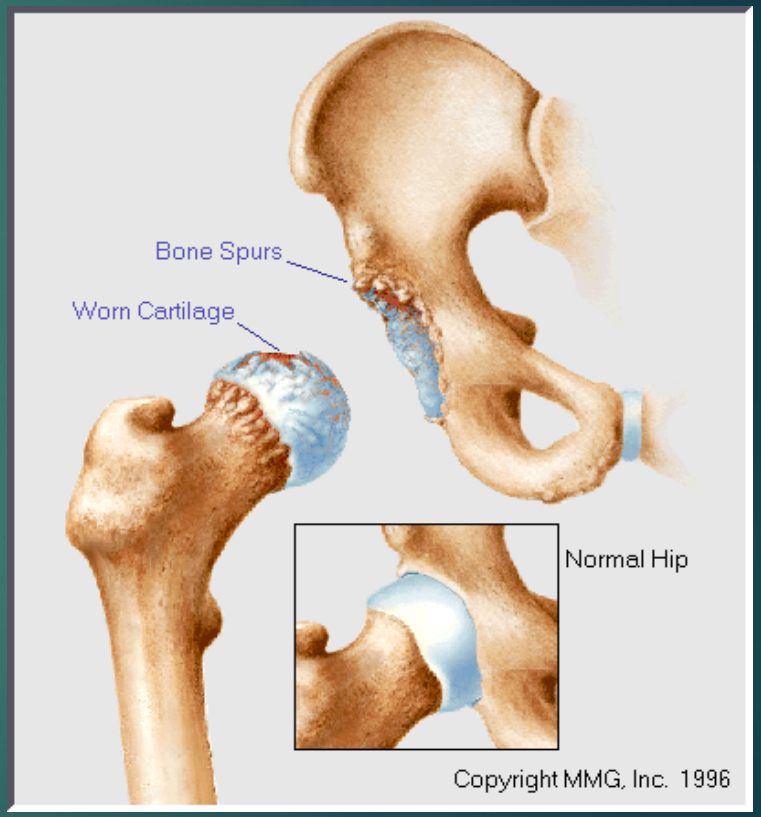


Patient presents with



Hip Osteoarthritis

- Cartilage gradually wear down
  - Femoral head and acetabulum grind on each other (bone-on-bone arthrosis)

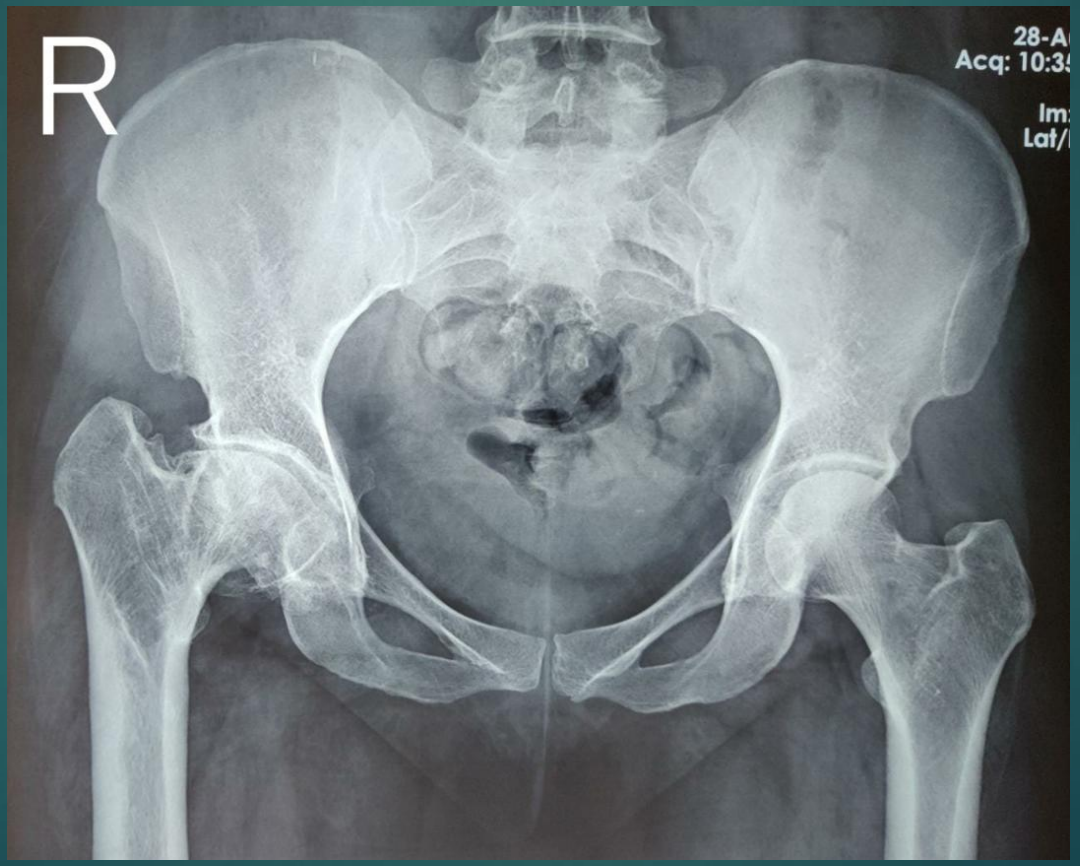


Traumatic arthritis

- Occurs following injury to hip
  - Direct trauma
    - Damage to cartilage
  - Hip dislocation
    - Blood supply may be lost leading to avascular necrosis

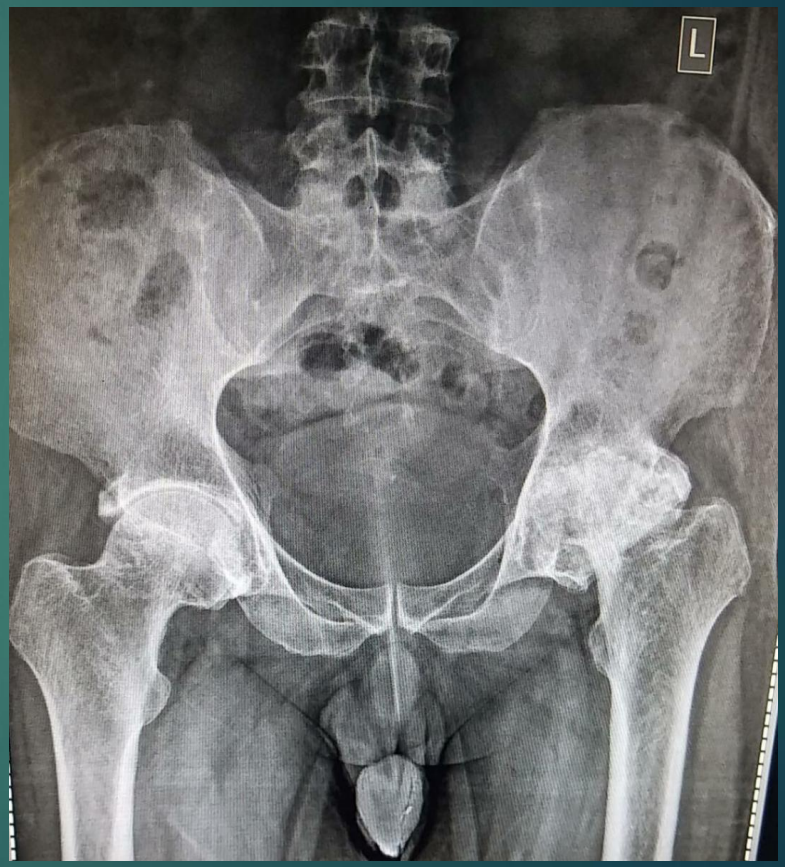
Avascular Necrosis

- Due to decreased blood supply to the femoral head leading to arthritic sequelae in stage 4 with collapsed and loss of sphericity of femoral head



Rheumatoid arthritis

- Body's immune system attacks synovium and cartilage
  - Joint arthritis
  - Deformity
  - Stiffness
  - Women are more often affected than men



TB HIP

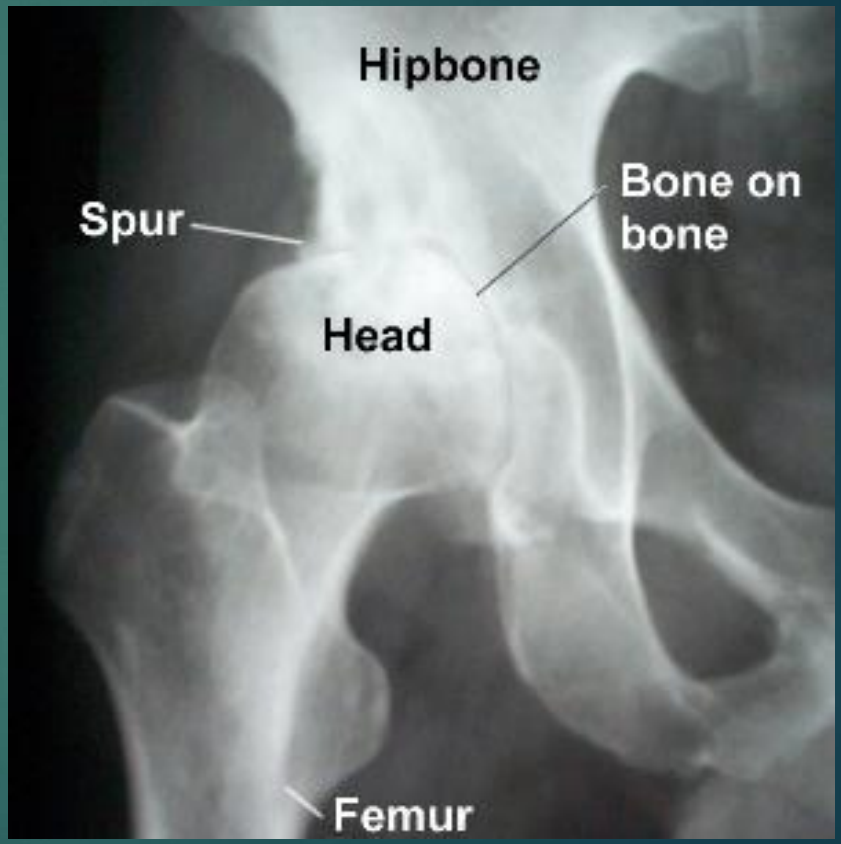
- In the stage of advanced arthritis the destruction leads to irregular and hazy joint margins with diminished joint space.
- The hip movements are painful and grossly restricted with shortening of the limb.

Protrusio Acetabuli

- Revision surgery in cases of Hemiarthroplasty with Protrusio acetabuli

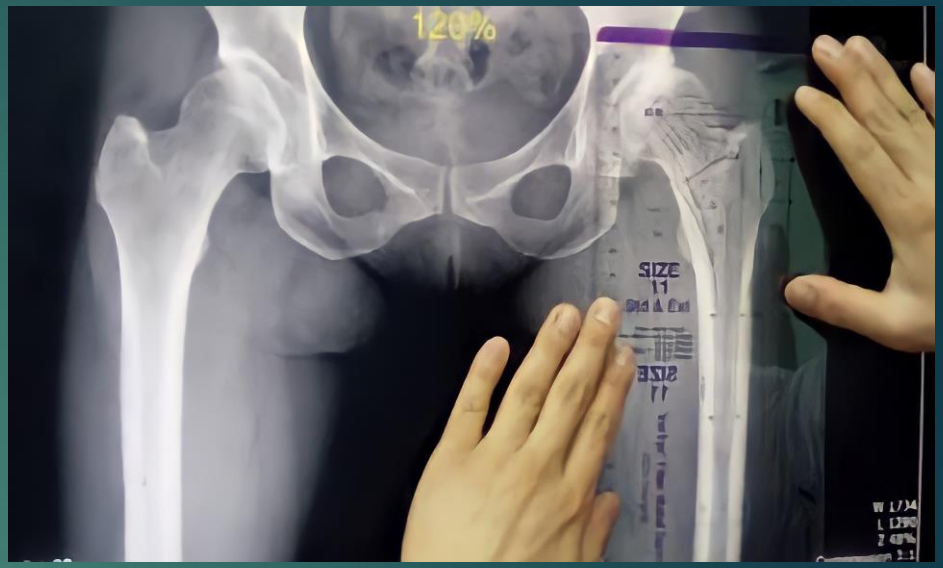
Plain X-rays

- Loss of joint space
- Subchondral sclerosis
- Subchondral Cysts
- Irregularity of joint surface
- Subluxation



Templating

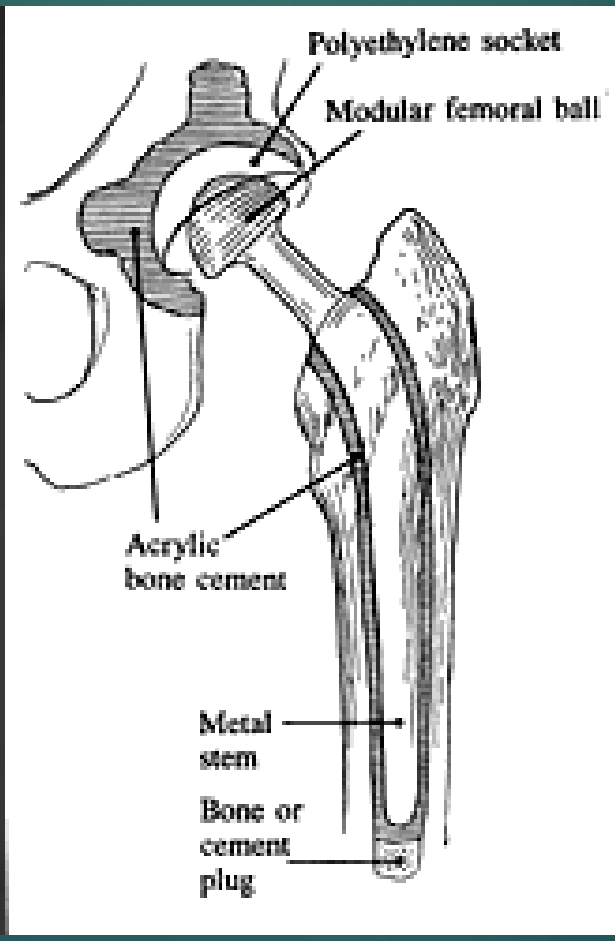
- The process of anticipating position and size of implants prior to surgery
- This allows the surgeon to anticipate potential difficulties to reproduce hip biomechanics and minimise limb length inequalities

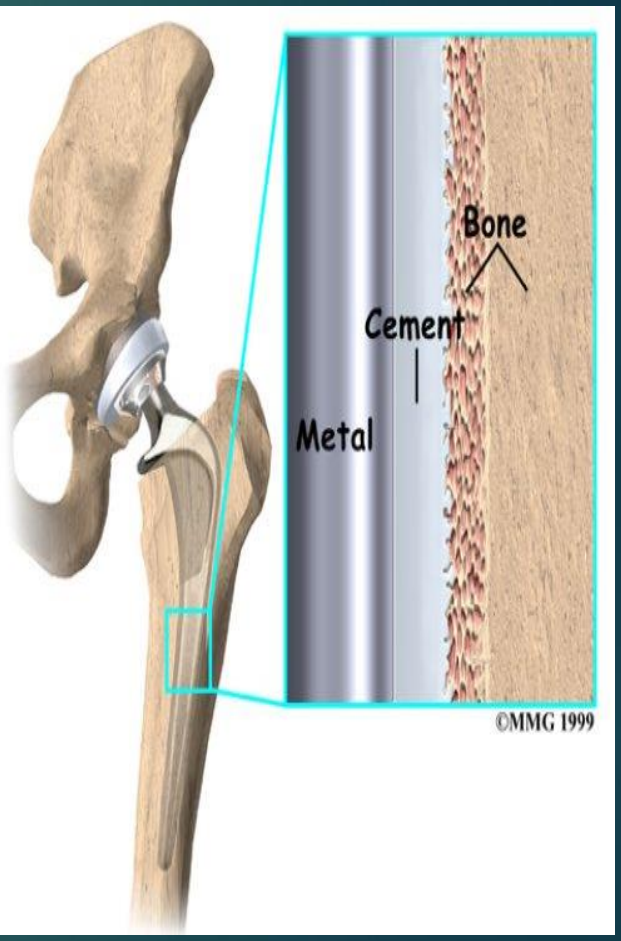


Types of Implants

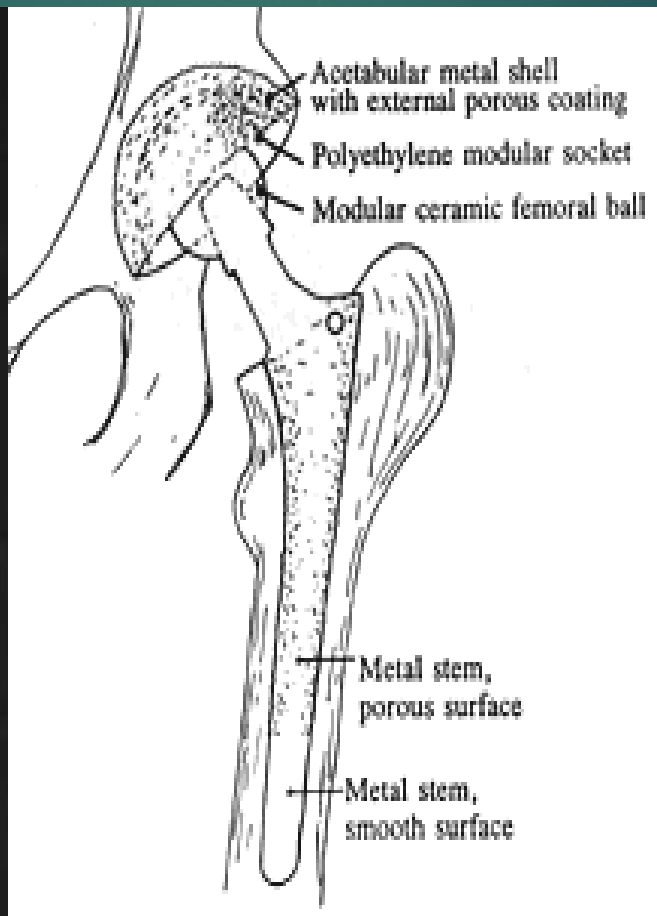
- Implants may be
  - Cemented
  - Uncemented

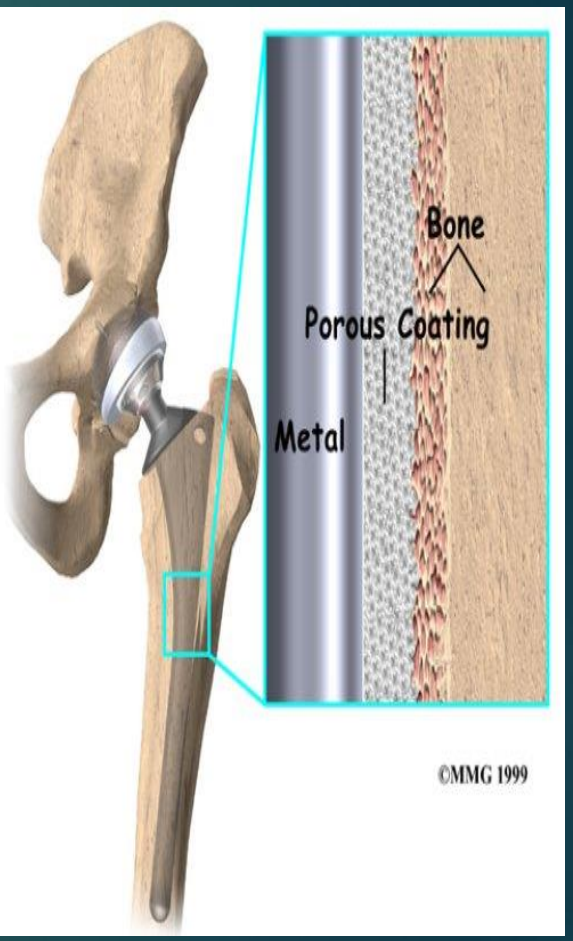
Cement Fixation





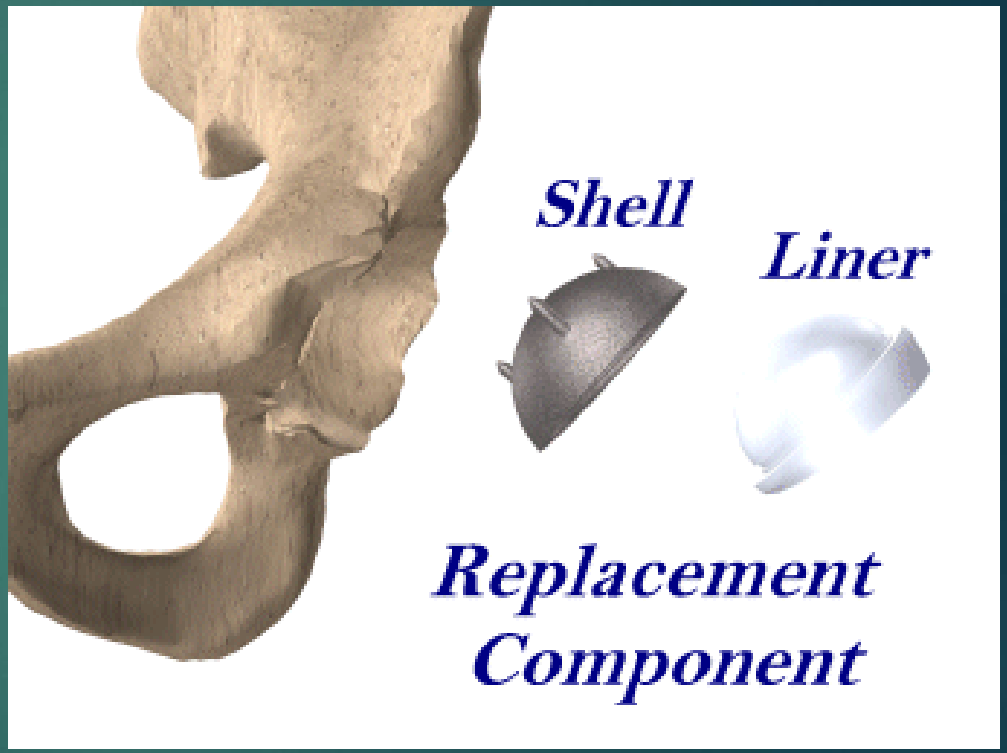
Cementless Fixation





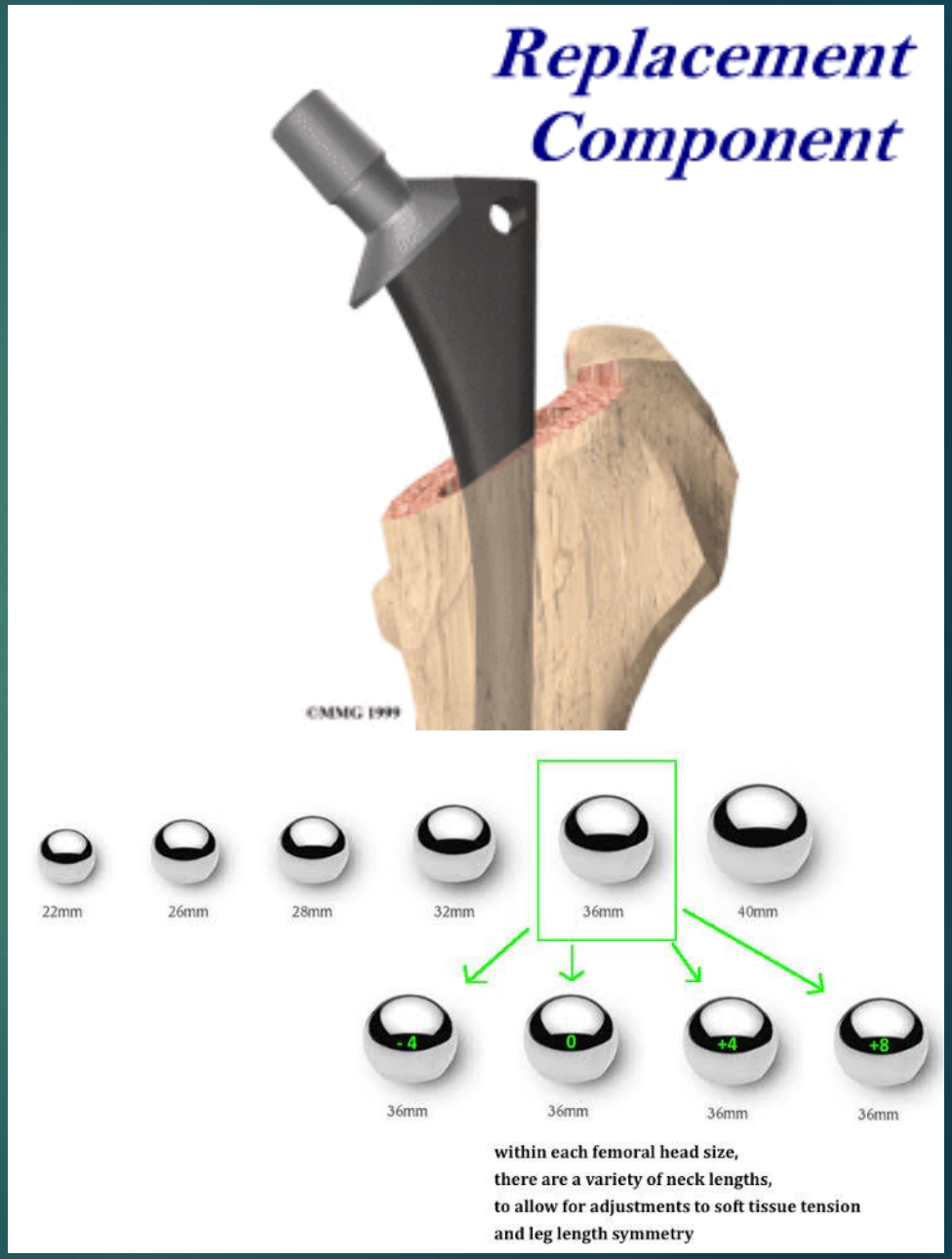
Acetabular component

- Shell is made of metal
- Plastic liner
  - Load bearing
  - Fits snugly inside shell



Femoral Stem

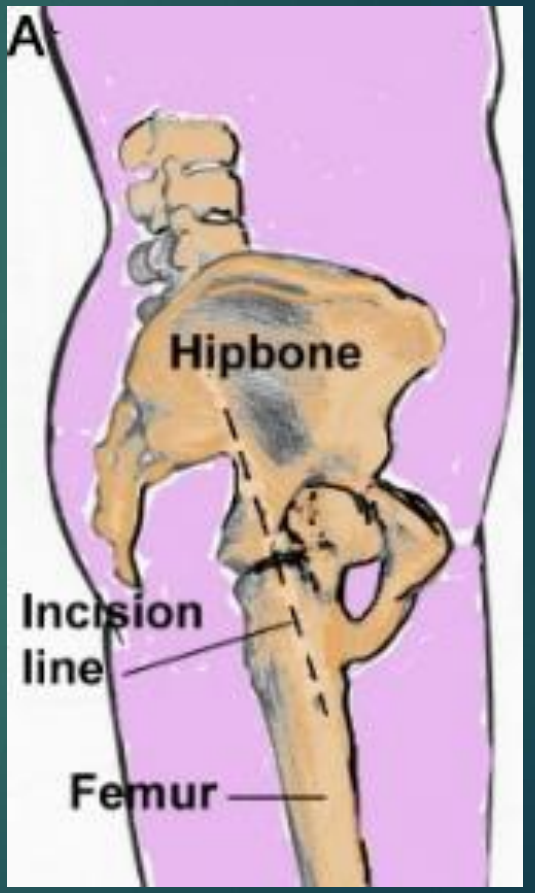
- Made of metal
  - Usually titanium
  - Head Material
    - Cobalt chrome
    - Ceramic



Bearing Surfaces

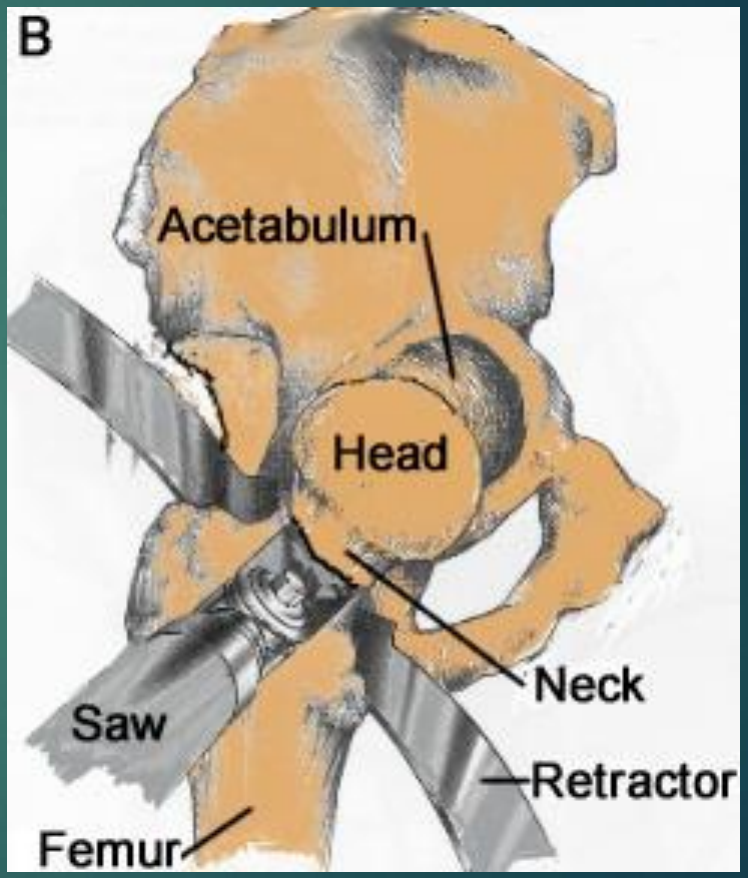
Surgical Procedure

- An incision about eight inches long (dotted line)
- Exposure hip joint
  - Anterior
  - Posterior

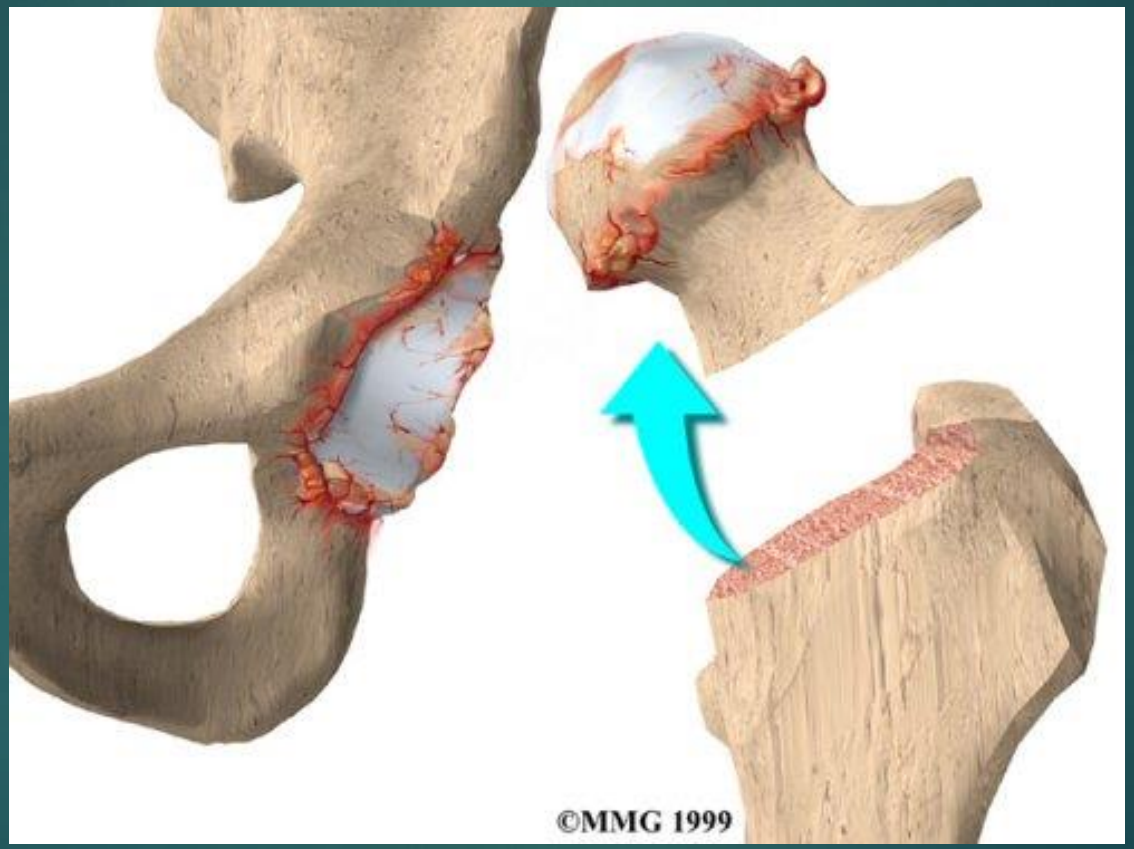


Removal of Femoral Head

- Femoral head is dislocated from acetabulum
- Neck cut
  - Femoral head is removed

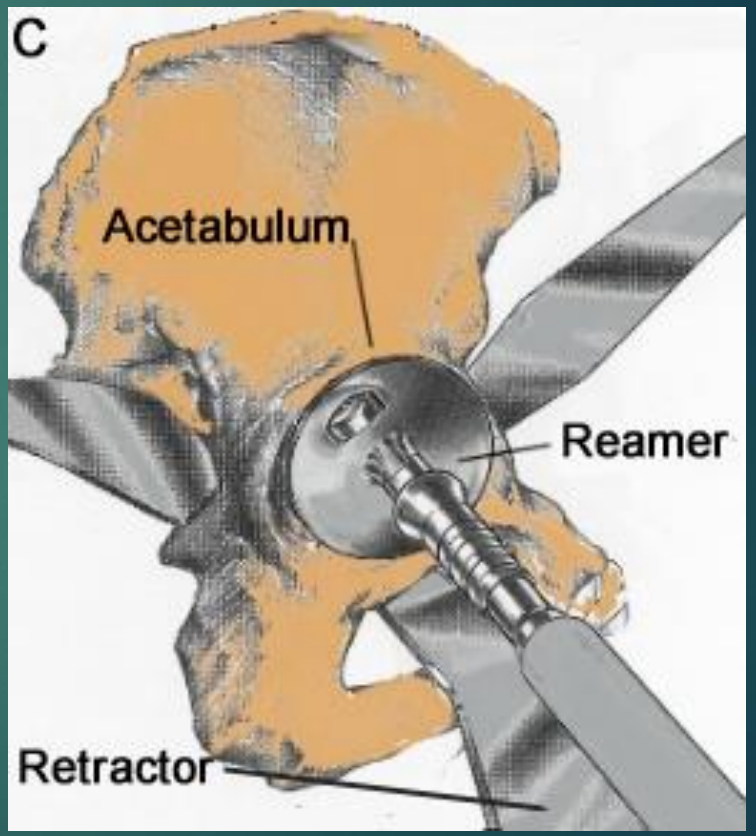


Femoral Neck Cut



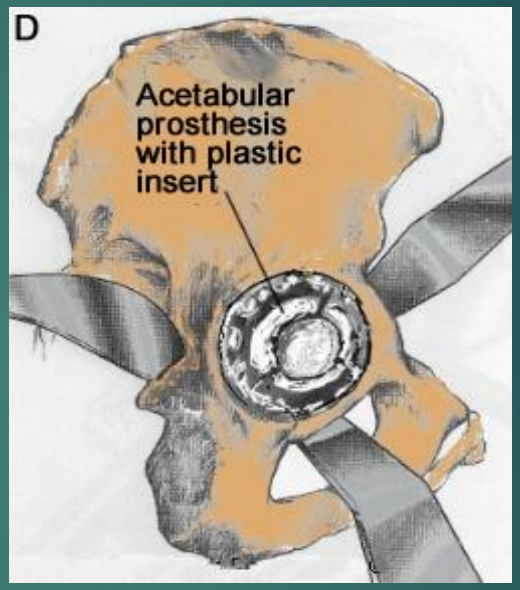
Acetabulum Reaming

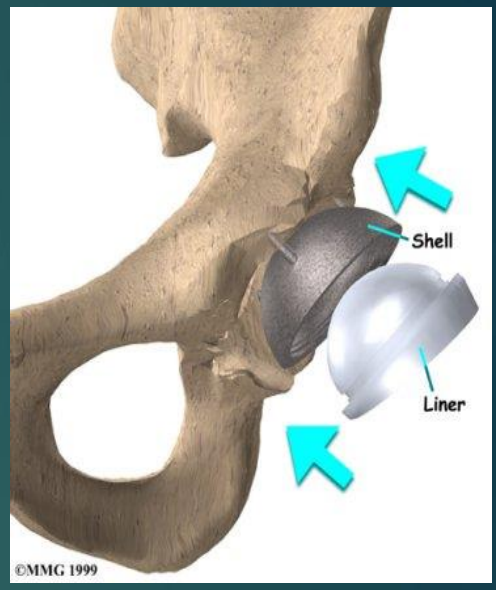
- Acetabular cup is reamed into a hemisphere
- Cartilage is removed



Inserting the Acetabular component

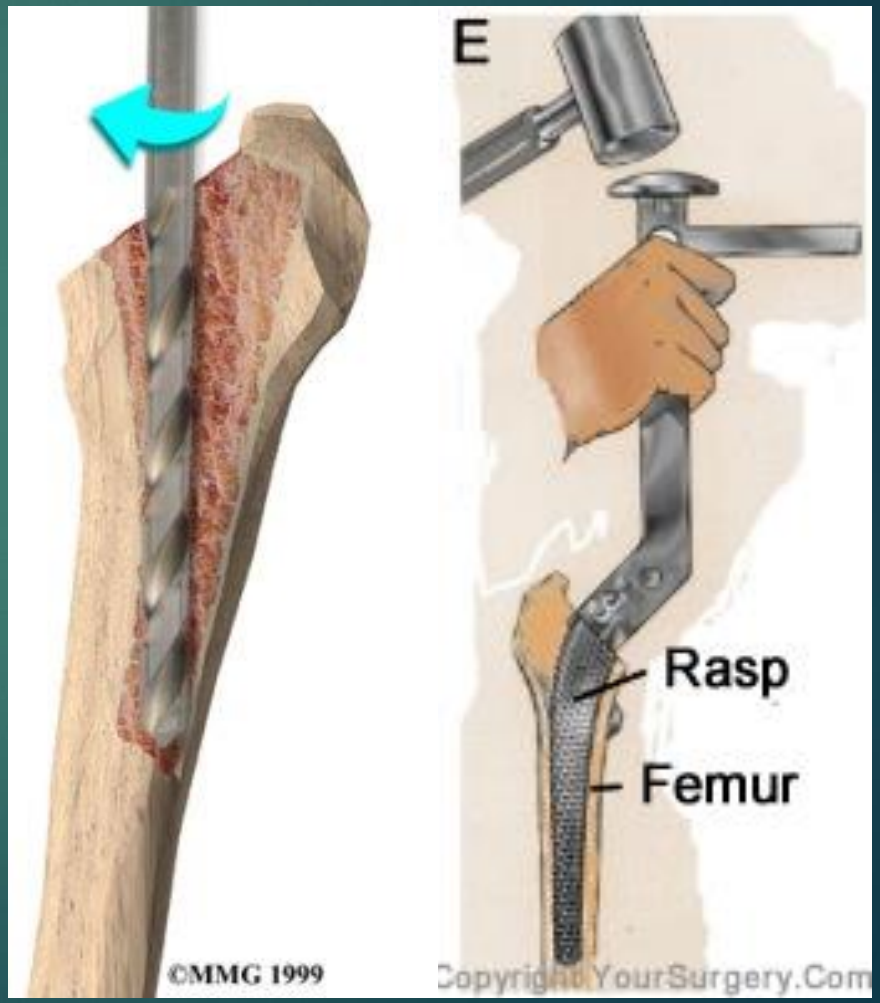
- Acetabular shell
  - Porous coated
    - Press fit
    - Screws for stability
  - Cemented
- A hard smooth plastic liner is inserted into metal shell





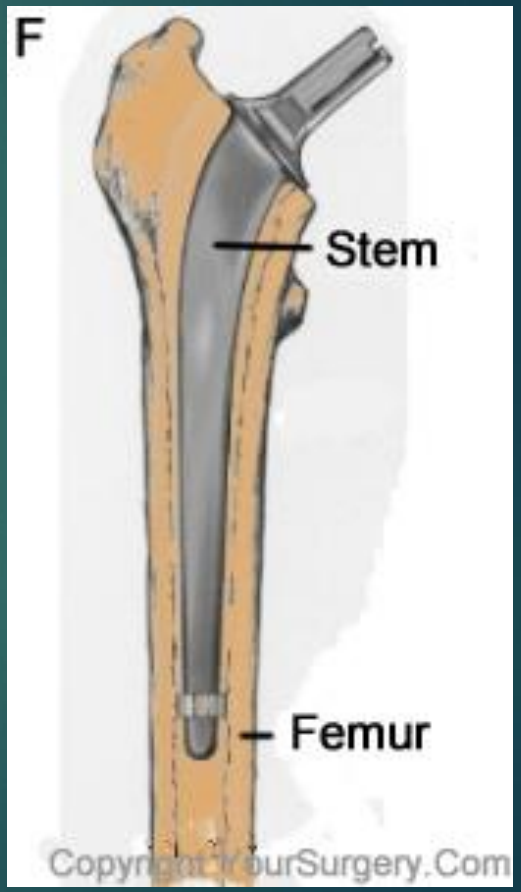
Reaming of Femoral Canal

- Intramedullary canal finder
  - Manual insertion of a rod
- Distal intramedullary reaming with a straight reamer
- Rasping

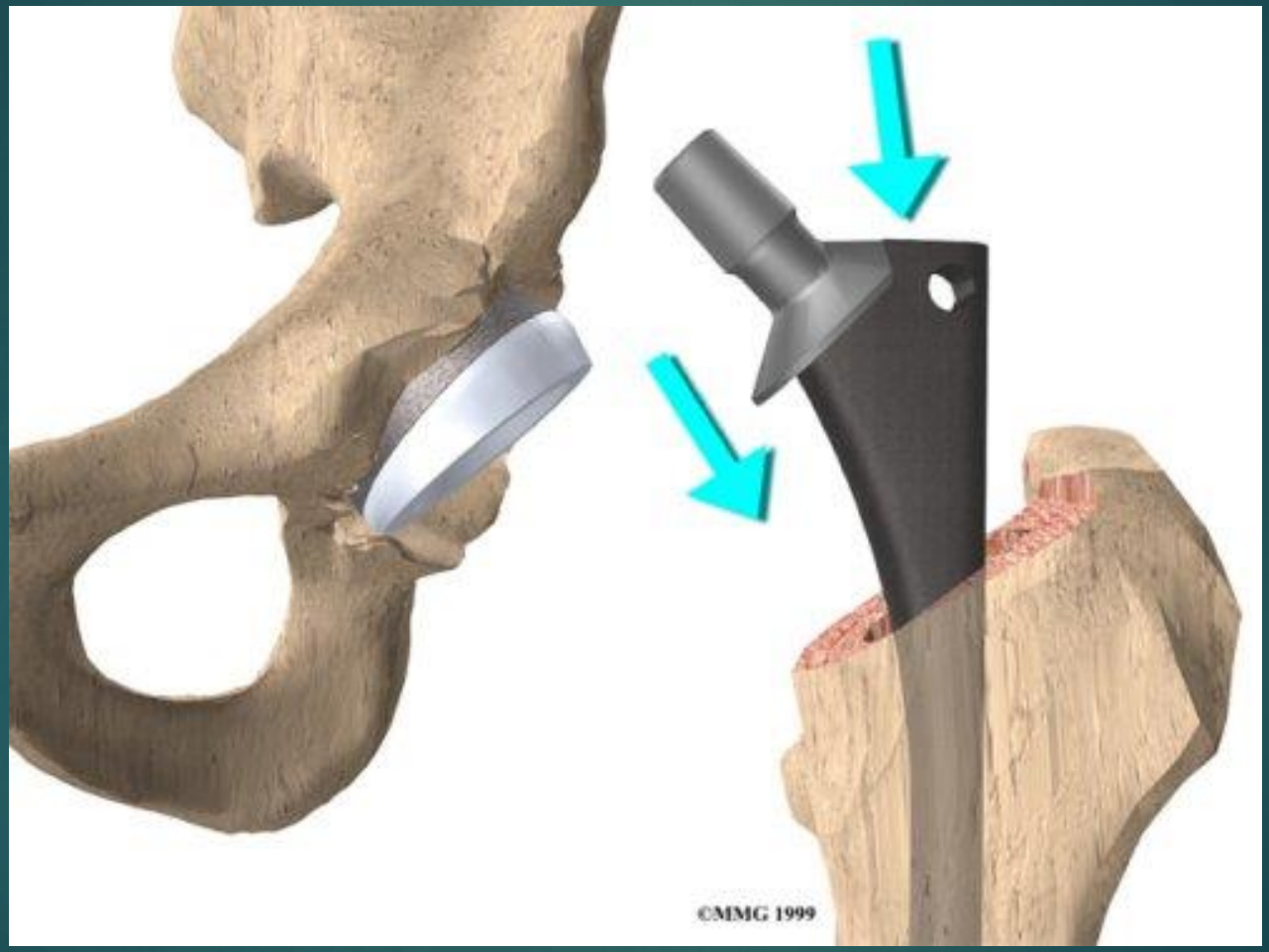


Femoral Stem Insertion

- Press fit
- Cemented
  - Pressurization
    - Canal plug
    - Cement vacuum mix
    - Cement Gun

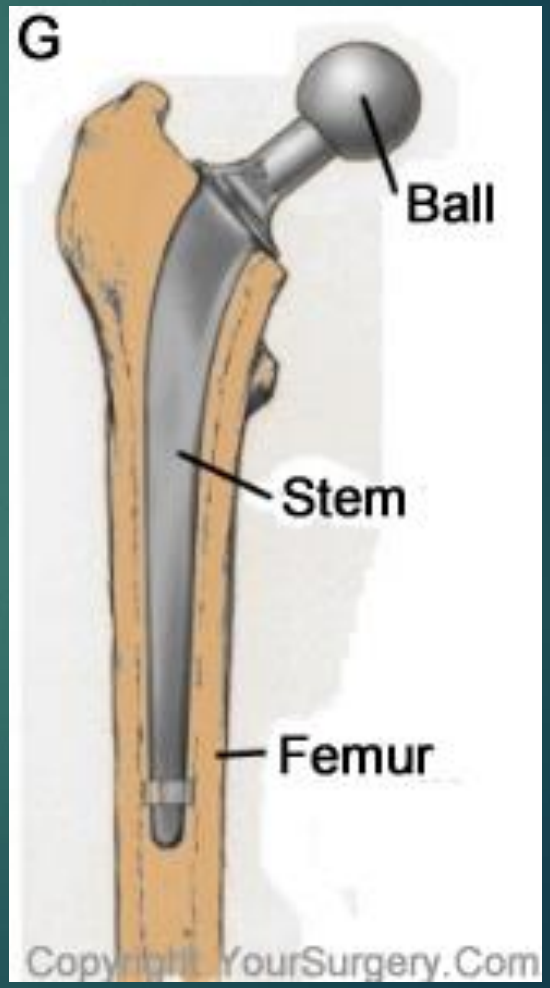


Inserting Femoral Stem

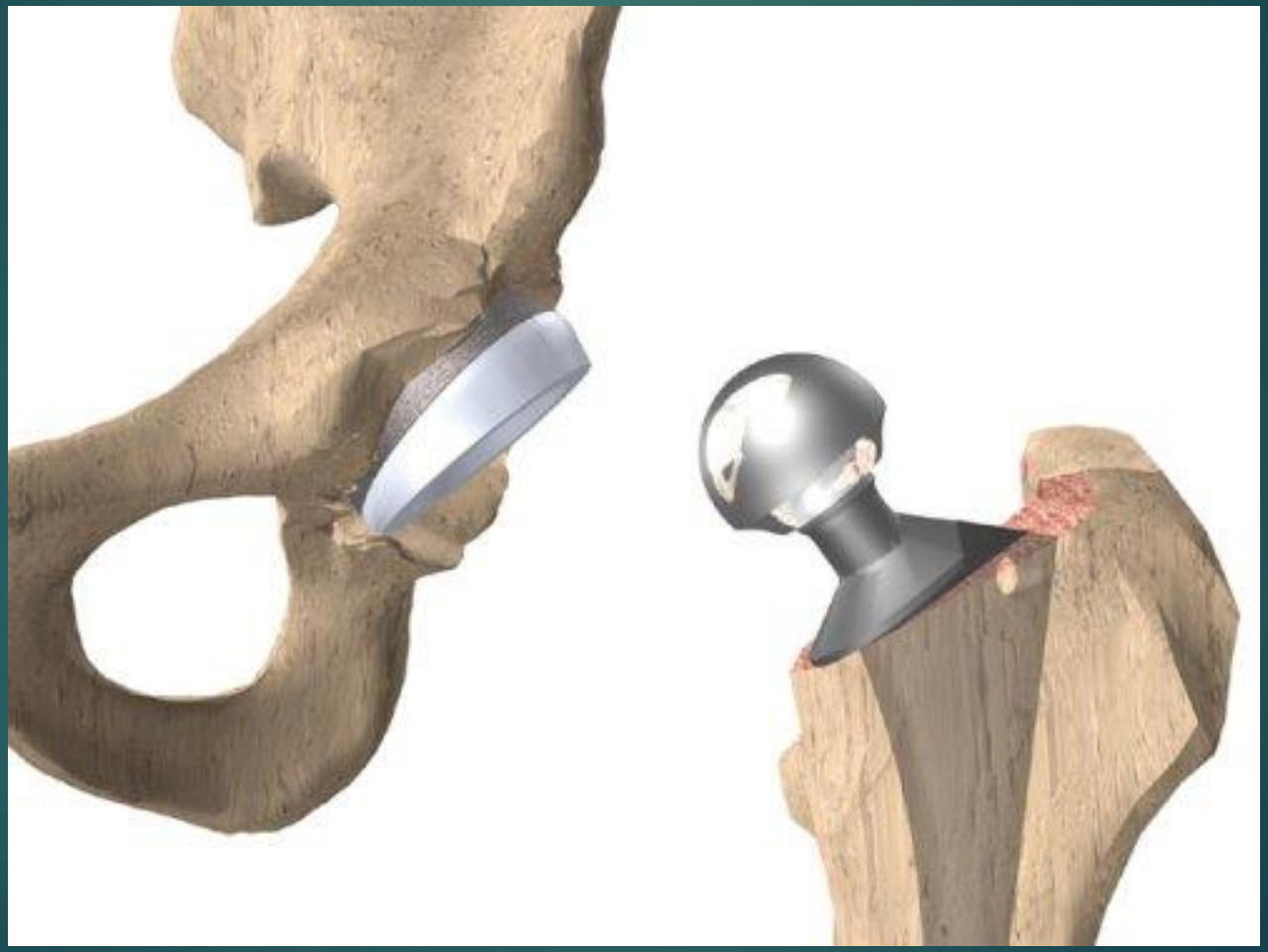


Femoral Head

- A metallic head is attached to stem



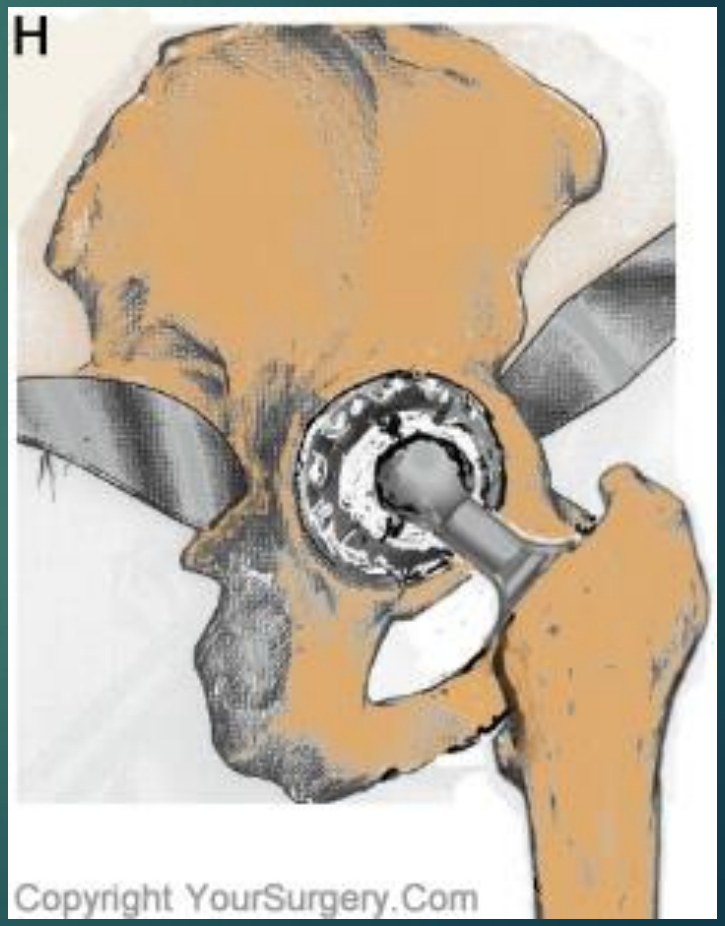
Attaching Femoral Head



Hip Reduction

Head is reduced into acetabular liner

- Soft tissue tension is tested
- Leg length may be a problem



THA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Hipbone
Acetabular prosthesis
Ball
Stem
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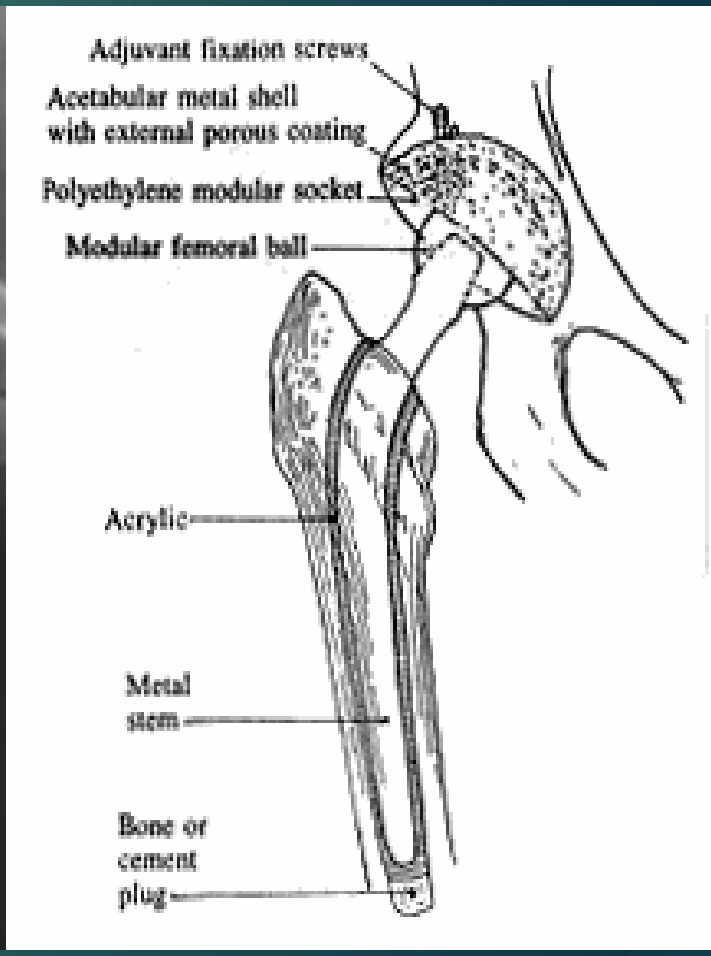
Hybrid Fixation

- Acetabular cup
  - Press fit
- Femoral stem
  - Cemented



Postop

- A suction drain
  - May be used for 1-2 days after surgery
- Intravenous fluids & antibiotics
- Pain medication
- Compression stockings and blood thinners
  - To decrease chances of blood clots

For first 6-8 weeks precautions to prevent dislocation

- Avoiding flexion of hip beyond 90 degrees.
- Avoiding sitting crosslegged.
- Avoiding to internal rotation and external rotation at hip
- Avoiding squatting
- Avoiding any combination of above movements

- Physical therapy
  - Getting in and out of bed
  - Standing and walking
    - Walker with weight bearing as tolerated initially and later progressed to full weightbearing over 6-8 weeks
    - Quadriceps and Hamstrings strengthening exercises
- Usually gets discharge from hospital in 3-5 days and advised to continue physiotherapy exercises and walking with walker support till adequate muscle strength and balance are obtained

Complications

- Thrombophlebitis
  - Blood clots within deep veins
  - Swelling of leg
    - Become warm to touch
    - Painful
  - May lead to pulmonary embolism
- Infection
- Dislocation
- Loosening

Thank you