Hip Fractures: Intracapsular Neck of Femur Fractures

Definition of an intracapsular neck of femur fracture (#NOF)

- Intracapsular neck of femur fractures (#NOF) occur within the capsule of the hip joint
- The blood supply to femoral head travels in a retrograde direction via the capsule. As such, any fracture within the capsule could be likely to damage this blood supply (see below, *complications*)

Epidemiology of intracapsular neck of femur fractures

- The classic patient is an elderly female with a low body mass index
    - This is an example of an insufficiency fracture and therefore most likely to occur in those with other comorbidities
- In young patients this is more often the result of high energy trauma such as road traffic accidents or falls from a height.
    - As such ATLS principles and investigation for coexisting injury must occur in these patients

Risk factors for neck of femur fractures

- The commonest cause in the elderly is generally a fall onto the side of the fracture
- The primary risk factors is osteoporosis but also other age-related issues which might make a frail patient likely to fall (i.e. poor vision, poor proprioception, arthritis, dementia)

Presentation of neck of femur fractures

- Fall followed by pain in the groin with referred pain to the thigh
- Limited ability to weight bear
- Limited range of movement (particularly straight leg raise)
- External rotation with shortening of the limb length in displaced fractures

Differential diagnosis of intracapsular neck of femur fractures

- Extracapsular neck of femur fractures
- Severe osteoarthritis of the hip/fracture osteophytes
- Femoral shaft fractures
- Acetabular/pelvic fractures (including pubic symphysis fractures)
- Septic arthritis of the hip
- Radicular pain from spinal pathology
- Psoas abscess

Classification of intracapsular neck of femur fractures

- The most common classification is the Garden classification:
    - Garden I: incomplete and undisplaced fracture
    - Garden II: Complete but undisplaced fracture
    - Garden III: Complete fracture with partial displacement
    - Garden IV: Complete fracture with 100% displacement

Initial management of intracapsular neck of femur fractures

- AP and lateral radiographs of the pelvis and affected hip
    - Full length femur radiographs should be obtained if there is any suspicion of a pathological fracture (such as malignancy)
- Once fracture determined
    - Po analgesia +/- a fascia iliaca block
    - Bloods, including clotting and G&S
    - Fluids if shocked (a lot of blood can be lost into the hip following fracture)
    - Discuss with the orthopaedic on call team

Further management of intracapsular neck of femur fractures

- This depends on the performance status of the patient as well as the displacement of the fracture
- Non-displaced fractures (Garden I+II)
    - Relatively young patients (either chronologically or more important, physiologically) should have urgent internal fixation via 3 or 4 parallel partially threaded cancellous screws
- Displaced fractures (Garden III+IV), or even non-displaced fractures in the context of patients unlikely to tolerate non-weight bearing
    - Replacement of the femoral head to obviate the risks of avascular necrosis (see below)
    - This is most often via a hemiarthroplasty
        - Younger, fitter patients are being offer a primary total hip replacement (THR) in centres able to provide the service

Complications following intracapsular neck of femur fractures

- **General risks**
    - Anaesthetic risks
    - Blood loss in theatre
    - Venous thromboembolic disease
        - Give anticoagulation +/- thromboembolic prevention stockings as per local protocol
- **Internal fixation**
    - Avascular necrosis
    - Mal-union or non-union of the fracture
    - Infection of metalwork
- **Hemiarthroplasty**
    - Dislocation of prosthesis
    - Peri-prosthetic fractures
    - Metalwork failure or acetabular erosion and consequent need for revision

Prognosis of intracapsular neck of femur fractures

- The presence of a hip fracture increase mortality for the first year
- After this period and levels return back to near normal

Common questions

- What is osteoporosis?
    - Osteoporosis is the decline in bone mass and quality, often related to reduced mobilisation and weight bearing, increased age and female sex.

    - It makes a bone more likely to fracture, occasionally following trivial or inconsequential trauma.
- What is avascular necrosis?
    - This is the loss of bone (in this case the femoral head) as a result of impaired blood supply and consequent ischaemia. It occurs due to disruption of the capsular blood supply to the femoral head.
- What is the typical fractured neck of femur patient?
    - Elderly, osteoporotic, female.
- What other fractures are commonly seen in the above group?
    - Distal radius fractures, vertebral body compression fractures.
- What is the typical clinical presentation of a patient with an intracapsular neck of femur fracture?
    - Groin pain and a shortened and externally rotated leg.
- What is a hemiarthroplasty?
    - A 'half' hip replacement where the femoral head is replaced only. The patient keeps their original acetabulum unlike in a total hip replacement where both femoral head and acetabulum are replaced.