Periprosthetic Hip Fractures

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Periprosthetic Hip Fractures

- Come in 2 forms:
  1. Intraoperative – may be detected at the time of surgery or in the immediate post-operative period following X-ray
  2. Post-operative – usually present late after procedure, often following minor trauma
Intra-operative Fracture

- More common with uncemented stems
- More common in revision surgery
- Often simple longitudinal split treated with cable.
Post-operative Fractures

- Incidence not truly known
- 0.1 – 2% of primary and 3 - 12% of revision THA
- 0.8% at 5 years and 3.5% at 10 years following primary THA*
- Most occur around tip of femoral stem which acts as a site of stress concentration
- Often caused by minor trauma / fall (cf NOF)

* Cook et al CORR (2008) 466: 1652-1656
Risk Factors

- Cortical defects (screw holes, perforations, progressive osteolysis)
- Osteoporosis
- Varus stem positioning
- Inadequate calcar
- Revision Surgery
- Inflammatory arthropathies

Age:
- >70yrs = 2.9 x risk
- >80yrs = 4.4 x risk*

* Cook et al CORR (2008) 466: 1652-1656
Treatment

Depends on a number of factors:

- Patients needs and expectations
- Fracture personality
- Available bone stock
Classification

Vancouver (Duncan and Masri 1995)

A: Trochanteric

B: Around or immediately below stem

C: Well distal to tip of stem
Type A

Separated into $A_{GT}$ and $A_{LT}$

Often associated with osteolysis in Gruen zones 1 and/or 7

Represent approximately 4% of PPFs

$A_{LT}$ treated symptomatically occasionally need surgery if stem unstable

$A_{GT}$ treated conservatively if undisplaced

Cables +/- plate if displaced
Type B

Represent approximately 87% of fractures

- **B1**: Fracture around tip of stem where prosthesis is stable
- **B2**: Fracture around tip of stem where prosthesis is loose
- **B3**: Loose stem + poor bone stock (Osteolysis/osteoporosis/severe comminution)
Type B1

- If undisplaced in a frail patient may be treated conservatively
- Majority need operation
- As prosthesis is stable just treat fracture
- ORIF with plate +/- cortical strut graft
- Strongest construct is proximal unicortical screws +/- cables and distal bicortical screws
Type B2

- Treat fracture + prosthesis
- Long-stem revision (uncemented/cemented)
- Must by-pass fracture site by >2 cortical diameters
- Can augment with plate fixation +/- strut graft
Type B2
Type B3

- Revision of stem to bypass fracture
- Conserve as much bone as possible
- Conserve proximal soft-tissue attachments
- May require proximal femoral replacement
- May require acetabular revision if unstable
Type C

- Represent approximately 9% of fractures
- Treat in a similar manner to any distal femoral fracture
- If plating may be better to overlap with prosthesis to avoid stress riser
Complications

Rates are very high (>30% in most series)

Include:

- DVT/PE
- Infection
- Refracture
- Non-union
- Dislocation
Failure

- Most common in patients with poor bone stock and delay in fracture healing

- 23% PPFs on Swedish hip registry underwent at least one further operation (44.5% within first year post-op)*

- B1 fractures treated with plate alone have increased rate of failure*

- Revision or revision + ORIF have decreased rate of failure*

Conclusions

- These are difficult fractures to treat well
- High rate of complications and failures
- Becoming more common with aging population and increasing rate of THA
Thank you!