Acetabular fractures: the first three days.

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Objectives:

- Clinical assessment.
- Radiological assessment.
- Emergency management.
- Urgent management.

Personality of the injury:

- Fracture.
- Limb.
- Patient
- Health care environment.

Tile, 1984

Emergency care:

- Identify and treat life-threatening or limb-threatening injuries first.
- Open acetabular fracture very rare – only with high energy major pelvic injury (itself often life-threatening).
- Dislocated hip must be reduced.
- Check/document Sciatic N function in conscious patient.

Dislocated hip:

- Increased risk of AVN if out >6 hours.
- Articular cartilage abraded against fracture surface.
- Pressure on Sciatic N.
- Pain.
- Hip “at risk”.

Protocol:

- #/dislocation of acetabulum should be identified on primary survey AP film of pelvis.
- Once patient haemodynamically stable:
  - Obtain Judet views.
  - Reduce hip in theatre under GA (disimpact head).
  - Assess and record stability.
  - Obtain Judet views with hip reduced.
  - Supracondylar femoral traction (20-25 lb).

Emergency surgery:

- Irreducible #/dislocation.
- New neurological deficit after closed reduction.
- Associated vascular injury.
- Open #.

Irreducible #/dislocation:

- Technically difficult, but hip “at risk”.
- Consider transfer to Pelvic # Unit if time allows (and always discuss).
- You may have to do it!
- Kocher-Langenbeck approach, with patient in lateral position.
- Identify Sciatic N in normal tissue planes distally.

Irreducible #/dislocation:

- Carefully trace Sciatic N into zone of injury and protect throughout.
- Keep knee flexed during procedure.
- Identify head and posterior wall fragments – acetabulum will be deep to these.
- Clear acetabulum and reduce hip.

Irreducible #/dislocation:

- Do not attempt to reconstruct acetabulum.
- Supracondylar femoral traction.
- Transfer within 24 hours for definitive surgical reconstruction.

New neurological deficit after closed reduction:

- Don’t procrastinate – it’s something you’ve done!
- Sciatic N injured by posterior wall fragment(s) or wrapped around femoral neck.
- Surgical exploration required.

New neurological deficit after closed reduction:

- Talk to Pelvic #Unit.
- Urgent transfer if possible/appropriate.
- If not, you will have to do it!

New neurological deficit after closed reduction:

- Kocher-Langenbeck approach with patient in lateral position.
- Allow hip to dislocate.
- Identify Sciatic N distally and trace into zone of injury.
- Reduce hip after freeing up Sciatic N.

Definitive care:

- Fracture factors:
  - Incongruity of hip joint.
  - Instability of hip joint.
- Bone fragments in joint can cause both incongruity and instability.
- Planning requires high quality radiographs.

Radiological assessment:

- Most information comes from AP Pelvis and Judet views.
- If you are not going to do surgery, you do not have to do the CT scan – it will probably be repeated at Pelvic # Unit anyway!
- CT scan must show both SIJ (20% incidence of associated injury) and be done with 1mm cuts in correct plane through both hips.

Incongruity:

- Plain XR: curve of femoral head fits dome on all three views.
- CT scan will show column congruity and loose fragments in joint.
- May affect one column only.
- Secondary congruity seen with associated both-column fracture.

Instability:

- Usually posterior injuries.
- May require formal assessment under GA with image intensifier.
- Remember medial instability with quadrilateral plate fractures.

Non-operative management:

- If hip congruent and stable.
- Undisplaced fractures.
- Minimally displaced low anterior column and low transverse fractures.
- Associated both-column fracture with secondary congruence.
- Supracondylar femoral traction for 6/52, then touch WB for 6/52.

Surgical reconstruction:

- Ask yourself:
  - Does this # need surgical reconstruction?
  - Can I do it?
  - Can it be fixed at all?
- Talk to Pelvic # surgeon within first 24 hours.

Indications for surgery:

- Instability and/or incongruity of hip.
- Ipsilateral femoral shaft fracture (femur fixation must not compromise acetabular reconstruction).
- Ipsilateral knee ligament injury requiring reconstruction.

Ipsilateral acetabulum/femoral shaft #:

- Define pattern of acetabular fracture so you can work out approach it will require.
- Don’t compromise acetabular reconstruction by femoral # fixation.
- Think before IMN – you may be better with retrograde IMN or plate fixation.

Timing of surgery:

- Cohort study – 128 acetabular # treated in Oxford and Vancouver.
- Surgery <3 days (median 1.5 d) – 64 patients.
- Surgery >4 days (median 8 d) – 64 patients.
- Matched groups with 24 month follow-up.

Deo et al, JBJS 2003

Timing of surgery:

- Higher complication rate in ‘late’ group.
- HO – 2% ‘early’ : 14% ‘late’.
- Outcome at 24 months:
  - 81% good/excellent in ‘early’ group.
  - 72% good/excellent in ‘late’ group.

Deo et al, JBJS 2003

Timing of surgery:

- Cohort study – 237 consecutive patients with acetabular fracture treated surgically in Oxford.
- Minimum follow-up of 24 months.
- 76% good/excellent at two years.
- Effect of delay studied for ‘elementary’ and ‘associated’ # on Letournel classification.

Madhu et al, JBJS 2006

Timing of surgery:

- Elementary: each day delay reduces odds of good/excellent result by 15%.
- Associated: each day delay reduces odds of good/excellent result by 19%.
- Anatomical reduction more likely if surgery performed within 15 days for elementary # and within 5 days for associated #.

Madhu et al, JBJS 2006

Outcome after acetabular fracture:

- Degree of displacement.
- Damage to dome and/or femoral head.
- Quality of reduction.
- Stability of joint.
- Complications of injury/treatment.

Outcome after acetabular fracture:

- Early definitive surgery is critical issue.

Acetabular fracture surgery:

- If surgery restores congruity/stability – better outcome.
- If surgery fails to restore congruity/stability – no improvement in outcome, but patient exposed to significant surgical risks.
- Surgical learning curve can be hard on patients.

Acetabular # - the first three days:

- Correct assessment and diagnosis.
- Detect/record complications of injury.
- Appropriate initial management to avoid later problems:
  - Reduce dislocation of hip.
  - Supracondylar femoral traction to keep head away from #.
- Rapid transfer for early definitive surgery.