Principles of Fracture Treatment

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Trauma & Orthopaedic Surgeon
Fractures
Fractures

- What are they?
- Why do they need fixing?
- How are they fixed?
- What are the consequences?
  - Healing
  - Complications
A fracture is....

- A break in a bone
A fracture is....

● A soft tissue injury with an associated break in bony continuity
A fracture is....

- A broken bone wrapped up in an injured patient
Fractures

● Description
  – How sick is the patient
  – Open or closed fracture
  – Associated injuries
  – Which bone
  – Which part of the bone
  – How bad
How Sick?

- ABC
- Other Injuries
- Head
- Chest
- Pre-existing Disease
Open or Closed?
Neuro/Vascular Damage?
Which Bone? Which Part? How Bad?
The Aims of Treatment

- Prevent further harm
- Return to function
- Promote healing
Principles of Treatment

- Reduce
- Hold
- Move
- Care for the Soft Tissues
Methods of Fixation

- Nothing
- Traction
- Plaster
- External Fixation
- Internal Fixation
  - Screws/plates
  - Nail
The feasibility of an operation is not the best indication for its performance

Henry, Lord Cohen of Birkenhead
Traction

- Fracture held out to length
- Pull through pin or skin
- May allow movement
Plaster / Splintage

- Use moulding to hold position
- Immobilises joints
External Fixation

- Pins inserted into bone
- Pins attached to bar
Ilizarov Fixator

- Fine wires through bones
- Circular frame
- For Non-unions, malunions & infection
- Demanding!
Internal Fixation

- Hold pieces together with plates/screws
Intra-medullary nailing

- Suitable for shaft of long bones
- Can be ‘locked’ to increase stability
How do we choose?

- The patient’s condition
- The fracture pattern
  - Bone
  - Soft tissue
- The team
  - Surgeon
  - Staff
  - Kit
The most important person in the operating theatre is the patient

Russell John Howard
Fracture Management

- Save Life
- Save Limb
- Restore Function
Life Threatening Pelvic Fracture – Blunt Trauma
Emergency External Fixation
External Fixation to Definitive Fixation
Limb Threatening Trauma
- Shotgun wound
Nailing for Acute & Definitive Care

- Sometimes ExFix first
- Care of vascular injury requires bony stability
- The first stage in reconstruction
Function Threatening – Blunt Trauma
Function Threatening Injuries
- often peripheral
Complications
The only weapon with which the unconscious patient can immediately retaliate upon the incompetent surgeon is haemorrhage.

W S Halsted (1852 – 1922)
Infection

- Greater risk in open fractures
- Wound surgery is best defence
- Antibiotics can help prevent it
- Dead tissue/bone promotes it
- Stability helps prevent it
Dead bone and infection
Compartment Syndrome

- Raised intra-compartment pressure
- Pain, pain, pain
- Paraesthesiae, paralysis
- Pain on passive movement
- Pulseless – too late
Compartment Syndrome

- Fasciotomies
DVT

- Especially in pelvic fractures
- Consider in lower limb fractures
- Balance bleeding complications with prophylaxis
Soft tissue breakdown
Failure of Fixation

- Wrong implant
- Wrong geometry
- Poor fixation
- Poor bone

... or ...
Poor Patient!
Fracture…

● More than just a broken bone
● Must be addressed in terms of life/limb/functional problems
● There is a menu of available fixation
  – Differing indications
  – Differing complications