Management of complex forearm injuries

- fracture dislocation
- compartment syndrome
- open fracture

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Fracture dislocation

- Forearm made up of radius and ulna
- 2 bones diseases
  - Monteggia
  - Galazzi
  - Essex-Lopresti
Monteggia fracture dislocation

- Fracture of ulnar with radial-humeral disruption
Bado

- I. - anterior dislocation radial head 60-80%
- II. - posterior PL dislocation
- III. - lateral or AL dislocation with ulnar metaphysis
- IV. - anterior dislocation with proximal 1/3 radius and ulna
• Radial subluxation
• PIN palsy
• Aim: rigid ulnar fixation
• Keep radial head reduced by supination
galeazzi

- Fracture distal third of radius and dislocation of distal radioulnar joint
• Radius reduction and keep supination
• Easily missed, subtle in xray films
• Ask for proper true lateral xray
Essex-Lopresti

- Racture head or neck and disruption of distal radioulnar joint and tearing of interosseous membrane for considerable distance proximally
- Loss of proximal radius bone buttress, disruption of DRUJ result in rapid proximal migration
• ORIF proximal radius and pinning of DRUJ is necessary
Compartment syndrome

- Accumulating fluid or external compression creates high pressure within a closed fascial space, reducing perfusion of the tissue within that compartment below a level necessary for viability
• Subsequent ischaemia of muscle, nerve, and other contents

• Elevated capillary permeability cause ischaemia and further edema

• Arterial pressure usually maintained, distal pulse palpable (late sign)
anatomy

- Forearm consists of 3 compartments
- Volar- flexors, pronators (superfical and deep)
- Dorsal- extensors (superfical and deep)
- Mobile wad- ECRL, ECRB, BR
Preop management

- Rise 10-30mmHG of patient diastolic BP
- Animal study of which muscle regeneration not occur until 8hr pressurization, fibrosis
Preop management

• Careful documentation
• Record sensory examination including light touch, pin prick, 2D
• Monitor frequently
• Intracompartmental pressure
Dorsal  Volar-Ulnar  Volar Curvilinear
Open fracture

• Gustilo and Anderson

• I.- wound less than 1cm caused by low energy, bone piercing

• II.- >1cm, moderate deep muscle damage secondary to high energy
Open fracture

• III.- >10cm, extensive muscle damage, or high-velocity gunshot, displaced segmental fracture, vascular require repair
• A.- limited periosteal stripping
• B.- extensive stripping
• C.- major vascular injury require repair
goal

- Prevent infection
- Achieve bone union
- Avoid malunion
- Restore limb and function
• Resusitation
• Splint and cover the wound
• Evaluate NV function
• Still possible compartment syndrome
• Joint reduction may need anaesthesia, depends on hospital facility
• Toxoid
• Antibiotics coverage
• Repeated culture
• Antibotic-impregnated beads and vacuum dressing ?promote bone healing
operation

- Irrigation and debridement
- ?pulsating lavage or dilutional
- 10L NS
- Additional detergent solution no additional benefit
- Skin flap length-to-base greater 2:1
- Debride all contaminated or devascularized fat, fascia
operation

• Tendon with only 10% muscle remain good function
• Nonviable muscle produce contracture
• Exposed tendons and bone not covered by peritenon or periosteum die within days
• Detached cortical fragments discarded
operation

• Type primary closure
• Repeated debridement with in 24-48hr
• Sufficient bone stabilisation
• Coverage with 5-10 days
• Thank You