Orthopaedic Emergencies

Avascular limb

- 6P's – Pain, Paraesthesia, Paralysis, Pale, Pulseless, Perishing cold.
- Ix= doppler, ABPI – compare upper and lower limbs, LL should be 90% of UL. Angiography – DO NOT DELAY SURGICAL EXPLORATION BY WAITING.

Management

- A-E assessment with haemorrhage control
- Reduce and align fracture + clinical assessment
- Vascular exploration
- Temporary extra-anatomical shunt within 3 hours of injury.
- Fasciotomies
- Wound debridement
- Skeletal stabilisation
- Definitive vascular reconstruction.

Open fracture

Broken skin and soft tissue overlying a fracture resulting in communication with the external environment.

- **Gustillo and Anderson classification**

Management

- ATLS + check and document neurovascular status.
- Fluid resuscitation + IV ABx
- Tetanus status – possible booster.
- Remove large debris/ contamination + wash with saline. + apply saline soaked dressing.
- Reduce and splint fracture.
- Early Orthopaedic + plastic involvement
- Keep fasted for theatre.

ABX – co-amoxiclav / ceftriaxone =1st line.
+ glycopeptide if MRSA +ve/ resistant
+ gentamycin on induction of anaesthesia.

Compartment syndrome

- Presentation – pain disproportionate to injury, feeling of tension, HX of trauma, pain on passive muscle stretch + woody on deep palpation. ↓2 point discrimination. Bullae/fracture blister on inspection.
- Investigations – intracompartmental pressure <30mmHg for 2 consecutive hours.

Management

- Fasciotomy for decompression of the affected area.
- Excision of non-viable muscle and cover wound with meshed split skin grafts.

Treatment of shock

- High flow oxygen
- Analgesia
- 1L Crystalloid bolus of 0.9% sodium chloride solution. 20ml/kg for children
- Re-evaluate
- Provide second bolus
- Re-evaluate
- Blood – consider massive transfusion protocol.
- Stop the bleeding.

Fat emboli

Fat emboli = inflammatory response to embolized fat

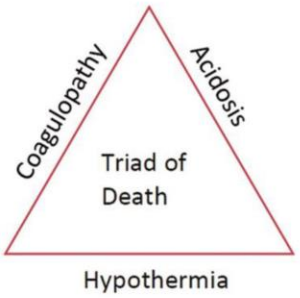
- Presentation – tachycardia, tachypnoea, petechial rash (axillary region, oral mucosa, conjunctivae) and confusion/ aggression
- Due to injuries to long bones, polytrauma or IM surgery, usually presenting within 24hrs of event

Diagnosis – major criteria = hypoxemia, CNS depression, petechial rash, pulmonary oedema.

Management

- Non-operative + mechanical ventilation with high levels of positive end expiratory pressure.
- Prevention = early fracture stabilisation, use of external fixation in fixation of long bone fractures in medically unstable patients.

Acidosis – PH<7.25, lactate >2.5. = sign of inadequate resuscitation.
Coagulopathy – INR>1.5, PLTS <120.
Hypothermia - <35.



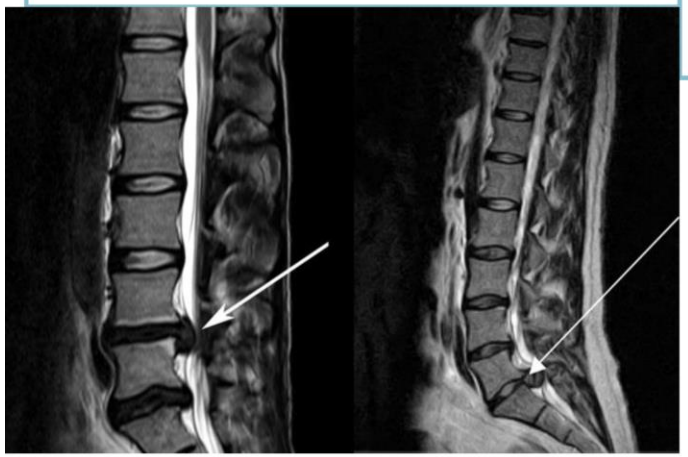
Basics of orthopaedic emergency's

- Identify the emergency – life or limb threatening.
- (C) A-E assessment
- Get senior help
- Clearly document everything following treatment
- Update family and patient on condition – very important!

Cauda equina syndrome

- Presentation – sexual problems, saddle numbness, bladder disturbance, bowel disturbance, back pain, sciatica, leg weakness
- Causes = compressive = herniated disc, spinal stenosis, spinal neoplasm, fracture of vertebrae
- Non-compressive = ischaemia, infection, inflammation

Investigations – urgent MRI scan, bladder scan
Management = emergency decompressive laminectomy/ microdiscectomy within 48hrs of onset of symptoms.



Shoulder dislocations

Anterior = most common – 95% usually due to sporting injuries
History – has this happened before? Do your other joints dislocate? Do you have any altered sensation?
Relocation techniques = Hippocratic method, traction counter traction and Kochers method.

- Check damage to axillary nerve – sergeants' patch.

Posterior = 5%; much rarer, associated with epilepsy
Lightbulb sign on X-ray (electricity = lightbulbs)

- Especially look at lateral view as can be missed then becomes locked posterior shoulder dislocation

Septic hip in a child.

Kochers criteria

- non-weight bearing
- temp >38.5
- ESR >40mm/hr
- WBC >12,000 cells/mm3

All 4 = 99% probability of septic arthritis.
Investigations = imaging – frog leg+ AP XR, ultrasound if neonate. Bloods – WBC, ESR, CRP, joint aspiration, blood cultures.
Management

- Urgent surgical incision and drainage
- IV abx

Post-operative – range of motion exercises of the affected joint a few days following surgery.

Examination of nerves in the hand

- **Make an OK/ fist** – anterior interosseous nerve and median nerve
- **Make an L/ thumbs up** – posterior interosseous nerve
- **Spread/ scissor fingers** – ulnar nerve – interosseous muscle of the hand.
- **Sensation of 1st dorsal web** – radial nerve
- **Extend wrist –** motor of radial nerve

Supra condylar fracture

- Most common paediatric #

PC – child who has fallen off something with a painful swollen elbow. – consider NAI.
Examination

- closed/ open
- skin puckering
- vascular status – radial pulse – is hand warm and well perfused?
- Nerves – AIN is most commonly injured.

Degree of displacement is classified using Gartland classification.
Management

- History and examination + Pain relief
- Keep fasted and call orthopaedics +/- vascular.

Type 1 = above elbow back slab and sling 2 = may require reduction along with back slab and sling

- 3 = surgical fixation using k wires.

Necrotizing fasciitis

- Life threatening, rapidly progressive infection that spreads rapidly along fascial tissue planes. 1:3 mortality, have a high index of suspicion.
- RF = immunocompromised, chronic disease, obesity, infection, IV drug user, abrasion/ laceration.

Early presentation – similar to cellulitis, systemically unwell, disproportionate pain.
Progression of wound – rapid expansion of erythema, discolouration, fascial spread, gas, gangrene.
Late – septic shock, multi organ dysfunction, bullae,

- Investigations = bloods, LRINEC (laboratory risk indicator for necrotizing fasciitis), >6 =92% risk
- ↑CRP,↑WCC,↑CR ↓Hb +↓Na
- Radiographs and US – gas and fluid in soft tissue and fascial plane. MRI wastes time.
- Emergent frozen section biopsy to confirm diagnosis

Management

- IV access + bloods. Give triple therapy ABX flucloxacillin, penicillin and clindamycin.
- Mark the boundary of erythema.
- Emergency surgery for exploration of area + wide excision of skin, fat and fascia until a healthy margin is found.
- Amputation is common.

Polymicrobial organism = 90% of cases. Group B strep

Infective myositis

- Similar to necrotising fasciitis but skin may appear normal, involvement of deeper structures – muscle
- Swollen painful muscles.
- Increase CK confirming muscle breakdown
- MRI for diagnosis.
- IV ABX + surgery if collection or deteriorating.

Septic arthritis

- RF – diabetes mellitus, Rheumatoid arthritis, chronic disease, IV drug use, alcoholism.
- presentation – painful hot swollen joint that is very painful on any movement. Systemically unwell – fever, tachycardia, unwell. No history of trauma, + nocturnal pain.

Investigations – Bloods – WCC, CRP ↑↑, imaging – US/ MRI/ XR to view joint effusion +/- adjacent bone involvement.
joint aspiration = gold standard investigation.
management

- IV ABX after aspirate taken. Start flucloxacillin and penicillin. Microbiology advice on local guidelines and allergies.
- Surgery – operative drainage and irrigation of the wound - +/- synovectomy.

Causative organism = Staph aureus in 50%,

	Normal	Inflammatory	Septic
Colour	Straw-coloured	yellow	Yellow / green
Clarity	clear	opaque	opaque
WCC/uL	<200	1000 – 50,000	50,000 – 200,000+
Polymorph	<25%	>50%	>75%

Code red

1. Early measures
2. Information gathering
3. Analysis
4. Surgery
5. Angiography

Early measures = tranexamic acid, pelvic BOAST guidelines, pelvic binder, Massive transfusion protocols. ,Damage control resuscitation – control BP + keep warm

Information gathering = haemdynamics, temp, lactate, clotting +CT, ROTEM – point of care test to monitor clotting process

Analysis – Blood, acid base, temperature, electrolytes.

Surgery – pelvic packing, clamping. Interventional radiology. haemodynamically unstable patients with active arterial bleeding on CT should have urgent selective angioembolisation. Patients with multiple sources of haemorrhage require damage control