University of Basrah
Al-Zahraa College of Medicine

Ministry of higher Education and Scientific Research

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Approach to patients with multiple traumas in Orthopedics

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References:
Apley & Solomon's System of Orthopaedics and Trauma 10th Edition
ATLS -2018
Bailey's and Love's Short Practice of Surgery 28th Edition 2023

Learning Objectives:

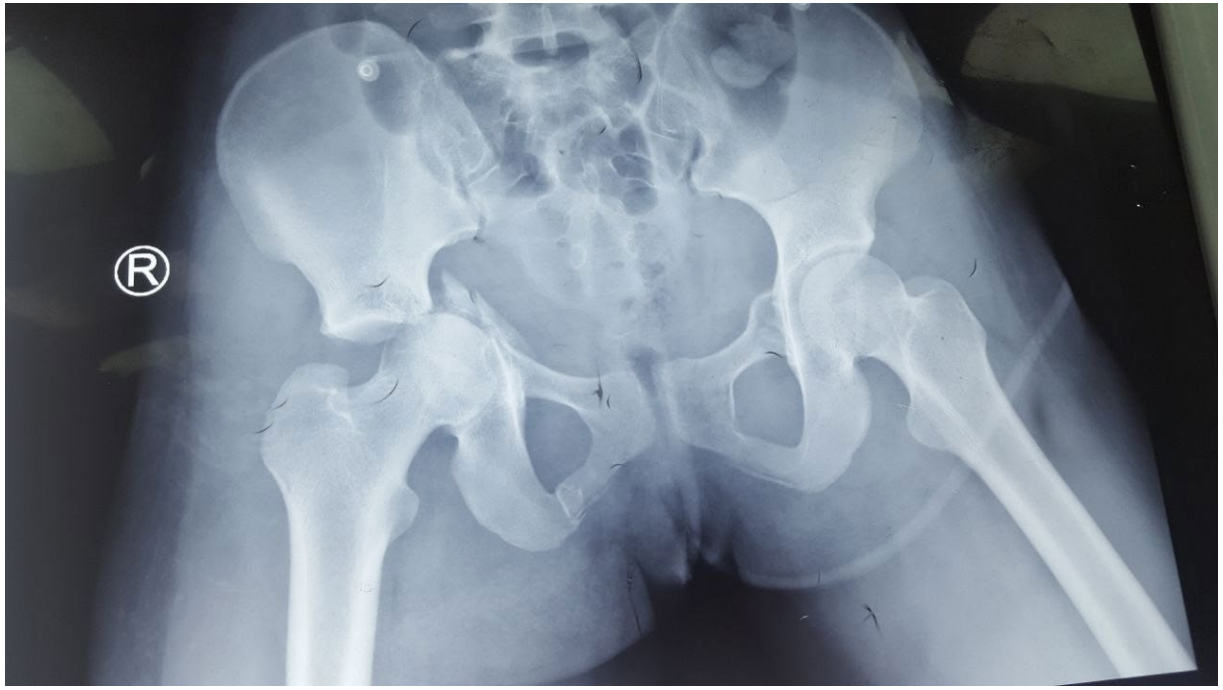
- To early diagnose and splint MSK injuries
- To understand that the MSK injuries often distracting, may be life threatening injuries
- To overview the primary and definitive treatment of the MSK injuries
- To be able to keep a high index of suspicion of acute serious complications of MSK injuries

Musculoskeletal injuries:

- Can be dramatic and distracting, but it is rarely immediately life-threatening in the absence of catastrophic haemorrhage. ***But***
- They are limb threatening and potentially life-threatening.

PELVIC FRACTURES

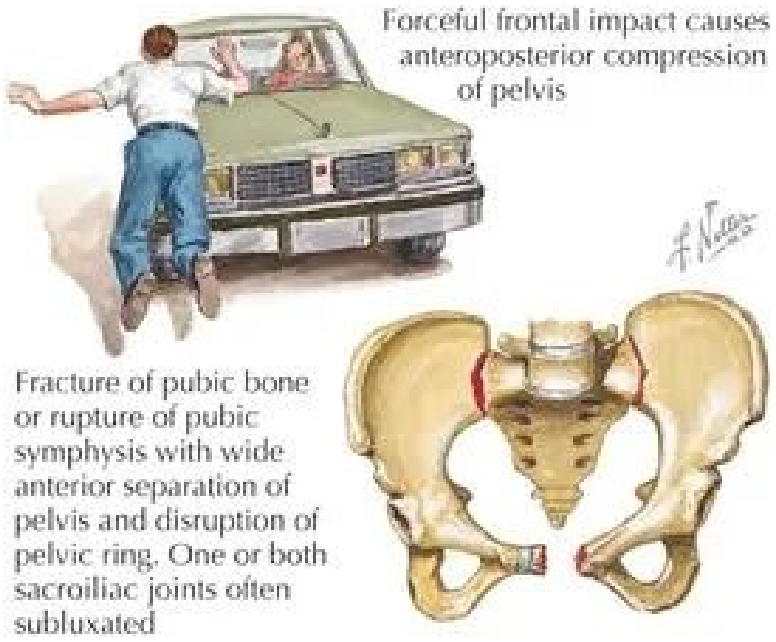
The pelvis and retroperitoneum constitute one of **'one onto the floor and four more'** spaces into which blood can be sequestered to a level resulting in non-responsive shock.



PELVIC FRACTURES:

Awareness:

- A haemorrhaging fracture pelvis: a life threatening emergency and should be considered in every patient with a serious abdominal or lower limb injury.



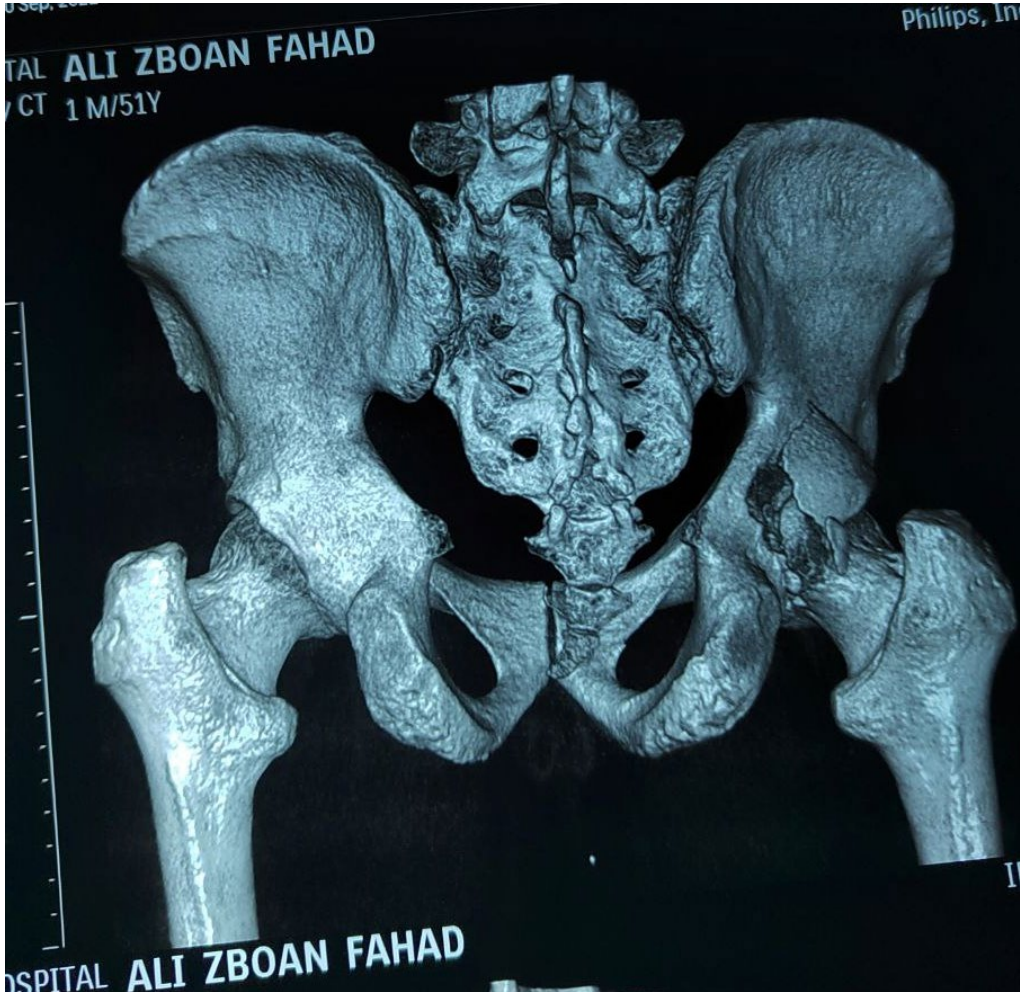
PELVIC FRACTURES:

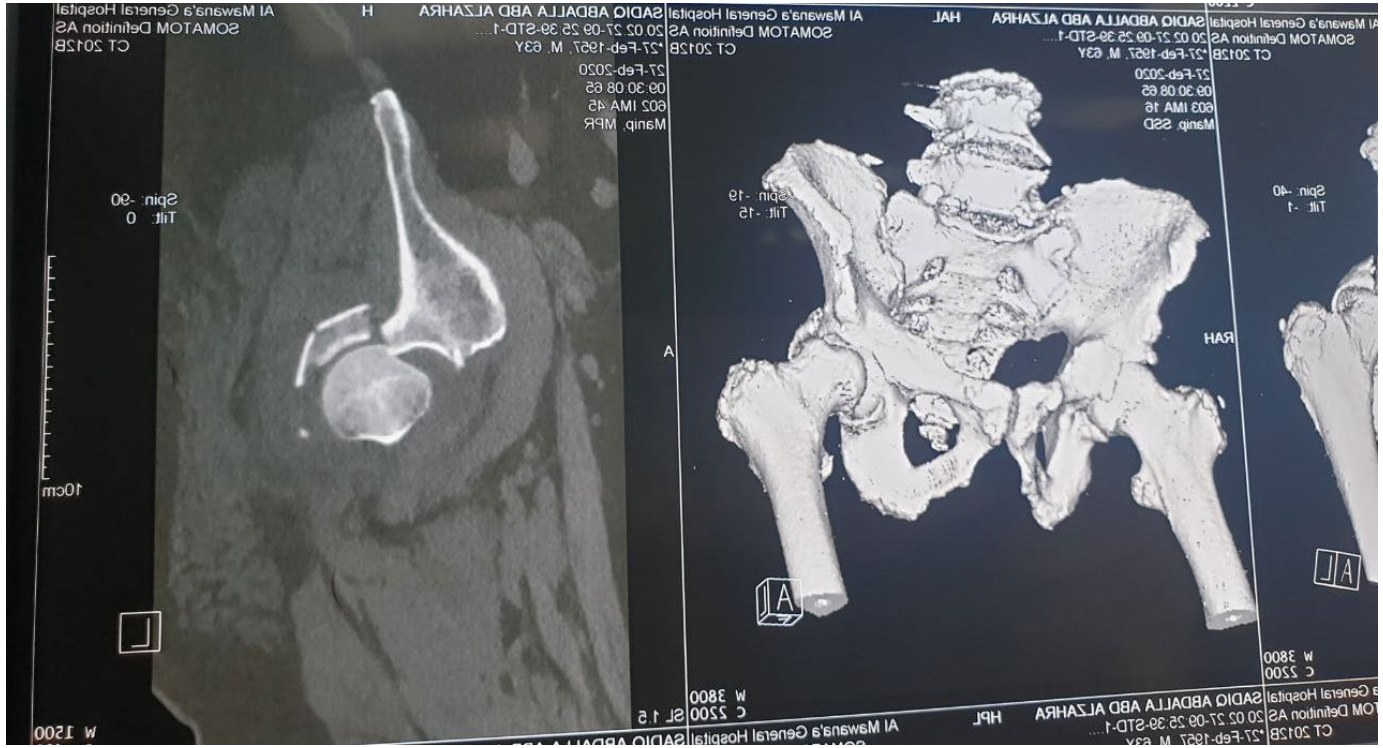
Recognition:

Significant signs: swelling and bruising of the lower abdomen, thighs, perineum, scrotum or vulva, and blood at the urethral meatus, unequal limb length.

X-ray
CT scan

PELVIC FRACTURES:





PELVIC FRACTURES:

Management:

The immediate management is to control the bleeding: By:

- Apply compression to approximate the bleeding fracture sites, reduce the potential volume of the pelvis. and allow clot formation.
- Manual compression: towel or blanket or Specialized **pelvic binder.**
- Angioembolization

Pelvis Fracture

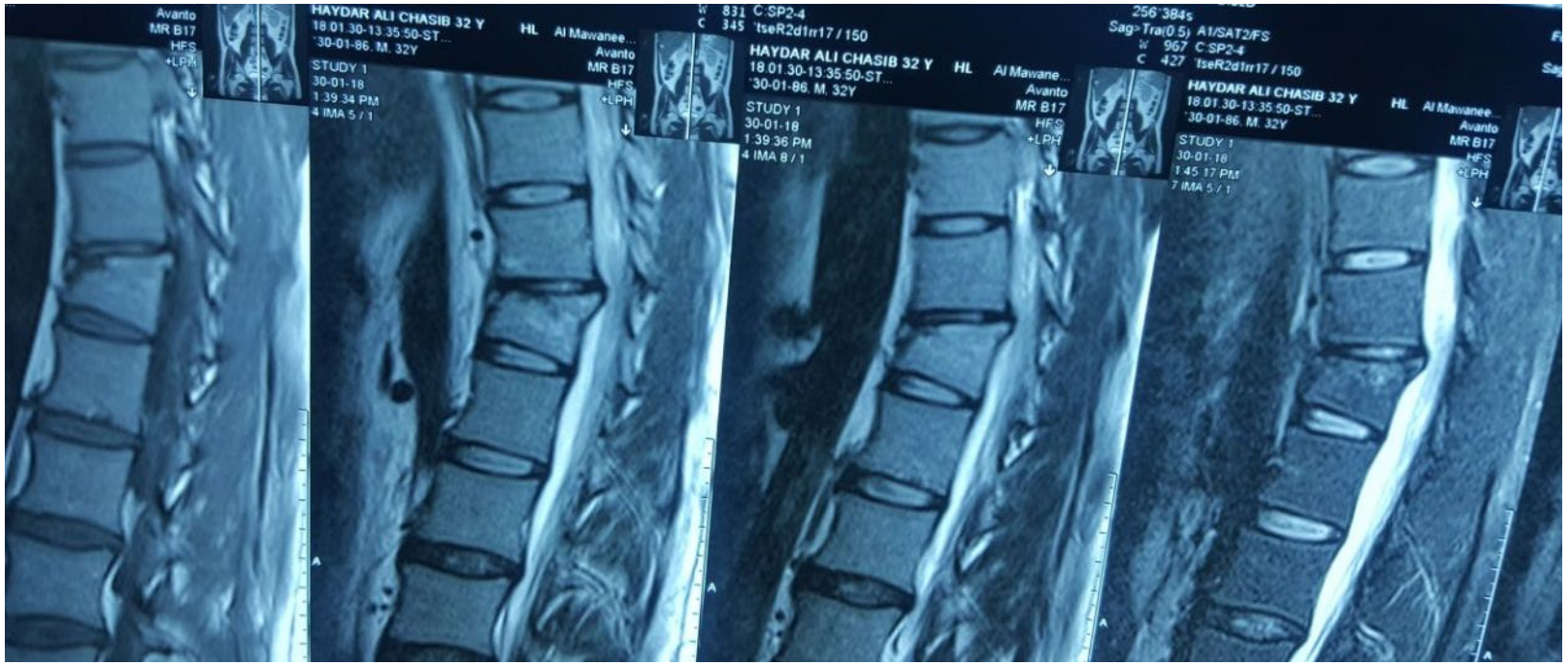
Pelvic binder, Should not be removed until the patient is in an environment where any resulting worsening of the degree of shock can be appropriately managed such as by embolization, external fixation or pelvic packing.

Angioembolisation can be a very useful adjunct to treatment, especially with deep pelvic injuries.

- Blood preparation?
- Antibiotics?
- Antithrombotic?
- Foley's catheter?

SPINAL INJURIES:

- Vertebral column injury, with or without neurological damage, must be considered in all patients with multiple injuries.
- A missed spinal injury can have devastating consequences.



SPINAL INJURIES:

- False-negative radiograph (SCIWORA: spinal cord injury without obvious radiographic abnormality) is around 10% especially in children.
- Rapid neurological assessment: lateralizing signs, loss of sensation and motor power, and abnormality of reflexes.

SPINAL INJURIES:

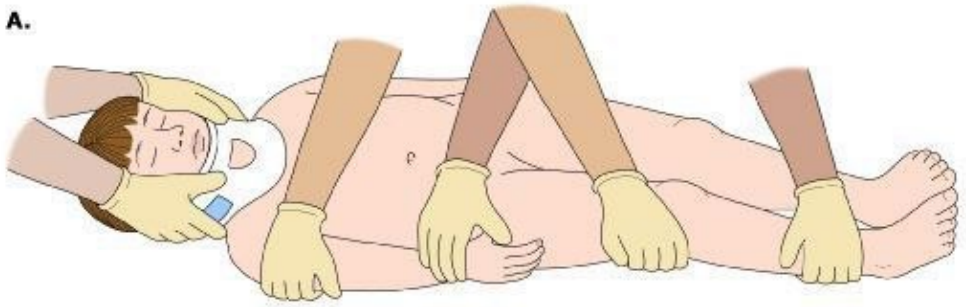
Awareness:

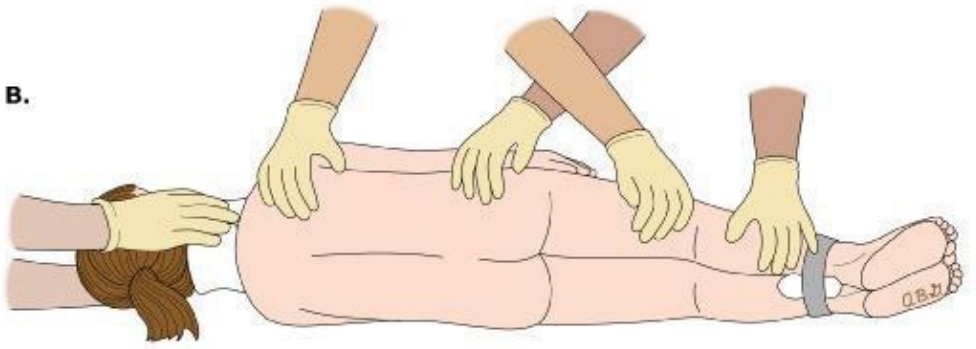
- Stable injury
- Unstable injury: there is significant risk of fracture displacement and neurological sequelae.

SPINAL INJURIES:

Recognition:

- ✓ The head and spine should be immobilized.
- ✓ The patient log rolled.
- ✓ Whole spine should be examined for:
  - bruising, contusions and ecchymosis
  - penetrating injury
  - swelling or 'bagginess'
  - tenderness
  - step
- ✓ A rectal examination: assess anal tone.
- ✓ A neurological examination: sensory and motor.





gure 30.12 Spinal log roll.

SPINAL INJURIES:

Management: no longer routinely

- If it is clinically suggestive or not possible to do so, precautions should be maintained until CT or MRI.
- The cervical spine must be immobilized at all times.

Musculoskeletal injuries:

LONG-BONE INJURIES:

- Can be hugely, but should not distract from the injuries compromising the airway, breathing or circulation.
- They are limb threatening but not immediately life-threatening, and in the absence of catastrophic bleeding they can be addressed in the secondary survey.

LONG-BONE INJURIES:

Awareness:

- Major limb injuries indicate significant trauma: high risk of chest, abdomen and pelvis damage.
- Although not immediately life-threatening, they present a potential threat to life and threaten the integrity and survival of the limb.

LONG-BONE INJURIES:

Awareness:

- Crush injuries can lead to compartment syndrome and myoglobin release with the risk of renal failure.
- Should be addressed as soon as the resuscitation priorities have been addressed.

LONG-BONE INJURIES:

Recognition:

The limbs are examined by:

LOOK:

- colour and perfusion
- wounds
- deformity (angulation and shortening)
- swelling
- discoloration and bruising.

FEEL:

- Tenderness, swelling or deformity.
- Crepitus may be felt but should not be specifically elicited.
- Peripheral circulation: pulses and capillary refill.

LONG-BONE INJURIES:

Vascular injuries in orthopedic trauma:

Vascular injury associated with orthopedic trauma is a potentially limb- and life-threatening and challenging event.

Common sites associated with vascular injury: knee, shoulder and elbow

Recognition:: Vascular injuries in orthopedic trauma:

- Doppler ultrasound may be needed to confirm the presence of pulses -
- The presence of a pulse does not exclude compartment syndrome; it is a very late sign.
- X-rays, as soon as the patient is stable.
- Early CT scanning or CT angiography should be performed if necessary.
- Peripheral perfusion must be restored within two hours from injury to avoid limb-threatening, ischaemic damage.

LONG-BONE INJURIES:

Management:

- The immediate management …
- Control limb haemorrhage with direct pressure, tourniquets, wound packing or haemostatic dressings.
- Large tissue deficits may need ongoing fluid and blood replacement as immediate haemorrhage control can be difficult.

LONG-BONE INJURIES:

Management:

- Fractures and dislocations:
- Should be reduced and splinted in the anatomical position where possible, to minimize neurovascular compromise.
- The anatomical position should not be forced if significant resistance is felt (e.g. posterior hip dislocation).

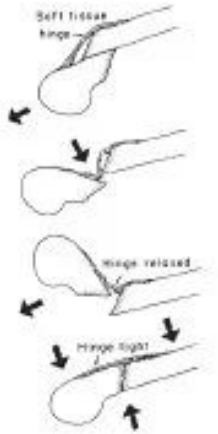
LONG-BONE INJURIES:

Management:

- Fractures reduction: disimpaction, correct the deformities, maintain the reduction

Sequences of fracture reduction

- Traction
- Increase deformity
- Reverse deformity
- 3 point bending



manual reduction of distal radius fractures is shown in Figure

Step 1: stretch the fracture part

Step 2: move the distal fragment

Step 3: maintain the position of flexion and ulnar deviation

LONG-BONE INJURIES:
Management:

(a)

(b)

(c)

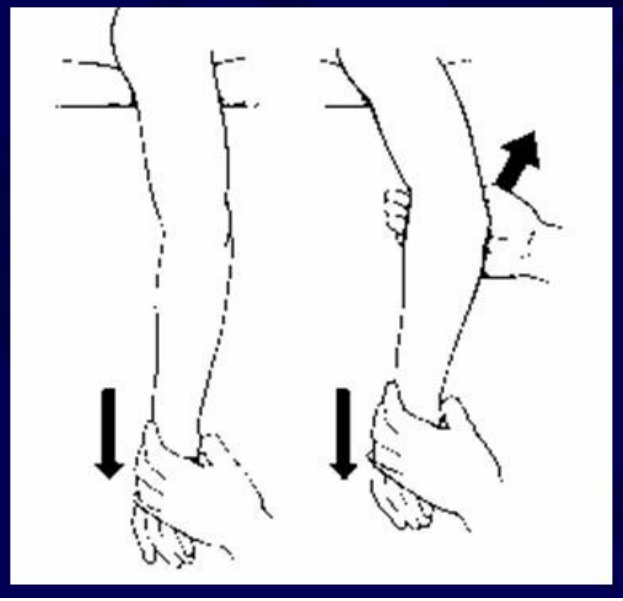
Figure 23.10 Closed reduction (a) Traction in the line of the bone. (b) Disimpaction. (c) Pressing fragment into reduced position.

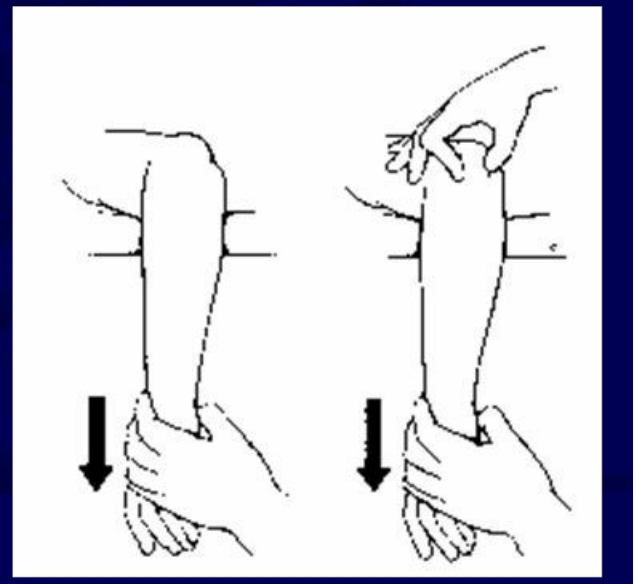
LONG-BONE INJURIES:

Management:

- Reduction of dislocation:

- Elbow Dislocation - traction, flexion, and direct manual push

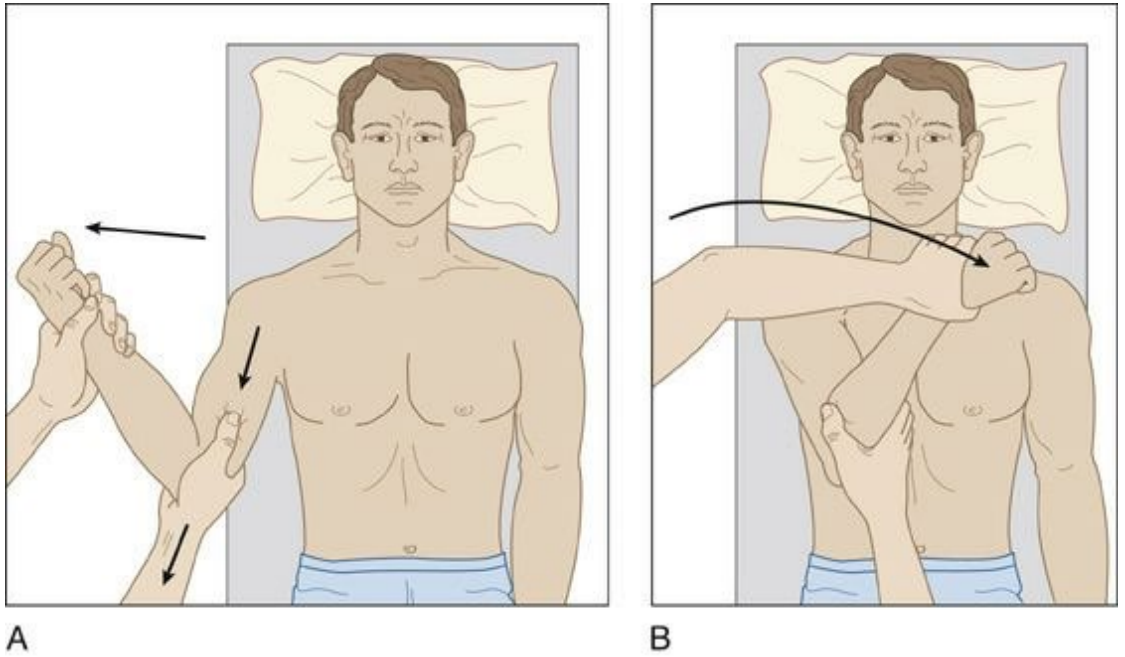




LONG-BONE INJURIES:

Management:

- Reduction of dislocation:



LONG-BONE INJURIES:

Management:

- Reduction of dislocation:

LONG-BONE INJURIES:

Management:

- Holding:

LONG-BONE INJURIES:

Management:

- Holding: SkinTraction

LONG-BONE INJURIES:

Management:

- Holding: Skeletal traction

LONG-BONE INJURIES:

Management:

- Significant fractures, open fractures and dislocations may need operative intervention whilst life-saving abdominal or neurological surgery is taking place.

LONG-BONE INJURIES:

Management:

Traumatic amputations, degloving injuries and blast injuries can be initially managed with dressing

Initial Management of Open Fracture

- Patients with open fractures may have multiple injuries.
- A rapid general assessment is the first step and any life-threatening conditions are addressed.

Initial Management of Open Fracture

- The open fracture may draw attention away from other more important conditions and it is essential that the step-by-step approach in advanced trauma life support is not forgotten.

Initial Management of Open Fracture

- The wound is first carefully inspected; any gross contamination is removed.
- The wound is photographed to record the injury and the area is then covered with a saline-soaked dressing.
- This is left undisturbed until the patient is in the operating theatre.

Initial Management of Open Fracture

- Antibiotics.
- Tetanus prophylaxis: toxoid for those previously immunized, human antiserum if not.
- Blood preparation.
- The limb is then splinted.
- The limb circulation and distal neurological status checked and followed.
- Compartment syndrome is not prevented by open fracture; caution for this complication is essential.
- Referred as early as possible to the orthopedic surgeon

Initial Management of Open Fracture

PRINCIPLES OF TREATMENT

- All open fractures, must be assumed to be contaminated; should try to prevent them from becoming infected.
- ✓ The four essentials are:
  - Antibiotic prophylaxis
  - Urgent wound and fracture debridement
  - Early definitive wound cover
  - Stabilization of the fracture.

Initial Management of Open Fracture

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Debridement

Plays a crucial part in the management of trauma

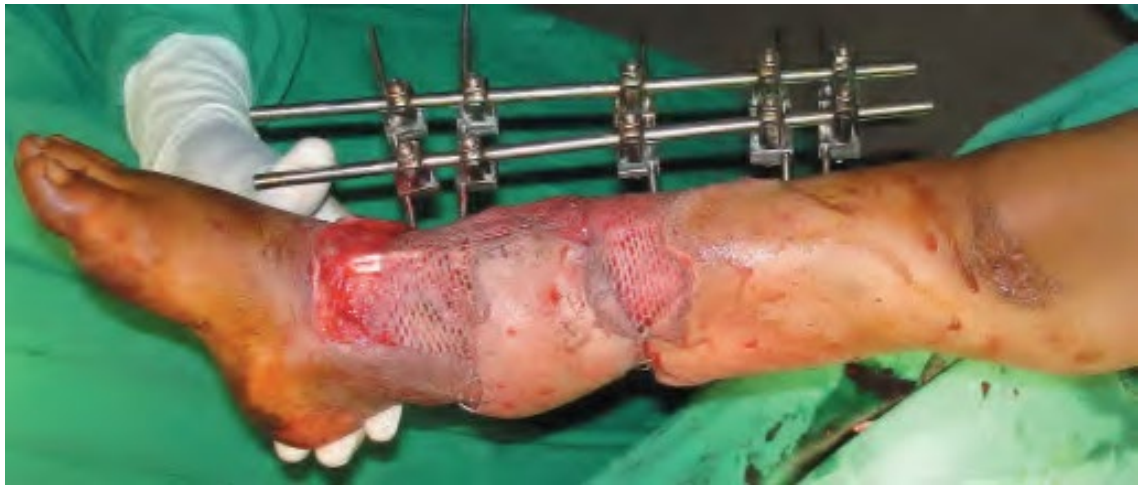
Principles of debridement and initial wound care

- Obtain generous exposure through skin and fascia
- Identify neurovascular bundles
- Excise devitalized tissue
- Remove foreign bodies
- Repair major vessels: Only repair done at acute care
- Obtain skeletal stabilization of fractures with external fixation
- Only tag tendons and nerves that have been cut. ***No repair***
- Leave the wound open and delay primary closure
- Avoid tight suturing and tight dressings
- Elevate the injured limb to reduce edema

Debridement

Skin edges and bone ends should be excised as minimum as possible.

Devitalized muscles should be excised generously: Muscle that is pale or dark in colour, that does not contract on pinching and that does not bleed on cutting must be removed.

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LONG-BONE INJURIES: Summary:

- Limb injuries are not immediately life-threatening in the absence of catastrophic haemorrhage.
- They should be recognized and initially managed in the secondary survey.
- Ischaemic limbs should be identified and managed early.
- Fracture reduction, splinting and immobilization are instituted before prompt surgical consultation.
- Antibiotics , should be given early in open fractures.
- Debridement plays a crucial part in the management of open fractures

THANK YOU

Questions?