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## Resource view

|                      |                         |
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| Resource name        | Trauma and orthopaedics |
| Resource description | Trauma and orthopaedics |
| Resource content     |                         |

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## ORTHOPAEDICS & TRAUMA

### OVERVIEW OF TOPICS IN ORTHOPAEDICS:

- A. Upper Limb Injuries
  1. Shoulder Dislocation
  2. Clavicle Fracture
  3. Acromio-clavicular Dislocation
  4. Sterno-clavicular Dislocation
  5. Fracture neck of Humerus
  6. Fracture shaft of Humerus
  7. Supracondylar Fracture
  8. Elbow Dislocation
  9. Monteggia Fracture-Dislocation
  10. Galeazzi Fracture- Dislocation
  11. Nightstick Fracture
  12. Colle's Fracture
  13. Smith's Fracture
  14. Barton's Fracture
  15. Greenstick Fracture
  16. Scaphoid Fracture

**17. Perilunate Dislocation****18. Mallet Finger****19. Bennett's Fracture****20. Game Keeper's Thumb****B. Lower Limb Injuries****1. Dislocated Hip****2. Neck of Femur Fracture****3. Fracture shaft of Femur****4. Patella injury or fracture****5. Dislocation of Patella****6. Dislocation of Knee****7. Ligament Injury****8. Meniscal Injury****9. Tibia or Fibula Fracture****10. Ankle Dislocation****11. Achille's Tendon Rupture****12. Quadriceps Tendon Rupture****C. Limping Child****1. Perth's Disease****2. Slipped Upper Femoral Epiphysis****3. Septic Arthritis****D. Sprains & Soft Tissue Injuries****GENERAL APPROACH TO ORTHOPAEDICS:**

1. **Mechanism** (FOOSH=fall onto outstretched hand, Epilepsy, direct trauma, electrical shock)

1. **Age** Some fractures are more common in children and others are more common in adults

1. **Clinical presentation:** pain, swelling, deformity or open wound and loss of function

1. **Which Nerve is damaged**

1. **Which Artery is damaged**

1. **Investigation:** X-ray

1. **Treatment:**

- **Conservative:** Includes Plaster of paris (POP), sling, splint,
- **Operation:** Open reduction and internal fixation (ORIF)
- **Dislocation:** Manipulation or reduction

**A. UPPER LIMB INJURIES**

1. [Shoulder dislocation](#) It refers to acute dislocation of glenohumeral joint. The shoulder joint is a ball and socket joint

**Classification & Mechanism:**

1. **Anterior shoulder dislocation.** More than 95% are anterior dislocation. often follows a fall or other mechanism where there is force rotation in abduction.
2. **Posterior shoulder dislocation:** Uncommon. Usually associated with [electric shock](#) or [Epileptic seizure](#).

**Signs & Symptoms:****Anterior dislocation:**

- Pain & absence of active movement
- Abnormal shoulder contour

- Absence of sensation over the badge area indicates axillary nerve damage/compression.
- Absence of hand pulses suggest compression of the axillary artery and need for urgent reduction.

**Investigations: Shoulders X-ray****Management: 1. Reduce immediately in ED****2. Immobilize in a collar & cuff****2. Clavicle fracture:** Commonly it's a mid clavicular fracture and most often treated conservatively.**Mechanism:**

- Fall on to outstretched hand (FOOSH)
- Fall directly onto the point of the clavicle or shoulder

**Signs & Symptoms:**

- Pain, deformity, occasional bruising
- Subclavian artery can be damaged by bone fragments resulting in an ischemic Stroke
- Neurological sign- Brachial plexus damage

**Investigations: X-ray of clavicle****Management: 1. >95% are treated conservatively****2. A broad arm sling to support the arm.****3. Acromio – clavicular dislocation (ACJ joint)****Mechanism:** Often follows rolling onto the shoulders impact on to anterior shoulder**Signs & Symptoms:**

1. Pain and deformity at lateral end of clavicle.
2. Outer end of affected side is more prominent than normal side.

**Investigations: X-ray of ACJ****Management: Broad arm sling for 3 weeks.****4. Sterno- clavicular dislocation( SCJ joint)****Mechanism:** Fall or blow to the front shoulder; e.g: rugby players. Occasionally may be spontaneous.**Signs and symptoms:** Localized tenderness and asymmetry of the inner ends of the clavicle.**Investigations: X-ray of SCJ****Management:**

1. **Acute vascular problems/ airway obstruction require immediate intervention.**
2. **A broad arm sling for 2- 3 weeks.**

**5. Proximal Humerus fracture: e.g neck of humerus fracture**

Common in elderly/ osteoporotic patients.

**Mechanism:**

- Fall on to outstretched hand or face directly onto shoulder
- Often occur in osteoporotic bone
- High energy impact in young

**Signs & Symptoms:**

1. Pain, deformity and swelling
2. Unable to move the shoulder
3. Axillary nerve and artery may be damaged

**Investigations: X-Ray. Check for pathological lesions****Management: Depends on the type of fractures.**

1. **Non displaced/ minimal displaced fracture, treat with collar & cuff and mobilize**
2. **Displaced anatomical neck fracture, treat treat collar & cuff**

**6. Fracture of Shaft of Humerus** Common in adults.

Fracture are considered and described as being of the proximal, middle or distal third.

**Mechanism:**

1. FOOSH
2. Direct blow to the arm

\*\*Low energy injury may suggest pathological fracture like in osteoporosis and bone metastasis.

**Signs & Symptoms:**

1. Pain, deformity & swelling
2. Wrist drop & sensory loss over the 1<sup>st</sup> dorsal web space (Radial Nerve damage)

**Complications:** Non-union**Investigations:** X-ray of the humerus**Management:**

1. **Displaced, comminuted/ angulated fractures require ORIF (open reduction & internal fixation or if options include plates & screws & intramedullary nails.**
2. **If not displaced or minimally displaced then conservative Management.**

**7. Supracondylar fracture**

Transverse fractures of the distal third of the humerus.

Commonly seen in children, less frequently in adults.

**Need to be assessed & addressed promptly to prevent serious complication.****Mechanism:** FOOSH in a child is the typical presentation**Signs & Symptoms:**

1. Pain & swelling
2. The child tends to hold the affected arm with the other.
3. **Check for pulses & nerve!**

**Arteries:** Presence & quality of radial, ulnar & brachial arteries. Absence/ diminished findings suggest compression of the brachial artery may leads to ischemia. **It is an emergency.****Sensation & Motor Function:** Check all components of the median & radial nerve.**Investigations:** X-ray of the elbow**Management:** 1. **Undisplaced: Backslab plaster**2. **# > 50% displacement : Theatre****8. ELBOW DISLOCATION** Occurs in children and adults**Mechanism:**

1. FOOSH
2. direct fall on to the elbow.
3. Common in young children who after being swung by parents or the child falls down while being held by the hand by a parent.

**Signs & Symptoms:**

1. Pain & absence of movements
2. Abnormal elbow contour

**Investigations:** X-ray of the elbow**Management:** Reduction**9. Monteggia fracture-dislocation:**

This is a fracture of the proximal ulnar with dislocation of the radial head.

**Mechanism:** FOOSH with forced pronation**Signs & Symptoms:**

1. Elbow pain and swelling
2. Elbow flexion and forearm rotation are limited and painful
3. Motor branch of radial nerve commonly damaged, sensory branch not commonly damaged but should also be checked

**Investigations:** X-ray of the entire forearm (elbow to wrist)**Management:** ORIF**10. Galeazzi fracture-dislocation** Solitary fractures of the distal one third of the radius with accompanying subluxation or dislocation of the distal radioulnar joint (DRUJ). Sometimes called reverse Monteggia fracture.**Mechanism:** Fall on to an extended, pronated wrist**Investigations:** X-ray of the entire forearm (elbow to wrist)**Management:**

1. **Admit and place in a above elbow back slab plaster, elbow at 90 degrees and elevate the limb on pillows**
2. **ORIF**

**11. Nightstick Fracture** Isolated mid shaft ulnar fracture**Mechanism:** usually caused by a direct blow to the ulnar bone, classically if someone receives a blow from an object whilst raising their arm in defence

**Signs & Symptoms:** point tenderness over the ulnar shaft, and forearm swelling

**Investigations:** X-ray the entire forearm (elbow to wrist)

**Management:**

- **Non-displaced or minimally-displaced fractures**      **Conservative (posterior splint)**
- **Marked displacement or angulation**      **ORIF**

**12. Distal Radius Fracture (Colle's fracture)** Occurs most commonly in osteoporotic bones. It refers to dorsal displacement, radial displacement and impaction occurring within 2.5cm of the wrist joint.

**Mechanism:**

1. FOOSH: forced dorsiflexion of the wrist may be bilateral
2. In the young it is usually caused by high energy injuries
3. Check for other upper & lower limb injuries

**Signs & Symptoms:**

1. Dinner fork deformity with pain on attempted wrist movement.
2. Check for median nerve compression (carpal tunnel syndrome)
3. Look for signs of new onset carpal tunnel syndrome

**Investigations:** X-ray of the wrists (shows dorsal displacement, dorsal angulation and radial shortening)

**Management:**

1. **Uncomplicated fracture do Closed manipulation**
2. **Complicated fracture, especially if there is nerve injury do ORIF**

**13. Distal Radius Fracture (Smith's fracture)** Often described as reverse of colle's #.

**Mechanism:** Fall on to the back of the and with wrist flexed.

**Investigations:** X-ray of the wrist (shows volar/ palm displacement)

**Management:**

1. **Uncomplicated fracture**      **Close manipulation under LA**
2. **Complicated fracture**      **ORIF**

**14. Barton's Fracture** Volar distal radial fracture which extends into radio carpal joint.

**Investigations:** X-Ray

**Management:** ORIF

**15. Distal Radial fracture in children/ Greenstick Fracture**

Very common fracture of childhood. Greenstick fracture is an incomplete fracture.

**Mechanism:**

- Usually an indirect injury following FOOSH
- Occasionally caused by a direct trauma

**Signs & Symptoms:**

1. Pain & dinner fork deformity
2. Check for median nerve compression
3. Look for signs of carpal tunnel syndrome
4. Examine the elbow & fingers fully

**Investigations:** 1. X-ray wrist 2. Obtain full length and forearm & elbow if in doubt.

**Management:**

1. **Non displaced/ non angulated fractures, put in plaster cast for 3-4 weeks (backslab for 1- 2-3 days)**
2. **If symptomatic or angulation do MUA (manipulation under anaesthesia.)**

**16. Scaphoid fracture:** Meta carpal bone fracture often occurring in young adults.

**Mechanism:** FOOSH

**Signs & Symptoms:**

1. Tender scaphoid tubercle
2. Tender anatomical snuff box
3. Pain on movement of the thumb
4. Pain on deviation of wrist over the scaphoid region
5. Check pulses from distal to proximal for Radial artery damage

**Investigations:**

1. **Scaphoid X-ray (7% identified on 1- X-Ray, 20% are identified on X-Ray at 10-14 days,)**
2. **Bone isotope scan/MRI if not seen on X-ray**

**Management:**

1. **Severely displaced fracture - immediate reduction and ORIF**

2. **Non displaced fracture - Scaphoid cast for 8-10 weeks**
3. **Non visible fracture but significant clinical presentation**  
- put scaphoid cast & review in 7 – 10 days
1. **Still not visible - MRI/CT scan**

**Complications:**

1. Non- union (5-10% undergo non union leading to Avascular necrosis)
2. AVN ( Avascular necrosis)
3. Osteoarthritis

**17. Peri-lunate dislocation** Lunate is m/c dislocated carpal bone

**Mechanism:** FOOSH

**Signs & Symptoms:**

1. Pain at the wrist
2. Signs of acute median nerve compression caused by the bone protruding into carpal tunnel.

**Investigations: X-ray wrist**

**Management: 1) MUA 2) K-wire reduction**

**18. Mallet Finger**

This is rupture of the extensor digitorum profundus resulting into failure to extend the distal interphalangeal joint.

Common in hotel workers, sustained when tucking in bed sheets

**Investigations: X-ray to r/o avulsion fracture**

**Management: Mallet splint**

**19. Bennett's fracture:** Fracture of the base of the thumb or 1<sup>st</sup> metacarpal bone due to thumb hyperextension

**Investigations: X-ray**

**Management: ORIF**

**20. Gamekeeper's thumb**

Tear of the ulnar collateral ligament of the thumb at MCP joint due to forced abduction of the thumb

**Management: Surgery**

**B. LOWER LIMB INJURIES****1. Dislocated Hip**

a. Normal Hip

**Causes:** Requires high energy impact e.g. road traffic accident

b. Total Hip Replacement

**Causes:**

1. Problem with prosthesis (loose components)
2. Problem with patient (poor compliance not following instruction)

**Mechanism:**

- Occurs in elderly after fall, twist or low energy injury
- Pain & inability to bear weight
- On/ examination the limb is typically shortened

**Investigations: Pelvis X-ray**

**Management: Admit for reduction in theatre under general anaesthesia**

**2. Neck of Femur Fracture** Patients with NOF commonly present with co-existing multiple co-morbidities

1. Majority due to osteoporosis
2. Metastatic deposits
3. In young due to high energy impacts e.g. road traffic accidents

**Mechanism:** Follows a fall

**Signs & Symptoms:**

1. Pain over the hip & groin
2. Affected limb is often shortened & externally rotated
3. Inability to raise straightened leg
4. Check for sensation in the foot & adequate pulses
5. Circumferential artery and sciatica nerve are commonly damaged.

6. Full examination is mandatory

**Investigations:** X-ray pelvis & femur

**Management:** Operative fixation (ORIF) or hip replacement

### 3. Femur Shaft Fracture

**Mechanism:** Usually due to a fall or road traffic accident

**Signs & Symptoms:**

- Swelling deformity, pain
- Femoral artery and femoral nerve are commonly damaged.

**Investigations:** X-ray

**Management:** Thomas splint

**In children commonly this is the only treatment.**

**In adults - Thomas splint followed by ORIF and Intramedullary Nail**

### 4. Patella Injury or Fracture

**Mechanism:**

1. Typically occurs after direct blow e.g – fall on to the knee
2. Avulsion fracture (from muscle contraction)

**Signs & Symptoms:**

- Pain over the patella
- Inability to raise straightened leg/ extend knee
- A palpable gap felt at the level of the fracture

**Investigations:**

1. **X-ray of patella (knee joint)**
2. **Patella fracture can be: vertical,; non displaced horizontal; comminuted**

**Management:**

1. **Hold in cylinder cast or cricket cast**
2. **Vertical & non displaced-horizontal fracture -> cylinder cast for 6 weeks**
3. **Displaced horizontal —> ORIF**

### 5. Dislocation of Patella

**Mechanism:**

- Typically in young females as a congenital anomaly
- Also direct trauma

**Signs & Symptoms:**

- The patella typically displaces laterally
- Patients may present with dislocated patella or after it has reduced

**Management:**

1. **Reduce by pushing the patella medially while the leg is straight (extended knee) with Entonox analgesia**
2. **Cylinder plaster cast for 3 weeks followed by physiotherapy.**

### 6. Dislocation of the knee Significant injuries. May occur from high/low energy mechanism

1. **Anterior dislocation:** Due to severe hyperextension
2. **Posterior dislocation:** Direct injury to the front of the tibia Check for presence of distal foot pulses (difficult to feel popliteal artery pulse)

**Management:**

1. **Knee should be reduced asap**
2. **Give Entonox for initial pain relief**
3. **Morphine IV**
4. **Always check neurovascular deficit (both before & after reduce)**
5. **Treat in a loose above knee back slab and admit**

### **\*Ligamental & Meniscal Injuries:**

- Common in sportsmen, also in older less active people
- Extremely painful, even in absence of fracture

### 7. Ligamental Injuries

**Mechanism:** Twisting, or foot got caught while running

**Types of Ligament Injury:**

- i) **Anterior Cruciate Ligament:** Anterior draw test positive
  - Associated with medial collateral ligament or medial meniscus injury
- ii) **Posterior Cruciate ligament:** Posterior drawer test positive
  - Associated with middle/ lateral collateral ligament injury
- iii) **Lateral collateral ligament:** Varus stress test positive
  - Fracture of head of fibula
- iv) **Medial collateral ligament:** Valgus stress test positive
  - Associated with medial meniscal and ACL injuries
  - 'unhappy triad' = ACL, MM, MCL

**Signs & Symptoms:**

- Popping sensation, cracking sound, immediate pain or no swelling
- May/may not able to bear weight
- Effusion – detectable, mild, undetectable
- Intense pain

**Investigations: X-ray to exclude fracture.****Management: Analgesia & elevation****If minor (fully weight bearing) —> mobilize****If major (non weight bearing) —> use crutches & surgical repair.****8. Meniscal injuries****Mechanism:**

- Result of twisting injuries with flexed knee
- Common in Footballers, typically in men
- Often history of leg giving away

**Signs & Symptoms:**

- Pain and difficulty in bearing weight
- Presence of locked knee – not fully extended
- Effusion
- Joint line tenderness

**Investigations: X-rays, MRI or Arthroscopy (especially if there is locked knee)****Management:**

- **Knee strapping ± crutches**
- **Locked knee —> admission & analgesia**

**9. Tibia & Fibula Fracture****Mechanism:** Twisting force or direct force to the leg, or any mechanism that presses lower ligament**Signs & Symptoms:** Pain, swelling, deformity.**Management:** ORIF**10. Ankle Dislocation**

- This is an **Orthopaedic Emergency**
- Always associated with ankle fracture

**Mechanism:** Often follows serious traumatic injuries e.g heavy fall, direct blow

Joint is displaced in some degree

**Signs & Symptoms:**

- Foot is cold and pale
- Impalpable pulses
- Diagnosis is **clinical**

**Management: Reduction before X-ray (reduction can take place in A&E)****11. Achilles Tendon Rupture**

- Lower limb tendon problem
- Common injury

**Mechanism:**

- Follows sudden muscular contraction e.g jumping, pushing off
- Patients reports feeling of clicking back of leg or heard a crack as tendon ruptures.



**Signs & Symptoms:**

- Pain and swelling
- Poor walking with inability to stand on toes
- Visible gap palpable at tendon.
- Simmond's Test Positive – patients lies prone on table with feet hanging off edge. Positive if no movement of foot on squeezing corresponding calf.

**Investigations:**

- **Plain X-ray ankle to rule out an avulsion fracture**
- **USG shows extent of injury**

**Management:**

- **Conservative - Cast in plantar flexion**
- **Invasive - Surgical repair**

**12. Quadriceps Tendon Rupture**

- Rupture of quadriceps tendon
- Usually 60 – 70 yrs
- Associated with hyperparathyroidism, diabetes, renal fx, arthritis, gout
- Also common in patients on steroids or those who abuse steroid especially sportsmen.

**Mechanism:** Strong contraction of quadriceps muscle

**Signs & Symptoms:**

- Associated with intense pain ± haemarthrosis
- Loss of extension of knee
- Walking impossible
- Gap superior to patella is palpable

**Investigations: Plain knee X-ray**

**Management: Admit for early open repair**

**C. THE LIMPING CHILD****1. Perth's Disease**

- Form of aseptic necrosis of femoral head
- Often due to disruption of blood supply to femoral epiphysis
- Common 3-8 years
- M:F 5:1
- Mostly unilateral, bilateral in 10%,

**Signs & Symptoms:**

1. Limp and painful gait
2. Pain referred to knee, thigh (middle side) on exam
3. Hip abducted & internal rotation are limited
4. One leg may be shorter than the other
5. Muscle wasting

**Investigations:**

- **X-ray hip**
  - **Femoral epiphysis appears smaller on affected side**
  - **Widening of joint space**
  - **Femoral head sclerosis**
- **X-ray is not always enough, can do CT**

**Management: Refer to Orthopaedics**

**Initial Management: Bed Rest & Analgesia**

**2. Slipped upper femoral epiphysis (SUFE):**

- Commonest hip disorder in adolescents
- Boys: 10-13 years old ; Girls: 11-14 years
- M:F 3:1;
- More common in obese boys

**Cause:** Unknown

- Seen during rapid growth (during this time plates are rapidly growing so prone to injuries as it is soft)
- Hx of trauma in 50%
- 60% bilateral

**Signs & Symptoms:**

- Pain and limping
- Not localised to the hip
- Shortening of limb & external rotation.

- Pain & limited internal rotation on examination

**Investigations: X-raysshow**

- **Widening of epiphysis**
- **Displacement of femoral head**
- **Epiphysis appears smaller due to post slippage.**

**Management: Prevent further slippage with conservative treatment and maintain function**

**Definitive management is surgical pinning**

**3. Septic Arthritis**

- Common in children less than 2 years
- Acute pain in the joint, fever and limping
- Joint is hot swollen
- Reduced joint movement and unable to weight bear

**Investigations:**

- **X-ray**
- **Joint aspiration with microscopy, culture & sensitivity**
- **Blood culture if fever.**

**Management of Sprains and Soft Tissue Injuries**

1. **Hand sprains** - immobilize in high arm sling for 2-3 days to reduce the swelling.
2. For **ankle sprain** - give crutches due to pain and advise to elevate the leg.
3. For **whiplash injury** - physiotherapy. Nowadays they do not use neck collar

**OVERVIEW OF TOPICS IN TRAUMA:**

- A. **Chest Trauma**
- B. **Abdominal Trauma**
- C. **Urological Trauma**
- D. **Head Injury**
- E. **Wound Management**
- F. **Burn Management**

**CHEST TRAUMA**

**1. Traumatic Diaphragmatic Rupture**

**Mechanism:** May occur after blunt or penetrating trauma

**Presentation:**

Abdominal content usually moves into the thoracic cavity. This may be apparent on insertion of NG tube, which is usually coiled in the chest.

**Investigations: Chest x-ray - will show elevated diaphragm. CT is more definitive.**

**Management: NG tube to decompress stomach followed by surgical repair.**

**1. Oesophageal rupture**

**Causes:**

- Post endoscopy (usually in difficult endoscopy) - Localized neck pain/retrosternal chest pain
- Trauma

**Presentation:**

- **Boerhaave's syndrome - Mackler's triad:** vomiting, followed by severe chest pain (usually retrosternal) and surgical emphysema
- Low grade pyrexia
- Pale clammy tachycardia
- Hypotension
- Pleural effusion
- Subcutaneous (surgical) emphysema in the neck or chest

**Investigations: Chest x-ray - shows free gas in the mediastinum**

**CT Scan with oral contrast**

**Management:**

- Take care of ABC's, keep NBM, give antibiotics (cefotaxime + metronidazole)
- Definitive management can be conservative or surgical

**1. Massive Haemothorax**

Haemothorax and pneumothorax often coexist together (haemopneumothorax)

Massive haemothorax will cause trachea shift, hypoxia, shock, shortness of breath and chest pain

**Presentation:**

- Trachea shift, hypoxia, shock, shortness of breath, and chest pain
- Tachycardia, tachypnoea, reduced chest expansion, dullness to percussion, decreased breath sounds, shock

**Investigations: Chest x-ray initially. CT scan is the investigation of choice.**

**Management: Take care of ABCs and insert chest drain. If there is massive ongoing bleeding after insertion of chest drain**

**1. Simple Pneumothorax**

Air in pleural space without aggressive increase in intrathoracic pressure

**Presentation:**

- Chest pain
- Shortness of breath, tachycardia
- Affected side has reduced chest expansion, hyperresonance, reduced to absent breath sounds
- Trachea is central

**Investigations: Chest x-ray**

**Management: Traumatic simple pneumothorax regardless of size requires chest drain insertion.**

**1. Open pneumothorax**

Open thoracic wound with breach of parietal pleura, leads to air in pleural space

**Presentation:**

- Ipsilateral chest pain
- Open chest wound
- Same as simple pneumothorax

**Investigations: Chest x-ray**

**Management:**

**Initial treatment: application of sterile occlusive dressing to cover whole wound. Tape is secured on three sides to make a one way valve.**

**Then insert chest drain.**

**1. Tension pneumothorax****Presentation:**

- Chest pain
- Distressed patient, tachypnoea with cyanosis, profuse sweating, tachycardia and hypotension
- Affected side has reduced chest expansion, hyper-resonant on percussion, reduced to absent breath sounds
- Trachea is deviated to the contralateral side
- Distended neck veins

**Management: Do IMMEDIATE needle thoracocentesis, followed by chest drain insertion as soon as possible**

**NB. This is a clinical diagnosis, no need for investigations to confirm before management.**

**1. Rib Fractures****A. Single rib fracture**

Isolated fracture of a single rib after trauma is uncommon, suspect multiple fractures and exclude injuries to the underlying structures

**A. Multiple Rib Fractures**

- Fracture to the lower ribs (10-12) should raise suspicion of injuries to the spleen or liver
- Fracture to the middle ribs (4-9) are commonly fractured in blunt chest trauma and usually associated with pneumothorax, haemothorax and pulmonary contusion

NB: The presence of subcutaneous emphysema suggests pneumothorax

**Clinical Features:** Visible deformity, tenderness, bruises

**Investigation: Chest x-ray**

**Management:**

- If uncomplicated rib fractures, only conservative management is needed, just prescribe oral analgesia

**1. Flail chest**

Occurs when two or more ribs are fractured in two or more places. The flail segment is paradoxically drawn in during inspiration and drawn out during expiration. This causes inadequate ventilation.

**Presentation:**

- Severe chest pain
- Paradoxical chest movement of the flail segment
- Hypoxia

**Investigations: Chest x-ray, CT of chest**

**Management: Refer to cardiothoracic surgery for operative fixation. Ensure adequate oxygenation – patient may require CPAP or require mechanical ventilation.**

**1. Cardiac tamponade**

**Mechanism:** Caused by either penetrating or blunt chest trauma

**Presentation:**

- **Beck's triad:** Muffled heart sounds, distended neck veins, hypotension
- Tachycardia
- Shock

**Investigations: Echocardiogram**

**Management: Pericardiocentesis**

**1. Thoracic Aortic Dissection****Presentation:**

- Sudden of severe tearing chest pain radiating to interscapular area
- Stroke or syncope may occur
- Abdominal pain due to mesenteric ischaemia
- Paraplegia due to spinal ischaemia
- Collapse
- On examination: shock, hypotension, tachycardia
- Different blood pressure and pulses in each arm

**NB: Abdominal pain radiating to back is always abdominal aortic dissection until proven otherwise.**

**Investigations: Chest x-ray shows widened mediastinum. Contrast enhanced CT chest is investigation of choice.**

**Management: Refer to cardiothoracic surgeon immediately. Transfer to ITU. Definitive treatment is open repair of aneurysm.**

**B. ABDOMINAL TRAUMA****Causes:**

1. Penetrating knife/ gunshot wound
2. Blunt blows/ RTA due to deceleration

**Organs affected:**Solid Viscera:

1. Liver
2. Spleen
3. Mesentery artery
4. Duodenum/Small Bowels
5. Pancreas

**1. Liver**

- Occurs in penetrating or blunt injuries
- Common in major rib fracture especially lower ribs on the right side.

**Presentation:**

- Unresponsive hypotension
- Abdominal distention
- Pain & peritonitis in conscious patient

**Investigations: CT is investigation of choice. USS if not CT scan in the options.**

**Management: Emergency laparotomy**

**Definitive: Transplant**

**2. Splenic Rupture**

In penetrating or blunt injury. It is also associated with fractures of the left lower ribs.

**Presentation:**

- Unresponsive hypotension, abdominal distention

- Pain & Peritonitis
- **Left flank bruising** (most important)

**Investigations:**

- CT scan, Ultrasound of the abdomen
- Definitive: Splenectomy

**3. Major Vessel Laceration:**

**Mechanism:** Commonest in deceleration injuries. Mesentery arteries are commonly damaged by the belt.

**Presentation:**

- Unresponsive Hypotension
- Abdominal distention
- Back & Flank pain
- Flank Bruising

**Investigations: CT scan is diagnostic**

**Management: Emergency laparotomy**

**4. Duodenal Rupture:** mesenteric vascular injury

**Mechanism:** Compression seat belt injury

**Presentation:**

- Positive DPL = diagnostic peritoneal lavage (bile stained)
- Features of Peritonitis
- Associated with pancreatic or lumbar injury

**Investigations: CT scan diagnostic**

**Management: If part of multiple injuries then put surgical staples**

**Definitive Management is Primary repair**

**5. Small Bowel Laceration:**

**Mechanism:** Caused by sharp penetrating trauma

**Presentation:**

- Features of peritonitis
- Features of sepsis

**Management: Same as duodenal rupture**

**6. Pancreatic Disruption:**

**Mechanism:** Deceleration injury

**Presentation:** Back pain, flank bruising,

**Investigations: CT scan**

**Management: Analgesia & drainage of pancreatic collection**

**7. Abdominal Aortic Dissection****Presentation:**

- Sudden of severe tearing abdominal pain radiating to back
- Stroke or syncope may occur
- Abdominal pain due to mesenteric ischaemia
- Paraplegia due to spinal ischaemia
- Collapse
- On examination: shock, hypotension, tachycardia
- Radiofemoral delay
- Weak or unpalpable femoral pulses

**NB: Abdominal pain radiating to back is always abdominal aortic dissection until proven otherwise.**

**Investigations: Chest x-ray shows widened mediastinum. Contrast enhanced CT chest is investigation of choice.**

**Management: Refer to cardiothoracic surgeon immediately. Transfer to ITU. Definitive treatment is open repair of aneurysm.**

**INDICATIONS FOR EMERGENCY LAPARATOMY:**

1. Unexplained shock
2. Clinical peritonitis
3. Positive DPL
4. Evisceration
5. Gun shot wounds
6. Bleeding PR, penetrating trauma, stomach.

**INDICATION FOR CT ABDOMEN.**

1. Abdominal pain and vomiting with hypotension.
2. Signs of peritonism
3. Severe abdominal pain after road traffic accidents

\*\*For abdominal trauma It's to do mandatory chest X-ray & Pelvic X-ray

**C. UROLOGICAL TRAUMA:**

**Causes:** Penetrating or blunt injury

**Most Common Causes:**

1. Restrained passengers in RTA high speed (Compression of kidneys)
2. Crush injuries
3. Vehicle vs pedestrian injuries
4. Abdominal stab wounds
5. Blunt assault      Renal contusion

**Investigations:****Mandatory**

- **Chest & pelvic X-ray**
- **Urinalysis for blood (looking for hematuria)**
- **PR Exam for prostate**

**Optional**

- **CT, Abdomen & Pelvis is diagnostic method of choice. Therefore, CT scan for diagnosis**
- **Intravenous Urography (IVU) is definitive for kidney function**

**1. Renal Injuries**

- 5-10% of all abdominal injuries affect kidney
- Most common causes in the urinary tract are RTA, sports injuries, falls, assaults

**Presentation:**

- Microscopic haematuria on urine dipstick
- Loin & back pain
- Hypotension

**Delayed Presentation:** Flank Pain, fever due to infected hematoma

**Investigations:** **CT scan is diagnostic** Contrast extravasation on CT or IVU

**Management:**

**May be conservative or surgical depending on severity of the injuries**

**Laparotomy indicated if:**

1. **There are penetrating injuries with signs of shock or peritonitis**
2. **Blunt injuries with haemodynamic compromise despite fluid resuscitation**

**Complications of Renal injuries:**

1. Secondary Haemorrhage
2. Perinephric abscess
3. Fistula development
4. Ureteric injury

**2. Urethral Injuries**

**Mechanism:** Major pelvic fracture from RTA

**Presentation:**

- Suprapubic pain
- Blood at urethral meatus
- Inability to void urine
- Perineal swelling/bruising
- High riding prostate on Per Rectal examination

**Investigations:** **Retrograde urethrogram – shows extravasation of contrast**

**Management:**

**\*\*In emergency do NOT attempt Urethral Catheterisation\*\***

**Do suprapubic catheterisation**

**Definitive Management:**

- **Incomplete laceration - conservative Management with urethral catheters**
- **Complete transection - Primary repair with catheter**

#### **D. HEAD INJURY**

##### **Common causes:**

1. Non accidental injury
  2. Shake baby syndrome especially in premature babies
  3. Epilepsy
  4. Falls
  5. RTA
  6. Sports – rugby
- NB. All can cause intracranial bleed which can cause dilated pupils due to 3<sup>rd</sup> nerve palsy

##### **1. Skull Fracture**

**Base skull fracture** - Rhinorrhea, otorrhea, hemotympanum, battle sign (mastoid bruising), raccoon eyes/panda eyes (bruising around eyes)

**Depressed skull fracture** - Indication for CT

**Vault skull fracture** - Crack, needs a CT scan

##### **2. Cerebral Contusion**

Focal intraparenchymal oedema  
Located at the site of impact

##### **3. Extradural Hematoma**

**Head injury & immediate LOC = Extradural hematoma**

- Hx of trauma
- Commonest injury causes **immediate LOC**
- Due to disruption of **middle meningeal artery**
- Lucid interval
- Bruise in the temple area
- Rapid deterioration in consciousness
- Lucid interval is usually minutes to hours, and not days or weeks.  
If weeks or days then subdural haematoma is the diagnosis.

**Investigations: CT scan**

**Management: Burr hole ~ Emergency evacuation of hematoma to relieve increased intracranial pressure**

##### **4. Subdural hematoma**

- Common in alcoholics, recurrent falls
- May be no history of trauma because trauma may have happened weeks ago and patient has forgotten about it
- Fluctuating LOC
- ± cognitive impairment
- Progressive confusion
- Subdural Hematoma – acute < 24 hours  
Chronic > 24 hours

**Management: Evacuation of hematoma**

#### **INDICATIONS FOR CT SCAN HEAD IN HEAD INJURY**

1. GCS < 13 at initial assess
2. GCS 14 if 2 hours after injury
3. Any neurological deficit
4. Depressed skull fracture
5. Base skull fracture
6. Post traumatic seizures
7. Vomiting post trauma ≥3 times
8. Amnesia

#### **CLASSIFICATION OF HEAD INJURY:**

GCS 13 -15 = Mild (observe 24 hours)

9 – 12 = Mod (CT scan)

≤ 8 = Severe = **call anaesthetist and intubate**

##### **NB:**

1. **Alcoholic with head injury, even of GCS 15/15 observe for 24 hours**

2. If no supervision at home, admit

### **E. WOUND MANAGEMENT**

#### **Full course of Tetanus Vaccination:**

3 Vaccines in infancy + 2 boosters

#### **Scenarios of Wound Management:**

**1a)** Fully immunized & wound is clean: No tetanus vaccine or immunoglobulin

**b)** Fully immunized & wound is tetanus prone (meaning dirty).

Involves manure ((garden) or extensive necrosis

- Give only Tetanus-specific Ig (TIG)

**2)** Not immunized or immunization status unknown/ uncertain &

a) Wound is dirty:

- Give Tetanus Vaccine and Ig
- Arrange for full Vaccination in different arms via GP

b) Wound is clean: Arrange vaccination only

**3)** Primary immunisation incomplete or booster not up to date

a) Wound is dirty

- Give Immunoglobulin and vaccination

b) Wound is clean

- Give vaccine

#### **Antibiotics NOT required**

Unless in human or animal bite or hand wound

### **F. BURNS**

#### **Causes:**

1. Fire
2. Hot water
3. Chemicals
4. Electrical
5. Irradiation

#### **Calculating total body surface area (TBSA) of burn:**

##### **Use rule of 9**

Leg: 18% each

Arm: 9% each

Trunk back: 18%

Trunk front: 18%

Head: 9%

Perineum: 1%

*Just erythema is not counted as an area of burn.*

#### **Classification of burn:**

1. Partial thickness
2. Full thickness burns

#### **Management:**

1. If it's just erythema in some part of body, no treatment is required just reassure
2. For all other serious burns
  - a. **Check the airway**, if signs of **inhalation injury**, e.g soot singed nasal hair, burns to the oropharynx, hoarseness of voice, black sputum

##### **Management: anaesthetize and intubate.**

- a. Give analgesia
- b. Give IV fluids
- c. Transfer to special burns units if indicated

#### **CRITERIA FOR TRANSFER TO BURNS UNIT:**

1. Partial thickness burn: > 10% TBSA in adults, > 5% TBSA in children / elderly
2. Full thickness burns: >5% any age group
3. Burns on face, hands, feet, perineum, genitalia, major joints, chest
4. Any size of electrical burns
5. Any size of chemical burns



6. Any burn with inhalation injury

#### **INTRAVENOUS FLUIDS:**

1. 10% in children and 15% in adult of partial thickness burns
2. 10% or more in anyone of full thickness burns

\*Use Hartmans solution/Ringer's Lactate or Normal Saline

#### **Spinal Cord Compression:**

1. Constipation
2. Lower limb weakness & Sensory loss
3. Urinary retention
  - Peri-anal anaesthesia & reduced anal tone on PR examination
  -

Investigation : MRI

**Treatment: 1) Dexamethasone as an emergency**

**2) Surgical decompression is definitive**

#### **Disc Prolapse:**

- Back pain radiating posterior aspect of the thigh down to the knee. All the way up to below knee
- After heavy lifting
- If Sensory loss is on L5 dermatome then disc prolapse is at L4/ S1
- If sensory loss is on L4 dermatome then disc prolapse is at L3/L4
- If sensory loss is on the S1 dermatome then disc prolapse is at L5/ S1

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