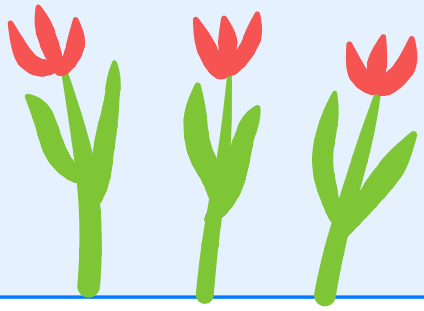
تبييض محاضرة

Trauma

د. سعد العزّاوي

Done by :



Trauma

The causes of trauma related injuries

1. Motor vehicle accidents most common ≈ 80%
2. Violence including gun shot wounds, Stabs 9%
3. Falls 9% ← second most common
4. Others:
   - Burn :Thermal, electrical, chemical
   - corrosive
   - drowning
   - Blast very rare

← آخر مرة صارت بالأردن بال 2004

leading causes of death

"Data are for the U.S. , 2010 "

- Taking the whole age incidince
- (Productive age groups)

15- 50 years الأعمار المنتجة

1. **Heart disease**
2. **Cancer**
3. **Chronic lower respiratory diseases**
4. **Stroke (cerebrovascular diseases)**
5. **Accidents (unintentional injuries)**

Takes the fifth rank in the causes of death

Epidemiology

* Traumatic injuries range from minor isolated wounds to multiple organs injury.

* Trauma is a leading cause of mortality globally in young adults

* trauma accounts for approximately 30 percent of all intensive care unit (ICU) admissions.

* According to the World Health Organization (WHO), road traffic Injuries accounted for 1.25 million deaths in 2014 ← RTA

* Outside areas of armed conflict, penetrating injuries are responsible for fewer than 15 percent of traumatic deaths worldwide ,.

Deaths from trauma

1. Immediate deaths in the first minutes at the scene are either due to massive haemorrhage " laceration of great vesseles" or due to massive CNS trauma
2. Early deaths during the 'Golden hour' are often due to the effects of haemorrhage or hypoxia and may be preventable
3. Late deaths are chiefly due to sepsis and organ failure occur from 1 –7 days after trauma due to sepsis, septicemia, pulmonary embolism, multiple organ failure .

*The "golden hour" concept emphasized the increased risk of death and the need for rapid intervention during the first hour of care following major trauma

The risk factors in trauma injuries

RTA risk factors :

- Car speed
- Rolled over car → multiple injuries
- Throughn out person → very severe that let one of the passengers to be throughn from the glass
- Dead passenger
- Car indentation >30Cm
- Extraction time >20 minutes
  → The time that civil defense takes to extract the injured person from the car

* Trauma may be : Trivial or severe

Falling down risk factors:

- The height → if >3 m → serious
- The ground
- Way of fall → head, abdomen, ---

Burn risk factors:

- Flame with close space
- Associated with other trauma "falling down"

→ boiled (scalding water, tea ---)
→ smooked (more risky) → fire, CO

- 50% of deaths at the site of incident (they see)
- 30% they die after (1-2 hours) → cause of severe bleeding (severe laceration)
  ↳ we as a medical staff can help them (ourself, as well)
- 20% they die in the hospitals → cause of organ failure, cepticemia, ...

- can we minimize the mortality (death) from trauma ?

answer: yes we can → in 30%
& 20% → by well equiped trauma hospital

* **Causes of mortality after major trauma :**

I) Immediate death :(within few minutes)

- **Airway** obstruction or major injuries of airway .
- Rupture **heart** or major blood vessels .
- Major injury of **brain** or upper spinal cord.

II)Early death : (within few hours)

- Intracranial **haemorrhage** .
- Intra-thoracic or intra-abdominal haemorrhage .
- Major fracture (femur, pelvis & spine)

III)Late death : (within few weeks)

- **Sepsis**.
- Multiple organ **failure**.

They can Possibly minimize The mortality down as much as Possible

TRAUMA SYSTEM (ideal 😎)

This system not exist in Jordan, middle east or europe, but exist in Japan ✓

A coordinated National approach to trauma care

مثل الوزارات (توجيه و توعية)

optimal care of a trauma patient requires effective and efficient communication and teamwork among all members [The hieghest death rate in Jordan was in 2007 = وفاة 970]

1. Access to care
2. Pre hospital care → Their should be approper medical staff or at least Para-medical staff
3. Hospital care
4. Rehabilitation (Psychologically, Physically)
5. Injury prevention

how you Proceed the Patient (how we start)

The approach to care of trauma patient

لأنه الأكسجين بيطل يوصل دماغه (barain damage)

عندك 3 دقائق فقط

1. **Primary Survey** : الإسعاف الأولي
   - simultaneous assessment and Management
   - Identify & treat what is lethal.

فحص المريض من راسه لرجليه

2. **secondry survey** :
   Proceed to identify all other injuries, with Proper management

   Secondary survey is started once, stabilization of vital signs and preliminary radiological evaluation are completed

3. **Definitive management** :
   The definitive management plan

Primary Survey

mainly Respiratory & vascular (ABCDE)

1. **The aim of the primary survey is to detect and immediately treat life threatening problems.**

2. **Do not proceed to Secondary Survey until ABC's are stable**

3. **The primary survey must be repeated any time a patient's status changes, including changes in mental status,changes in vital signs.**

The primary survey

consists of the following steps:

1. **A**irway assessment and protection (maintain cervical spine stabilization when appropriate)
   - **A**natomy of Respiratory system 😉 (The airway is open) → mouth, pharynx, larynx
2. **B**reathing and ventilation assessment(maintain adequate oxygenation)
   - **P**hysiology of Respiratory system (gas exchange), flail chest, Pneumothorax
3. **C**irculation assessment (control hemorrhage and maintain adequate end-organ perfusion)
   - CNS disfunction
4. **D**isability assessment (perform basic neurologic evaluation)
5. **E**xposure, with environmental control (undress patient and search everywhere for possible injury, while preventing hypothermia)

Keep the following points in mind while performing the primary survey

* Airway obstruction is a major cause of death immediately following trauma .

* The airway may be obstructed by the tongue, a foreign body, aspirated material, tissue edema, or expanding hematoma

* Definitive guidelines for tracheal intubation in trauma do not exist,when in doubt, it is generally best to intubate early, particularly in patients with hemodynamic instability, or those with significant injuries to the face or neck, which may lead to swelling and distortion of the airway

?? ① when GCS < 8 , ② comatose , ③ cardiovascular unstable

* Unconscious patients with small pneumothoraces that are not visible or missed on the initial chest radiograph may develop tension physiology after tracheal intubation from positive pressure ventilation. It is important to re auscultate the lungs of trauma patients

A: Airway

Passage

: Assessment

* Begin by asking the patient a simple question (eg, "What is your name?").

A clear accurate response verifies the patient's ability to mentate, phonate

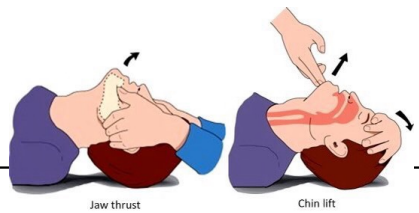
if the patient is capable of **unstrained speech** , his airway is **patent** (intact)

* Observe the face, neck, chest, for signs of respiratory difficulty, including tachypnea, accessory or asymmetric muscle use, abnormal patterns of respiration, and stridor.

* Inspect the oropharyngeal cavity for disruption; injuries to the teeth or tongue; blood, vomitus, or pooling secretions.

* Inspect and palpate the anterior neck for lacerations, hemorrhage, swelling, or other signs of injury

First maneuver used: chin lift
jaw thrust .or both
Next : endotracheal intubation .



The possible causes of air way obstruction

- o Vomitus
- o Bleeding
- o Loose or missing teeth
- o Dentures
- o Facial trauma
- o backward tongue displacement

airway tools can be helpful when managing a trauma patient

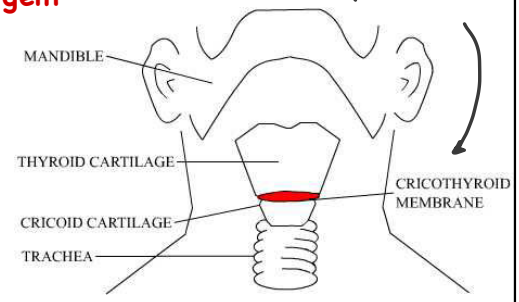
* Remove 1st any tight clothes at the neck
* Suction :To clear the oropharynx of blood, mucus and foreign bodies
* Bag-valve mask attached to high flow oxygen
* Cricothyrotomy kit
* Endotracheal tubes in a range of sizes

in emergency (very quick)

Cricothyroidotomy

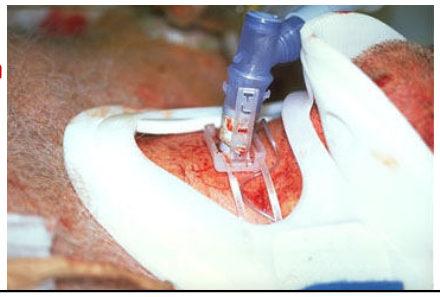
- temporary measure done for **urgent** upper airway obstruction with inability to ventilate and inability of tacheal intubation

There is no blood vessles

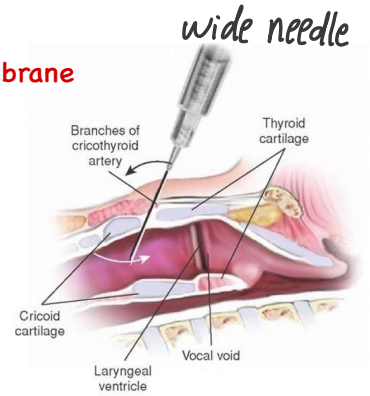


- This done either by **surgical cricothyroidotomy** (make incision in the middle line in the skin and cricothyroid membrane and insertion of a tube)

or pecutaneous needle cricothyroidotomy (insertion of wide bore needle)



wide needle



Cervical spine protection

* The high index of suspicion depends on the history of the accident.
* Avoid rough manipulation of the head and neck. *
*Protection is initially provided by holding the head in a neutral position facing forward. and can be secured with a hard cervical collar .
* Obtain appropriate radiological evaluation and should be done only after the patient has been stabilized.

after stabilization of vital signs

Rigid Collar

B. BREATHING AND VENTILATION

"assessing the adequacy of oxygenation and "ventilation

1. Inspect for symmetrical chest movements.
2. Palpate for : ex about non-symmetric → Tension Pneumothorax
   - the trachea for deviation
   - the chest wall for bone crepitus "fractures" or air crepitus " surgical emphysema".
3. Auscultate for breath sounds bilaterally.

سؤال أرشيف

* Patient with Paradoxical movements Treats with chest tube (thoracostomy)
except, flail chest → Just treated by fixation (تثبيت بالإضاءع)

* فقط بالسماعة بشوف اذا فيه air-entry or not

problems to be identified The life-threatening

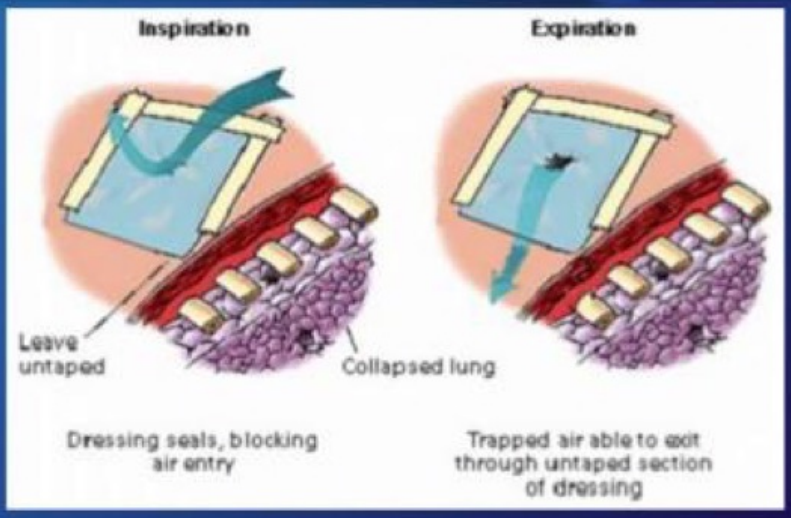
1. Tension pneumothorax: Initial decompression with needle insertion through the 2nd or 3rd intercostal space anteriorly, mid-clavicular line.
   or Thoracostomy tube
2. massive haemo-thorax : Thoracostomy tube
3. Flail chest:
- Monitor pulse oximetry and blood gases,
- intubate and ventilate if there is hypoxia or respiratory distress.
- Consider early intubation in elderly or severe multitrauma patients. يتنفس من الـ mouth أكثر من الـ opening
4. Open pneumothorax, a sucking wound in the chest wall

* كلهم الأربعة بيعملو dyspneq ← 1,2,3,4

* فقط الـ Tension Pneumothorax & massive Pneumothorax بيعملو Tracheal deviation ← 1,2

Open Pneumothorax

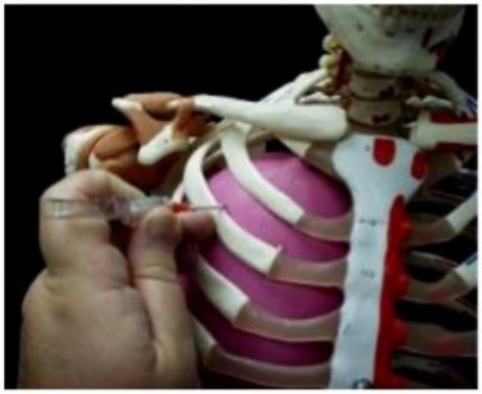
■ FIGURE 4-4 Dressing for Treatment of Open Pneumothorax. Promptly close the defect with a sterile occlusive dressing that is large enough to overlap the wound's edges. Tape it securely on three sides to provide a flutter-type valve effect.

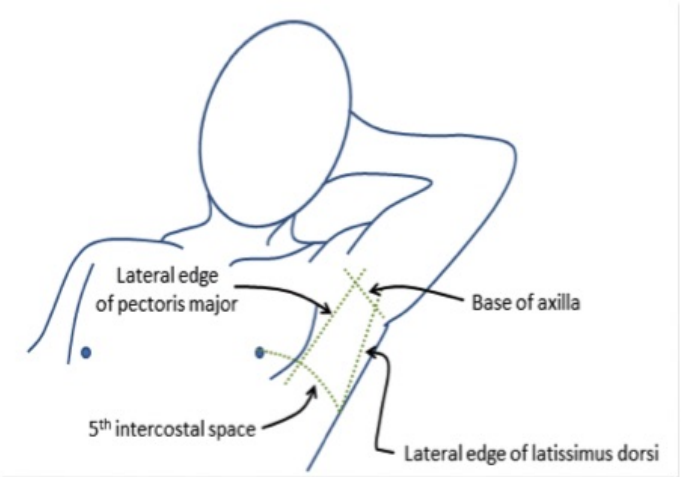


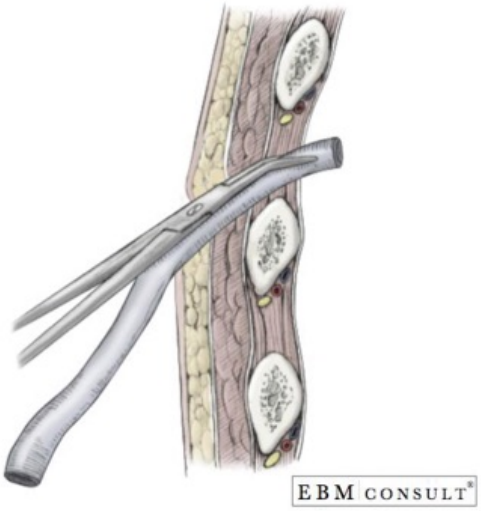
Intial treatment for Open pneumothorax

Tension Pneumothorax

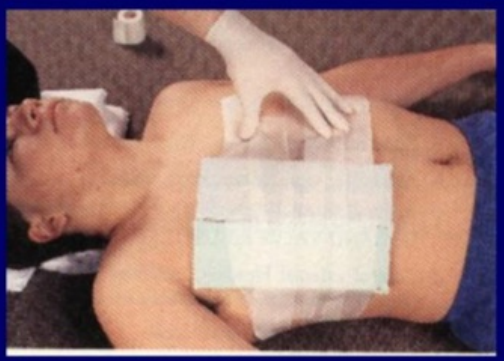
Needle decompression 2nd ICS in MCL







Treatment for Flail Chest



Combat Trauma Treatment Chest Injury 43

Site of insertion of intercostals tube

C. CIRCULATION AND HEMORRHAGE CONTROL

1. Assess BP, heart rate and evidences of bleeding or signs of shock.
2. Control any external bleeding .
3. If there is shock, insert one or two large intravenous lines and start fluid resuscitation and prepare blood.

D: Disability and neurologic evaluation

(AVPU) conscious / un-conscious / semi-conscious * أهم اشي فقط أشوف المريض اذا

include a description of the patient's level of consciousness using the APVU or Glasgow Coma Scale (GCS) score,

* assessments of pupillary size,equality and reactivity

* gross motor function and sensation ,the level of sensation if a spinal cord injury is present

AVPU evaluation : Base on patient's best response :

A. Alert and responsive

V. Response to Vocal stimuli

P. Response to painful stimuli

U. Unresponsive

E :Exposure and environmental control

*Be certain that the trauma patient is completely undressed and that his or her entire body is examined for any sign of injury .

*Regions often neglected include :

- the scalp" posterior scalp"
- the gluteal fold, axilary folds, perineum,
- abdominal folds in obese patients.

Penetrating wounds may be present anywhere

* While maintaining spine precautions examine the patient's back.

ADJUNCTS TO PRIMARY SURVEY

* Pulsoxymeter, cardiac monitors, BP monitor,
* ECG
* Xrays:

Cspine, CXR, pelvis

* Trauma blood work
* ABG

Quick medical history (AMPLE)

Allergy
Medication
Past Medical History (health problems, previous surgery)
Last food and drink
Events leading up to the situation

SECONDARY SURVEY half to 1 hour

***The secondary survey aims to detect and treat any other trauma injuries**

the secondary survey should not be started until the primary survey is complete.

*** It is a head-to-toe examination**

Specialized diagnostic tests are performed when indicated

These tests include, extremity radiography, ultrasonography CT scanning

Top-to-Toe

Head

*Observe and palpate skull (anterior and posterior) for signs of trauma

deformity, Wounds – bruising/bleeding , lacerations)

Panda eyes/Battle's sign

*Check the face for deformity

* Check eyes for: equality and responsiveness of pupils, movement and size of pupils foreign bodies, discoloration, contact lenses, prosthetic eye

* Check nose and ears for bleeding, CSF leaks

Neck

look for any Swelling or Wounds

· jugular venous distention, use of neck muscles for respiration, tracheal shift

cervical spine

Bruise,swelling, tenderness, wound

Cont.Top-to-Toe

Chest

- Symmetrical expansion, Paradoxical movement
- Wounds/bruising
- Deformity

Resp.rate and depth

Tenderness

- Breath sounds,

Abdomen

- Bruising/wounds
- Distension
- Tenderness
- Rigidity/guarding

Bowel sounds

Pelvis/Genito-urinary:

- deformity, Bruise :scrotal or perineal

bleeding per urethra

* urethral injury or bruises.

foley cath

Cont.Top-to-Toe

Back

- Wounds/bruising or swelling
- Tenderness

Arms and Legs

- Wounds
- Deformity
- Tenderness
- Movement
- Pulses
- Sensation

Archive

*** Wrong about thoracic trauma :-**

a. Chest tube indicated in all traumatic pneumothorax

*** The primary survey in trauma:**

Select one:

a. Aims to identify all injuries

b. Should be completed before instituting any treatment

c. It should not take more than ten minutes

d. Should be performed only once

e. may Includes AP X-rays of the c-spine, chest and pelvis

*** Spine immobilization is indicated in prehospital trauma patient who has sustained an injury from a mechanism having the potential to cause a spine injury and who has at least one of the following excep**

a) altered mental status

b) evidence of intoxication

c) a distracting painful injury "such as a long extremity fracture" d) neurologic deficits

e) spine pain-free or tenderness on palpation