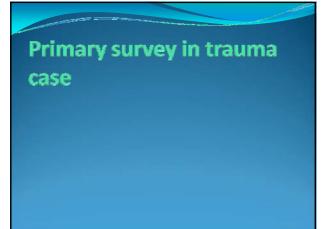


#### **DISCUSSION**

- 1.Trauma case Primary survey ABCD
- 2.Shock
- 3.Blunt injury and myocardial rupture



# Primary survey of trauma case

- Airway maintence with cervical spine protection
- Breathing and ventilation
- Circulation with hemorrhage control
- Disability(Neurologic evaluation
- Exposure/Environmental control

## Chest injury primary survey

- Primary
- > Airway
- ➤ Breathing:

Tension pneumothorax

Open pneumothorax

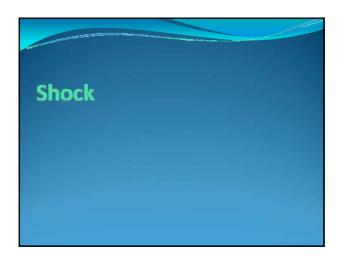
Flail chest and pulmonary contusion

Massive hemothorax

➤ Circulation:

Massive hemothorax

Cardiac tamponade

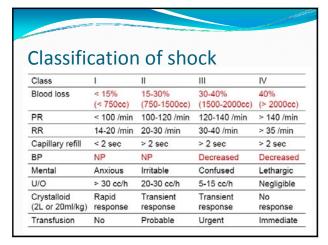


#### **Definition of shock**

- Inadequate Tissue Perfusion →Global Tissue Hypoxia
- Evaluation
  - Mean BP < 60mmHg or SBP < 90 mmHg
  - Altered mental status
  - Oliguria (< 30 cc/hr)
  - Lactic acidosis

## Shock signs---compensatory

- 1.Tachycardia
- 2. Vasoconstriction
- 3. ↓ cardiac output
- 4.Narrow pulse pressure
- 5. ↓ MAP
- 6. ↓ Blood flow



Shock D.D.

Hypovolemic
Traumatic
Cardiogenic
Intrinsic
Compressive

Septic
Hyperdynamic
Hypodynamic
Neurogenic
Hypoadrenal

Blunt injury and myocardial rupture

# Epidemiology

- High-speed motor vehicle crashes---most
- 15% of fatal thoracic injuries
- 0.5~2% of blunt chest trauma
- Most common cause of death in cases of nonpenetrating cardiac injuries
- 1/3 multiple chambers, 1/4 with ascending aortic rupture
- 20 % of patients survived 30 minutes or more---enough to OR!
- Incidence of chambers rupture---RV=LV>>RA>LA

## Pathophysiology

- Chamber distended(during closure of outflow track)
- shearing force, intracardiac pressure ↑, compression of the heart, fr. Rib fr. Sternum, myocardial contussion
- >70% of survivors with major associated injuries
- Integrity of the pericardium---exsanguination or hemopericardium, pericardial tamponade

#### Clinical features

- Most common---cardiac tamponade(intact pericardial sac)
- Rarely---large hemothorax (due to pericardial tear)

### Clinical features

 Review of survivors of myocardial rupture: hypotension(100%),CVP ↑ (95%), tachycardia(89%), distendedneck veins(80%), cyanosis of head, neck, arms, and upper chest(76%), unresponsiceness(74%), distant heart soune(61%), associated chest injuries(50%)

### Suggestive of pericardial rupture

- 1. **Hypotension** disproportionate to the suspected injury
- 2. Hypotension unresponsive to rapid fluid resuscitation
- 3. Massive hemothorax unresponsive to thoracostomy and fluid resuscitation
- 4. Persistent metabolic acidosis
- Elevation of CVP and neck veins with continuing hypotension despite fluid resuscitation

# Diagnostic strategies

- CVF
- · Cardiac ultrasonography
- If <u>shock</u> with <u>CVP</u>↑ in Patient with blunt chest trauma--immediately suggest <u>pericardial tamponade</u>
- Other considerations--- tension pneumothorax, RV myocardial contusion, SVC obstruction, tricuspid valve ruptured, preexisting pulmonary disease.

## Diagnostic strategies

- Sono visualization of pericardial effusion--emergent OP(cardiac sono should be performed if pericardial tamponade or vavular rupture is suspected
- CXR---usually no help
- ECG changes---often nonspecific

## Management

- Pre hospital---patient with sustained blunt chest trauma---pay attention to signs of pericardial tamponade or tension pneumothorax
- In the ED---decompression of cardiac tamponade and control of hemorrhage(quick to OR)
- ED emergency thoracotomy and pericardiotomy--- if vital signs rapid deteriorating

## **Prognosis**

- Ventricular rupture only few survivors
- Atrial rupture more survivors
- Most undergo surgical within 3~ 4 hours of injury.

### Reference

- Rosen P.396~P.397
- ATLS 2009
- UpToDate

