TRAUMA CASE CONFERENCE

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DISCUSSION

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

Primary survey in trauma case

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

Shock

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

Classification of shock

Class	I	II	III	IV
Blood loss	< 15% (< 750cc)	15-30% (750-1500cc)	30-40% (1500-2000cc)	40% (> 2000cc)
PR	< 100 /min	100-120 /min	120-140 /min	> 140 /min
RR	14-20 /min	20-30 /min	30-40 /min	> 35 /min
Capillary refill	< 2 sec	> 2 sec	> 2 sec	> 2 sec
BP	NP	NP	Decreased	Decreased
Mental	Anxious	Irritable	Confused	Lethargic
U/O	> 30 cc/h	20-30 cc/h	5-15 cc/h	Negligible
Crystalloid (2L or 20ml/kg)	Rapid response	Transient response	Transient response	No response
Transfusion	No	Probable	Urgent	Immediate

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**
5. **Elevation of CVP** and neck veins with continuing hypotension despite fluid resuscitation

Diagnostic strategies

- CVP
- Cardiac ultrasonography
- If **shock** with **CVP ↑** in Patient with blunt chest trauma---immediately suggest **pericardial tamponade**
- 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

THANKS FOR YOUR ATTENTION