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Deaconess REGIONAL TRAUMA CENTER

Penetrating Chest Injury

Purpose: To define guidelines for the management of penetrating injuries to the chest. To define an optimal diagnostic strategy and appropriate treatment plan for suspected injuries.

Definitions:

A. Penetrating injury to the chest is any penetrating injury to the thorax in an area bounded superiorly by the lower neck and inferiorly by the lower costal margin

B. Signs of life include presence of blood pressure, cardiac electrical activity, and respiratory effort.

C. Aggressive fluid resuscitation includes 2 units of packed red blood cells and 1-2 liters of LR

Guidelines:

A. Assess and resuscitate per ATLS protocol

B. If patient has suffered cardiac arrest, proceed directly to left anterior thoracotomy while the patient is being intubated and large bore intravenous lines are being inserted

C. Recommendations for Emergency Room Thoracotomy for penetrating thoracic injuries
   a. Patients presenting pulseless with signs of life after penetrating thoracic injury
   b. Suffer cardiac arrest after arrival to trauma bay

D. In the non-arrested patient, determine whether the patient is hemodynamically stable and whether the patient has respiratory distress
   a. If the patient is hemodynamically unstable or has respiratory distress, consider
      i. Tension pneumothorax
         1. Insert a chest tube
            a. Consider needle thoracostomy to temporize and convert tension to open pneumothorax

ii. Massive hemothorax
    1. Insert chest tube
    2. Take immediately to OR if
        a. Hemodynamically unstable
        b. Initial drainage > 1500ml, or
        c. Drainage continues at >200ml/hr for -3 hours
    3. Consider massive transfusion/TXA
iii. Cardiac tamponade
    1. Perform FAST exam
    2. Perform needle pericardiocentesis or pericardial window if FAST exam positive
    3. Go immediately to OR for thoracotomy or median sternotomy if needle pericardiocentesis or open subxiphoid pericardiocentesis positive for blood

b. If the patient is stable and has little respiratory distress, obtain AP supine chest x-ray
    i. Mark the entry and exit sites with radiopaque markers

E. If the wound is below the nipples, consider abdominal surgery

F. If the injury is in Zone 1 of the neck (clavicle to inferior border of the cricoid), consider angiogram, bronchoscopy and esophagoscopy or exploration
    a. See Penetrating Neck Injury guideline

G. If the injury is between the nipples and between the suprasternal notch and xiphoid, consider the possibility of cardiac injury with occult cardiac tamponade

H. If all x-rays are normal and there is no firm indication that the pleural space or mediastinum was penetrated, consider further imaging with CT

References:

- Advanced Trauma Life Support, American College of Surgeons, 10th Edition
- Deaconess Trauma Guideline Penetrating Abdominal Injuries
- Seamon, Mark, Haut, Elliott, MD, PhD, Van Arendonk, Kyle, Barbosa, Ronald,Chiu, William, et al. (2015). An evidence-based approach to patient selection for emergency department thoracotomy: A practice management guideline from the Eastern Association for the Surgery of Trauma. Journal of Trauma and Acute Care Surgery, 79, 159-173. Https://doe.org/10.1097/TA.0000000000000648