Emergent Thoracotomy

ie “Cracking the Chest”
Anatomy, Indications and Techniques

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A 30 year old man is brought into the ED following a gunshot wound to the left chest. He had signs of life at the scene of the shooting but is now without vital signs. The above procedure is performed. Diagnosis and treatment?
Emergency Department
Thoracotomy Indications

• Control of Intrathoracic Hemorrhage
• Cardiac Tamponade that cannot be decompressed via needle pericardiocentesis
• Cross-clamping of aorta to control distal abdominal and lower limb exsanguination
• Performance of Internal Cardiac Massage and Defibrilation
• As a temporizing procedure en route to OR

• Contraindications
  • Blunt trauma without signs of life at scene or in transit
  • Obvious intracranial trauma
Epidemiology

- Very dangerous procedure, rarely works

- Indicated for select patients with *signs of life at scene of accident* who lose vitals en route to ED or in ED

- Survival is dismal
  - 2.5% survival if signs of life at scene/4% if signs of life upon ED arrival
  - Thoracic Gunshot wounds 4% survival
  - Thoracic Penetrating/Stab Wounds 15% survival overall but 29% survival if for control of cardiac tamponade
  - Better survival among abdominal GSW (16%) and stab wounds (23%)
• Note-The performance of this procedure is on a cadaver to demonstrate relevant anatomy. Certain necessary steps have been left out to preserve clarity. Where possible there will be slides of live-procedures and anatomic illustrations.
Identify Fifth Intercostal Space
Make a single large incision from the sternum to the posterior axillary line. Incise through skin, fat and intercostal musculature.
Insert Finochietto’s Chest Retractors. Take care not to damage underlying lung tissue.
Open Rib Spreaders for Maximal Exposure.

Cadaver with incised pericardium

Live Patient
Identify Pericardium and grip with Allis Clamps or Hemostats. Using Metzelauba Scissors Incise Pericardium Anteriorly in a Vertical manner, taking care to avoid the Phrenic Nerve, which runs longitudinally along the pericardium.
“Deliver” heart out of pericardium.
Manually control cardiac wounds.
May utilize fingers or foley catheters to tamponade bleeders.
Suture bleeding cardiac tissue.
If distal control needed cross-clamp aorta with DeBakey Tangential Occlusion Clamp.
Deliver manual cardiac compressions and cardiac defibrillation if needed.