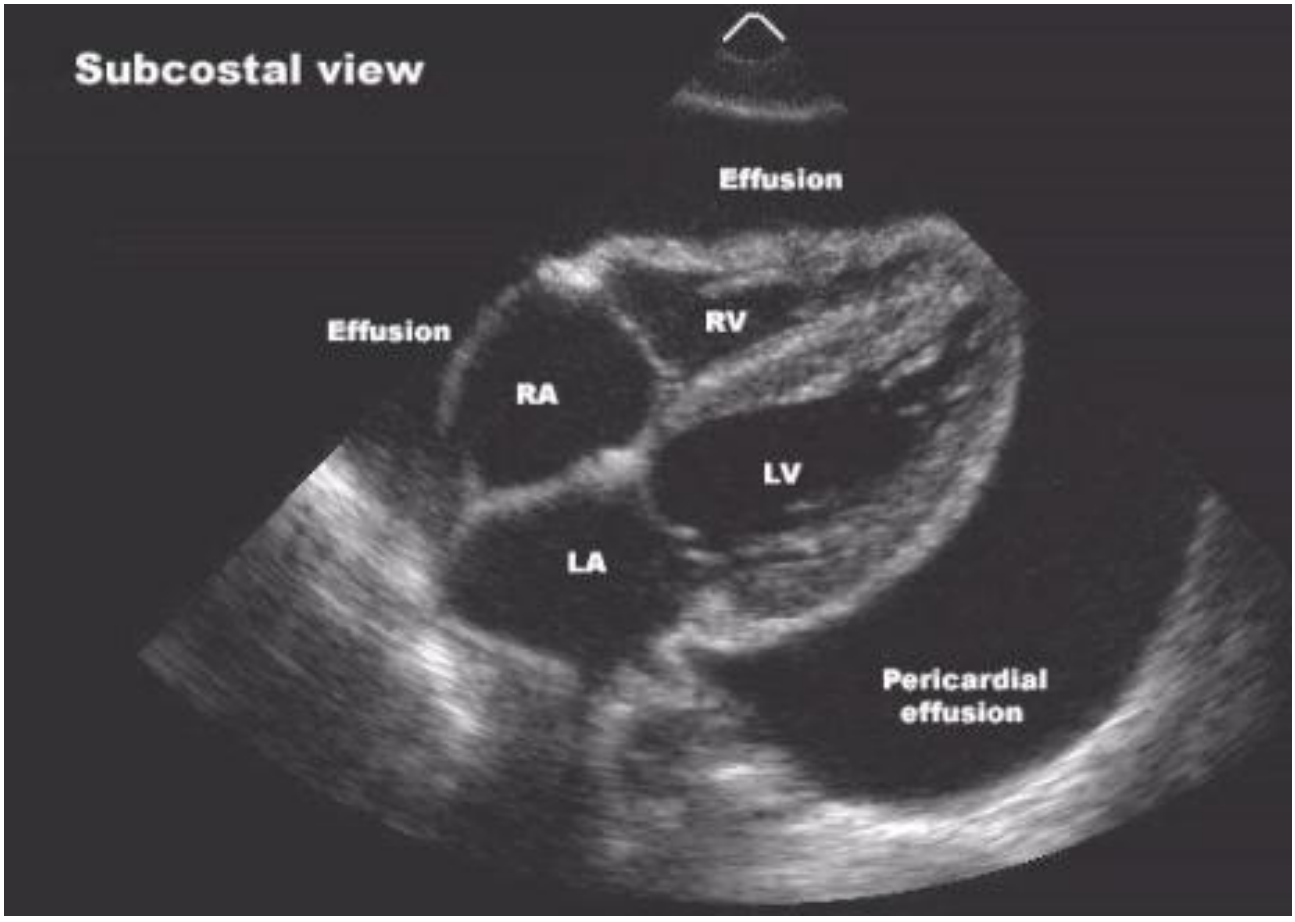
ED QUICK QUIZ
WHAT IS THE DIAGNOSIS?

BACKGROUND

A 28 year old male attended the Emergency department via standby following a dosemtic dispute at home were he received a single left sided chest wound from a kitchen knife. On presentation the patient is agitated and arguing with the ambulance crew. His observations are : T 36 ^{o}C, HR 136 bpm, BP 83/42 mmHg, RR 30, SaO_2 93% on 15L of O_2. When you assess him his GCS has dropped to 9/15 (E 4 V: 2 M: 3).

Initial Venous Gas on 100% O_2 shows : H^+ = 140, pCO_2 = 7, Lac = 13.0, HCO_3^+ = 12

After gaining vascular access your patient arrests with no cardiac output though normal electrical activity on ECG. A Fast Scan reveals:



QUESTIONS

1. What is the cause of current presentation?
2. What are the next steps in evaluation and treatment?

3. How would you perform this procedure?

ANSWERS & DISCUSSION

1. Cardiac tamponade secondary to a penetrating thoracic injury.

2. An emergency thoracotomy would be required to relieve pressure secondary to cardiac tamponade and allow restoration of circulation. The indications for performing emergency thoractomy are controversial with low survival rates, as 9-12% of patients survive post emergency thoractomy when presenting with a penetrating trauma. Increased survival rates are associated with stab wounds having a higher rate of survival than gunshot wounds and thoracic injuries have a higher survival rate than arrest post abdominal trauma. An emergency thoracotomy can be performed to achieve haemorrhage control, release cardiac tamponade, allow internal/open cardiac massage, treatment of air embolus, and cross-clamping of the descending thoracic aorta. Accepted indications for emergency thoracotomy are penetrating thoracic injury with previously witnessed cardiac activity and/or unresponsive hypotension despite appropriate fluid resuscitation, blunt thoracic injury with rapid exsanguination from a chest tube (> 1500 mL). Relative indications for emergency thoracotomy are: penetrating thoracic injury with a traumatic arrest, penetrating non-thoracic injury with traumatic arrest, and blunt thoracic trauma with traumatic arrest. Contraindications for emergency thoracotomy are: blunt injury without witnessed cardiac activity (pre-hospital), penetrating abdominal trauma without witnessed cardiac activity, non-traumatic cardiac arrest, severe head injury, severe multi-system injuries, untrained staff, and inappropriate/inadequate equipment.

3. Stepwise approach to clamshell emergency thoracotamy:
   A) Position the patient in the supine position
   B) Using a scalpel and blunt forceps make bilateral 4 cm thoracostomies (breaching the intercostal muscles and parietal pleura) in the 5th intercostal space in the mid-axillary line—the same technique and landmarks as for conventional chest drains.
   C) Connect the two thoracostomies with a deep skin incision along the 5th intercostal space
   D) Insert two fingers into a thoracostomy displace the lung while cutting through all layers of the intercostal muscles and pleura towards the sternum using heavy scissors. Perform this on left and right sides leaving only a sternal bridge between the two anterolateral thoracotomies.
   E) Cut through the sternum or xiphoid using the heavy scissors
   F) Open the “clam shell” using one or two large self retaining retractors/rib spreaders from a full thoracotomy set. The retractor should be opened to its full extent to provide adequate exposure of the chest cavity with access to all areas.
   G) Lift (“tent”) the pericardium with clamp/forceps and make a large midline

longitudinal incision using scissors. This approach minimises the risk of damage to the phrenic nerves.