Emergency Pericardiocentesis

Indications

Cardiac tamponade is the emergent indication, as it may lead to cardiac arrest with PEA

-Signs and symptoms
  -Beck’s Triad: Classic case, but rarely will a patient present with all three
    -Jugular venous distension
    -Muffled/distant heart sounds
    -Hypotension
  -Respiratory distress (dyspnea is the most common presenting symptom)
  -Pericardial friction rub, pulsus paradoxus, Kussmaul’s sign
  -ECG findings: Low voltage QRS complex or electrical alternans
  -CXR findings: Enlarged cardiac silhouette
  -Ultrasound findings: Primary finding is pericardial fluid with diastolic RA or RV collapse

-Etiology: Effusion fluid, blood, purulence, gas
  -Oncology patients, specifically metastatic cancer and mediastinal radiation
  -Recent cardiac surgery
  -Trauma
  -Pericarditis (viral, bacterial, uremia, TB)
  -CHF, recent MI (Dressler’s syndrome)
  -Collagen vascular disease

Contraindications

-Stable patient with normal vital signs and a pericardial effusion (medical management)
-Traumatic pericardial effusion and unstable vitals (thoracotomy likely indicated)
-Myocardial rupture and aortic dissection (surgery likely indicated)
-Severe bleeding disorder (relative contraindication)

Equipment

-Universal precautions, sterile technique, hemodynamic monitoring, code cart
-Ultrasound machine with sterile probe cover for ultrasound guidance
-If unavailable, consider ECG guidance (alligator clamp between needle and V1)
-Spinal needle, >20ml syringe, three-way stopcock, tubing
-Consider a pericardiocentesis kit if available (guidewire, catheter, etc.)

Procedure

-Positioning: HOB 30-45 degrees if tolerable to patient, but supine is acceptable
-Palpate xiphoid process, sterilize field, local anesthetic if appropriate
-Subxiphoid, parasternal and apical approaches with direct ultrasound guidance
  -Aim needle towards largest effusion pocket, remove as much fluid as possible
  -Consider confirming placement with the activated saline technique by injecting agitated saline
-Blind approach by inserting needle at 45 degrees from skin between xiphoid process and left costal margin, aiming towards left shoulder (much higher complication rate)

Aftercare

-Ultrasound to monitor success and reaccumulation
-CXR to assess for pleural effusion or pneumothorax
-Consider Cardiology consult, as patient may need catheter placement for continuous drainage

Complications

-Death, cardiac dysrhythmias, cardiac puncture, pneumothorax, and coronary-vessel injury.
-Peritoneal puncture, liver or stomach injury, diaphragmatic injury (subxiphoid approach)
-Puncture of the internal thoracic artery (parasternal approach)