Basic Emergency Echocardiography

Introductory Emergency Ultrasound Course

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Basic Emergency Echocardiography

- Arrest / Peri-Arrest Scenario
- Subxiphoid Views
- PEA: Electrical Activity vs Mechanical Activity
- VF / Asytole
- Pericardial Effusion & Tamponade
View

Subxiphoid
View

Subxiphoid

Liver
RV
RA
LV
LA
Cardiac Arrest
Cardiac Arrest

- Assessment of LV activity in Cardiac Arrest
- Electrical Activity vs Mechanical Activity
- Assess for LV Activity
- Is there Ventricular Activity or Cardiac Standstill
Cardiac Arrest

Prognostic Implications:

Blaivas & Fox (Acad Emerg Med 2001)

❖ 169 patients presenting to ED with on-going cardiopulmonary resuscitation

❖ 136 patients had cardiac standstill on initial echocardiographic assessment

❖ None of the patients with cardiac standstill on initial echocardiographic study survived to leave the ED regardless of electrical activity
Cardiac Arrest

Prognostic Implications:

Salen et al (Acad Emerg Med 2001)

- 102 cardiac arrest patients

- 41 patients with identifiable electrical activity of which 11 (27%) survived to discharge (8 PEA, 2 VT, 1VF)

- 61 patients with cardiac standstill on initial presentation, none of whom survived to discharge
Cardiac Arrest

- Cardiac Standstill on initial presenting echocardiographic assessment has important prognostic implications.

- Survival to discharge is not associated with cardiac standstill in this setting.

- Evidence of cardiac standstill should be an important factor in the decision to terminate resuscitative measures.
Cardiac Standstill
Cardiac Arrest

- VF vs Asystole

- Echocardiography can be used to identify fibrillating ventricle
Pericardial Effusion & Tamponade
Pericardial Effusion & Tamponade

- Pericardial or Pleural?

- Size & Distribution

- **Remember:** The risk of tamponade is more a function of the rate of accumulation than total volume

- Is there evidence of tamponade?
  Diastolic RV Collapse

- **Remember:** Cardiac tamponade is a clinical diagnosis
Can emergency physicians detect pericardial effusions?


- 515 patients at ‘high risk’ for pericardial effusion were enrolled, 103 of whom had pericardial effusions

- EPs detected pericardial effusions with an overall sensitivity of 96%, specificity of 98%, and accuracy of 97%
Pericardial Effusion & Tamponade

Can emergency physicians assess for tamponade?

- Echocardiographic diagnosis of tamponade is more difficult and controversial

- Most frequently used echocardiographic finding to support a diagnosis of tamponade is collapse of the right heart chambers during mid-to-late diastole

- However a number of studies have questioned both the sensitivity and specificity of this echocardiographic sign

Levine MJ et al: J Am Coll Cardiol 1991
Pericardial Effusion & Tamponade

SUMMARY

- Pericardial Tamponade is a clinical diagnosis in a patient with a known Pericardial Effusion
Questions?