Utility of Echocardiography in Diagnosis of Acute MI


Key Points:
- Although data on this subject are somewhat inconsistent, the absence of regional wall motion abnormalities on echocardiogram seems to have an excellent NPV for cardiac ischemia
- Data on PPV is much more variable (not especially surprising, given the multitude of other possible causes of RWMAs)

- How many patients with acute myocardial infarction should be expected to have regional wall motion abnormalities on echo?
  → Pathophysiologically, you would expect 100% (see below graphic). In experimentally induced coronary occlusion, RWMAs appear within seconds, even prior to EKG changes.

- What is the utility of getting an echocardiogram in the ER to assess for regional wall motion abnormalities in patients with suspected cardiac ischemia?
  → In one study of 169 patients presenting to the ER with chest pain (Sabia et al), 88 had no RWMAs; only 2 of those had positive cardiac enzymes (designated NQWMI’s). 87 patients had RWMAs; of those, 31% were ultimately determined to have an MI.
    ▶ Other causes of RWMAs included prior MI, focal myocarditis, LBBB, WPW, cardiomyopathy, and RV volume overload.
    ▶ Of note, all the included echocardiograms were considered “technically adequate” (others were tossed out) and were interpreted by an experienced echocardiographer.
  → A recent review article in *Am J Cardiol* cited a PPV of 50% and NPV of 95% for RWMA in the evaluation of acute chest pain.
  → In a more recent study (Muscholl et al) of 132 consecutive patients presenting with CP to an ER with no known history of CAD and with a “non-specific ECG,” RWMA on echo as a test was compared to typical history for angina, positive cardiac enzymes, or ECG changes. Outcome was rate of adverse cardiac outcome, MI, or death. PPV of RWMA was 93%, NPV 96%.
    ▶ Why the difference in PPV in this study? Perhaps due to the high prevalence of CAD in the population; 45 patients out of 132 had a total of 60 cardiac events.