Stress Echocardiography: Interpretation Landmines

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Sources of Error

- Patient's fault
  - Respiratory interference
  - Delay in getting to the table
  - Obesity / lung interference
- Sonographer's fault
  - Ensuring appropriate ECG capture
  - Poorly educated patient
  - Off axis or non-equivalent views
  - Failure to use contrast appropriately

Sources of Error

- Interpreting physician's fault
  - Interpreting what's not there
    - Defaulting to abnormal when wall not seen
  - Failure to recognize non-ischemic abnormalities
    - LBBB, paced rhythm
    - Normal variants: early relaxation, tardokinesis
    - RV overload
    - Extrinsic compression
  - Threshold of WMA to call abnormal

Non Ischemic Wall Motion Abnormalities

- Anterior and septal
  - LBBB**
  - Post operative motion
  - Early relaxation*
  - RV overload
  - Constriction
- Inferior and posterior
  - Tardokinesis***
  - Posterior compression

- * Most prevalent / obvious at high heart rates and in mid – distal septum
- ** More dramatic with dobutamine
- *** Most common in proximal inferior wall

Napa 2011: Case #17a

- 43 YO female
- No cardiac risk factors
- Chest / neck pain after starting exercise program
  - Occurs only at “high heart rates”
  - Relieved immediately with rest

Napa 2011: Case #17a

- A. Normal / LBBB pattern
- B. LAD ischemia
- C. Posterior ischemia
- D. Multivessel ischemia
- E. Other

Napa 2011: Case #17a

- What next?
- A. Proceed to cath
- B. Coronary CTA
- C. Perfusion study
- D. Conservative management /
  - β-block
- E. Other

Napa 2011: Case #17a

- SPECT large LAD distribution reversible defect
- Cath re-re-re-reviewed – NORMAL
- Rx: β – blocker and long acting nitrates
- Asymptomatic at 3 month F/U

LBBB: Bottom Line

- LBBB motion abnormality should be accurately recognized
  - Confined to early systole
  - Thickening preserved
- May become more dramatic with stress
  - Chamber size decreases in absence of ischemia
- Some patients with LBBB do not know the rules
- Syndrome of “Painful LBBB”

Napa 2010 #17b

- 27 YO female graduate student
- Exercise induced chest pain and palpitations for 2 years, much worse in past 3 weeks
- FHx- father with MI age 47

Napa 2010 #17b

- Exercised 15 minutes on Bruce protocol without symptoms
- 2mm horizontal ST segment depression in inferior and lateral leads

Stress Echo

- A. Normal no CAD
- B. LAD ischemia
- C. Posterior ischemia
- D. Multivessel CAD
- E. Non-ischemic disease (not CAD)

Early Relaxation: Don't be Fooled

- Virtually always high heart rate has been attained (>160 / minute)
- Usually low to non-existent pre-test likelihood of disease
- Often in anatomically incorrect location
- Adjacent segments are hyperdynamic
  - ie no abnormal border zone

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Inferior and Posterior Wall Motion Abnormalities

- Biggest source of false positive stress echocardiograms
- Specificity higher if have >2 segments and frank dyskinesis / systolic thinning

Napa 2009 #13

- 38 yo female
- PMHx: atypical chest pain on a random basis
- FHx:
  - Father with fatal MI, age 47
  - sister age 40 with CAD, S/P PCI
- Stress: 13:00 to HR 174 without symptoms, 1.0 mm upsloping ST depression

Stress Echo

- A. Normal no CAD
- B. LAD ischemia
- C. Posterior ischemia
- D. Multivessel CAD
- E. Non-ischemic disease (not CAD)

Pitfalls: Conclusions

- Everyone has a role to play in avoiding false positives
- Consider probability of underlying disease
  - If CAD likelihood low, and abnormality atypical, think again
- Pay attention to overall function and LV size