Dyspnea and chest pain when exercising

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Clinical history

- Male 63 y.o., hypertension.
- Dyspnea and chest pain when exercising, progressive.
- Normal rest ECG.
- Stress echo: poor acoustic window, technically suboptimal.
- Myocardial perfusion study with exercise ($^{99m}$Tc-sestamibi).
- Stress test: Chest pain, mild ECG changes, drop in SBP.
Myocardial perfusion study
The perfusion result is consistent with:

a) Congenital heart disease.
b) Motion artifact at stress.
c) Right ventricular ischemia.
d) CAD – multiple vessel disease.
The perfusion result is consistent with:

a) Congenital heart disease.

b) Motion artifact at stress.

c) Right ventricular ischemia.

d) \textit{CAD – multiple vessel disease.}

- There are several reversible perfusion defects involving - at least - septal, apical, anterolateral and inferior walls.

- Other important prognostic information is also derived from the study.
Quantitative data / regional wall motion results
How would you risk-stratify the patient based on these results?

a) High risk for cardiac events.

b) Moderate risk for cardiac events.

c) Low risk for cardiac events.

d) Not enough data for risk stratification.
How would you risk-stratify the patient based on these results?

a) High risk for cardiac events (see next slide).
b) Moderate risk for cardiac events.
c) Low risk for cardiac events.
d) Not enough data for risk stratification.

- Extensive ischemia, SDS>8 \(\text{(red circle + arrow)}\).
- Transient LV dilation \(\text{(yellow squares)}\).
- Drop in post-stress LVEF \(\text{(blue circles)}\).
- Worsening wall motion abnormalities \(\text{(green arrows)}\).
Quantitative data / regional wall motion results
Additional finding:
Right ventricular (RV) uptake post-stress

[Images of cardiac scans showing stress and rest conditions]
Transient post-stress RV uptake can be related to:

a) Hypertrophic cardiomyopathy.
b) Idiopathic pulmonary hypertension.
c) Extensive LV ischemia.
d) Chronic or acute pulmonary embolism.
Transient post-stress RV uptake can be related to:

a) Hypertrophic cardiomyopathy.
b) Idiopathic pulmonary hypertension.
c) *Extensive LV ischemia.*
d) Chronic or acute pulmonary embolism.

- a, b & d could also be associated with increased RV uptake but it would be fixed, i.e. observed both at rest and post-stress.
Follow-up

- The patient was hospitalized after the test and underwent cardiac catheterization.

- Findings: Severe stenosis of left main, 70% mid LAD, 90% distal Cx, 70% proximal and distal RCA.

- The patient had CABG with multiple by-pass grafts to the 3 major arteries.

- At 6 months he was almost totally asymptomatic.
Teaching points

- Post-stress increased RV uptake has prognostic implications and can reflect RV pressure overload due to postischemic LV dysfunction.

- Post-stress increased RV activity can be also an indicator of stress-induced RV:LV perfusion imbalance associated with severe CAD (e.g., high-grade left main stenosis with less severe proximal right CAD stenosis).

- The amount of inducible ischemia, transient dilation of the LV, LVEF post-stress & rest, and reversible regional wall motion abnormalities are other major indicators of poor prognosis (predictive parameters of cardiac events).
Bibliography


