Typical chest pain with normal ECG

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Clinical history

- Male 41 y.o.
- Overweight, hypertension, high cholesterol, stress.
- Typical chest pain.
- Echocardiogram: mild LVH, normal LV function.
- Exercise test: chest pain with no ECG changes
- Myocardial perfusion study (MPS) with exercise.
2-D echocardiogram

- Mild concentric LVH, normal systolic function, LA dilation, normal valves.
Myocardial perfusion study
The study demonstrates:

a) Ischemia in the RCA territory.
b) Ischemia in the LCx territory.
c) Ischemia in the LAD territory.
d) Ischemia in the RCA + LAD territories.
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a) Ischemia in the RCA territory.
b) Ischemia in the LCx territory.
c)** Ischemia in the LAD territory.**
d) Ischemia in the RCA + LAD territories.

- There is a severe, extensive, reversible anteroseptal perfusion defect which is characteristic of ischemia affecting the LAD territory.
- From the study viewpoint, this is consistent with single-vessel disease (segments 1, 2, 7, 8, 13, 14, 17).
Vascular territories (17-segment LV model)
The stress perfusion score (SSS) in this case indicates:

a) Normal perfusion.
b) Mildly abnormal perfusion.
c) Moderately abnormal perfusion.
d) Severely abnormal perfusion.
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a) Normal perfusion.

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c) Moderately abnormal perfusion.

d) Severely abnormal perfusion (18).

SSS

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\begin{align*}
<4 & = \text{Normal} \\
4-8 & = \text{Mildly abnormal} \\
9-13 & = \text{Moderately abnormal} \\
>13 & = \text{Severely abnormal}
\end{align*}
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The LV function parameters indicate:

a) Possible myocardial scarring/fibrosis.
b) Possible myocardial stunning.
c) Possible hibernated myocardium.
d) Possible dilated cardiomyopathy.
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a) Possible myocardial scarring/fibrosis.

b) **Possible myocardial stunning.**

c) Possible hibernated myocardium.

d) Possible dilated cardiomyopathy.

- There is a drop in post-stress LVEF (67% rest vs. 52% post-stress) and development of regional hypokinesia in wall motion analysis (WMA).

- Both are typical findings of post-ischemic regional ventricular dysfunction or **myocardial stunning**.
Contrast ventriculography

Normal ventricular function
Coronary angiography

LAD stenosis (>90%, arrow)
Normal LCx

Normal RCA
PTCA procedure

Pre-procedure  Balloon inflation  Post-procedure
Follow-up

- 4 months after successful PTCA, the patient is asymptomatic and controlling risk factors with medication and life-style modifications.
- Exercise test with no symptoms and normal ECG (below).
Teaching points

• In patients with no known coronary artery disease and at overall low-to-intermediate risk, myocardial perfusion SPECT adds prognostic information and risk-stratifies patients beyond clinical and exercise data.

• Semiquantitative information obtained by gated SPECT provides important measurements of disease extent and severity.

• Perfusion scores are useful tools in clinical decision making and have been shown to have independent risk-stratification value.

• Post-ischemic stunning, as assessed by gated SPECT, is a marker for poor prognosis, particularly for ischemic cardiac events.

• Patients with high risk results should be managed aggressively - with revascularization procedures if possible.

