Typical chest pain with intermittent LBBB

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Clinical history

- Woman 65 y.o.
- No coronary risk factors.
- Typical chest pain.
- Normal rest ECG.
- Exercise test: intermittent left bundle branch block (LBBB).
- Exercise MPI ($^{99m}$Tc-MIBI): Frequency-dependent LBBB.
Rest ECG

Exercise ECG
Myocardial perfusion study
The perfusion result is consistent with:

a) Anteroseptal defect - due to LBBB.
b) Anteroseptal myocardial ischemia.
c) a or b can be true.
d) Myocardial infarction + technical artifact.
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- There is a relatively large, mostly reversible defect (SDS=5) involving the anteroseptal and apical regions.

- In the clinical context, this is probably due to the presence of LBBB, although myocardial ischemia cannot be ruled out.
Quantitation of perfusion and function
The quantitative results indicate:

a) Normal LV function at stress and rest.
b) Both LVEF below normal due to LBBB.
c) Post-ischemic myocardial stunning.
d) Depressed LV function due to myocardial scar.
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- Left ventricular asynchronic contraction due to LBBB can affect systolic function.

- In this case, there is a mild decrease in LVEF both at post-stress and rest, with no evidence of myocardial scar.
The optimal stress test for MPI in patients with LBBB is:

a) Exercise.
b) Dipyridamole/adenosine.
c) Dobutamine.
d) Combined exercise/pharmacologic.
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- Vasodilators are the stressors of choice in patients with LBBB because heart rate usually does not change significantly, limiting the appearance of septal defect which is more evident at high heart rates even if the conduction disturbance is permanent. These should have been used in this case.
• Since the patient persisted with chest pain and the test results were inconclusive, she underwent cardiac catheterization.

• Coronary arteries were normal.

• The patient further developed heart failure and is currently under medical treatment.
Teaching points

• Approximately 1/3 of patients with heart failure (HF) present with conduction disturbances, most commonly (in about 25% of HF patients) as a LBBB pattern.

• This percentage is significantly higher than the estimated (1.5%) prevalence of LBBB in the general population.

• LBBB can be permanent or, more rarely, related to heart rate - that is, appearing above a frequency threshold.

• Many patients with intermittent LBBB develop a permanent conduction disturbance in the long term.
Teaching points

• Repolarization changes are common in patients with LBBB, thus interfering with interpretation of stress tests.

• Non-invasive imaging is indicated to depict ischemia in symptomatic patients with non-diagnostic ECG.

• LBBB is commonly associated with perfusion defects at the anteroseptal and apical walls.

• Frequency-dependend LBBB can cause “reversible” defects mimicking an ischemic pattern.

