Atypical pain with positive CTA and normal myocardial perfusion

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Clinical history

- Woman 51 y.o.
- Heavy family history of CAD, no other known risk factors.
- Episodes of atypical chest discomfort.
- Positive exercise test.
- Submitted for CT angiography (CTA), reported as:
  - Severe proximal LAD stenosis.
  - No other lesions.
  - Ca score >1000.
64-slice CT angiography

LAD lesion (arrow)

3D rendering
• Since Ca score was high, a myocardial perfusion study was indicated using $^{99m}$Tc-MIBI with exercise test.
• Patient achieved 101% of maximum predicted heart rate.
• She remained asymptomatic.
• There was a 1 mm ST segment depression.

*(see following slide for stress ECG)*
Myocardial perfusion study
The perfusion result is consistent with:

a) Small inferior myocardial infarction.
b) Mild anterior myocardial ischemia.
c) Normal.
d) Myocardial infarction + technical artifact.
The perfusion result is consistent with:

a) Small inferior myocardial infarction.
b) Mild anterior myocardial ischemia.
c) Normal.
d) Myocardial infarction + technical artifact.

- The technical quality of the study is adequate.
- No perfusion defects are observed.
What would you do now?

a) Send patient home with medication.
b) Send patient to the cath lab.
c) Indicate stress echocardiography.
d) Hospitalize patient in the coronary care unit.
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• Despite a normal perfusion study, due to CTA findings and a positive stress test in a symptomatic patient, coronary angiography is the most logical option.
Angiographic findings
Coronary angiography shows:

a) Normal coronary arteries.
b) Multivessel disease.
c) Moderate Cx stenosis.
d) Minimal LAD stenosis.
Coronary angiography shows:

a) Normal coronary arteries.
b) Multivessel disease.
c) Moderate Cx stenosis.
d) *Minimal LAD stenosis.*

*(see next slide)*
• Mild stenosis (~30%) in proximal LAD can be seen, with otherwise unremarkable findings.
Incomplete visualization of coronary tree with 64-slice CTA vs. Ca score

Cheng et al., AHA abstract, Nov 2006
CTA is sensitive for detecting CAD, however the technique has limited value in predicting the degree of stenosis.

Especially in the presence of arterial calcifications, it is sometimes difficult to assess the characteristics of a coronary lesion by CTA.

Calcium score >300 is associated with poor accuracy of CTA results (incomplete evaluation of coronary tree).

Myocardial perfusion has powerful prognostic value and is not affected by calcium score.
Bibliography


• Li JM, Li T, Shi RF, Zhang LR. Comparative analysis between SPECT myocardial perfusion imaging and CT coronary angiography for diagnosis of coronary artery disease. Int J Mol Imaging 2012; 2012:253475.