Pre- and post- PTCA gated SPECT findings

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Clinical history

- Male, 50 y.o.
- Dyslipidemia.
- Abnormal rest ECG (repolarization changes).
- Asymptomatic.
- MPS performed because of atypical angina.
- Exercise/rest, 2-day protocol, 99mTc-MIBI.
Exercise test

• The patient achieved 85% of maximum predicted heart rate, remaining asymptomatic.
• An ST segment depression of 2 mm was registered.
Myocardial perfusion study #1

stress
rest
stress
rest
stress
rest
stress
rest
Myocardial perfusion study #1

Study: SPECT MIOCARDICO
Dataset: STRESS Sincronizadas [Recon]
Date: 2008-09-30 14:33:57
Volume: 60ml [5]
EDV: 123ml [14]
ESV: 60ml [5]
EF: 52%
Area: 125cm² [5]
Eccentricity: 0.89 [5]

Study: SPECT MIOCARDICO
Dataset: REST Sincronizadas [Recon]
Date: 2008-09-20 12:16:45
Volume: 50ml [4]
EDV: 100ml [14]
ESV: 30ml [4]
EF: 62%
Area: 100cm² [4]
Eccentricity: 0.80 [4]
The MPS result is consistent with:

a) Anteroseptal ischemia + TID(*)

b) Anterior wall infarction + TID.

c) TID, mild apical ischemia.

d) Normal study.

(*)TID = Transient Ischemic Dilation.
The MPS result is consistent with:

a) Anteroseptal ischemia + TID.

b) Anterior wall infarction + TID.

c) TID, mild apical ischemia.

d) Normal study.

- The images show mild apical perfusion defect, reversible (although perfusion scores = 0).
- Stress LV volume = 111 mL, rest LV volume 75 mL, TID ratio = 1.48.
- There is also a drop in ejection fraction (EF) from 62% at rest to 52% post-exercise.
Cardiac catheterization
Catheterization results show:

a) Normal coronary arteries.
b) Single-vessel disease.
c) Two-vessel disease.
d) Three-vessel disease.
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a) Normal coronary arteries.
b) Single-vessel disease.
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- There is significant stenosis at the proximal level of the three major coronary arteries: ADA, LCx and RCA (see following slide).
Cardiac catheterization

Left
- LAD
- LCx

Right
- RCA
Follow-up

- PTCA with stent was performed on ADA, with good angiographic results.
- Almost one year later, the patient experienced the onset of non-specific chest discomfort and was submitted for a new MPS.
- Exercise test was normal, no ECG changes or symptoms.
Myocardial perfusion study #2
Myocardial perfusion study #2
The new MPS result is consistent with:

a) Anteroseptal ischemia + TID.
b) Anterior wall infarction + TID.
c) TID, mild apical ischemia.
d) Normal study.
The new MPS result is consistent with:

a) Anteroseptal ischemia + TID.
b) Anterior wall infarction + TID.
c) TID, mild apical ischemia.

d) Normal study.

- The images show homogeneous distribution of the radiotracer, no perfusion defects.
- Stress LV volume = 77 mL, rest LV volume 89 mL, TID ratio = 0.87.
- Normal EF in both studies with no significant difference (67% vs. 68%).
### gSPECT #1 (sep/2008)

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### gSPECT #2 (oct/2009)

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TID ratio = 1.48

TID ratio = 0.87
gSPECT #1 (sep/2008)

- Study: SPECT MIOCARDICO
- Dataset: STRESS-Sincronizada
- Date: 2008-09-30 14:33:57
- Volume: 60ml [5]
- EDV: 123ml [14]
- ESV: 60ml [5]
- EF: 52%

gSPECT #2 (oct/2009)

- Study: SPECT MIOCARDICO
- Dataset: STRESS-Sincronizada
- Date: 2009-10-06 11:25:35
- Volume: 34ml [4]
- EDV: 107ml [14]
- ESV: 34ml [4]
- EF: 68%
Teaching points

• TID is usually found in patients with LAD ischemia or multivessel disease (MVD).

• TID – even in the absence of evident perfusion abnormalities – should raise the question of balanced myocardial ischemia, which is common in MVD.

• A drop in post-stress EF is another marker of severe CAD.

• After a successful revascularization procedure, most transient MPS abnormalities can resolve.
Bibliography

• Abidov A, Bax JJ, Hayes SW, et al. Transient ischemic dilation ratio of the left ventricle is a significant predictor of future cardiac events in patients with otherwise normal myocardial perfusion SPECT. J Am Coll Cardiol 2003; 42:1818-25.

