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Meeting abstract

1030 Validation of perfusion defects on prone myocardial perfusion SPECT imaging using delayed enhancement MR Imaging as reference method

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Introduction
It is of great clinical importance to exclude myocardial infarction in patients with suspected coronary artery disease who do not have stress-induced ischemia and no history nor ECG signs of infarction. The diagnostic use of myocardial perfusion single-photon emission computed tomography (SPECT) in this situation is sometimes complicated by attenuation artifacts that mimic myocardial infarction. Imaging in the prone position has been suggested as a method to overcome this problem, but this approach has not been validated by an independent technique.

Purpose
The purpose of this study was to evaluate myocardial perfusion SPECT imaging in the prone position using delayed enhancement magnetic resonance imaging as reference technique.

Methods
In this study, 52 patients with suspected ischemic heart disease but without verified infarction or stress-induced ischemia, were examined with SPECT imaging in both supine and prone position. The results were compared with CMR with delayed enhancement technique to confirm or exclude myocardial infarction.

Results
There were 63 perfusion defects in supine-position images, 37 of which disappeared in the prone position. None of the 37 defects were associated with myocardial infarction by CMR, indicating that all of them represented attenuation artifacts. Of the remaining 26 defects, myocardial infarction was confirmed by CMR in 1, two had other kinds of myocardial injuries. In 4 patients CMR detected small injurys not detected by SPECT.

Fig 1. Figure showing SPECT short axis stress images to the left and a magnet resonance delayed enhancement image to the right. A perfusion defect is seen in the inferior part of the image in supine position but has diappeared in prone position. CMR shows no myocardial scar in that area.

Conclusion
In this study perfusion defects in the supine position that disappeared in the prone position were caused by attenuation, not myocardial infarction. Hence, imaging in the prone position could help to rule out ischemic heart disease for some patients admitted for SPECT with suspected but not documented ischemic heart disease. For these patients, this would indicate a better prognosis and prevent unnecessary treatment and further investigations. CMR detected some myocardial injuries that was not identified by SPECT, and should be used when there is a need for more elaborate diagnostics concerning infarct and fibrosis. The technique could also be used as gold standard in other studies to confirm or exclude myocardial injury. This would probably enhance the clinical power and reliability of other diagnostic tools.
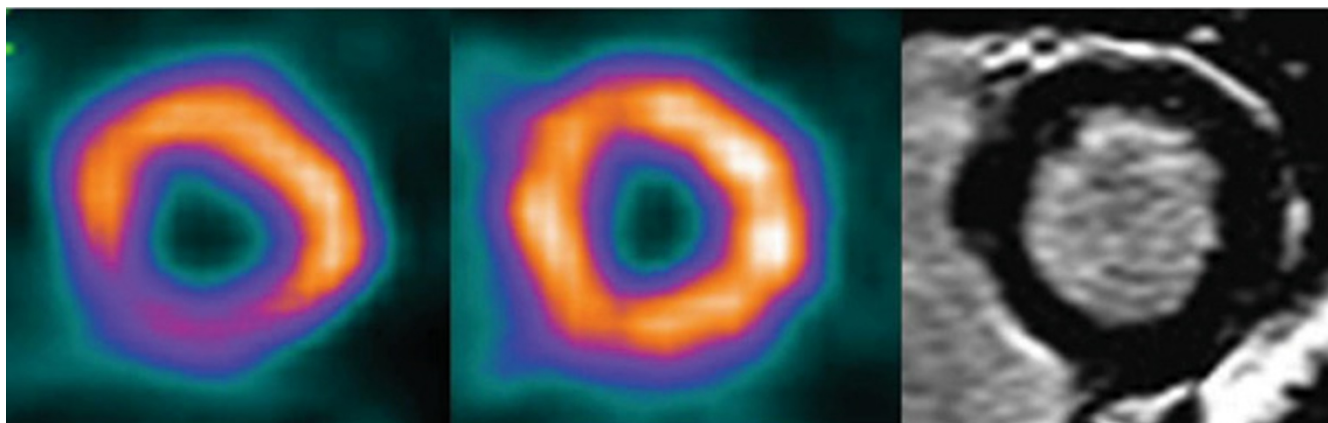
Figure 1
Infarction or not? The diagnostic use of prone myocardial perfusion single-photon emission computed tomography validated by delayed enhancement cardiac magnetic resonance imaging.