# Comparison between CT and Nuclear Perfusion to Predict Late Myocardial Function Following Reperfused Acute Myocardial Infarction

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Background: Early hypoenhancement (EH) on CT, as well as delayed hypo- (DH) and hyper-enhancement (DE) have been shown to be correlated to perfusion defects on SPECT following acute myocardial infarction (AMI), however there has been no comparison between the two methods regarding their ability to predict late (4 months) myocardial function.
Methods: 20 patients (17 male, age 54 ± 9) with a reperfused first acute STE AMI underwent cardiac CT, early and 24 hour Thallium SPECT, and contrast echo within 4 days of AMI, followed by a repeat contrast-echo exam 4 months later to assess the change in myocardial function. Perfusion defects on CT were identified on 6 short-axis reformations and their areas planimetered and summed. SPECT and echo were scored using a 16 segment model. For each segment SPECT was scored from 0 (no defect) to 4 and echo from 1 (normal) to 3. Scores were summed for each heart.
Results: The infarct-related artery was LAD=13, LCx=4, RCA=3. 1 patient died before the follow-up echo. For the remaining patients, late myocardial function correlated best with SPECT (r=0.87), whereas CT EH (r=0.61), DH (r=0.67) and DE (r=0.63) showed more moderate correlations, increasing to 0.73 using multivariate analysis combining the 3 variables. The number of myocardial segments involved (5.8±4.2 by echo) was underestimated by SPECT (3.4±2.7) and both early (4.7±3.3) and late (3.2±4.3) CT. The relative reduction in myocardial blood volume measured as ratio of CT values in abnormal:normal regions was also moderately related to late function for both early (r=0.58) and delayed CT (r=0.49).
Conclusions: SPECT summed perfusion grade correlates better with late myocardial function after acute MI than CT defect size however it significantly underestimates infarct size. Both size and degree of CT perfusion defects may have value in predicting late myocardial function.