Methods: 20 patients (5 female, 15 male, mean age: 59 years) were studied. MDCT was performed using a 16 slice scanner with 0.75 mm collimation and 420 ms rotation time. 80 ml of contrast agent were injected i.v. and a half-scan reconstruction algorithm (210 ms temporal resolution) was applied. All patients received oral or i.v. beta blockers prior to the scan, the mean heart rate during MDCT was 59/min. IVUS of one coronary artery (40 MHz, motorized pull-back) was performed during coronary angiography one day after MDCT. In non-calcified coronary plaques identifiable in MDCT, the CT attenuation was measured and compared to the IVUS classification of the respective lesion, based on its echogenicity (“soft” = hypo-echogenic as compared to adventitia, “dense” = hyper-echogenic as compared to adventitia).

Results: MDCT and IVUS were compared at 237 sites. The mean CT density measured within plaques classified as “soft” by IVUS was 59±42HU (-39HU to 184HU), while it was 137±44HU (60HU – 242 HU) in plaques classified as “dense” by IVUS (p < 0.001, see graph).

Conclusion: The average CT attenuation within non-calcified coronary atherosclerotic plaques varies with plaque type. However, there is significant overlap between plaques classified as “dense” and “soft” by IVUS.
Compared with angiography, MDCT underestimated the inner diameter of the stent (p<0.0001). The mean error from the high resolution images (16%) was lower than the error from the conventional images (27%)(p<0.0001). The attenuation measured inside the stent was higher than that in the contrast enhanced coronary lumen proximal and distal to the stent (p<0.0001). However, the in-stent attenuation was highly correlated with the contrast attenuation in the coronary arteries (r=0.87).

**Conclusion**

By measuring the contrast enhancement within coronary stents, an objective method of determining stent patency is possible with 16-row MDCT.

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### Table 1

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pearson Correlation</th>
<th>Mean Difference</th>
<th>Standard Deviation</th>
<th>95% CI of the Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>LA (mm²)</td>
<td>0.840*</td>
<td>0.045*</td>
<td>0.081</td>
<td>-0.058 to -0.032</td>
</tr>
<tr>
<td>TVA (mm²)</td>
<td>0.939*</td>
<td>0.029</td>
<td>0.159</td>
<td>-0.048 to 0.002</td>
</tr>
<tr>
<td>AP (mm²)</td>
<td>0.664*</td>
<td>0.122</td>
<td>0.388</td>
<td>-0.180 to -0.060</td>
</tr>
<tr>
<td>LAT (mm)</td>
<td>0.573*</td>
<td>0.294</td>
<td>0.320</td>
<td>0.243 to 0.345</td>
</tr>
</tbody>
</table>

CI, confidence interval; LA, lumen area; TVA, total vessel area; AP, anterior-posterior; LAT, lateral diameter.

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**Figure 1A**

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**POSTER SESSION**

### 1036 Contrast Echocardiography: Viability With Comparison to Other Techniques and Bioeffects

Sunday, March 07, 2004, Noon-2:00 p.m.
Morial Convention Center, Hall G
Presentation Hour: 1:00 p.m.-2:00 p.m.

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### 1036-155

**Myocardial Viability Assessment After Primary Angioplasty in Patients With Acute Myocardial Infarction: Comparison of Contrast-Enhanced Magnetic Resonance Imaging With Myocardial Contrast Echocardiography**

Elena Biagini, Arend F.L. Schinkel, Tjiebe Galema, Robbert van Geuns, Pim de Feyter, Folkert J. ten Cate, Erasmus MC, Rotterdam, The Netherlands

**Background:** The assessment of reversible myocardial dysfunction after primary coronary intervention (PCI) is important for clinical decision-making. The aim of this study was to compare the merits of myocardial contrast echocardiography (MCE) and contrast enhanced magnetic resonance (MR) imaging to predict functional recovery after PCI.

**Materials and methods:** Twenty-five consecutive patients with acute myocardial infarction (AMI) were studied after PCI. MCE images were obtained using low mechanical index (MI: 0.1) real time perfusion imaging (power modulation). MR was performed with first-pass perfusion (hypo-enhancement) and late contrast-enhancement imaging (hyper-enhancement). A 16-segment model of the left ventricle was used to analyze MCE and MR images. Recovery of regional contractile function was evaluated at sixty days follow-up in all patients.

**Results:** In 181 segments related to acute infarct territory, wall motion and perfusion were analyzed. Dysfunctional myocardium was present in 152 segments. Fifty-six (31%) and 58 (32%) segments were respectively hypokinetic according to MCE and MR, and 87 (47%) and 83 (46%) segments were akinetic (agreement between MCE and MR 95%, kappa 0.88). The sensitivity of MCE and MR imaging with hypo- and hyper-enhancement to identify reversible dysfunction was respectively 95%, 96% and 86% (P<NS).

**Conclusions:** Identification of potential reversible dysfunctional myocardium can be determined both by MCE and MR imaging after AMI and PCI, although MR has a better specificity for the identification of reversible myocardial dysfunction (stunned myocardium).

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**1036-156**

**Can Resting Myocardial Contrast Echocardiography Replace 99mTc Sestamibi SPECT for the Diagnosis of Myocardial Viability Following Myocardial Infarction**

Michael Hickman, Rajesh Janardhanan, Girish Deviday, Avijit Lahiri, Roxy Senior, Northwick Park Hospital, Harrow, United Kingdom

**Background:** Microvascular perfusion is a pre-requisite of myocardial viability early after acute myocardial infarction (AMI). Low-power myocardial contrast echocardiography (MCE) is a new bedside technique that can assess microvascular perfusion during a single breath-hold. We have hypothesised that MCE is comparable to SPECT for the detection of myocardial viability early after AMI.

**Methods:** Twenty-five consecutive patients with acute myocardial infarction (AMI) were studied after PCI. MCE images were obtained using low mechanical index (MI: 0.1) real time perfusion imaging (power modulation) and by SPECT if there was either normal, or a mild to moderate reduction in tracer uptake. All patients proceeded to revascularisation and 3-6 months later had repeat TTE, those with significant residual dysfunction had a low-dose dobutamine echocardiographic study to assess contractile reserve (CR). A segment was termed viable if there was an improvement in wall motion or retained CR in a previously dysfunctional segment.

**Results:** On a segmental basis, 130(49%) out of 212 dysfunctional segments demon-