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.

**Table:**

<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>Lower: -0.058 Upper: -0.032</td>
</tr>
<tr>
<td>TVA/2 (mm²)</td>
<td>0.939*</td>
<td>0.029</td>
<td>0.159</td>
<td>-0.048 - 0.002</td>
</tr>
<tr>
<td>AP (mm)</td>
<td>0.664*</td>
<td>0.122</td>
<td>0.388</td>
<td>Lower: -0.180 Upper: -0.060</td>
</tr>
<tr>
<td>LAT (mm)</td>
<td>0.573*</td>
<td>0.294</td>
<td>0.320</td>
<td>0.243 - 0.345</td>
</tr>
</tbody>
</table>

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

**Figure 1A**

**1034A ABSTRACTS - Noninvasive Imaging**

**1018-149**

**In-Stent Restenosis Evaluation With 16-Slice Computed Tomography Coronary Scanner**

Patrick Dupouy, Stéphane Chamagne, Karim Bougirni, Eduardo Aptecar, Jean Paul Convard, Denis Hovasse, Didier Vilmant, Mario Auguste, Jean Marc Pernès, PCVI, Hôpital Privé d’Antony, Antony, France

**Background:** Multislicies Computed Tomography scanner (CT scan) have shown a good negative predictive value and specificity in coronary artery stenosis evaluation. Whether it can be useful in the assessment of in-stent coronary restenosis remains to be evaluated.

**Methods:** A total of 27 coronary stents were systematically imaged by coronary angiography and 16 slices CT scan in 15 patients 6 months after angioplasty in order to evaluate the accuracy of CT scan in determining the occurrence of coronary in- or peri-stent restenosis. Restenosis was defined as a relative stenosis more than 50% of the reference segment as measured by QCA for angiography and by visual assessment for CT scan. Angiographic and CT scan interpretation were made by 2 independent operators.

**Results:** Patients were investigated 6 ± 1 month after the initial angioplasty. Mean diameter and length of implanted stent were respectively 3.0 ± 0.6 and 10.2 ± 2.6 mm. Stent were placed in LAD in 13 cases (48%), LCx in 5 (18.5%), RCA in 5 (18.5%) and Left Main in 4 (14.8%). By QCA, in-stent restenosis prevalence was 10%. In 2 cases (27%) CT scan stent image was not evaluable. In the remaining 25 stents, sensitivity of CT scan for restenosis diagnosis was 33%, specificity 100%, positive predictive value 100% and negative predictive value 80%.

**Conclusion:** Coronary 16 slices CT scan is a non invasive imaging technique which can be used with a high accuracy to eliminate in-stent restenosis.

**1018-150**

**16-Slice Multidetector-Row Computed Tomography and Magnetic Resonance Imaging for the In Vivo and Noninvasive Assessment of Vessel Areas and Diameters**

Juan Federico Viles-Gonzalez, Michael Poon, Javier Sanz, Teresa Rius, Konstantin Nikolacu, Zahi Adel Fayed, Valentin Fuster, Juan Jose Badimon, Mount Sinai School of Medicine, New York, NY

**Background:** Non-invasive imaging can detect early atherosclerotic disease. Magnetic resonance imaging (MRI) is already established as a tool for plaque characterization. Sixteen-slice multidetector-row computed tomography (MDCT) was recently introduced in the field of cardiac imaging with promising results as a non-invasive angiography. We compared the capabilities of MDCT and MRI for detecting changes in vessel areas and diameters.

**Methods:** Five atherosclerotic rabbits were imaged in vivo. MRI protocol: proton density, T1, T2 weighted, fat saturation, 400 slices, 2D spoiled gradient recalled echo, 40 cm FOV, 10 cm slab thickness, 1.5 mm slice thickness, TE=1.5, TR=3000 ms; MDCT protocol: 120kV, 120mA, collimation 12x0.75 mm, slice thickness 3 mm, pitch 1, 0.72s per rotation cycle. Both techniques were performed on the same day. AV = 85±10 ml, HR = 305±22 bpm. The findings were analyzed by Pearson correlation and paired Student's t test (2p).

**Results:** See table below. Overall, there was an excellent agreement between both modalities. MDCT slightly overestimated anterior-posterior (AP) and lateral diameter (LAT), lumen area (LA), and underestimated total vessel area (TVA).

**Conclusions:** The subtle measurement differences found between both modalities may be due to the better spatial resolution of MRI. Both techniques offer the possibility of non-invasively detect modifications of vessel area and diameter. MDCT offers the additive value of a shorter image acquisition time.

**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.

**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 Biajini, Arend F.L. Schinkel, Tjbbie Galemia, Robbert van Geuns, Piim 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 MI and MR, and 87 (48%) and 83 (46%) segments were akinetic (agreement between MCE and MI 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). Specificity was respectively 57%, 50% and 92% (P=0.05). Accuracy was respectively 78%, 90% and 75%.

**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).

**1036-156**

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

Michael Hickman, Rajesh Janardhanan, Girish Devedi, 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:** Forty-four patients underwent transthoracic echocardiography (TTE), resting MCE and nitrate enhanced SPECT 7-10 days after their first AMI and thrombolysis. Contrast opacification was assessed using a 16 segment model. A dysfunctional segment was classified as viable by MCE if there was homogenous or reduced contrast opacification within 15 cardiac cycles following a destruction pulse, 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 repeated 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, 132(49%) out of 212 dysfunctional segments demon-