1096-56 **Evaluation of Rapamycin Coated Stents by Multi Row Detector Computed Angiography: Comparison to Quantitative Angiographic Results**

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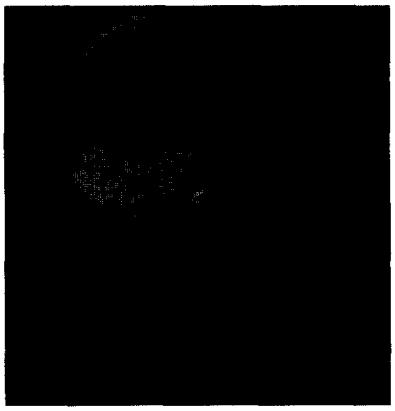
Background: Muti Row Detector Computed Tomography (MRDCT) is a proposed form of non-invasive evaluation of the coronary arteries. Stents were reported as a limitation to this technique, but newer protocols might allow the visualization of the stent lumen. Rapamycin coated stents (RCS) reduce intimal proliferation and would be an effective platform to test the capacity of MRDCT in this set. Our goal was to evaluate RCS by MRDCT comparing its results to those of quantitative coronary angiography (QCA).
Methods: We selected 18 patients with RCS implantated 6 to 12 mo before MRDCT, that included a locator series, a test bolus contrast injection and an infusion of 1.5 ml/kg of non-ionic, low osmolarity contrast media. Radiation doses was adjusted to patient weight and examination time was 12.5 ± 4 min. Images were retrospectively gated to the ECG and transferred to a workstation for additional processing. We assessed RCS patency, reference diameter (RD) proximal and distal to the stent and the in stent minimal lumen diameter (MLD). QCA was done before MRDCT and assessed the same variables.
Results: All stents were seen (figure) and were patent by both methods. Proximal RD was 3.09 ± 0.35 mm by QCA and 3.01 ± 0.33 mm by MRDCT (p= ns), distal RD was 2.74 ± 0.45 mm by QCA and 2.8 ± 0.35 mm by MRDCT (p= ns). In stent MLD was 2.85 ± 0. 38 mm by QCA and 2.67 ± 0.24 mm by MRDCT (p= ns).
Conclusion: MRDCT permits to reveal stent patency and to measure the RD. Its measurement of the in stent MLD may lead to some underestimation of the actual lumen.



1096-57 **Coronary Calcium Score Is Influenced by the Image Reconstruction Interval in Retrospectively ECG-Gated Multi-Slice Spiral CT**

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Background: Coronary calcium scoring by CT has been shown to be a useful noninvasive tool for detection of coronary artery disease. Multi-slice spiral CT (MSCT) enables a continuous reconstruction of coronary arteries without interruption of sequence acquisition. However, less is known about the influence of reconstruction artifacts deriving from different image reconstruction intervals on the calcium scoring in retrospectively ECG-gated MSCT of the heart.
Methods: 50 consecutive patients (pts, 7f, 43 m, age 64 ± 11 y) with symptoms of coronary artery disease underwent ECG triggered MSCT (Somatom Volume Zoom, Siemens, Germany; tube voltage 120 kV, tube current 133 mAs, slice collimation 4x2.5 mm) in breathhold technique for evaluation of coronary calcification. Retrospectively gated image construction with an increment of 3 mm was performed every 10 % of R-R interval (from beat to beat). Coronary calcification was evaluated using the Agatston score with a threshold of 130 HU.
Results: For 80% R-R interval 7 pts showed no coronary calcification (group 1), 11 pts had a score < 100 (group 2), 14 pts a score of 101 - 400 (group 3) and 18 pts a score >400 (group 4). The mean calcium score for all coronary arteries and all reconstruction intervals was 551.6 ± 88.4 (range 0-3937). Using different R-R intervals resulted in different score values with least values at 90% R-R interval (512.2 ± 779.8, range 0-3937) and highest values at 10 % R-R interval (575.9 ± 774.4, range 0-3933). Application of the 10% RR interval resulted in assignment of 6 pts to a different group as compared to use of the 80 % R-R interval, with an upward shift of 1 pts from group 1 to 2, 2 pts from group 2 to 3 and 1 pts from group 2 to 4; 1 pt shifted downward from group 3 to 2.
Conclusions: Calcium scores determined by MSCT are affected by the applied image reconstruction interval. This may have consequences for the graduation of severity of coronary artery disease by MSCT in the individual patient. Standardization of the applied image reconstruction intervals is necessary to obtain a reproducible analysis of the calcium score.

1096-58 **Electron Beam Tomography Permits to Noninvasively Rule Out Coronary Artery Stenoses in Patients Scheduled for Noncoronary Cardiac Surgery**

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Invasive coronary angiography is frequently performed to rule out significant coronary artery stenoses prior to cardiac valve surgery. We investigated whether electron beam tomography (EBT) permits to reliably rule out high-grade coronary artery stenoses in patients scheduled for valve surgery.
Methods: 85 patients (47 male, 38 female, mean age: 63 years) scheduled for valve surgery were investigated. By EBT, coronary calcification was assessed in 40 axial images of the heart (3 mm slice thickness) and quantiffed using the Agatston Score. In addition, 50 axial images of the heart (3 mm slice thickness, 2 mm table feed) were acquired during intravenous injection of contrast agent (160 ml at 4 ml/s) to perform non-invasive coronary angiography. Coronary stenoses were assumed to be absent if the calcium score was below 400 and the contrast-enhanced EBT images were evaluable and displayed no significant lumen reduction. EBT results were compared to invasive coronary angiography.
Results: In 37 patients, coronary stenoses were ruled out by EBT. In all of these 37 patients, coronary angiography confirmed EBT and ruled out significant coronary lesions. In 48 patients, coronary stenoses could not be ruled out by EBT (42 patients: calcium score exceeding 400, 6 patients: stenoses demonstrated in EBT angiogram). In 28 of these 48 patients, invasive angiography displayed significant coronary lesions which required revascularization, while in 20 patients, no significant stenoses were found. These results correspond to a sensitivity of 100%, specificity of 65%, negative predictive value of 100%, and positive predictive value of 58% of EBT for the detection of patients who required revacularization at the time of valve surgery. In addition, EBT identified two patients with anomalous coronary arteries.
Conclusions: EBT permits the reliable identification of patients who do not require revascularization and may therefore reduce the need of invasive coronary angiogram procedures prior to valve surgery.

ORAL CONTRIBUTIONS

803 New Echocardiographic Methods for Assessing Left Ventricular Function

Monday, March 18, 2002, 9:15 a.m.-10:30 a.m.
Georgia World Congress Center, Room 160W

9:15 a.m.

803-1 **Feasibility of Simultaneous Imaging of Myocardial Perfusion and Regional Left Ventricular Function Using Color-Encoded Contrast-Enhanced Power Modulation**

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Background: We hypothesized that contrast-enhanced power modulation images in conjunction with on-line automated border detection would allow simultaneous imaging of myocardial perfusion defects and regional wall motion abnormalities in a format suitable for objective quantitative analysis. Methods: Power modulation images (SONOS 5500, Philips) were obtained in 13 unselected patients following intravenous injections of Optison (1 ml). High-power ultrasound pulses were used to destroy intramyocardial contrast and track subsequent contrast replenishment. A prototype system for automated border detection allowed simultaneous color-encoding of systolic endocardial motion (Color Kinesis) during real-time contrast perfusion imaging. Color-encoded images were subjected to segmental analysis resulting in regional fraction area change histograms. Results: Images obtained in patients with normal wall motion showed color bands of uniform thickness and regular color layers, reflecting synchronous contraction, concurrent with relatively uniform myocardial contrast enhancement and uniform post-impulse replenishment (figure, top). Wall motion abnormalities were depicted by thin color bands, coinciding with perfusion defects that were visualized as dark areas with delayed replenishment (figure, bottom). Conclusion: Color-encoded power modulation images obtained during iv contrast enhancement allows simultaneous on-line imaging of myocardial perfusion and regional LV function.