



IMAGING AND DIAGNOSTIC TESTING

QUANTITATIVE AND DIAGNOSTIC ACCURACY OF 64-MDCTA FOR SEGMENTAL CORONARY ARTERY STENOSIS DETECTION: RESULTS FROM THE CORE-64 MULTICENTER INTERNATIONAL STUDY

ACC Poster Contributions

Georgia World Congress Center, Hall B5

Monday, March 15, 2010, 9:30 a.m.-10:30 a.m.

Session Title: CT Coronary Angiography: Diagnostic Accuracy I

Abstract Category: CT Coronary Angiography

Presentation Number: 1145-206

Authors: *Julie M. Miller, Carlos E. Rochitte, Marc Dewey, Hiroyuki Niinuma, Armin Arbab-Zadeh, Ilan Gottlieb, Narinder Paul, Melvin E. Clouse, Edward Shapiro, John Hoe, David E. Bush, Albert Lardo, Albert de Roos, Christopher Cox, John Texter, Andrea Vavere, Joao A. Lima, Jeffery Brinker, Johns Hopkins University, Baltimore, MD, InCor Sao Paulo Heart Institute, Sao Paulo, Brazil*

Multidetector Computed Tomography Angiography (MDCTA) has been proposed as a non-invasive method to assess CAD. The CORE-64 study demonstrated 64-row MDCT is an accurate diagnostic tool in identifying symptomatic patients with or without obstructive CAD. We now present the segment diagnostic value.

Methods: CORE-64 was a prospective, multicenter study comparing 64-row 0.5mm MDCT with conventional coronary angiography (CCA) for detection of obstructive CAD. 291 patients with calcium score <600 were analyzed by independent core laboratories. Diameter stenoses were assessed quantitatively by both methods in all segments > 1.5 mm. CCA lesions >50% by quantitative coronary angiography (QCA) were considered significant.

Results: 99 % of segments were evaluable by MDCTA. The prevalence of significant CAD (per segment) by CCA was 10.5% (397/3782). Quantitative analysis of diameter stenosis by MDCTA in comparison with QCA revealed an area under the ROC curve (AUC) of 0.89 [0.87, 0.91]. Compared with the patient-based analysis (AUC=0.93) there was a small (0.04) difference [95% CI 0.008, 0.07]. Using a threshold of >50% for MDCT, the segment-based sensitivity = 60% [58-62], specificity = 95% [94-96], PPV=58% [56-60], and NPV=95% [95-96]. Bland-Altman analysis showed an overall mean difference in percent stenosis of -0.58 [-1.05, -0.12] +/- 29%, with proximal segments of 1.2 [0.30, 2.1], mid 0.22 [-.78, 1.23], and distal segments -2.14 [-2.89, -1.43]. Overall correlation between diameter stenosis by QCA and MDCTA was R= 0.71, p<0.0001, with proximal, mid, and distal segment correlations of 0.79, 0.76, and 0.61. Linear regression beta of QCA and CT measures = 0.82. Using a threshold of 30% to define a significant stenosis by MDCT, sensitivity = 75% [71-80], specificity = 87% [85- 88], PPV= 40% [36- 43], NPV = 97% [96- 97].

Conclusions: In the CORE64 study, the segment-based diagnostic performance characteristics of 64-MDCT detecting a > 50% coronary stenosis was high (ROC of 0.89). The limits of agreement of +29% indicate that MDCT can not precisely quantify diameter stenosis compared with QCA. A lower threshold for severity of stenosis by MDCT should be considered for improving segment-based evaluation.