Accuracy of CT Angiography Supported in Trial

BY PATRICE WENDELING
Chicago Bureau

CHICAGO — A second multicenter trial has shown that noninvasive CT angiography is highly accurate in assessing coronary artery disease when compared with conventional invasive angiography.

The per-vessel negative predictive value of 64-slice coronary CT angiography (CCTA) was 97% for identifying blockages greater than 50%, and 99% for blockages greater than 70%, when measured in 232 patients with typical or atypical chest pain in the Assessment by Coronary Computed Tomographic Angiography of Individuals Undergoing Invasive Coronary Angiography (ACCURACY) trial. Positive predictive values were 51% and 33%, respectively, Dr. James K. Min and his associates reported at the annual meeting of the Radiological Society of North America.

“The ACCURACY results (obtained) in a prospective, multicenter fashion definitively establish the high diagnostic accuracy and high negative predictive value of 64-detector-row CT angiography in chest pain patients with intermediate prevalence of coronary artery disease,” said Dr. Min, director of the cardiac CT laboratory at New York-Presbyterian Hospital.

The findings echo those of the recent Coronary Artery Evaluation Using 64-Row Multidetector Computed Tomography Angiography (CORE-64) trial, in which CT angiography had a 91% positive predictive value and an 83% negative predictive value for identifying significant coronary artery stenoses. CORE-64 was the first large, multicenter trial of the 64-slice technology for coronary angiography, but was criticized by some that it lacked the academic setting.

Regarding the 64-slice CT angiography, Dr. Min said in an interview, “We quickly learned that medications were not necessary with the DS CT in all cases. Temporal resolution at 64-slice CT probably is only worth it if you want to exploit the particular capabilities of this device, which include the faster shutter speed and better image quality.”

“Overall, the diagnostic quality was better in the DSCT group despite the faster heart rates,” said Dr. Schoepf.

The average computed tomography dose index (fundamental radiation dose parameter used in CT) volumes were 61 milligray (mGy) for patients aged 35-72 years and 33 mGy for patients aged 21-89 years, respectively (P < .001).

The average heart rates were 64 beats per minute among the control group and 73 beats per minute among those imaged with the dual scanner. β-Blockers were used in 12 of the 30 patients scanned with 64-slice CT; none were used in the DSCT group.

Cardiac motion artifacts were observed in 24% of coronary segments in 64-slice CT patients, compared with 9% of segments in the DSCT arm. In each group, data sets were completely void of motion artifacts in 3 of 10 and 12 of 30 patients, respectively.

“Overall, the diagnostic quality was better in the DSCT group despite the faster heart rates,” said Dr. Schoepf, who disclosed that he is relevant to and has received research support from Siemens Medical Solutions and the imaging contrast divisions of Bayer, GE Healthcare, and Bracco Diagnostics. How many patients were used in the current study or the scans used in it, he said.

“With another step in the evolution of medical imaging, we’re closing the gap from invasive to noninvasive diagnostic catheterization and getting to the point of being able to get the same results for conventional angiography particularly for excluding coronary artery disease,” Dr. Schoepf said.

But the investment of around $2.6 million for a dual-source CT probably is only worth it if you want to exploit the particular capabilities of this dedicated cardiac, vascular, and dual energy applications.”

The SOMATOM Definition has been available in the United States since early 2006.