Low-dose chest CT effective in reducing radiation for evaluation of cardiothoracic surgery patients

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Recent studies have shown that a 64-detector CT angiography utilizing prospective electrocardiographic (ECG) gating produces a quality image but considerably reduced patient radiation dose when compared to retrospective ECG gating, according to research being presented at the 2011 American Roentgen Ray Society's annual meeting.

The study was conducted in the Department of Radiology at the University Hospitals Case Medical Center, in Cleveland, OH. Researchers evaluated 29 patients who underwent prospectively-gated 100 kV whole chest CT for preoperative cardiothoracic surgery. The mean radiation dose was determined and compared to a group of regular dose prospectively-gated exams. "The most significant aspect of our study was to demonstrate that pre-operative evaluation of cardiothoracic surgery patients can be reliably and accurately performed with low-dose chest CT that results in a radiation dose reduction of 42% when compared with traditional dose chest CT exams. In an era of heightened awareness of radiation exposure to patients from medical imaging, this is a significant finding," said Sonali Mehandru, MD, one of the authors of the study.

"In particular, our study showed that low-dose chest CT can provide accurate assessment of the coronary arteries in a sizable percentage of patients. The coronary arteries are particularly important to evaluate prior to cardiothoracic surgery because the presence of coronary artery

disease impacts a patient's risk for perioperative morbidity and mortality," said Dr. Mehandru.

"Traditionally, this evaluation has been performed with cardiac catheterization -- an invasive and expensive procedure. In our study, we found that a large cohort of patients (23 of 38 patients) had accurate enough noninvasive assessment of the coronary arteries on low-dose chest CT that they did not require further evaluation with cardiac catheterization," she said.

"This is a preliminary study and further research with larger cohorts of patients is needed. However, it is a good starting point in demonstrating that radiation dose from chest CT's can be significantly reduced without compromising accuracy or reliability of anatomic evaluation. In preoperative patients who are especially prone to undergoing repeated imaging studies, this radiation dose reduction can be very significant," said Dr. Mehandru.

Provided by American Roentgen Ray Society

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