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Evaluation of Patients With Congenital Coronary Anomalies with Cardiac CT Angiography

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Introduction: Invasive coronary angiography has been the gold standard for the diagnosis of coronary anomalies (CA). Cardiac computed tomographic angiography (CTA) provides the ability to non-invasively detect, evaluate and follow patients (pts) with CA. Additionally, cardiac morphology and function can be reliably assessed to determine the functional significance of these lesions.

Methods: Non ionic contrast enhanced CTA using 16 and 64 MSCT was performed in 1084 consecutive patients in the last 12 months (February 2005 to January 2006) of whom 11 (1%) were diagnosed with coronary artery anomalies.

Results: Of the 11 pts with CA, 7 were men (64%) and the age range was 17-80 yrs. The left main was anomalous in 4 pts, the left circumflex was anomalous in 3 pts, 4 pts had an anomalous RCA. The entire course of all coronary arteries could be identified in all 11 patients. Three pts were previously known to have coronary anomalies. Six pts were being evaluated for chest pain, one presented with cardiomyopathy, 3 pts had abnormal stress tests and 1 pt was referred for preoperative evaluation. Two pts needed CABG and one needed surgical repair based on the cardiac CTA findings. Extracardiac pathology was seen in 4/11(36%)pts and most commonly represented post inflammatory lung disease. Ventricular function, prior infarction, regional wall motion, chamber size and other cardiac anomalies could additionally be reliably assessed.

Conclusions: Cardiac CTA is a reliable, accurate non invasive tool to assess coronary anomalies in adult patients and may be used as the preferred initial imaging modality. Potentially lethal anomalous course between the two great arteries is easily identified contrary to coronary angiography. With the use of an adaptive multicycle reconstruction algorithm, there was no substantial difference in image quality between the 16 slice and 64 slice MSCT for assessment of CA. Thus, CTA can be used as the primary diagnostic test to diagnose, evaluate the need for coronary bypass surgery, and follow up of these patients.