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Evaluation of Patients Post Coronary Bypass with Cardiac CT Angiography
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Introduction: Cardiac computed tomographic angiography (CTA) provides the ability to non-invasively evaluate and follow patients (pts) with coronary bypass grafts (CABG). Additionally, cardiac morphology and function can be reliably assessed. We assessed the value of cardiac CTA to analyze the extent of disease and patency of arterial and venous grafts.

Methods: Non contrast CT of the chest followed by non ionic contrast enhanced CTA using 16 and 64 MSCT was performed in 1084 patients in a 12 month period (February 2005 to January 2006) of whom 149 (14%) had prior CABG.

Results: Of the 149 pts, the mean age was 71 years. There were a total of 413 grafts: 141 (34%) arterial (LIMA, RIMA) and 272 (66%) venous grafts. The study was performed on average 5 years post CABG. 91% of the grafts were adequately visualized throughout the entire extent, including the origin, stents and insertion site. The native vessel distal to anastomosis could be reliably assessed for flow in all patent grafts. We could assess the grafts despite the presence of surgical clips, stents, implanted pacemakers and defibrillators.

There were 171 normal vein grafts, 53 occluded, 48 diseased. There were 120 normal arterial grafts, 4 occluded, 17 diseased. The study was technically inadequate in one pt due to severe emphysema. Irregular cardiac rhythm did not preclude performance nor interpretation of the CTA in these pts. The CTA's were correlated with conventional angiography and clinical follow up. Extracardiac disease was seen in 69% of pts. Ventricular function, prior infarction, regional wall motion, chamber size, extra myocardial collaterals and extra cardiac pathology could additionally be reliably assessed.

Conclusions: Cardiac CTA is a reliable, accurate and non invasive tool to assess the arterial and venous grafts for disease in adult patients with prior CABG. Thus it helps to follow up and triage pts for possible intervention versus medical therapy alone. With the use of an adaptive multicycle reconstruction algorithm, there was no substantial difference in image diagnostic quality between 16 and 64 MSCT for assessment of grafts. These studies were not impeded by the presence of pacemakers or arrhythmias. Extracardiac pathology is also common in these pts.