



Abstract: P590

Non-invasive bypass angiography with the cardio-computed tomography avoids unnecessary cardiac catheterizations

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On behalf: Heart Diagnostic Center

Topic(s):

Cardiovascular surgery, other
Electron beam CT
Threedimensional reconstruction
Coronary heart disease

Despite all improvements, the patency rate of coronary bypass grafts is still limited: One year after surgery, 12 to 17% of venous and 3 to 6% of arterial grafts are occluded. Since clinical outcome depends on graft patency, more frequent evaluation of bypass anatomy could be performed non-invasively.

Multislice-CT (MSCT) has evolved as a valuable alternative to catheterization of coronary bypass grafts. We therefore examined 80 patients with no angina pectoris and no clear evidence of myocardial ischemia. The mean age was 65 ± 9 years (5% female). The average time interval since bypass surgery was 4.9 years. Of the 220 bypass vessels, 60% were venous and 40% were arterial. CT-angiography (CTA) was performed using the Philips Mx 8000 4-slice spiral CT in 1 mm collimated sections and retrospective gating within a single breathhold at 120 kV and 300 mAs. Heart rates above 60 per minute were reduced with beta-blockers for better image quality.

36.4% of bypass grafts were occluded. As compared to cardiac catheterization, MSCT was able to identify all occluded grafts. One LIMA bypass presumed to be occluded by the CTA was shown to have a narrow lumen with slow flow. Therefore the sensitivity was 100%; the specificity 96%.

Summary: Non-invasive bypass angiography with the MSCT has excellent sensitivity and specificity in detecting occluded coronary bypass grafts in asymptomatic patients. MSCT can therefore be helpful in avoiding unnecessary cardiac catheterizations.