Coronary Computed Tomography Angiography for Detection of Coronary Artery Stenosis in Patients Undergoing Transcatheter Aortic Valve Implantation: Feasibility and Diagnostic Performance

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Background:

Coronary computed tomography (CT) angiography has become the foremost noninvasive imaging modality for detecting coronary artery stenoses in patients with suspected coronary artery disease (CAD). Nevertheless, little is known about its performance in patients undergoing transcatheter aortic valve implantation (TAVI). The purpose of this study was to assess the accuracy of CT angiography for the detection of coronary artery stenosis in patients referred for TAVI.

Methods:

Thirty seven consecutive patients (mean age = 80.5 ± 8 years)with severe aortic stenosis underwent 256-slice coronary CT angiography with retrospective ECG-gating and iterative reconstruction technique. For assessment of coronary artery stenosis the CT data were reconstructed at 10% interval over the whole cardiac cycle to define the phase with the best image quality. Feasibility (number of evaluable coronary segments divided by the total number of coronary segments), and diagnostic accuracy of CT angiography for detecting significant coronary stenosis ($\geq 50\%$ luminal diameter stenosis) in segments ≥ 1.5 mm diameter were compared with invasive coronary angiography as the standard of reference. The exclusion criteria were atrial fibrillation and previous coronary artery bypass graft operation.

Results:

The feasibility of CT angiography was 91%.In the patient based analysis CT angiography had a diagnostic accuracy of 81% (95% confidence interval [CI]: 63 to 99), sensitivity and specificity of 70% and 92%; respectively, and positive and negative predictive value of 78%, and 89%; respectively, in patients with 28%CAD prevalence. In the vessel based analysis CT angiography had a diagnostic accuracy of 80% (95% CI: 65-95%).

Conclusion:

Coronary 256-sclice CT angiography with retrospective gating and iterative reconstruction is feasible and allows for accurate detection of coronary stenosis in patients undergoing TAVI.