Coronary artery imaging with 64-slice computed tomography from cardiac surgical perspective

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INTRODUCTION: 64-Slice computed tomography (CT) has been introduced with high expectations. This study illustrates the value of 64-slice CT for the diagnosis of significant coronary artery stenoses when images are analysed by cardiovascular surgeons. METHODS: Fifty patients (39 males, 11 females) underwent invasive coronary angiography and 64-slice CT. In these patients, 40 had coronary artery disease and 10 patients had valvular disease. Evaluation of right coronary artery (RCA), left main (LM), left anterior descending artery (LAD), diagonal branch 1 (D1), circumflex branch (CX), and 1st marginal branch was performed by two cardiovascular surgeons. All vessels with a diameter ≥=1.5 mm were analysed and a lumen restriction of >50% was considered a significant stenosis. CT image quality was classified as excellent, reduced but still diagnostic, and not assessable. Invasive coronary angiography was taken as gold standard for calculations of diagnostic accuracy. RESULTS: Mean heart rate during CT scan was 65+/−11 beats per minute (bpm). Image quality of 92% (506/550) of all segments was rated as excellent, 5% (27/550) were rated as being of reduced quality but still diagnostic, and 3% (17/550) were considered not assessable. The sensitivity for diagnosing a significant stenosis with CT when including all reliably evaluated segments was 93% (106/114), specificity was 97% (381/392), positive predictive value was 91% (106/117), and negative predictive value was 98% (381/389). CONCLUSION: 64-Slice CT provides a high diagnostic accuracy in assessing significant coronary artery stenosis. Nevertheless, still exist some disadvantages such as strong vessel wall calcifications reducing the reliability for image interpretation. At the moment, 64-slice CT should be used as a complementary imaging modality to invasive coronary angiography.

type            journal paper/review (English)
date of publishing 7-2006
journal title    Eur J Cardiothorac Surg (30/1)
ISSN print       1010-7940
pages            109-16