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Can we perform coronary artery bypass grafting on the basis of computed tomographic angiography alone? A comparison with conventional coronary angiography

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Objectives: Multislice (64 slice) computed tomography (MSCT) angiography has recently emerged as a potential technique that can evaluate the coronaries in an accurate yet non-invasive manner. It has still not been shown whether the accuracy of the anatomy shown is precise enough to operate on the basis of MSCT alone. The aim of this prospective clinical trial is to compare MSCT to conventional coronary angiography (CCA), and to conclude whether MSCT alone is adequate for proceeding for CABG. **Methods:** 50 patients with proven severe coronary artery disease (CAD) on CCA for elective CABG underwent MSCT prior to CABG. The MSCT images were compared with CCA and the accuracy, sensitivity and specificity of detecting significant stenosis cross checked. Lesion-by-lesion analysis was made. CCA was used as the reference standard for location and degree of stenosis. **Results:** An excellent correlation was found between the CCA and MSCT findings. The overall sensitivity, specificity, positive (PPV) and negative (NPV) predictive values for quantitative assessment of stenosis >70% by MSCT compared to CCA were 98.5, 99.1, 82.3 and 99.8%, respectively. Comparing the maximal percent diameter luminal stenosis by MSCT versus CCA, the Pearson's correlation coefficient between the two modalities was 0.994 ($p < 0.0001$). Bland-Altman analysis demonstrated a mean difference in percent stenosis of $0.05 \pm 2.42\%$ ($p = 0.753$). There was no significant correlation between stenosis difference and stenosis severity (Pearson's correlation coefficient = -0.027 , $p = 0.695$). 192 out of 207 (92.8%) of the observations were within ± 1.96 SD (4.8 to -4.7% stenosis difference). **Conclusions:** The improved spatial and temporal resolution of the 64 row scanner provides an excellent correlation of MSCT with CCA. MSCT is a valuable tool in the armamentarium of the cardiac scientist. For the cardiac surgeon performing off pump CABG it helps in precise planning of the procedure and pre-judging the length of the conduit required. On the basis of our findings, in selected patients, we recommend the consideration of MSCT as a sole criteria for proceeding for CABG without CCA.

Key Words: Computed tomography • Conventional coronary angiography • Coronary artery disease

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