The importance of end-systole for optimal reconstruction protocol of coronary angiography with 16-slice multidetector computed tomography.


The Zena and Michael A. Wiener Cardiovascular Institute, Marie-Josee and Henry R. Kravis Center for Cardiovascular Health, Mount Sinai School of Medicine, New York, New York 10003, USA.

OBJECTIVES: Multidetector-row computed tomography coronary images are usually analyzed in mid-diastole (MD). Because of slow coronary motion also in end-systole (ES), we evaluated the impact on image quality of including ES images and defined an efficient reconstruction protocol.

MATERIAL AND METHODS: In 50 coronary multidetector-row computed tomography studies, 9 reconstructions (at 10% increments of the RR interval) were graded for image quality. Multiple combinations of reconstructions were compared.

RESULTS: MD (60-70% of the RR interval) offered the best image quality. In 44% patients, the best reconstruction for \( \geq 1 \) coronary was found in ES (20-30%). Their heart rate was higher (68.2\(\pm\)9.9 bpm vs. 59.2\(\pm\)8.8 bpm, \( P=0.0014 \)). Combining ES and MD consistently offered superior image quality and less nonevaluable vessels than even larger numbers of diastolic reconstructions alone. A combination of 2-3 reconstructions was most efficient. Adding more reconstructions did not significantly improve results.

CONCLUSIONS: Combining ES and MD reconstructions reduces nonevaluable coronary arteries, particularly with higher heart rates. A protocol including 2-3 reconstructions is the most efficient.

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