

**Image quality and radiation exposure in post-CABG coronary CT angiography: influence of imaging direction with dual-source CT**

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**PURPOSE:** Evaluation of native coronary arteries after CABG is essential in evaluating the downstream from graft and the status of ungrafted coronary arteries. However, due to long scan time, native coronary arteries are often blurred by respiration artifact when scanned in craniocaudal direction. The purpose of this study is to determine whether there is a significant difference in the image quality and radiation exposure when post-CABG patients underwent coronary CT angiography (CCTA) in craniocaudal direction versus caudocranial direction.

**MATERIALS AND METHODS:** This was a prospective study of 188 consecutive subjects undergoing for CCTA for the evaluation of CABG patency. Scans were performed on dual source CT (Definition, Siemens Healthcare, retrospective ECG gating, 120 kVp, 320 mA, pitch 0.2–0.5, combined tube current modulation (CARE Dose 4D)). Patients were examined in cranio-caudal (group A, n = 98), or caudo-cranial (group B, n = 90) direction including entire course of CABG (from the thoracic inlet to diaphragm). Independent investigators determined the image quality of coronary arteries (left main), measured contrast-to-noise ratio (CNR), and determined radiation exposure by calculating the effective dose (ED). Subjective image quality was assessed with five point scale (1, unacceptable; 2, suboptimal; 3, adequate; 4, good; and 5, excellent).

**RESULTS:** All 199 subjects' images showed diagnostic quality. There was no significant difference between two groups in the scan time (group A = 14 sec, group B = 15 sec) and mean heart rate (group A = 76 bpm, group B = 72 bpm). However, there was significant differences between two groups in radiation exposure (group A = 9.6 mSV, group B = 6.6 mSV) and CNR (group A = 7, group B = 10) ( $p < 0.01$ ). Subjective image quality was not statistically different in two groups; however, the image quality of group B tended to be better than group A ( $p = 0.57$ ). Better subjective image quality in group B was mostly due to the absence of respiratory artifacts in coronary arteries

**CONCLUSION:** Although both scanning directions can yield diagnostic-quality images in post-CABG patients, the scanning in caudo-cranial direction resulted in reduced radiation dose and better image quality. This might be due to earlier scanning of coronary arteries and reduced radiation at thoracic inlet as a result of combined tube current modulation in reverse direction.