

Initial Experience with Low Dose High-Pitch 128-Slice Dual-Source CT Coronary Angiography

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Background: CT Coronary Angiography (CTCA) allows high-quality imaging of coronary arteries. Radiation exposure remains a concern in spite of prospective gating. High-pitch spiral acquisition mode of a novel CT system provides high temporal resolution and fast image acquisition, at low level of radiation dose.

Aim: To describe our initial experience with high-pitch spiral "Flash" mode (one heart beat), as compared to "Prospective Sequential Axial" (3-4 heart beats) and retrospective "Spiral" modes CTCA.

Methods: Forty consecutive patients (pts) referred for CTCA were prospectively recruited. Pts were prepared with beta-blockers as chronically prescribed, or oral propranolol one hour before the scan, if HR>65. IV-propranolol was added in 4 pts. Scan protocol was chosen according to the test requested (CTCA only or "Double Rule Out") and rhythm parameters. Flash and Sequential mode acquisition parameters were: 128x0.6mm collimation, 0.28 seconds gantry rotation, 370mAs at 100/120kV. Data acquisition was prospectively ECG-triggered to cover the heart in diastole. Radiation exposure was estimated in mSv.

Results: Twenty pts had normal coronary arteries, 9 pts single, 7 pts double vessel disease, 1 pt was post coronary bypass surgery. In 3 pts the number of diseased vessels could not be determined due to suboptimal enhancement. In 2 pts Sequential was repeated after Flash mode and in one pt vice-versa, due to motion artifacts.

	Flash Mode (n=13)	Sequential Mode (n=21)	Spiral Mode (n=6)	p Value
Age, yrs	55±14	57±12	59±14	ns
BMI	28±4	27±3.5	28±4	ns
HR, bpm	60±9	63±11	67±10	ns
Estimated radiation dose, mSv	1.8±0.9	4.8±1.8	8±1.7	<0.0001
Scan Quality, n (%)				ns
Excellent/Good	10 (77)	17 (80)	5 (83)	
Fair	2 (15)	2 (10)	1 (17)	
Poor	1 (8)	1 (5)	0	

Conclusions: Our initial results suggest that high-pitch spiral "Flash" mode CTCA enables accurate visualization of the coronary vessels and good diagnostic image quality in pts with low stable HR, with very low radiation exposure. An attempt to further reduce radiation exposure can be achieved by more frequent utilization of low tube voltage.