127 Evaluation of Coronary CT scans radiation dose and image quality using different scanning protocol on a 256-slice CT scanner

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**Background**

Cardiac CT scan is a new, performing, non invasive and accurate coronary imaging method to detect the presence or absence of coronary lesions in symptomatic or asymptomatic patients. It has been hardly criticized about the patients radiation dose. New acquisition protocols has been developed to decrease the delivered radiation dose.

**Objective**

To evaluate the estimated radiation dose and image quality difference of prospective ECG-gating (step-and-shoot) mode and retrospective ECG-gating (helical) coronary computed tomography angiography (CTCA) on a 256-slice scanner.

**Methods**

Radiation doses were estimated for 373 patients routinely scanned with either prospective or retrospective ECG-gating. Only patients with heart rate less than 65 bpm were scanned using step-and-shoot technique. All examinations were performed on the same computed tomography scanner using the standard injection
protocol. Image quality was assessed objectively using the signal-to-noise ratio on axial coronary images and subjectively by coronary segment quality scoring into a 3 grade score.

**Results**

It was found that radiation doses associated with prospective ECG-gating were highly significant lower than retrospective ECG-gating (3.5 ± 1.4 mSv versus 15.4 ± 4.6 mSv respectively, p < 0.0001). No statistically significant differences in image quality were observed between the two scanning protocols for objective quality assessments but the image quality was highly statistical significant better in prospective ECG-gating in comparison to retrospective ECG-gating (p < 0.0001) for subjective scanning evaluation.

**Conclusion**

prospective ECG-gating using a ‘step-and-shoot’ protocol effectively reduces radiation doses in 256-slice CT coronary angiography with better image quality. This is a definite answer cardiac CT over irradiation. When applicable this should be the standard acquisition protocol.

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