Intelligent cardiac CT registry: the feasibility of a structured reporting and automated registry generation in the daily routine

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Background: Routine cardiac CT reporting and research data collection require detailed data acquisition and robust data management.

Purpose: We sought to test the feasibility of automated registry generation regarding patients' history, indications, image acquisition parameters and clinical findings in a cardiac CT program of a single center.

Methods: The intelligent cardiac CT registry (iCCTR) is a database generated by an in-house developed structured reporting tool that automatically stores all relevant data points, such as anamnestic data, indications, premedication, CT acquisition parameters, segment based coronary evaluation and clinical recommendation. In addition, the platform automatically calculates the pretest probability of obstructive coronary artery disease (CAD) using the Diamond-Forrester criterion and generates clinical report.

Results: In total 2866 consecutive patients (age 59.5±11.9 years, 41.3% females) were included in the iCCTR between August 2014 and September 2015. All examinations were performed with a 256-slice multi-detector row CT scanner. Suspected CAD was the main indication (60.1%) followed by left atrial angiography (20.3%). Based on the automated pretest probability estimation in patients with suspected CAD 3.4% had high, 90.0% had intermediate, 5.9% had low and 1.7% had very low probability of obstructive CAD. Average effective radiation dose of the cardiac CT was 4.0±1.4 mSv. For premedication 68.3% of the patients received metoprolol, 4.1% ivabradin and 98.5% nitroglycerin. Invasive coronary angiography was recommended in 14.3% and secondary prevention (statin and/or aspirin therapy) in 47% of the cases.

Conclusions: The majority of the patients had an intermediate pretest probability of obstructive CAD and the main indication for cardiac CT was to rule out severe coronary artery stenosis. Invasive coronary angiography was avoidable in the majority of patients. Structured cardiac CT reporting and automated registry generation is feasible using a dedicated software tool in the daily routine and it provides valuable data for

quality assurance and scientific research.