Validation of an Automated Cardiac CT Angiography Analysis System: Initial Experience at an Academic Center

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Introduction: The COR Analyzer (Rcadia Medical Imaging, Haifa) is a commercially available software that provides a fully automated real time analysis of Cardiac CT angiography (CCTA) images. The goal of this study was to examine the diagnostic performance of this novel analysis tool against an expert interpreter.

Methods: From our database of approximately 700 CCTA studies, 80 were randomly selected. Each study was interpreted by the COR Analyzer system automatically without user interference. The software reported each study as A) data set unusable, B) results indeterminate, C) no significant coronary stenosis (CS), and D) significant CS. The COR Analyzer results were compared retrospectively against the "gold standard" interpretation of a CBCCT certified expert in CCTA. The expert read was classified as either positive (presence of CS >50%) or negative (absence of CS >50%).

Results: One study (1%) was reported as unusable, 7 (9%) were inconclusive, and 72 (90%) were successfully processed. The most common reason for an inconclusive study was the presence of significant cardiac motion (n=6). No obvious explanation could be determined for the inconclusive result in one patient with a severe left anterior descending artery stenosis. The diagnostic performance of the COR Analyzer system, on a per-patient basis was sensitivity 91.7% (11TP, 1FN), specificity 61.7% (37 TN, 23FP), negative predictive value (NPV) 97.4%, and positive predictive value (PPV) 32.4%. On a per vessel basis, the NPV ranged from 95.6-100%, but the PPV was less than or equal to 22.2% (Table).

Conclusion: The COR Analyzer program successfully processed the majority of studies. The software had a high NPV making it a potentially useful software program for ruling out obstructive coronary artery disease. Multicenter trials and more validation against invasive coronary angiography are still needed.

Table 1:

	Sensitivity	**Specificity**	**PPV**	**NPV**
Per patient analysis	91.7%	61.7%	32.4%	97.4%
LAD	71.4%	67.7%	19.2%	95.6%
Left Circumflex	50%	87.1%	10%	98.4%
RCA	100%	79.4%	22.2%	100%