

Continuous Daily Utilization of Coronary CTA for Exclusion of CAD in ED Patients with Low Risk Chest Pain: A One-Year Experience

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Background:

- Six to eight million ED visits for chest pain each year.
- Most patients with chest pain do not have ACS.
- Current protocols require serial biomarkers and perfusion studies to exclude ACS.
- There have been several reports of using Cardiac Computed Tomographic Angiography (CCTA) to exclude ACS.

Objectives:

- To describe our experience with the daily use of CCTA in ED patients.
- To determine if the rate of cardiac adverse events over the six month follow-up period remains favorable for CCTA.

Hypothesis:

The rate of death or major cardiac adverse events in patients discharged home after a negative or non-obtrusive CCTA will be less than 1% over a six month follow up period.

Methods:

Study Design

Prospective Observational

Setting

- Tertiary care university medical center with a regional heart center and an annual ED census of 80,000.

- CCTA was performed using a 64-Slice CT scanner (Light-speed VCT, GE Healthcare)



Subjects

- Patients with low risk chest pain whose ED physician ordered a CCTA.
- Excluded: Patients with ST segment elevation, positive cardiac troponin levels, and known coronary artery disease.

Methods (continued):

Measures

- Electronic medical records systematically reviewed for demographic and clinical information.
- Telephone follow-up and death index search were conducted.
- To grade the extent of luminal stenosis, CCTA images were classified using a semiquantitative scale: normal or no stenosis (0%), non-obstructive (1-49%), and obstructive (≥50%).

Outcomes

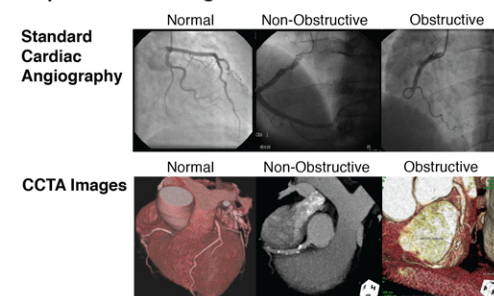
- Presence of CAD in low risk chest pain patients.
- Rate of major cardiac adverse events during the six month follow-up period.

Data Analysis

- Descriptive statistics, χ^2 tests and analysis of variance.

Results:

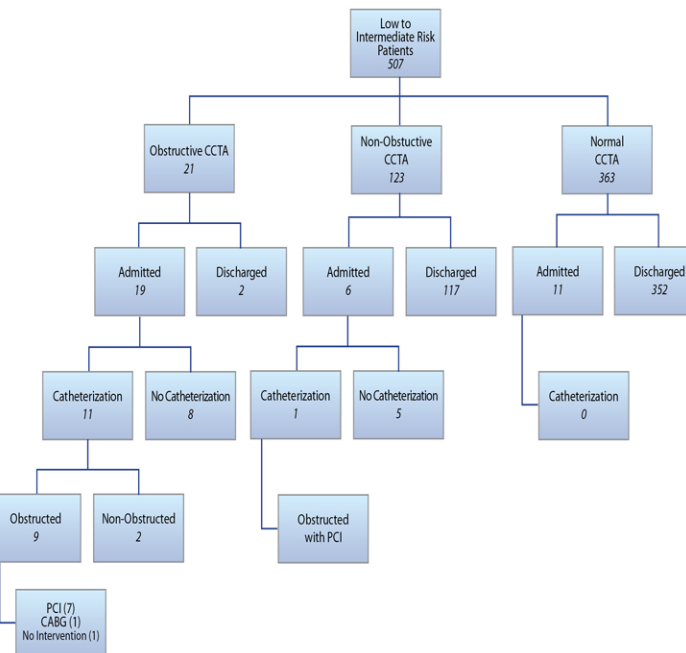
Figure 2: Representative Images



Results (continued):

- 507 ED patients included (see Figure 1)
- Results of CCTA:
 - Normal: 71.6%
 - Non-Obstructive: 24.3%
 - Obstructive: 4.1%
- Of patients with normal or non-obstructive CCTA:
 - 469 discharged from ED
 - No subsequent MI, PCI, CABG, or death (0%, 95 CI 0 - 0.8%)

Figure 1: Cardiac CTA Subject Flow Chart



Results (continued):

Table 1: Characteristics of Patients by CCTA Result

Characteristic	Normal CCTA (n=363)	Non-Obstructive CCTA (n=123)	Obstructive CCTA (n=21)	P
Mean Age	46	55	60	<.001
% Female	57.6	36.6	33.3	<.001
% Hypertension	30.6	52.8	66.7	<.001
% Diabetes	6.3	8.1	14.3	.34
% Hyperlipidemia	21.2	35.0	66.7	<.001
% Ever Smoked	29.8	38.2	60.0	.003
% Family History CAD	41.0	44.3	52.4	.52
% History of CAD	0.6	8.1	0.0	<.001
% Prior Aspirin Use	13.0	21.1	28.6	.02
% Multiple Chest Pain Episodes	36.4	29.3	33.3	.36
Mean Calcium Score	0.02	151	867	<.001

Table 2: Procedures/Outcomes of Patients Admitted at Initial Hospitalization

	Obstructive (n=19)	Non-Obstructive (n=6)	Normal (n=11)	P
PCI	36.8%	16.7%	0%	.05
CABG	5.3%	0%	0%	.62
MI	0%	0%	0%	-

Limitations:

- Single center study
- Incomplete telephone follow-up rate of 68%
- Highly experienced CCTA readers

Conclusions:

- Patients with normal or non-obstructive CAD have very low rate of adverse events.
- Most low risk patients with chest pain with normal or non-obstructive CCTA can be safely discharged from the ED.
- Daily implementation of CCTA retains performance.