Posters - Friday: Poster Session 01: Acute Chest Pain
Abstracts 1-7

1 A Peculiar Case of ST Elevation
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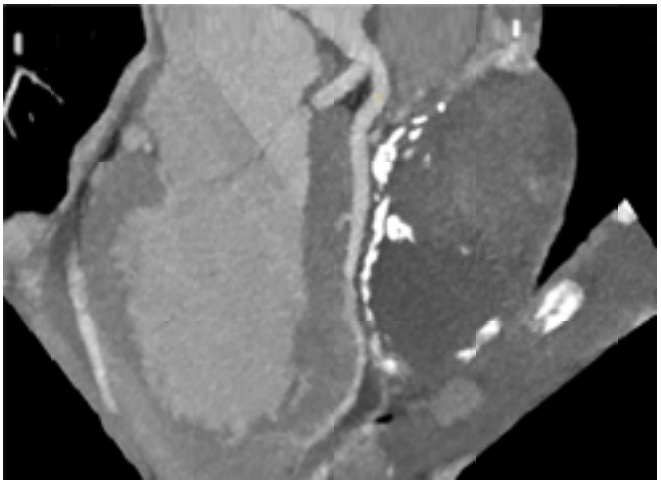
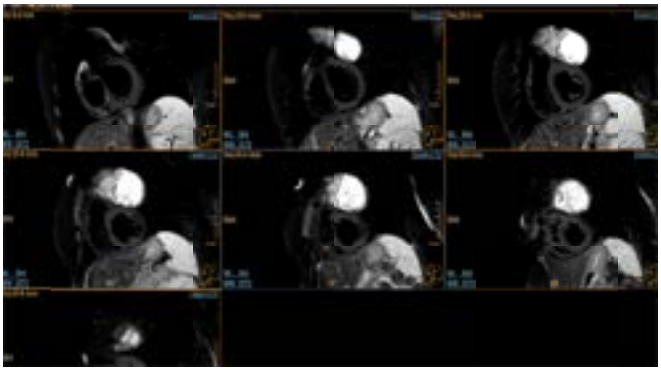
Introduction: ST elevation is usually associated with acute coronary syndrome due to occlusion of a coronary artery. However, when a young patient with no known risk factors presents with evidence of ST elevation on an electrocardiogram, other causes should be considered. We present a peculiar cause of ST elevations in a young patient.
Methods:
Results: The coronary CT demonstrated a large extra-cardiac mediastinal mass perched above the diagonal branches of the left anterior descending artery with external compression . The coronary arteries were of normal caliber without any intrinsic pathology. A Cardiac MRI (Images 4 & 5) was performed for further tissue characterization definition of this mass, revealing both solid and cystic components. The mass was confirmed to be extra-cardiac without invasion of the pericardium or great vessels. The patient underwent successful surgical excision of this mass. Pathologic analysis revealed B2 type thymoma. The subsequent hospital course was uneventful and the patient was discharged in stable condition.
Conclusions: Thymomas are uncommon tumors that are found in up to 20% of patients with myasthenia gravis. Mediastinal masses are an extremely rare cause of acute chest pain in young men. We report here a rare case of extrinsic compression of coronary arteries by a thymoma in a patient with myasthenia gravis. In this patient, the extrinsic compression was transient and resolved spontaneously, with surgical excision being the curative treatment.





2 Feasibility and Safety of ECG-Gated Whole Body Computed Tomography for Cardiac and Non-Cardiac Diagnoses of Out-of-Hospital Circulatory Arrest Survivors
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Introduction: Whole body computed tomography (WBCT) can visualize a high proportion of cardiac and non-cardiac causes for out-of-hospital circulatory arrest (OHCA), but it has not been prospectively evaluated.
Methods: Thirty three OHCA survivors without obvious cause prospectively underwent early (<6 hours from admission) dual source WBCT scanning including non-contrast head, followed by ECG-gated arterial phase thoracic CT angiography and venous phase abdominal CT. Informed consent was obtained from patients or relatives if they survived hospitalization. Patients with a clear OHCA cause or indication for urgent invasive coronary angiography or those deemed unstable for CT scanning were excluded. OHCA rhythm and baseline characteristics were tabulated from the medical record, when available. Primary endpoints were WBCT diagnosis compared to adjudicated cause(s) for OHCA, hospital survival, and CT safety (acute kidney injury or false WBCT findings causing inappropriate treatments).
Results: Participant characteristics are shown in Table 1. WBCT scans identified 12/33 (37%) of all causes and 12/12 (100%) of visualizable causes for OHCA (Table 2). No WBCT findings resulted in inappropriate treatments. Six (21%) participants had a >0.3 mg/dL creatinine increase at 48 hours. Of these, 5/6 had vasopressor-requiring shock and 1/6 had known Stage IV kidney disease that ultimately required temporary dialysis. Survival to hospital discharge was 58%.
Conclusions: In this pilot prospective study of OHCA survivors, early WBCT scanning is feasible and may lend considerable diagnostic yield to identifying cardiac and non-cardiac OHCA causes.

Participant Characteristics and Causes of OHCA (n=33)

Table 1: Patient Characteristics	**Mean or N (SD or %)**	***Table 2: Cause of OHCA***	**N(%)**	**Diagnosis by CT [N(%)]**
Age	51.1 +- 14.1	Acute coronary syndrome	3 (9%)	3 (100%)
Male Gender	21 (64%)	Cardiomyopathy	3 (9%)	3 (100%)
Hypertension	7 (21%)	Pulmonary (COPD, Pneumonia)	6 (18%)	2 (33%)
Diabetes	3 (9%)	Stroke (any)	2 (6%)	2 (100%)
Known CAD	3 (9%)	Pulmonary embolism	1 (3%)	1 (100%)
COPD	5 (15%)	Abdominal catastrophe	1 (3%)	1 (100%)
OHCA Ventricular tachycardia/fibrillation	8 (24%)	Substance abuse	5 (15%)	0
OHCA pulseless electrical activity	10 (30%)	Seizure	2 (6%)	0
ohca Asystole	7 (21%)	Unknown/Other	10 (30%)	0

3 Incremental Value of Coronary Calcium Score to Coronary Artery Disease Consortium and Diamond-Forrester Scores to Predict Obstructive Coronary Artery Disease in Acute Chest Pain Patients
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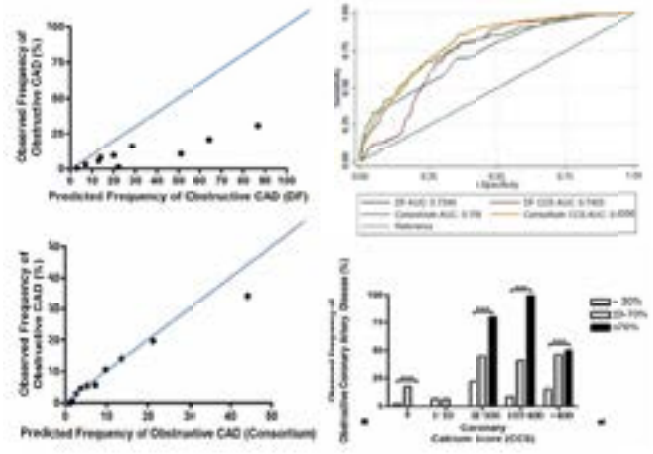
Introduction: The performance of Diamond Forrester (DF) score compared to coronary artery disease (CAD) consortium score for predicting obstructive disease in acute chest pain patients is not clearly known. Furthermore, the incremental value of coronary calcium score

(CCS) to DF and CAD consortium scores has not been directly compared in acute chest pain setting

Methods: Study subjects were consecutive acute chest pain patients ≥ 40 years old with no known CAD, normal cardiac biomarkers and electrocardiogram referred for coronary computed tomographic angiography (CTCA). After excluding patients who were missing clinical information required to determine pretest probability, a final cohort of 1731 patients were included in the analysis. We compared DF and CAD consortium scores with and without coronary calcium score (CCS) with respect to their power to predict obstructive CAD (≥ 50% stenosis) on CCTA.

Results: The mean age was 54.3 (SD 9.99) years and 44.1% were males. Obstructive CAD was found in 176 (10.2%) patients, of whom 58 (3.3%) underwent revascularization. CCS was zero in 937 (54.1%) of patients, of whom 27 (2.9%) had obstructive CAD and 10 (1.1%) underwent revascularization. The area under the receiver-operating characteristic curve (ROC) for predicting obstructive CAD was 0.7346 vs. 0.789 for DF and CAD consortium scores, respectively (P<0.001). Continuous CCS did not add incremental value to DF alone (0.7403, *p*=0.72) and only marginally to CAD consortium score alone (0.8056, p=0.07). When selectively applied to patients with low (<30%) vs. intermediate (30-70%) pretest probability by CAD consortium score, a zero CCS showed negative predictive values of 98% (95% CI 97.0-98.6%) vs. 82.2% (95% CI 69.9- 90.3%) as well as negative likelihood ratios of 0.2 vs 0.4, respectively.

Conclusions: In acute chest pain patients evaluated by CCTA in the Emergency Room, CAD consortium risk score offered better prediction of obstructive CAD than DF risk score. CCS did not provide incremental value beyond DF and CAD consortium scores. When selectively applied to patients with low-pretest probability, CCS of 0 could reliably rule out obstructive CAD.



Value of calcium score (0 or >0) according to pretest probability

	<30% pretest- probability	30-70% Pretest-probability
	%(95 Confidence Interval)	%(95% Confidence Interval)
Sensitivity	86.0 (79.6-91.0)	85.7 (73.8-93.6)
Specificity	60.8 (58.5-63.1)	33.3 (24.7-42.9)
PPV	16.5 (15.3-17.7)	39.3 (35.4-43.5)
NPV	**98.0 (97.0-98.6)**	**82.2(69.9-90.3)**
LR+	2.2 (2.0-2.4)	1.3 (1.1-1.5)
LR-	**0.2 (0.16-0.34)**	**0.4 (0.21-0.86)**

4 Adherence to and Utility of Coronary Computed Tomographic Angiography Appropriate Use Criteria for Chest Pain Evaluation in a Tertiary Care Emergency Room

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Introduction: Appropriate Use Criteria (AUC) for Coronary Computed Tomography Angiography (CCTA) in the Emergency Department (ED) acute chest pain patients has not been validated with respect to its impact on diagnostic yield, healthcare resource utilization and patient outcomes.

Methods: We evaluated 749 consecutive chest pain with no known Coronary Artery Disease (CAD), negative cardiac troponin, and normal electrocardiogram who had CCTA in the ED as the initial test. CCTA use was mapped as appropriate, uncertain, or inappropriate according to the 2010 AUC. We abstracted index and 30-day data to determine diagnostic yield and healthcare resource utilization.

Results: Rates of appropriate, uncertain, and inappropriate utilization were 48.4%, 48.8% and 2.8%, respectively with the triple-rule-out (TRO) accounting for 42% of all CCTAs. Among appropriate, uncertain, and inappropriate classifications, rates of obstructive CAD were 9%, 8% and 32% (p=0.002); rates of revascularization were 3%, 1% and 36% (p<0.001); downstream stress test utilization rates were 5% vs. 5% vs. 14%, (p=0.17) and 30-day hospital return rates were 6% vs. 6% vs. 5% (p>0.99), respectively. D-dimer had a negative predictive value (NPV) of 97.4% (95% Confidence Interval: 93.5% - 99.3%) for the detection of acute pulmonary embolism (PE) by TRO.

Conclusions: Appropriate and uncertain uses are both associated with low diagnostic yield and revascularization rates compared to inappropriate use. Our findings did not demonstrate the impact of AUC with respect to downstream healthcare resource utilization. Further studies are needed to validate the utility of AUC for CCTA in ED setting and delineate the most appropriate clinical use for TRO by integrating D-dimer in to AUC algorithm.

Clinical scenarios for CCTA evaluation

Clinical Indication	AUC Category	Cases (%)
Triple rule out (Acute chest pain of uncertain cause (differential diagnosis includes pulmonary embolism, aortic dissection, and ACS)	Uncertain	332 (42.0%)
Acute symptoms onset, Normal ECG and biomarkers, intermediate pretest probability	Appropriate	143 (18.1%)
Non-acute symptoms onset, ECG interpretable, Intermediate pretest probability	Appropriate	122 (15.5%)
Acute symptoms onset, Normal ECG and biomarkers, low pretest probability	Appropriate	116 (14.7%)
Non-acute symptoms, ECG Interpretable and able to exercise, Low pretest probability	Uncertain	47 (6.0%)
Non-acute symptoms, ECG Interpretable and able to exercise, High pretest probability	Inappropriate	16 (2.0%)
Positive Troponin	Inappropriate	6 (0.8%)
Acute presentation with high pretest probability, normal ECG and troponin	Uncertain	5 (0.6%)