Coronary CTA is the Test of Choice for Acute Chest Pain

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Disclosure

• Research grant: HeartFlow Inc.
Does negative Calcium score exclude ACS?

- 61 yo Female
- 4/24/17 ED visit, DM, lipids, HTN
- 2 wks recurrent substernal “tight” CP
- EKG, Trop neg
Calcium Score: Zero
Does positive Calcium score indicate ACS in ACP?

- 75 yo Male
- ED visit 4/13/17 HTN, lipids, COPD
- 3/10 “pressure” CP1-2 hrs,
- neg EKG, neg Tn
Severe coronary calcification – completely covers lumen 100%
Findings:
Lexiscan Test Interpretation: The patient completed a Lexiscan protocol without reports of chest discomfort. Blood pressure was normal. Resting EKG showed sinus rhythm a right bundle branch block pattern. During the study there were no electrocardiographic changes diagnostic of ischemia. No ectopy was detected.

Nuclear Analysis: Perfusion images following both rest and stress appeared normal.

Gated Analysis: Gated images were done to evaluate resting perfusion abnormalities to correlate wall motion. The calculated ejection fraction was 72%. There was normal thickening in all regions. There was no motion artifact.

Impression:
Clinical response: Nonischemic
EKG response: Nonischemic
Nuclear response: Nonischemic
Coronary CTA is the Test of Choice for Appropriately Selected Patients with Acute Chest Pain

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Coronary CTA is the Test of Choice for Appropriate Patients with ACP such as:

Patients with True Positive hs-Tn

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Coronary CTA is the Test of Choice for Appropriate Patients with ACP such as:

Patients with True Positive hs-Tn and

Patients with False Positive hs-Tn

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Coronary CTA is the Test of Choice for Appropriate Patients with ACP such as:

Patients with True Positive hs-Tn
and
Patients with False Positive hs-Tn
and
Patients with Equivocal hs-Tn
When hs-Tn is positive, who are you gonna call?

- Stress testers?
- Cath testers?
- CCTA testers?
Beaumont 10 Yr ED Experience: Distribution of CAD by CCTA Stenosis Severity (N=6,490)

- 72% No or Minimal Disease

<table>
<thead>
<tr>
<th>Severity</th>
<th>Count</th>
<th>Percentage</th>
</tr>
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<tbody>
<tr>
<td>CT 0</td>
<td>3,723</td>
<td>57.4%</td>
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<tr>
<td>CT 1-25</td>
<td>973</td>
<td>15.0%</td>
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<tr>
<td>CT 25-50</td>
<td>617</td>
<td>9.5%</td>
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<tr>
<td>CT 50-70</td>
<td>328</td>
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<tr>
<td>CT &gt; 70</td>
<td>284</td>
<td>4.4%</td>
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<tr>
<td>UI</td>
<td>565</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

Legend:
- CT 0
- CT 1-25
- CT 25-50
- CT 50-70
- CT > 70
- UI
72% No or Minimal Disease

I’m all in favor of hs-Tn in these patients
Then we can concentrate on the 20% with real CAD
Potential advantage: neg hsTn may exclude ACS and avoid CTA altogether.
Potential dis-advantage: hs-Tn may be false positive in host of other conditions.
Potential Advantages CTA vs Stress tests: Efficiency and Cost

Multicenter Trial Evidence - Efficiency

- **CT-STAT**
  - 54% reduction in time to diagnosis
  - 38% cost savings

- **ACRIN-PA 4005**
  - LOS 18 hrs CCTA vs. 25 hrs usual care
  - Negative testing: 12 vs. 25 hrs
  - 50% vs. 23% direct ED discharge

- **ROMICAT II**
  - LOS 22 hrs CCTA vs. 31 hrs usual care
  - 47% vs. 12% direct ED discharge
  - ED visit cheaper in CCTA: $2053 vs. $2532
  - Hospital costs more in CCTA: $1950 vs. $1297
  - Overall care similar: $4004 vs. $3828
How does CCTA perform if hs-Tn is available? – The BEACON Trial

Coronary CT Angiography for Suspected ACS in the Era of High-Sensitivity Troponins

Randomized Multicenter Study

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An attractive consequence of early CCTA in our study was the reduced number of subsequent outpatient testing and lower medical costs at 30 days.
• Late outpatient testing was reduced with CCTA, because even if neg hs-Tn don’t have ACS, they still may have angina and need a correct diagnosis. Evaluation was deferred...not eliminated in hs-Tn neg pts. For deferred testing, I still think CCTA is the best choice.
Summary

• It is hard for me to understand use of CAC alone in ACP
• hs-Tn is a valuable addition to ED diagnosis.
• It may reduce the need for CCTA in many cases.
• However, when positive or equivocal, further evaluation is needed.
• In many cases, negative hs-Tn will need outpt non-invasive evaluation since hs-Tn did not provide explanation for their Sx, even if it was not ACS.
• The proven advantages of CCTA over other diagnostic strategies are still compelling.