ACS and NSTEMI: When to Intervene and When not

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SYMPTOMS SUGGESTIVE OF ACS

Noncardiac Diagnosis

Treatment as indicated by alternative diagnosis

Chronic Stable Angina

ACC/AHA Chronic Stable Angina Guidelines

Possible ACS

Nondiagnostic ECG
Normal initial serum cardiac biomarkers

Observe
≥ 12 h from symptom onset

No recurrent pain; negative follow-up studies

Stress study to provoke ischemia
Consider evaluation of LV function if ischemia is present (tests may be performed either prior to discharge or as outpatient)

Negative
Potential diagnoses: nonischemic discomfort; low-risk ACS

Arrangements for outpatient follow-up

Positive
Diagnosis of ACS confirmed or highly likely

Definite ACS

No ST-Elevation

ST and/or T wave changes
Ongoing pain
Positive cardiac biomarkers
Hemodynamic abnormalities

 Evaluate for reperfusion therapy

ACC/AHA STEMI Guidelines

ST-Elevation

Diagnosis of ACS confirmed

Admit to hospital
Manage via acute ischemia pathway

Algorithm for evaluation and management of patients suspected of having ACS. Anderson JL, et al. J Am Coll Cardiol 2007;50:e1–e157, Figure 2.
Was your Stent Unnecessary?

WAS YOUR STENT UNNECESSARY?

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Acute Coronary Syndromes

1.41 million hospital admissions for ACS in 2010

- **STEMI**: 22%
- **NSTEMI (biomarker +)**: 50%
- **Unstable angina**: 28%

**NSTE-ACS**
Early Risk Stratification

Risk Score App

TIMI Score for UA/NSTEMI

- Known coronary stenosis ≥ 50%
- Aspirin use in past 7 days
- 2 angina episodes in prior 24 hours
- Elevated serum cardiac markers
- ST deviation ≥ 0.5 mm on admission ECG

Result

- TIMI Risk Score: 4
- Risk of Events by 14 Days after UA/NSTEMI: 19.9%

GRACE

Admission

- Years
- Age

Discharge

- bpm
- HR

- mmHg
- SBP

- mg/dL
- Creatinine

- Killip Class
- CHF

Yes No

Cardiac arrest at admission
TIMI Risk Score for UA/NSTEMI

Death, MI, Urgent Revascularization by TRS

One Point for each of:
- Age ≥ 65 y
- > 3 CAD Risk Factors
- Prior Stenosis > 50%
- ST deviation
- > 2 Anginal events ≤ 24 h
- ASA in last 7 days
- Elevated Cardiac Markers

Antman EM, JAMA 2000; 284:835-42
To Cath or not to Cath?! This is the Question....
NSTE-ACS
2 of 3 Criteria: Ischemic symptom, ST-T change, troponin rise with TIMI score ≥ 3

Immediate cath
Median time 1.1 h

Next day cath
Median time 20.5 h

All PCIs on abciximab

Primary Endpoint: Peak Troponin

1-month Follow-up

Montalescot et al. JAMA 2009
### ACC/AHA Guidelines: Class I early invasive strategy

| 1. | Recurrent angina / ischemia at rest or with low level activities despite intensive anti-ischemic therapy |
| 2. | PCI within 6 months |
| 3. | Previous CABG |
| 4. | New (or presumably new) ST depression |
| 5. | High-risk finding on noninvasive stress testing |
| 6. | Hemodynamic instability |
| 7. | Elevated cardiac biomarkers (TnT, TnI) |
| 8. | CHF, S3, pulmonary edema, rales, new/worsening MR |
| 9. | Depressed LV function (<0.40) |
| 10. | Sustained VT |
| 11. | High risk score |
| 12. | Diabetes |
| 13. | Mild/moderate renal dysfunction |

Conservative preferred

### Risk Categories

- **Ischemia**: Recurrent angina / ischemia at rest or with low level activities despite intensive anti-ischemic therapy, PCI within 6 months, previous CABG, new (or presumably new) ST depression, high-risk finding on noninvasive stress testing, hemodynamic instability, elevated cardiac biomarkers (TnT, TnI).

- **Heart Failure (HF)**: CHF, S3, pulmonary edema, rales, new/worsening MR, depressed LV function (<0.40).

- **Arrhythmia**: Sustained VT.

- **Conservative preferred**: Low risk score, patient or physician preference in the absence of high-risk features.
What you need to know at 3AM

Ischemia
Heart failure
Arrhythmias
Women

For women with high-risk features, recommendations for invasive strategy are similar to those of men.

In women with low-risk features, a conservative strategy is recommended.

These recommendations are also found in the Initial Invasive Versus Initial Conservative Strategy Section.
I get it!

- All the data suggests high risk patients should get cath.
- Not clear to me if Cath should be done at 2 am or wait till AM
- Do I need to treat a NSTEMI not in shock like a STEMI ie cath at all hours?
To Cath or Not to Cath?

UA/NSTEMI

Ongoing chest pain
Hemodynamic/electrical instability

High-risk

Urgent cath (IA)

Early non-urgent cath (IB)

Early conservative (IIB)

Anderson et al: JACC 2007
An early invasive strategy is indicated in UA/NSTEMI patients with refractory angina or hemodynamic or electrical instability.
Sometimes hard to know when to go to lab
The Problem for you

“refractory angina”….on any therapy or on maximal medical therapy??

What’s electrical instability? Long run of sustained VT requiring shock? 7 beat run of VT on low dose BB?

Is ‘hemodynamic instability’ simple hypotension responsive to fluids?
Classic Phone Call

- Patient admitted that afternoon with a \textit{normal} tpn and minimal ECG changes. Now completely pain free but tpn=20 and you are called to go to lab in absence of ECG changes at 1 AM!!!
OR

- Patient has minimal ECG STE but no chest pain on NTG and other maximal medical Rx
Case 1

- 41 yo old admitted with severe CP
- Initial tpn=0.9
- ECG X 2 NSTTE
- ASA, Clopidogrel, heparin, IV NTG
- Recurrent pain easily relieved with 2 SL NTG
First Injection
An ISSUE

• “Recurrent angina or ischemia at rest despite intensive medical therapy”
• What if your HR=110 and BP=170/80??

• “Elevated Biomarkers”…….Ever???. To what extent? Tpn=0.9 gets cath same as tpn of 8???
What did we learn??

- Don’t want to take everyone at night to lab with minimal CP and minimal ECG changes
- BUT....young person with loss of R waves and some STE...think hard.
- Echo may be helpful
- Err on side of going.... some of LV dysfct prevented by earlier opening of LAD
Case 2

• 32 yo woman RN went for jog.
• After one block, chest pain made her stop. Typical to my ears, atypical to others
• To local ED: no ECG changes, neg tpn.
• Transferred on IV NTG, ASA, Clopidogrel, heparin…Pain FREE
• ECG normal…..recurrent pain 4 am
• 2 MS…pain free
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You Would....

• Put up guide, do IVUS to document

• Stent Diag, provisional LAD, stent Cx

• Back to floor on heparin and Med Rx

• CABG
Lessons learned

• “Atypical CP’ in woman may not be...just men who cannot listen
• Always think hard about spontaneous coronary dissection in young females
• I try to avoid wires, IVUS, stents if SCD is suspected
• Remember, intramural hematoma may narrow lumen without obvious dissection
Get out of Bed when you need to....sleep when you don’t
Conclusion

No question: Don’t cath patients you are not willing to intervene upon.

Older patients: GDL and common sense suggest you individualize it.

Appropriate elderly patients benefit from PCI….recognize high risk PCI here, clarify CABG role if disaster occurs.
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