Case 4

- 55 yo W history of htn, smoker, DM, cancer
  - Presents with chest heaviness and dyspnea
  - Looks uncomfortable
2-JAN-1951 (55 yr)
Female  Black

Ventricular rate 118 BPM
PR interval 152 ms
QRS duration 66 ms
QT/QTc 320/448 ms
P-R-T axes 30 56 43

SINUS TACHYCARDIA
ST ELEVATION CONSIDER INFERIOR INJURY OR ACUTE INFARCT
* * * * * * * * * * ACUTE MI * * * * * * *
ABNORMAL ECG
WHEN COMPARED WITH ECG OF 18-JAN-2006 14:50,
VENT. RATE HAS INCREASED BY 49 BPM

Referred by:  
Confirmed By: M.D.
Case 4

ECG traces showing abnormal findings in leads II, aVL, and V6.
Case 4
Case 4
Case 4
ST, low voltage, pericardial effusion
• Takehome point...be careful in using the PR segment as the isoelectric segment of the ECG
  – The TP segment is often more reliable and recommended by many authors
  – If the PR is down-sloping, don’t use it!
45 yo woman with CP and SOB
STEMI or AP?
STEMI or AP?
Acute pericarditis...?
Acute pericarditis...?
Acute pericarditis...?
Using the TP segment, there is ST depression
Diffuse ischemia
STEMI with PR depression
Marked sinus tachycardia (TP segment gets lost)
Takehome Points

• Usually either the PR or the TP segment can be used as the isoelectric segment, but...
  – The PR can be affected by ischemia or pericarditis
  – When the PR is downsloping or depressed, use the TP segment!
  – TP loses reliability in marked tachycardia
I'M SO ANGRY I MADE A SIGN
Case 5

- 36 yo M present with sharp lateral CP
  - Worse with deep inspiration
  - Worse laying back
  - Better sitting upright
  - Smokes but no FHx or other CRFs
Case 5

| 36 years | Vent. rate 62 bpm | Normal sinus rhythm |
| Male | PR interval 160 ms | Acute pericarditis |
| Black | QRS duration 90 ms | Abnormal ECG |
| Room: QT/QTc 406/412 ms | Technician: KMT |
| Loc: 2 | P-R-T axes 64 48 59 | |
STEMI vs. Pericarditis

36 years, Male

- Vent. rate: 62 bpm
- PR interval: 160 ms
- QRS duration: 90 ms
- QT/QTc: 406/412 ms
- P-R-T axes: 64 48 59

Normal sinus rhythm
Acute pericarditis
Abnormal ECG

Technician: KMT
STEMI vs. Pericarditis

1. Factors that strongly favor STEMI
   - STD except in V1 or aVR
     • (STD in V1 or aVR is allowed in AP)
   - STE in III > II
   - Horizontal or convex upwards STE
   - Q-waves that you know are new
1. Factors that strongly favor STEMI
   - STD except in V1 or aVR
     • (STD in V1 or aVR is allowed in AP)
   - STE in III > II
   - Horizontal or convex upwards STE
   - Q-waves that you know are new

2. Factors that strongly suggest AP (after above has been evaluated!)
   - PR depression in multiple leads
     • (Only reliably seen in viral AP, transient)
STEMI vs. Pericarditis

When in doubt, get serial ECGs!

- Other options: echo, serial TNs, cath
STEMI or Acute Pericarditis?
STEMI
STEMI or AP?
STEMI or AP?
STEMI or AP?
STEMI or AP?
STEMI or AP?
STEMI or AP?
STEMI or AP?
STEMI or AP?
STEMI or AP?
When in doubt, get serial ECGs!

- Other options: echo, serial TNs, cath
STEMI or AP?
STEMI or AP?
30yo man with 3 hrs. central CP

Dr. Hasdan AlMaateeq (Saudi Arabia)
Consultant: “Pericarditis”

Dr. Hasdan AlMaateeq
Dx: STEMI

Dr. Hasdan AlMaateeq
Elderly woman with CP
Pericarditis??

- 12-Lead 2
- Name:
- Patient ID:
- Incident ID:
- Device:
- Device Configuration:
- Software Revision:

Ensure printer accuracy, confirm that the calibration markers are 10mm high and the grid squares are 5mm wide.
STEMI!

12-Lead ECG

- Name: 
- Patient ID: 
- Incident ID: 
- Device: 
- Device Configuration: 
- Software Revision: 

Ensure printer accuracy, confirm that the calibration markers are 10mm high and the grid squares are 5mm wide.
STEMI or AP?

- Additional factors that favor STEMI
  - R-T sign ("checkmark sign")
- Additional factors that favor pericarditis (after above has been evaluated)
  - Spodick sign: downsloping of the TP
“Checkmark” or “R-T sign”
“Checkmark” or “R-T sign”
“Checkmark” or “R-T sign”
Spodick’s Sign

Courtesy Dr. Pablo Aguilera (Chile)
Spodick’s Sign

Downsloping TP segment

Courtesy Dr. Pablo Aguilera (Chile)
Spodick’s Sign

Courtesy Larry Moore (Firecaptain, Honolulu)
Spodick’s Sign
Spodick’s Sign
Spodick’s Sign (subtle)

Courtesy Andrew Bowman
(NP working in Indiana)
Spodick’s Sign (subtle)

Courtesy Andrew Bowman
STEMI!

Courtesy Dr. Baruch Fertel
Takehome Points

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   - STD except in V1 or aVR
     • (STD in V1 or aVR is allowed in AP)
   - STE in III > II
   - Horizontal or convex upwards STE
   - Q-waves that you know are new

2. Factors that strongly suggest AP (after above has been evaluated!)
   - PR depression in multiple leads
     • (Only reliably seen in viral AP, transient)
STEMI or AP?

- Additional factors that favor STEMI
  - “R-T sign” and “checkmark sign”
- Additional factors that favor pericarditis (after above has been evaluated)
  - Spodick sign: downsloping of the TP

- Don’t trust your computer!!!
Takehome Points

- STE is complicated!
  - Pay attention to ST-T morphology
  - Pay attention to potential reciprocal changes
  - Consult cardiology for joint decision-making
Takehome Points

- Beware straightening of the initial part of the T-wave
  - This is often an early finding in ischemia
  - Get serial ECGs to evaluate this!
Takehome Points

• Reciprocal changes can be the first manifestation of an impending STEMI
  – Especially in aVL → inferior STEMI

• When you see ST or T-wave changes in a symptomatic patient, get serial ECGs!

• Respect the T-wave!
Takehome Points

• Usually either the PR or the TP segment can be used as the isoelectric segment, but...
  – The PR can be affected by ischemia or pericarditis
  – When the PR is downsloping or depressed, use the TP segment!
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Takehome Points

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   - STD except in V1 or aVR
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2. Factors that strongly suggest AP (after above has been evaluated!)
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     • (Only reliably seen in viral AP, transient)
Remember...

• Just because electrocardiography is a basic skill in EM...
Remember...

• Just because electrocardiography is a basic skill in EM doesn’t mean that our skills should be *basic*. 
Remember...

• Just because electrocardiography is a basic skill in EM doesn’t mean that our skills should be basic.
• YOU must be the experts in electrocardiography!
Thank you!
Thank you!

- Questions/comments? Email me: amalmattu@comcast.net
- PDF of slides at lectures.umem.org/Mattu (for 1 month only)