ECG MIMICS OF MYOCARDIAL ISCHEMIA AND INFARCTION

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Disclosures: None

PITFALLS IN THE ACCURACY OF THE ECG DIAGNOSIS OF ACUTE MI

• Nonspecific ST/T wave abnormalities
• Age of Q-waves (may not be known)
• Paced ventricular rhythm
• Left bundle branch block
• Right bundle branch block: secondary
  ST-T abnormalities in V1-3 can mimic anterior wall MI; tall R waves in V1-2 can mimic posterior wall MI
• Nonspecific intraventricular conduction delay with repolarization abnormalities

DIAGNOSIS OF ACUTE MI IN LBBB

• 1 mm ST segment change in same direction as terminal QRS
• More than 5 mm ST elevation in direction opposite to QRS
• Sgarbossa criteria (NEJM 1996;334:481)
  - ST-elevation > 1 mm in lead with concordant QRS complex 5 points
  - ST-depression > 1 mm in leads V1, V2 or V3 3 points
  - ST-elevation > 5 mm in lead with discordant QRS complex 2 points
Same patient, baseline ECG obtained 6 months earlier
PITFALLS IN THE ECG DIAGNOSIS OF ACUTE MI: MI MIMICS - 1

- Early repolarization
- Electrolyte disorders
  - Hyperkalemia
  - Hypokalemia
- Inflammatory conditions
  - Pericarditis
    - (PR depression, scooped ST segments, J point elevation)
  - Myocarditis
- Conduction system disorders
  - Fascicle blocks
    - Anterior: qV_{2,3, aV_L}
    - Poor R progression
  - Posterior: qII, III, aVF

PITFALLS IN THE ECG DIAGNOSIS OF ACUTE MI: MI MIMICS - 2

- Accessory pathways: ventricular pre-excitation
- Cardiac conditions
  - LVH, RVH
  - HCM
- Arrhythmias
  - Wide QRS tachycardias
  - Ectopic atrial tachycardias with prominent T waves
  - Paced ventricular rhythm with inapparent pacing artifacts
  - Junctional or ventricular tachycardias with retrograde conduction
  - Atrial flutter with flutter waves → pseudo ST ↑or ↓
  - Brugada pattern

PITFALLS IN THE ECG DIAGNOSIS OF ACUTE MI: MI MIMICS - 3

- Other
  - Osborne waves
  - Pneumothorax with mediastinal shift
  - Double standardization
EARLY REPOLARIZATION

- Prevalence about 1%
- Male prevalence (87% in men, 33% in women)
- Age less than 50 (OR 3.3)
- High prevalence in black and Asian races
- High prevalence in athletes
- Benign clinical course
- Exercise and hyperventilation normalize the pattern

EARLY REPOLARIZATION: ECG FEATURES

- J point elevation
- Terminal R wave notch
- Upwardly concave ST segments
- PR segment depression often seen
- PR interval often short
- Bradycardia common
- Best seen in precordial leads (usually V2-4); unusual in limb leads
- Early transition common
- T waves tall and asymmetric
- U waves often present (may be negative)

HYPERKALEMIA vs ANTERIOR OR INFEROPOSTERIOR WALL MI vs BRUGADA PATTERN

IMICS OF MYOCARDIAL ISCHEMIA AND INFARCTION REVISED FOR LAS VEGAS 2008
RETROGRADE P WAVES – PSEUDO ST DEPRESSION

Flutter - Pseudo ST elevation
37 y.o. O—“found down”

6 hrs. later: T° 25° → 30° C
J (OSBORNE) WAVE

Results from electrical heterogeneity between ventricular endo- and epicardium during repolarization

Seen in:
- Hypothermia
- Hypercalcemia
- Intracranial (subarachnoid) bleed
- Brugada syndrome
- Coronary vasospasm
- Idiopathic VF
- ? ischemia