Medicolegal Briefs: Myocarditis

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Case presentation:
"Decedent presented to ED at 10:56 a.m. on August 14 and note from physician at 11:15: a 24-year-old man presents w c/o chest congestion, pain when taking a deep breath, chest discomfort, fever and back pain with coughing. Triage vitals 102 degrees and pulse of 116. CXR normal. Diagnosis of bronchitis. [The defendant's examination was less than five minutes]. No cardiac work-up was ordered.
Mgmt: He was administered 650 mg of Tylenol at 11:20 a.m. and discharged home at 11:25 a.m. with a prescription for an antibiotic and a narcotic for the chest pain. a.m."

- The chart from the patient had a limited consideration for differential diagnoses but, Drs. Weinstock and Demeester discuss a number of possible conditions to consider:
  - Pulmonary embolism (tachycardia, pleuritic chest pain).
  - ACS (unlikely but no information about exertional pain etc).
  - Pneumonia (not ruled out by a clear chest x-ray).
  - Thoracic aortic dissection (chest pain + back pain).
  - Myocarditis (chest pain, tachycardia, fever).
- Medical outcome
  - "The decedent was found unresponsive the following morning in his home and was pronounced dead at 6:52. Autopsy confirmed cardiac dysrhythmia due to viral myocarditis."
- Legal allegation
  - "The plaintiff brought suit against the defendant physician alleging that the defendant was negligent in failing to order any cardiac work-up to rule out any cardiac related problem with the decedent's heart as the cause of his chest pain."
  - The plaintiff's attorney and the expert witness took issue with the brief amount of time spent in evaluation of the patient (~ 5 min). The plaintiff expert witness contended that a full evaluation of a patient with chest pain cannot be done in 5 minutes.
- Myocarditis Review
  - Basics
    - Often preceded by a viral prodrome of a fever, rash, sore throat, malaise, arthralgias, and non-specific gastrointestinal or respiratory symptoms.
    - Patients can present with dyspnea, chest pain, and arrhythmias.
    - Myocarditis may present with unexpected sudden cardiac death, presumably due to ventricular tachycardia or fibrillation.
    - Bradyarrhythmia and syncope due to a new-onset unexplained heart block may also occur in both infectious (ie, Lyme disease) and immune-mediated forms of myocarditis.
    - The clinical presentation of myocarditis may mimic ACS, but unlike with pericarditis, myocarditis will result in profound troponin elevation. Acute myocarditis in patients with underlying coronary artery disease often results in false-positive activation of the catheterization suite
  - A **non-invasive diagnostic test for myocarditis does not currently exist**. Hence, many cases are undetected because of subclinical/non-specific presentations or a missed diagnosis. In many cases of early patient presentation, a definitive diagnosis is not possible.

- Acute myocarditis is usually a presumptive clinical diagnosis, as a definitive diagnosis requires established histological, immunological, and immunohistochemical criteria that require endomyocardial biopsy.
- Fulminant myocarditis:
  - Distinct symptom onset (usually in the past 2 weeks).
  - Signs of severe heart failure, electrical instability, hypotension, or cardiogenic shock requiring inotropic or mechanical circulatory support.
- ECG abnormalities can be highly variable.
  - Sinus tachycardia (most common)
  - Atrial and ventricular arrhythmias
  - High-grade AV block
    - Common in Lyme disease, sarcoidosis, and cases of giant cell myocarditis.
  - Wide QRS or pathologic Q waves
    - Associated with a worse prognosis
- Pitfalls and Pearls
  - EKG findings in myocarditis can mimic the changes seen in ACS and cannot be used to rule out the diagnosis of myocarditis.
  - Troponins are usually elevated in myocarditis and within the right scenario, can help you make the diagnosis.,
  - Patients with myocarditis can initially present with relatively normal vital signs but, unexplained or persistent tachycardia is often present and can help you make the diagnosis.

***Core*Pendium: Acute Myopericardial Syndromes** https://www.emrap.org/corependium/chapter/recMrl1YMzIvGyWyF/Acute-Myopericardial-Syndromes