Clinical Case

May 2016

Case Presentation: The Atypical Presentation of Acute Ischemic Heart Disease in Women

A 35-year-old female presents at 0321 by ambulance with a complaint of chest pain. The records show EMS arriving at her house and finding the patient on the couch.

EMT Notes

Patient appears to be anxious and hyperventilating. Encouraged patient to slow breathing down. VS obtained: Pulse 120; BP 152/112; Resp. 22; shallow. Patient complains of: intermittent sharp chest pain located in sternum area non-radiating; started at 0230. Pain is 8 on a scale of 1-10. Patient also complains of an increase in pain upon palpation to the sternum and with coughing. Patient has a productive cough of a clear, thick substance. Denies fever or recent trauma. Patient states she has had the chills for the past week. Lung sounds are clear and present in all lobes excluding the left lower lobe, which is diminished. Abdomen soft non-tender. Further exam unremarkable.

The EMT started an IV and administered NTG x 3, but no improvement was noted. He then administered Morphine Sulfate 2 mg IVP x 3 per protocol, and the pain decreased to a 6.

EMT Impression

- R/O chest wall pain, pleuritic pain
- R/O cardiac chest pain
- R/O pneumonia, upper respiratory infection
- R/O PE

Nursing Triage Note

The triage is timed 0321. The triage nurse noted: chest pain, productive cough. Started 1 week ago, has just worsened. Has chills and cough. PMH: HTN and CVA. EMS Meds 4 ASA, 3 NTG. Meds include: amlodipine, atenolol, nortriptyline, desloratadine, escitalopram, tizanidine, sumatriptan, hydrocodone.

Triage Vitals (timed 0230): Pulse 97; BP 142/115; Resp 14; Temp 97.2°F (36.2°C); SpO2 98%; Pain 8/10.

The physician saw the patient at 0348; he documented his exam on an electronic medical record using a chest pain template.

History of Present Illness

Chief Complaint	Chest pain
Started	Awakened her 0250
Time Course	Still present; constant
Quality	Pressure, tightness, sharp
Location of Pain	*The sternal area is circled on the body illustration.*
Radiation	*This section is not filled in; radiation was not addressed.*
Associated Symptoms	Nausea, shortness of breath and sweating; no vomiting
Worsened By	Deep breaths
Relieved By	Nitroglycerin x 3 by paramedics and MS gave partial relief; oxygen
Onset During	Sleep
Pain Severity	Severe
Pain When Seen in ED	*The physician noted "recurring" without a number.*
Similar Symptoms Previously	2 episodes, brief, this past week

ROS

Positive for occasional cough, headache. Negative for fever, ankle swelling, leg pain, blackouts, abdominal pain, black stools, problems urinating, skin rash, joint pain. All systems neg. except as marked or checked.

PMH

High blood pressure, gestational diabetes, chronic bronchitis, CVA three years ago, migraines. PMH negative for high cholesterol, heart disease, DVT risk factors, peptic ulcer and gallstones.

Allergies

No known allergies

Social History

Negative

Family History

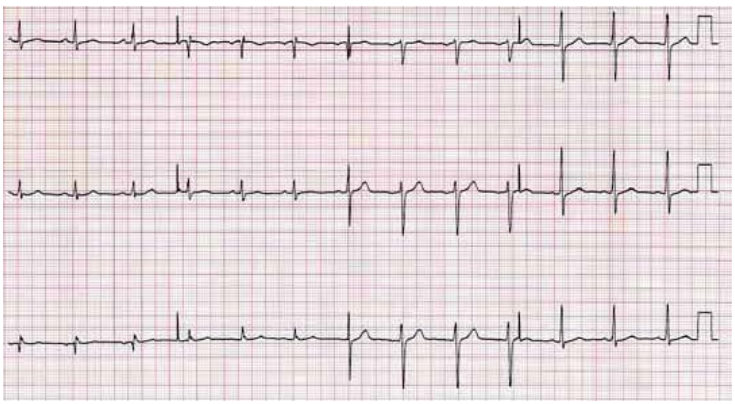
Negative for CAD. Positive for lung cancer, epilepsy and diabetes.

Physical Exam

General	Appears anxious. She is holding her chest.
HEENT	Checked as normal on the template
Neck	Checked as normal on the template
Respiratory	Checked as normal on the template
CV	Regular rate and rhythm, no murmur, no gallop, no rub
Chest	Mild chest wall tenderness, left side, mid clavicular line
Abdomen	Checked as normal on the template

The skin, extremities, and neurologic and mental status exams were also documented as normal.

The ECG, which the physician interpreted as normal, is shown below:

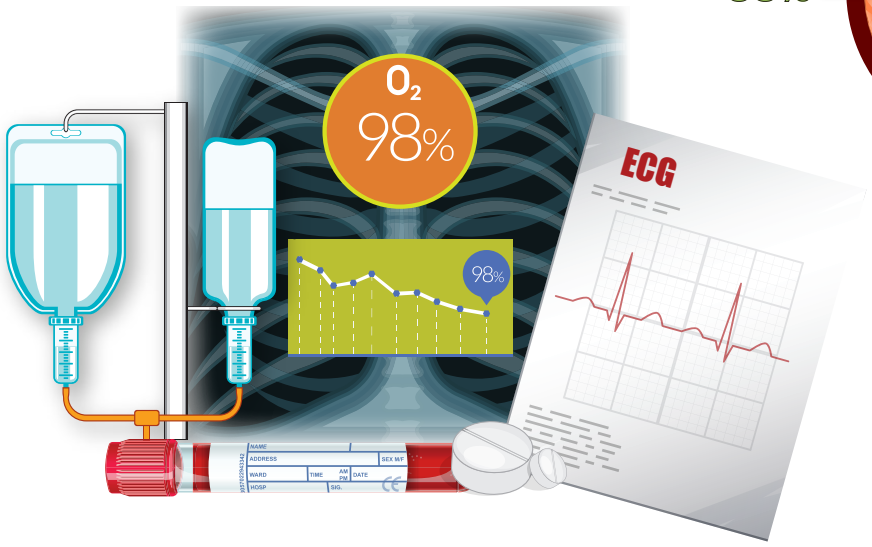


ED Course

The physician ordered the ED acute chest pain protocol; it included:

- Oxygen 2L/min by nasal canula
- IV 0.9 normal saline at 125 ml/hr
- Chest X-ray
- Aspirin 325 mg PO
- Morphine Sulfate 2mg IV PRN titrate to pain
- Metoprolol 5 mg IV slow q 5 minutes x 3, or until HR 50-60 and SBP> 90
- Basic Metabolic Profile, BMP, troponin, CBC
- ECG on arrival and at 1 hour

The initial chest X-ray was interpreted as normal by the emergency physician, who noted, "no infiltrates, normal heart size." Her Pulse Ox was 98%-99% on room air. Her electrolytes, CBC, and BMP were all within normal limits; troponin was 0.05 (reported as normal for this hospital).



Nursing Progress Notes

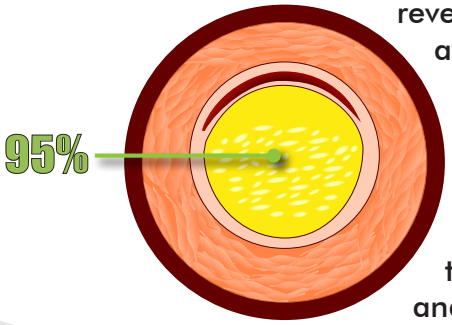
0425	Morphine 2 mg IVP. Pain 8/10. Vitals: Pulse 84; BP 142/92; Resp 20
0435	Toradol 60 mg IM
0545	The patient was discharged home.

Patient Discharge

Physician Impression	Left-sided chest wall pain, musculoskeletal
Discharge Instructions	Warm pack to chest wall
Prescription	Naproxen and acetaminophen/ hydrocodone
Follow-Up	None
Discharge Vital Signs	Pulse 76; BP 107/69; Resp 14; Pain 6/10

Outcome

Eleven days later, the patient presented to the same ED in full cardiac arrest. Autopsy revealed a 95% atherosclerotic narrowing of the LAD.

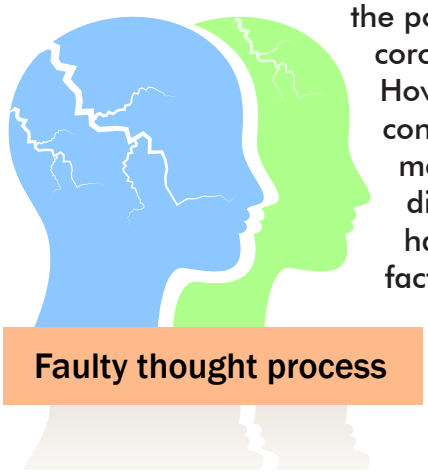


Following the depositions with the physician and nurses, the defendants settled out of court with the patient's family for an undisclosed amount.

Case Discussion

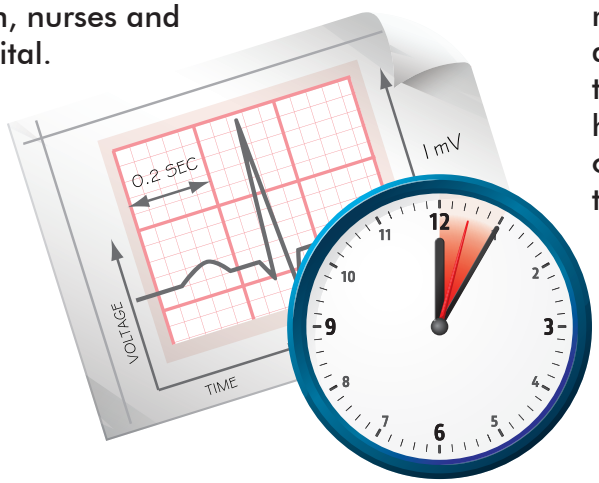
1 Rule Out MI

On the patient's arrival, the physician appropriately considered the possibility of acute coronary syndrome. However, he did not continue management to rule out the disease. This patient had chest pain, risk factors for coronary artery disease, and known prior cerebrovascular disease. The physician applied a faulty thought process as he anchored on the presence of reproducible chest wall pain and in determining that he had ruled out an acute coronary syndrome.



2 The Second ECG

The physician ordered but never obtained a second ECG. The first ECG does appear normal, as the emergency physician noted. However, the failure to obtain a second ECG at one hour was one of the major allegations against the physician, nurses and the hospital.

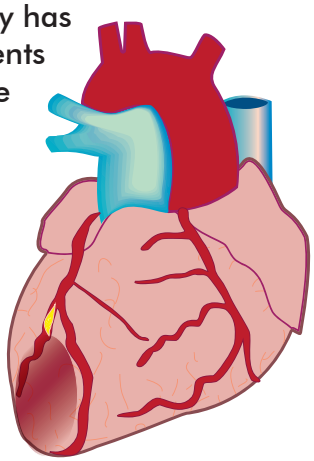


3 Troponin Timing

On arrival in the ED, the pain had been present for less than two hours. The patient reported the onset of pain occurred at 0230. Labs were drawn soon after arrival in the ED. Troponin is not present in the serum until three hours after the onset of pain; it is present at three hours and peaks at 12 hours. It is not possible to rule out acute coronary syndrome with one troponin test at the two-hour mark. This is a common finding in failure to diagnose MI cases. The inappropriate use of cardiac markers is a significant and recurring issue.

4 Atypical Presentation of Acute Ischemic Heart Disease in Women

This presentation clearly has some atypical components for acute MI or unstable angina. See the lists on the next page of this patient's typical and atypical signs and symptoms abstracted from all the notes.



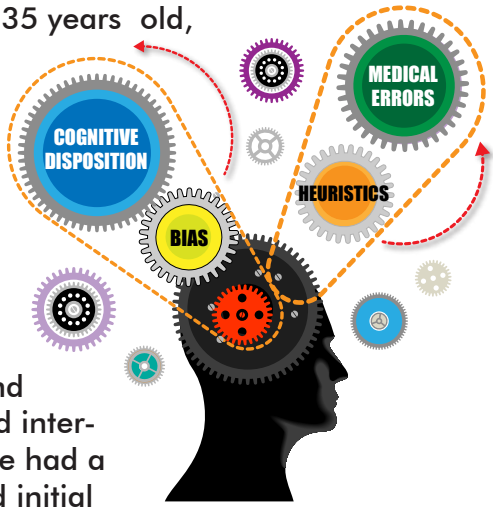
Ischemic heart disease is underdiagnosed in women. Look at the list of typical signs/symptoms; there is no way to rule out acute ischemic heart disease based on these elements of the history and physical and a single troponin and ECG.

What Happened in this Case?

The physician absolutely anchored on the atypical symptoms. He used the wrong mental algorithm; he was swayed by the cognitive bias of triage cueing; or he independently and inappropriately anchored on elements in the atypical list. From the deposition testimony, it is not clear which atypical symptom took him down the wrong path and caused the failure to diagnose. But looking specifically at the physician notes regarding the quality of the pain, the associated symptoms and the risk factors for CAD, the atypical nature of the presentation should not have altered his thought process. This patient needed continuing evaluation and admission or observation for further testing.

Atypical	Typical
Anxious	Chest pain
Hyperventilating	Risk factor - HTN
Non-radiating pain	Pain feels pressure-like and tight (MD)
Sharp pain	Nausea and vomiting
Pain on chest palpation	Diabetes
Pain with coughing	
Pain with deep breath	
Productive cough	
Chills for the last week	
No improvement with NTG	
Onset during sleep	
Headache	
Appears anxious	
Chest wall tenderness	

When you look at cases like this in retrospect, it is easy to wonder how a board certified emergency physician could possibly have discharged this patient with a diagnosis of chest wall pain. Don't discount the power of heuristics or the cognitive disposition to respond – in other words, human bias. The patient was 35 years old, complained of a productive cough, and had worsening pain with cough and pain with palpation of the chest wall. She described the pain as sharp and she had reported intermittent chills; she had a normal ECG and initial troponin.



This case is presented in this issue in order to help practitioners avoid bias and recognize the pitfalls leading to this common failure to diagnose.

THE SULLIVAN GROUP

Toll Free
855.RSQ.INFO

Office
630.268.1188

1S450 Summit Avenue, Suite 320
Oakbrook Terrace, IL 60181

www.thesullivangroup.com