

CC: "chest pain"

**HPI:** ■ is a 76 yo man with h/o HTN, DM, and sleep apnea who presented to the ED complaining of chest pain. He states that the pain began the day before and consisted of a sharp pain that lasted around 30 seconds, followed by a dull pain that would last around 2 minutes. The pain was located over his left chest area somewhat near his shoulder. The onset of pain came while the patient was walking in his home. He did not sit and rest during the pain, but continued to do household chores. Later on in the afternoon he went to the gym where he walked 1 mile on the treadmill, rode the bike for 5 minutes, and swam in the pool. After returning from the gym he did some work out in the yard, cutting back some vines. He did not have any reoccurrences of chest pain while at the gym or later in the evening. The following morning (of his presentation to the ED) he noticed the pain as he was getting out of bed. Once again it was a dull pain, preceded by a short interval of a sharp pain. The patient did experience some tingling in his right arm after the pain ceased. He continued to have several episodes of the pain throughout the morning, so his daughter-in-law decided to take him to the ED around 12:30pm. The painful episodes did not increase in intensity or severity during this time. At the ED the patient was given nitroglycerin, which he claims helped alleviate the pain somewhat. ■ has not experienced any shortness of breath, nausea, or diaphoresis during these episodes of pain. He has never had chest pain in the past. He has been told "years ago" that he has a right bundle branch block and premature heart beats.

**PMH**

Active medical problems:

- HTN
- Diabetes
- Sleep apnea

Past surgeries

- cervical fusion of C3-C7 with laminectomy
- bilateral knee replacement

Medications – obtained from med list that patient brought in

- Hyzaar 100/25MG QD
- Furosemide 20MG QD
- Tramadol HCL 50MG QD
- Exotrin 81mg QD
- Calcium 333MG, Magnesium 133MG, Zinc 5MG QD
- Vitamin C 500MG 3 tablets daily
- Vitamin E 400 IU QD
- Beta Carotene 25,000 IU QD
- Selenium 200MCG QD
- Ginger Root 500MG 2 tablets daily
- Garlic 1250MG 2 tablets daily
- CVS Spectravite Senior Multiple Vitamins 1 tablet daily
- Flonase Inhaler SPR 0.05% 2 puffs as needed for allergies
- Aclovate Cream 0.05% as needed for rash

### Allergies

- Penicillin: anaphylaxis/swelling of face
- Scallops: anaphylaxis /swelling of face

### **Family History**

- Mom: died due to complications of childbirth when pt was 6; health problems unknown by patient
- Dad: died in 70's due to heart disease; other health problems unknown by patient
- Brother: healthy
- 4 children: 1 son has h/o non-hodgkin's lymphoma

### **Social History**

Pt is a retired [REDACTED] who lives in Chapel Hill with his wife. He denies smoking and illicit drugs. He drinks 3-4 alcoholic drinks each week.

### **ROS**

- General: no fever, no chills, no sweats. 15 pound weight loss recently. No fatigue.
- Eyes/Ears/Nose/Mouth/Throat: no vertigo, no vision changes, no eye pain. No neck stiffness. Pt denies sour taste in back of throat/regurgitation. He denies reflux/heart burn.
- Cardiovascular: recent chest pain-not substernal. No shortness of breath, no palpitations, no edema. No syncope.
- Respiratory: occasional nonproductive cough. No hemoptysis. No wheeze.
- GI: no N/V, diarrhea, blood per rectum. No abdominal pain. No change in bowel habits
- Genitourinary: occasionally has incomplete voiding. Some difficulty initiating urination.
- MSK: rotator cuff injury to right shoulder. No pain or swelling of joints. No cramps.
- Neuro: no headaches. no confusion or slurred speech. No tremor. Some tingling in right arm after episode of chest pain.
- Psychiatric: no depression or change in mood.

### **Physical Exam**

- Vitals: BP 108/58 (was 147/62 at presentation to ED); HR 72; RR 12; O2 sat 97% on 2L
- General: well appearing elderly man. NAD
- HEENT: PERRL. Clear sclera. No rhinitis. Moist mucous membranes of oral cavity
- Neck: supple. No masses. No thyromegaly. No bruits.
- Lymph nodes: no lymphadenopathy
- Cardio: RRR. S1, S2 normal without murmur/gallop/rub. No S3, S4. chest pain elicited with palpation of left chest.
- Pulmonary: CTAB. No wheezes/rales/crackles.
- Skin: no rash or lesions
- Psychiatry: alert and oriented X3. Responds appropriately to questions.
- Abdomen: soft, non-tender, non-distended. No masses. No rebound/guarding. No hepatosplenomegaly. +BS
- Extremities: no cyanosis, clubbing, or edema. No rash or lesions. + pedal pulses
- MSK: decreased range of motion in shoulders. Chest pain was not elicited with movement of arms
- Neuro: CN II-XII grossly intact. No decrease in strength. No decrease in sensation.

**Labs**

Na 135

K 4.1

Cl 98

Bicarb 26

BUN 21

Cr 1.2

Glucose 280

CK 143

CK-MB 5.4

Troponin <0.029

PT 10.3

INR 0.9

PTT 27.5

D-Dimer 311

WBC 4.6

Hgb 13.4

HCT 37.8

PLT 205

EKG: premature atrial complexes, otherwise normal

**Problem List**

1. chest pain
2. HTN
3. Diabetes
4. sleep apnea

**Assessment**

This is a 76 yo gentleman with PMH significant for HTN, DM, and sleep apnea who presented to the ED with 1 day history of intermittent chest pain.

**Differential Diagnosis of chest pain****1. MI**

Myocardial infarction occurs when blood supply to the myocardium via coronary arteries is interrupted resulting in ischemia. Risk factors for a MI are atherosclerosis, angina, previous MI or stroke, older age, smoking, hyperlipidemia, diabetes, HTN, obesity, etc. A patient that is having an acute myocardial infarction will typically present with substernal chest pain that may radiate to the shoulder, jaw, or arm as well as SOB, N/V, palpitations, and diaphoresis. On EKG there will be evidence of ST elevation or depression, Q waves, or inverted T waves. Cardiac enzymes such as troponin and CK-MB will typically increase within 3-12 hours after onset of chest pain if the pt is having a MI. A series of 3 measurements of cardiac enzymes is usually performed in order to monitor for elevations over time. All pts who are suspected of having a MI should receive an aspirin as well as nitroglycerin, as was done in the case of ■■■.

■■■'s age, diabetes, and HTN put him at an increased risk for a myocardial infarction. His presentation isn't typical for a MI since his pain is not substernal, there is no N/V,

palpitations, sweating, or radiation of pain. His normal EKG and initial normal cardiac enzymes also make it less likely that ■ is currently having a MI. However, it would be ideal to perform another EKG tomorrow morning as well as repeat cardiac enzymes in 6-8 hours to make sure a MI will not be missed.

## 2. Angina pectoris /Unstable Angina

Angina is chest pain that results from decreased blood flow and ischemia of the myocardium. Pts typically feel pressure, heaviness, or tightness in the chest that is precipitated by exertion or emotional stress. Worsening angina, angina at rest, or angina that lasts more than 15 minutes are all typical signs of unstable angina. A patient with unstable angina does not have ST elevation or new Q waves on EKG and serum CK-MB and troponin are normal. Based upon this information it seems that it is very likely that SR may have unstable angina. His chest pain has not been precipitated by exertion (as with stable angina), but has come on with varying degrees of activity from rest (sitting in bed) to mild exertion (walking around house). Also, once SR was given nitroglycerin in the ED, he stated that his pain had receded somewhat. The only factor in his history that makes the diagnosis of unstable angina less likely is the fact that his chest pain lasts only 2-3 minutes. Typically chest pain associated with unstable angina usually lasts more than 20 minutes in duration. Once SR is stabilized and a myocardial infarction is ruled out he should undergo nuclear stress testing in order to evaluate him for unstable angina.

## 3. Musculoskeletal pain

Musculoskeletal chest pain must be differentiated from potentially life-threatening causes of chest pain such as MI, PE, or aortic dissection. Typically with musculoskeletal pain, the chest pain can be reproduced on physical exam with palpation or with various exercises of the arms and trunk. The patient may also have a history of strength training, yard work, or other exercises that may have strained the chest muscles. Pts with MSK chest pain may benefit from NSAIDs, muscle relaxants, or possibly narcotic analgesics. If all possible cardiac causes of chest pain can be ruled out in the case of ■, his pain will likely be attributed to musculoskeletal. He has a history of exercising at the gym and he also reported doing some yard work after the first episode of chest pain both of which may have lead to chest muscle strain. On physical exam the chest pain was elicited with palpation as well as deep inspiration which also supports a diagnosis of musculoskeletal pain. Therefore, pending negative cardiac enzymes X3, normal EKG X2, and normal nuclear stress test SR can be discharged with the strong suspicion that the source of his pain was muscular.

## 4. Gastroesophageal reflux

A patient with gastroesophageal reflux typically complains of a substernal burning sensation that is most commonly experienced after meals, can wake the patient from sleep, and is relieved with antacids. The chest pain may be described as a squeezing/burning that is located substernally, which may radiate to back, neck, jaw, or arms. Symptoms felt with reflux can thus often mimic angina. A patient with reflux may also experience regurgitation of the gastric contents producing a sour taste in the mouth. This confluence of symptoms does not correlate with what ■ stated that he was experiencing. His chest pain was not substernal nor was it squeezing/burning in nature. He also denied any regurgitation or that the pain was associated with meals. Therefore, I do not believe that ■'s symptoms are due to reflux/GERD.

## 5. Pericarditis

Pericarditis typically presents with chest pain (usually pleuritic), friction rub, and widespread ST segment elevation on EKG. The causes of pericarditis include viral, neoplasm, tuberculosis, prior mediastinal radiation exposure, s/p MI, cardiac surgery or trauma, collagen vascular disease, and drugs.

Based upon this information, it does not seem likely that SM has pericarditis. Although he is experiencing chest pain, it does not seem to be pleuritic in nature. No friction rub was heard on physical exam and his EKG was normal. Therefore, a diagnosis of pericarditis is not concerning us at this time.

## 6. pulmonary embolism

Pulmonary embolism is a common and often fatal disease, but the mortality from a PE can be reduced with rapid diagnosis and therapy. A pulmonary embolism typically occurs when a blood clot from a DVT travels to a pulmonary artery (or one of its branches) and obstructs it. Less commonly it can occur from fat or bone (after trauma), air, or amniotic fluid (after childbirth). Risk factors for pulmonary embolism include immobilization, recent surgery, stroke, malignancy, chronic heart disease, and h/o venous thromboembolism. Typically a pulmonary embolism presents with dyspnea, pleuritic chest pain, cough, hemoptysis, tachypnea, rales, tachycardia, hypotension, S4, and fever. Routine lab findings include leukocytosis, increased ESR, and elevated serum LDH or AST with normal bilirubin, however these findings are all nonspecific for PE. BNP, troponin, and D-Dimer can also be elevated in PE, but elevations in these can also be seen with other disorders as well. The gold standard for diagnosing PE is pulmonary angiography, but spiral CT is increasing in popularity. If hypoxemia exists, the patient should be started on supplemental oxygen. If the patient is hypotensive then IV fluids should be administered. Anticoagulation should also be started as soon as a PE is suspected.

Given this description, it is very unlikely that ■■■'s chest pain is due to a PE. He does not have a history of any of the risk factors listed above. His chest pain does not appear to be pleuritic in nature, he denies shortness of breath or hemoptysis, he is not tachycardic or tachypnic, he is afebrile on exam and his lungs are clear. Therefore, based upon this information, PE is less concerning for us at this time.

## 7. aortic dissection

An aortic dissection occurs when there is a tear in the aortic intima that allows blood to pass into the aortic media, creating a false lumen between the intima and media. A history of HTN is the most important predisposing condition for an aortic dissection. Pts with an aortic dissection typically present with tearing posterior chest and back pain or anterior chest pain. On physical exam there is a pulse deficit resulting in weak or absent carotid, brachial or femoral pulses. There are usually no EKG changes that would indicate ischemia. Chest CT, MRI, or multiplane transesophageal echocardiography can be used for imaging after the patient is stabilized. Cardiac enzymes in an aortic dissection will be negative.

Due to this description of an aortic dissection, it seems very unlikely that an aortic dissection is the cause of ■■■'s chest pain. He is not experiencing a "tearing" chest pain, nor is he complaining of back pain. There were no pulse deficits on physical exam that would support a diagnosis of aortic dissection. Although ■■■ did not receive any of the

imaging studies listed above, he did receive a series of chest radiographs that did not reveal widening of the aorta that is seen in an aortic dissection.

## **Plan**

### 1. chest pain

As discussed above, the probability that the pt is having an acute cardiac or other life threatening event is low. However, we will repeat serial cardiac enzymes at 10pm and again in the morning to monitor for elevation. We will also get another EKG tomorrow morning in order to look for any changes that have taken place since the first one obtained in the ED. ■ will also receive a PA and lateral chest x-ray tomorrow. We will also plan for a nuclear stress test in order to identify any possible coronary causes of chest pain such as unstable angina.

### 2. h/o HTN

We will continue ■'s home medications of Hyzaar 100/25MG QD and Furosemide 20MG QD for control of his blood pressure. Although initially his blood pressure was 147/62, it later stabilized to 108/58. We will advise ■ to follow-up with his PCP for his HTN.

### 3. Diabetes

■ was recently diagnosed with borderline diabetes and has been trying to control it with diet and exercise. Upon presentation in the ED his blood glucose level was found to be 280. We will place the patient on sliding scale insulin and will continue to monitor his blood sugar levels throughout his stay in the hospital. We will also obtain a hemoglobin A1C to get a sense of what his sugars have been over the past 3 months. We will encourage the pt to follow-up with his PCP about his diabetes since it appears that diet and exercise may have failed, thus requiring a medication to control his diabetes.

### 4. h/o Sleep apnea

■ has a history of sleep apnea and sleeps with a cpap at home. Throughout his stay in the hospital we will provide him with a cpap at night.

### 5. FEN

■ will be placed on a diabetic, heart healthy diet. He will need to be NPO after midnight for his nuclear stress test tomorrow.

### 6. Prophylaxis

■ will be placed on Heparin for DVT prophylaxis and will be advised to be as mobile as possible and sit in a chair as tolerated.

### 7. DISPO

■ will likely be able to go home tomorrow pending negative cardiac enzymes X3, normal EKG, normal chest x-rays, and normal nuclear stress test.

■ is full code.

## **References**

Breall, Jeffrey MD, PhD, Julian Aroesty MD, and Michael Simons MD. "Overview of the management of unstable angina and acute non-ST elevation MI." uptodate. May 2007.

Corey, Ralph MD. "Etiology of pericardial disease." UpToDate. December 2006.

Kahrilas, Peter MD. "Clinical manifestations and diagnosis of gastroesophageal reflux in adults." UpToDate. March 2007.

Manning, Warren J. MD. "Clinical Manifestations and diagnosis of aortic dissection." UpToDate. April 2007.

Reeder, Guy MD. and Harold Kennedy. "Diagnosis of an acute myocardial infarction." UpToDate. September 2006.

Tapson, Victor MD. "Treatment of acute pulmonary embolism." UpToDate. March 2007.

Thompson, Taylor MD and Charles Hales MD. "Overview of acute pulmonary embolism" UpToDate. April 2007.

Thompson, Taylor MD and Charles Hales MD. "Diagnosis of acute pulmonary embolism." UpToDate. March 2007.

Phillips, Kristine MD. PhD and Peter Schur MD. "Treatment of musculoskeletal chest pain." UpToDate. August 2005.