

Case Closed: Chest Pain – Worst Cause First

By Frank Murabito, MD, FACEP

Frank Murabito, MD, is an emergency medicine physician in Nashville, TN, and a longtime member of SVMIC's Claims Management Committee

Emergency medicine is unique in that the first time you see the patient is often the only time you will have to make the diagnosis. The fact that the patient has chosen to go to the emergency department selects that patient for a potentially higher acuity illness. In the patient's mind something bad might be happening to them. No one is expected to make the correct diagnosis one hundred percent of the time. Diagnosis becomes easier as the disease process and its presentation evolves. Unfortunately, the practice of emergency medicine does not lend itself to the luxury of a wait and see method of diagnosis. To further complicate the process, it is done in a chaotic atmosphere without control of the patient flow with frequent interruptions. One must consider the worst causes first for a presenting complaint such as chest pain and rationally evaluate the patient, documenting clearly that you have considered the most serious causes and present a clear path for follow-up care and further evaluation if the patient does not mandate admission. The practitioner should be consistent in his evaluation.

The Problem of Chest Pain

Chest pain is a high-risk entity for the emergency department. In the last five years, the SVMIC experience has paralleled that of the nation with cardiovascular disorders accounting for approximately 37 percent of the claims. Even those patients judged to be "low likelihood" of cardiac disease when discharged turned out to have an acute myocardial infarction 2.1 percent of the time and unstable angina 2.3 percent of the time 1.

Case:

33-year-old overweight male with history of hypertension, gastro-esophageal reflux disease, chronic obstructive pulmonary disease, elevated cholesterol and a two-pack-per-day tobacco habit. He was on anti-lipid, anti-hypertensive, anti-reflux medications and bronchodilators. He presented to the emergency department with epigastric and right-sided chest pain at a 10/10 level. Associated with this pain were diaphoresis, weakness, nausea and fatigue. ECG showed non-specific ST-TW changes while CXR showed cardiomegaly and possible effusion. Troponin and amylase were normal. He was given a GI cocktail and injection of Demerol and discharged home with a diagnosis of non-cardiac chest pain and gastritis. He returned later that day with back pain, nausea and dyspnea. BP was 178/96, P106, R24. Troponin, gallbladder ultrasound and abdominal radiographs were normal. ECG was not done. At discharge his BP was 154/86 and pulse was 125. The next day paramedics were called because the patient was found to be unresponsive. Cause of death was listed as acute myocardial infarction on autopsy.

Case:

44-year-old female smoker with hypertension presented to the emergency department with chest pain, weakness and dyspnea. ECG and cardiac enzymes were normal. CXR was interpreted as having slight cardiomegaly. GI cocktail and IM pain medications were given without improvement. She was discharged with diagnosis of esophageal spasm. She called back to the emergency department 3.5 and 4.5 hours later with worsening pain and was told to return to the emergency department. She did not and expired that night. Autopsy showed thoracic aortic dissection and coronary artery disease.

In evaluating chest pain in the emergency department, consider the worst four causes first: acute myocardial infarction, thoracic aortic dissection, pulmonary embolus and tension pneumothorax. Take a rational history with attention to history, presentation (how the patient looks to you), risk factors, family history and medications. Do your own history – do not rely blindly on the intake history from the triage or primary nurse. Do an appropriate exam with testing based on your evaluation and experience. Do not be swayed when the patient, family member or another caregiver tells you it is reflux. Make your own decision and be sure that you have the documented history, exam and documentation to support it.

History:

Emergency physicians know how to take a history. Despite the challenges we face today with respect to documentation and the time it takes to implement appropriately, cutting corners is not the way to go. It is better to document both pertinent positives and negatives. This demonstrates that you have endeavored to provide an in-depth evaluation. If you choose to document “all other systems are negative,” be prepared to explain exactly what you did ask about when you are queried later over an adverse outcome. It is important to document onset, severity, exacerbating or mitigating factors; whether or not the patient has ever had similar discomfort in the past; and whether the patient has recently been immobilized or has traveled. Review of systems should be appropriate to address the complaint. Be aware that as time goes on, the concept of classic chest pain as a presentation for acute coronary syndrome becomes less helpful in diagnosis in that relying on it may lead you to exclude the now common “atypical presentation” such as fatigue, or weakness, dyspnea, or nausea as the presenting complaint. These presentations are common in the diabetic, female and elderly population. Descriptors for the type of pain vary from the classic “squeezing pressure” to dull, sharp, burning, pleuritic, or indigestion like, among others.

If the patient was recently seen for a similar complaint, do not rely blindly on the results of that visit. Do your own evaluation and repeat testing if you believe it is indicated, especially an ECG. In the patient who returns twice or more for the same complaint, consider admission and consult. When the patient returns you have another chance to avoid potential untoward outcomes.

Family History:

Ask about hypertension, myocardial infarction, diabetes and cerebrovascular accidents. Ask also about lipid abnormalities, early onset cardiac or vascular (aneurysms, dissections, deep venous thrombophlebitis and pulmonary emboli) and connective tissue disorders (think Marfan’s Syndrome in the thin, young adult with chest pain).

Medications:

By reviewing medications you obtain an understanding of the patient’s risk factors. Many women do not even report taking contraceptive medication unless asked. Obviously such hormones increase the risk of thromboembolic disease. Ask if the patients take any over the counter, illegal or herbal medications – many of which can interfere with the effects of prescribed medications or elevate the blood pressure.

Exam:

Look first at the vital signs and address abnormal values. Does the patient look ill? If your evaluation does not lead to a definite diagnosis and the patient still looks ill, step back and reassess your thought processes. Let your chart show that you performed a considered exam. Let your exam show that you considered the following:

- Bilateral upper extremity blood pressures;
- Pulse evaluation;
- Auscultation of the lungs and heart;
- Absence of jugular venous distention or bruits;
- Skin – moist or dry; and
- Abdominal exam with or without tenderness or pulsatile masses.

Remember: chest wall tenderness can be associated with cardiac disease and does not rule it out.

Treatment:

When the diagnosis of Myocardial Infarction is obvious, treatment is straightforward. It is hard to explain not giving aspirin. If you do not give it, document why not – contraindications, allergy, etc. Remember response to nitroglycerin or a GI cocktail does not mean that the patient has cardiac or GI disease respectively. Do not discharge the patient home with a diagnosis of GI disease if you have not presented a strong case in your record to support it.

Testing:

Testing should be driven by the presentation of the patient and the practitioner's rational evaluation, history and physical.

ECG: It is difficult to defend not doing an ECG. A normal ECG does not exclude cardiac disease. An ECG with non-specific ST-T wave changes is not a normal ECG, and if it wasn't present on a previous tracing, follow up must be recommended. Attempt to obtain old ECG's for comparison.

Troponin: A troponin is helpful in evaluation for a NSTEMI. However a single normal troponin does not exclude myocardial ischemia or infarction. Just as repeated ECG's are helpful in ruling out damage, so it is with troponins.

D-dimer: A d-dimer is a non-specific test and can be elevated by many conditions. An elevated one could be seen in either thoracic aortic dissection or pulmonary emboli and as such, if present, should be investigated. However, a normal d-dimer level is reported to be sensitive in ruling out thoracic aortic dissection.

Chest radiographs: should be looked at closely for any infiltrates, effusions, cardiomegaly, abnormal cardiac or mediastinal contours.

Discharge:

Document improvement of the patient's condition before they go home, both clinically and by vital

signs. Discharge notes that include abnormal vital signs should also include an explanation. If the patient is not better, rethink the strategy for sending your patient home. Be cautious of the discharge diagnosis of “Non-Cardiac Chest Pain” – especially if the patient has a history of elevated cholesterol, diabetes, coronary artery disease or congestive heart failure. Make sure that your encounter document accurately demonstrates your evaluation and thought processes. Not every patient you evaluate for chest pain will require admission. Make it clear to the patient the necessity of follow up with the appropriate provider, either their primary care provider or cardiologist (include contact information). Be sure the patient understands indications for return to the department should their condition change or new symptoms develop. Explain to them that you may not have the definitive diagnosis for them and further evaluation is mandatory. Consult freely. If you have any concern about discharging a patient home, call the PCP or consultant.

Conclusion

Chest pain is a challenging chief complaint to investigate. There are few absolutes that will give you an accurate diagnosis every time. In the evaluation of your patient, document a thorough history and exam that considers the high-risk issues discussed above. Perform appropriate testing as determined by your exam and history. Let your chart demonstrate that you provided a thoughtful process to seek out a dangerous illness. Be sure that you have addressed any questions that your patient or family member might have about the discharge plan before they leave. Make it clear that they can return at any time should their condition change or worsen.

Resources:

1 Annals of Emergency Medicine, 44,6 pp.565-74

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