

THERAPEUTIC AND DIAGNOSTIC MEASURES OF ACUTE CHEST PAIN

Jeremy M. Thomas, DPM

James E. Stone, MD

INTRODUCTION

The most common causes of chest pain in the outpatient setting are musculoskeletal, gastrointestinal, coronary artery disease, and pulmonary disease, with coronary artery disease being the most critical to differentiate.¹ As integral parts of the medical team it is important as podiatric clinicians to have an understanding of what chest pain is, and how to diagnosis and treat it. The purpose of this article is to give the podiatric physician a brief understanding of chest pain and the treatment in the outpatient setting.

HISTORY AND PHYSICAL

Obtaining a thorough history and physical is the key to pin pointing the cause of the chest pain. Being able to ask the right questions is crucial in starting your assessment. What are some of the distinguishing factors? Duration (sudden or gradual, associated with eating); character (aching, sharp, stabbing, pressure or crushing); location (radiating down both arms, to neck or jaw, relief with rest or position); symptoms (anxiety, diaphoresis, dyspnea, dizziness, nausea and vomiting, pain provoked by exertion, or relieved by rest) helps to clarify whether the pain is anginal or non-anginal. Patients with a history of diabetes, hyperlipidemia, smokers, patients with heart failure or prior CAD require close follow-up. Other questions in the initial work-up might be: Have there been recent respiratory infections, rheumatic fever, or swollen joints? Has the patient had recent chest or abdominal surgery and if so, where anatomically and when? Is the patient obese? Is there a history of smoking, alcohol, or drug abuse (cocaine), which can all predispose acute chest pain? A positive family history of myocardial infarction in a first degree relative (particularly <55 years of age), diabetes, hyperlipidemia, or hypertension should be indicative for further testing.

The physical examination can now further direct your clinical suspicions and allows the

podiatric physician to narrow down the history. Some key points that can be observed are position of the patient, breathing patterns, and patient overall color and appearance. Listen to the heart, lungs, and stomach. Palpate each area of the chest and stomach to help pinpoint areas of tenderness or swelling. At this point in your examination you are able to narrow down the possible causes of chest pain.

Possible Causes of Chest Pain

The possible causes of chest pain, by system are as follows: cardiac (angina, unstable angina, myocardial infarction); musculoskeletal (cervical radiculopathy, shoulder disorder, costochondral disorder, muscle strain, trauma); pulmonary (pneumonia, pulmonary embolus); and gastrointestinal (GERD, esophageal spasm, peptic ulcer, hiatal hernia, pancreatitis).

CHARACTERISTICS OF CHEST PAIN

If the cause is cardiac-related, the characteristics of typical angina occur in the mid to left side of the chest and may also extend to the left shoulder, left arm, the jaw, the stomach, or the back. Some other associated symptoms include shortness of breath, nausea, vomiting and diaphoresis. Angina is characterized by, a squeezing or tightness across the chest or classically, a "heaviness." Patients with angina often describe it as "an elephant sitting on my chest." Angina is always life-threatening. When angina occurs at rest, increases in intensity, or is not relieved by nitroglycerin tablets, this is considered unstable angina and could be a warning sign of a heart attack. A first attack of angina is always considered to be unstable.

If the cause is musculoskeletal related, pressing on the area will reproduce the pain, or the pain may be provoked by movement, particularly twisting. A history of trauma or physical effort will led the physician to suspect musculoskeletal, and there is a greater likelihood in cold, damp weather.

Pulmonary characteristics are sharp, pleuritic pain accompanied during respiration.

Pneumonia may mimic chest pain due to the strain of the chest wall muscles during prolonged coughing.

A gastrointestinal characteristic is GERD. GERD can often present with burning, epigastric pain or sour taste in the mouth. Usually there is more discomfort when lying flat. If antacids do not rid the chest pain then further testing may be required. It may also be relieved with food.

DIAGNOSTIC TESTING

Diagnostic testing will help confirm your clinical suspicions. Immediately obtain a 12-lead ECG. Gaining IV access and a chest radiograph will also save time and help narrow down your differential diagnosis. ECG findings suggestive of MI are ST segment elevation or ST depression, and/or T-wave inversion. Being able to compare with an old ECG is especially helpful. Serum markers of myocardial infarction include creatinine kinase, CK-MB, troponin T, troponin I. A CK-MB level greater than 6.0 (ng/ml) within 1 to 3 hours of presentation is highly suspicious of MI. Cardiac troponins T and I are proteins found in the contractile apparatus of the heart muscle and during injury are released and appear in the circulation. Troponin levels may become abnormal as soon as 3 hours from myocardial injury and remain elevated for 10 days. A normal troponin T or I twenty-four hours after the onset of chest pain is strong evidence against MI.² Therefore, a history and physical that indicates low risk of MI and a near normal ECG with normal troponin levels can be treated on an outpatient basis. If however, these tests are abnormal and the patient has higher than normal clinical predictors for MI then proceed directly to hospital admission.

TREATMENT

The goal of therapy especially in the outpatient setting is the reduction of risk and relief of symptoms. On initial word that you have a patient complaining of acute chest pain you should immediately call EMS, obtain vital signs, and begin oxygen via a nasal cannula. During this time the patient should be given four 81 mg aspirin or at least half of a regular aspirin (324 mg total) unless allergic and in that case a 300 mg Clopidogrel

should be considered.³ It is important for the patient to chew the aspirin due to it decreases the time the medicine takes to have an effect. Once you have been able to obtain a history and physical and obtain diagnostic tests then adequate treatment of the underlying chest pain can be administered.

Cardiac

Treatment on angina is directed at relieving the chest pain as a result of reduced blood flow to the heart. This is primarily accomplished by the use of nitroglycerin, which will dilate the coronary arteries. If the patient's symptoms are not reduced after 3 doses of nitroglycerin approximately 5 minutes apart then emergency services should be summoned.

Treatment of myocardial infarction is aimed at restoring blood flow to the heart. This can be accomplished by the use of aspirin, heparin, and thrombolytic drugs. Morphine can also be administered to decrease the pain associated with the attack. The patient will be admitted to the hospital and further testing and monitoring will be needed.

Treatment of musculoskeletal causes can be accomplished on an outpatient basis, with nonsteroidal antiinflammatory drugs, or muscle relaxants. In pulmonary causes, if a pulmonary embolus is suspected, then immediate admission to the hospital, with supplemental oxygen, and medication to prevent clotting, such as heparin or lovenox is indicated. Pneumonia is treated with antibiotics and pain medication for chest wall discomfort as needed. Gastrointestinal causes, particularly GERD can be managed with an antacid such as pepcid. Esophagitis is treated with an antibiotic, antiviral, or antifungal medication (Figure 1).

CONCLUSION

The evaluation of acute chest pain patients remains a complex challenge in the outpatient setting when the decisions to admit or discharge are based solely on traditional methods of history, physical and ECG. It is important as podiatric clinicians to understand the signs and symptoms of chest pain and differential diagnosis that accompany it. The benefits of understanding the proper steps in managing this potentially deadly symptom is crucial in the outpatient setting.

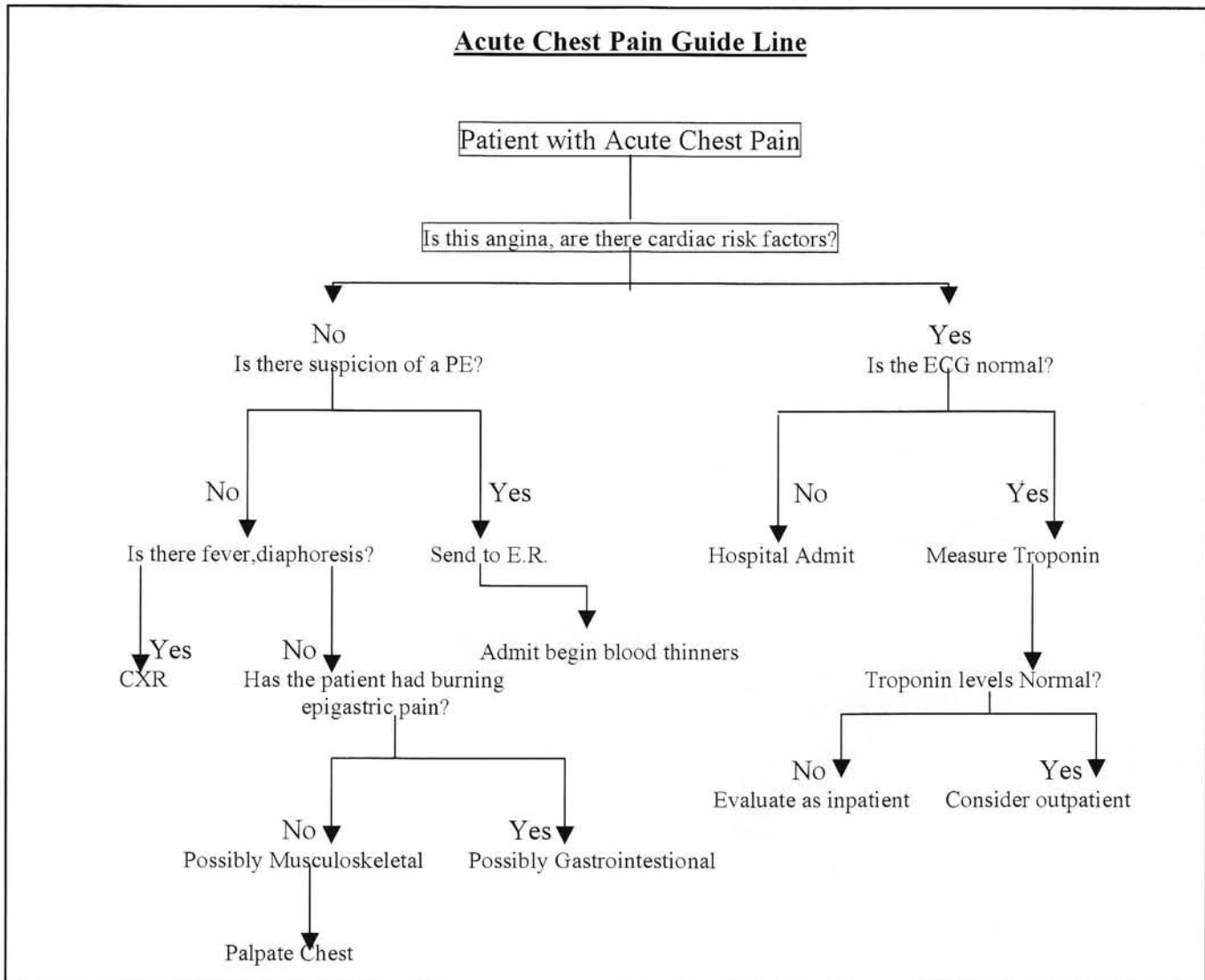


Figure 1. Acute chest pain guidelines.

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