CLINICAL CHALLENGE: CASE 1

In each issue, *JUCM* will challenge your diagnostic acumen with a glimpse of x-rays, electrocardiograms, and photographs of conditions that real urgent care patients have presented with.

If you would like to submit a case for consideration, please e-mail the relevant materials and presenting information to editor@jucm.com.

A 45-Year-Old with Chest Deformity

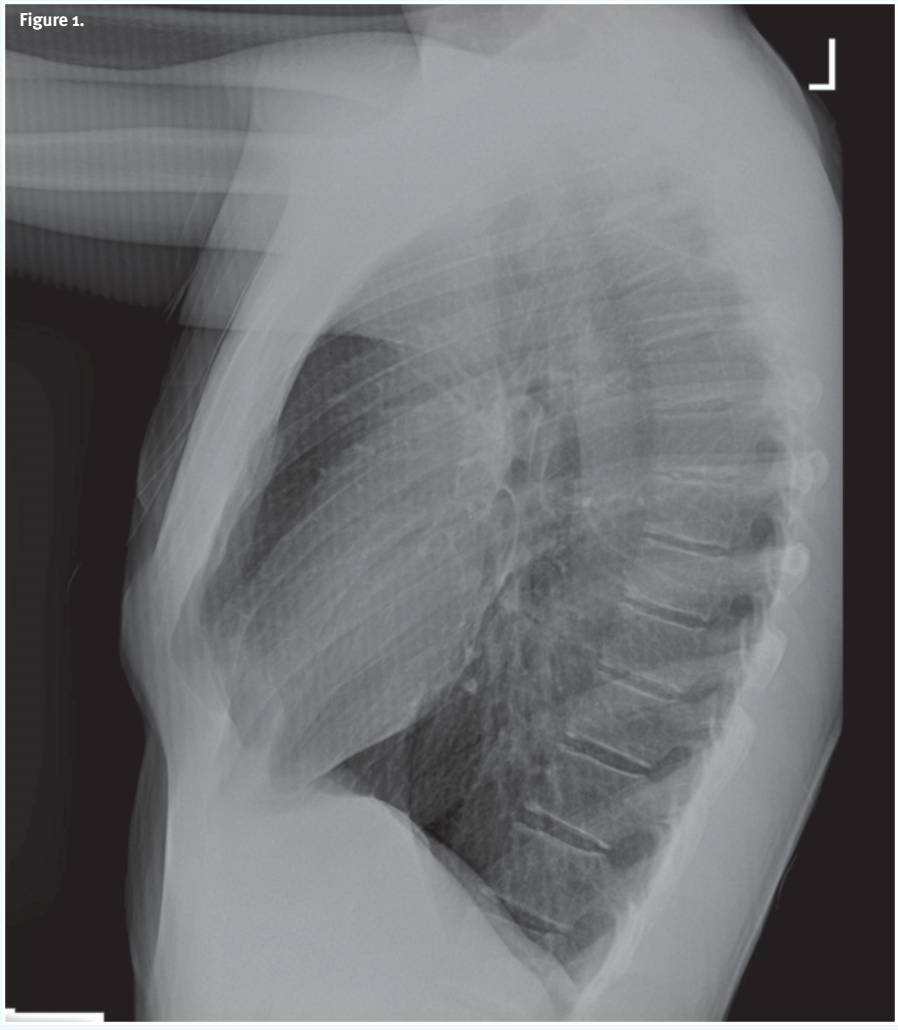
Figure 1.

A 45-year-old man presents with "asthma-like symptoms" that he says have "come and gone" for several years. He denies chest pain or a sense of racing heartbeat. A chest deformity is clear from observation.

View the images taken and consider what your diagnosis and next steps would be. Resolution of the case is described on the next page.

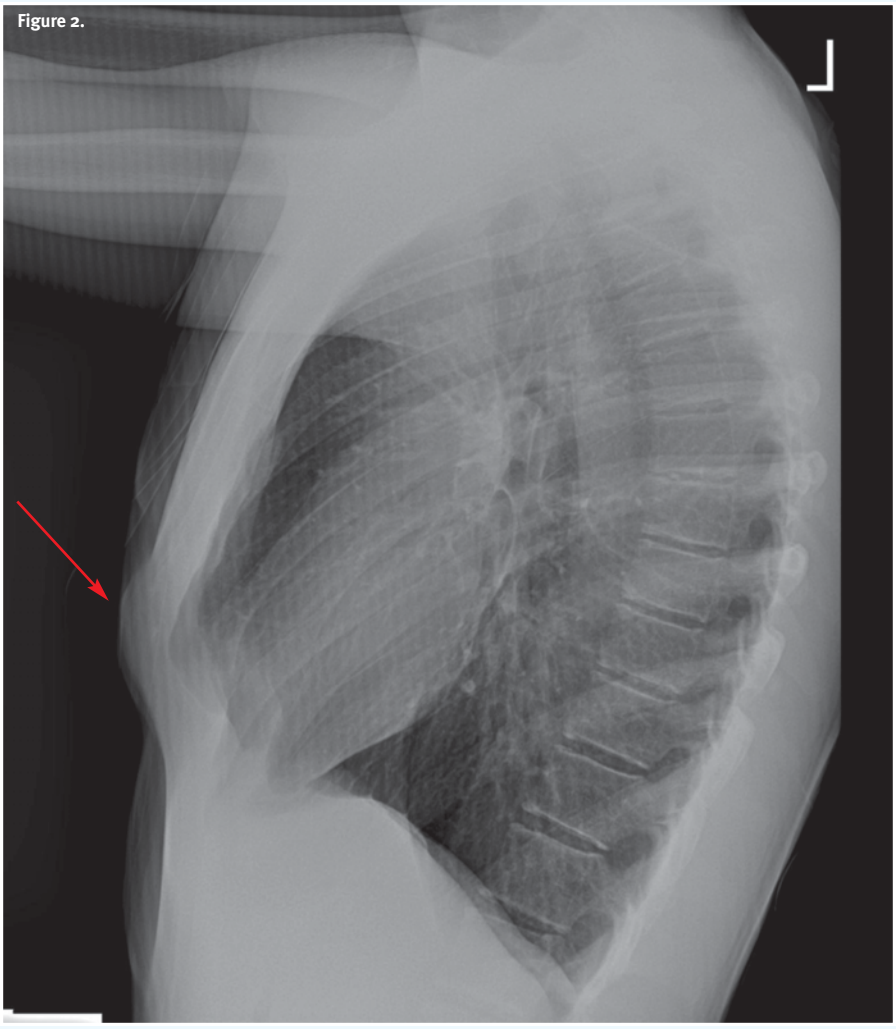
Figure 2.

Differential Diagnosis
- Pectus carinatum
- Pectus excavatum
- Poland syndrome
- Pentalogy of Cantrell

Diagnosis
The x-ray shows an angulated appearance of the lower sternum. This patient was diagnosed with pectus carinatum, otherwise known as a pigeon chest, in which the sternum protrudes anteriorly.

Learnings/What to Look for
- Shortness of breath and exercise intolerance are common symptoms
- Radiographic features include two patterns of sternal protrusion: chondrogladiolar (protrusion of the middle and lower sternum) and chondromanubrial (protrusion of the manubrium and upper sternum)
- Pectus carinatum can be associated with scoliosis, Marfan syndrome, and other disorders
- Familial occurrence is reported in approximately 25% of cases and usual diagnosis occurs during childhood or adolescence

Pearls for Urgent Care Management
- Nonsurgical external bracing may be effective, especially in adolescents
- Referral for surgical consideration may be necessary

Acknowledgement: Images and case provided by Experity Teleradiology (www.experityhealth.com/teleradiology).

A 23-Year-Old with a Pruritic, Spreading Rash


Figure 1.

A 23-year-old woman presents with a severely pruritic rash that developed on her leg and is spreading. The patient reports that 2 days prior to onset, she had gone hiking with her dog. She recalls going off-trail and brushing up against "woody vines and shrubs." She denies sustaining insect bites and notes that the sun was particularly intense that day, so she wonders if this may be a sun reaction. She appears well and has no systemic symptoms.

On examination, there are multiple erythematous and edematous, vesiculated and crusted papules and plaques; some are linear and some geometric in outline.

View the image taken and consider what your diagnosis and next steps would be. Resolution of the case is described on the next page.


Figure 2.

Differential Diagnosis
- Atopic dermatitis
- Arthropod bite or sting
- Urticaria
- Poison ivy dermatitis

Diagnosis
This patient was diagnosed with poison ivy dermatitis (also known as *Toxicodendron* dermatitis, along with poison oak and poison sumac). This is a contact dermatitis resulting from a type IV hypersensitivity reaction in sensitized individuals to the oleoresin urushiol. Urushiol is found in most parts of the plants from this genus, which is a member of the Anacardiaceae family.

Learnings/What to Look for
- The *Toxicodendron* genus is pervasive throughout the continental United States, southern Canada, and Mexico and is mostly found below 5,000 feet of altitude. It can also be found in Asia, Africa, Australia, and New Zealand
- Up to 75% of the North American population is sensitized, and the condition has no predilection based on age, sex, race/ethnicity, or skin type
- Occupational and recreational exposures are prevalent
- Rash begins to appear within 1-2 days after exposure in previously sensitized individuals; in the newly sensitized, it may be delayed 2-3 weeks
- Occult contact may occur from contaminated clothing, gear, or vegetation, even after months have elapsed

Pearls for Urgent Care Management
- After exposure, remove and wash contaminated clothing and wash the entire body with soap
- Over-the-counter treatments include soothing measures such as oatmeal baths, symptomatic relief measures such as calamine lotion, and oral antihistamines to help with itching
- Glucocorticoid therapies such as topical clobetasol or oral prednisone may be effective for severe or persistent cases

Acknowledgment: Image and case presented by VisualDx (www.VisualDx.com/jucm).

A 67-Year-Old Male with Chest Pain, Dyspnea, and a History of Lung Cancer

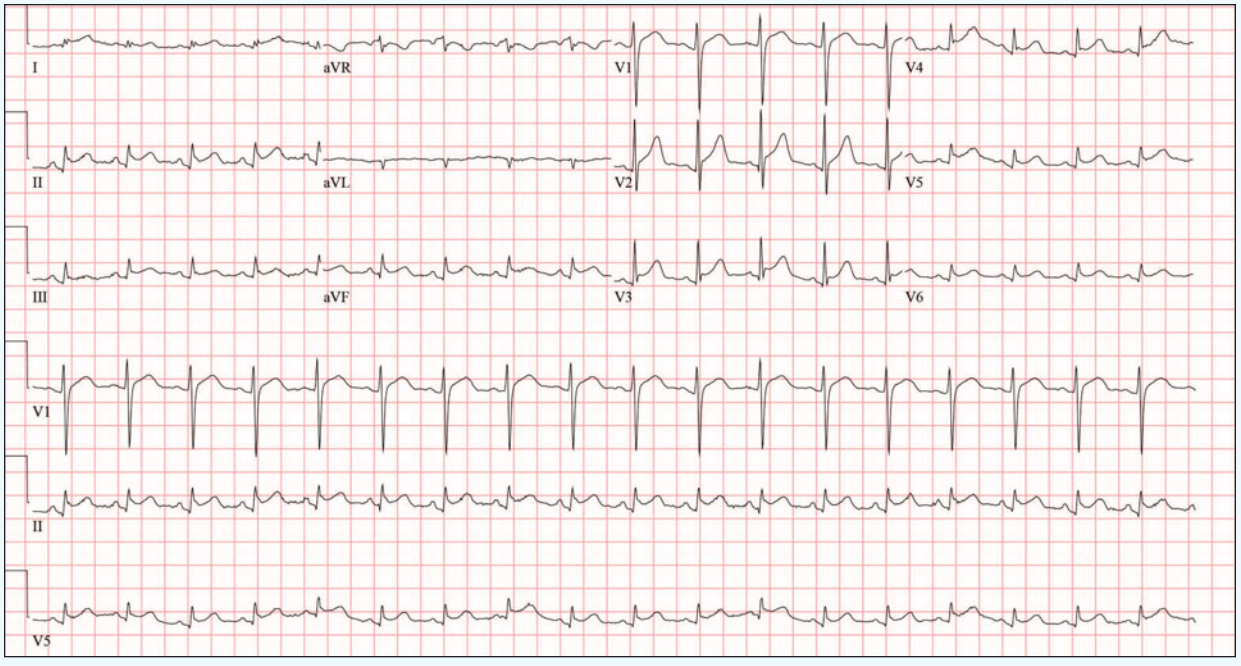

Figure 1. Initial ECG

A 67-year-old male presents to urgent care complaining of pleuritic chest pain and dyspnea. He has a history of lung cancer, but denies known cardiac history.

View the ECG taken and consider what your diagnosis and next steps would be.

(Case presented by Benjamin Cooper, MD, MEd, FACEP, Department of Emergency Medicine, McGovern Medical School at UTHealth Houston.)

Differential Diagnosis

- Early repolarization
- Hyperkalemia
- Acute pericarditis
- ST-elevation myocardial infarction
- Brugada syndrome

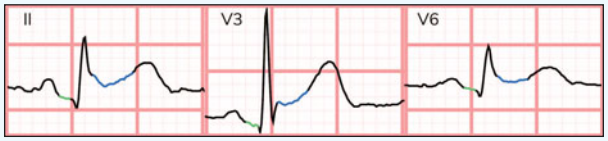

Figure 2. Blown-up images of PQRST complexes in leads II, V3, and V6. PR-segment depressions are in green and concave up ST-segment elevations are in blue.

Diagnosis

This patient was diagnosed with acute pericarditis. The ECG reveals sinus tachycardia with a rate of 108 beats per minute. There is diffuse, concave up ST-segment elevation without reciprocal changes and diffuse PR-segment depression (**Figure 2**).

Acute pericarditis is inflammation of the pericardium, extending to the epicardium. Common causes include drugs (eg, hydralazine, penicillin), infections (eg, bacterial, viral, or fungal), malignancy, rheumatologic conditions (eg, lupus, rheumatoid arthritis, etc.), sequelae of myocardial infarction (eg, Dressler syndrome), uremia, and idiopathic.[1] It is diagnosed by meeting two of four criteria (**Table 1**).

Table 1. Diagnostic Criteria for Acute Pericarditis*[2]

1. Typical symptoms (pleuritic, sharp chest pain relieved when leaning forward)
2. New pericardial effusion
3. Presence of a friction rub
4. Typical ECG findings

*Diagnosis requires meeting two of four criteria.
Broad notched or slurred R wave in leads I, aVL, V5, and V6

Differentiating pericarditis from ST-elevation myocardial infarction (STEMI) can be challenging, but the majority of cases can be accurately diagnosed with careful attention to several electrocardiographic features.

Features that suggest pericarditis over STEMI include any of the following: diffuse concave up ST-elevations without reciprocal changes, PR depression, PR elevation in aVR, ST-elevation in lead II greater than lead III, and Spodick's sign (downsloping of the TP segment).[3]

The test characteristics of any single electrocardiographic feature are insufficient to rule in/out pericarditis; the feature with the highest odds ratio for predicting STEMI (over pericarditis) is reciprocal ST-depressions.

Acute pericarditis tends to follow a natural progression of electrocardiographic findings.

The first 2 weeks are characterized by the aforementioned findings.

Over several weeks, the ST-elevation resolves, and the T waves flatten. Next, the T waves invert.

Finally, over several weeks, the ECG returns to the patient's baseline (**Figure 3**).[4]

Treatment includes nonsteroidal anti-inflammatory medications tapered over 3-4 weeks and colchicine for 3 months.

It's also reasonable to prescribe a proton pump inhibitor to counteract the gastrointestinal side effects. Corticosteroids are reserved for patients with contraindications to initial therapy, but are not preferred as they are associated with increased recurrence.[2]

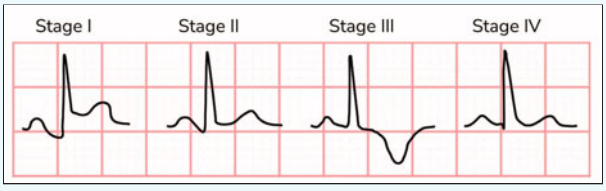

Figure 3. Morphologic features of the various stages of pericarditis.

Early repolarization can cause similar electrocardiographic features, but this patient's presenting symptoms make acute pericarditis the most likely diagnosis.

Hyperkalemia can cause several electrocardiographic changes, but diffuse concave up ST-elevation like those seen in acute pericarditis has not been described.

Brugada syndrome is a sodium channelopathy that causes characteristic ST-segment elevation in leads V1 and V2.

Additional examples may be found in the ECG Stampede glossary (www.ecgstampede.com/glossary).

Learnings/What to Look for

- Electrocardiographic features that suggest acute pericarditis include diffuse concave up ST-elevations without reciprocal changes, PR depression, ST-elevation in lead II greater than lead III, and Spodick's sign (downsloping of the TP segment)
- The presence of reciprocal changes or ST-elevation greater in lead III than lead II is highly suggestive of STEMI

Pearls for Urgent Care Management

- Patients with a clear diagnosis of acute pericarditis

with a benign etiology and reliable follow-up can be initiated on nonsteroidal anti-inflammatory medications with or without colchicine
- If the diagnosis is in question, the etiology is unclear, or the patient lacks reliable follow-up, transfer to an emergency department

References
1. Mattu A, Tabas J, Brady W. *Electrocardiography in Emergency, Acute, and Critical Care*. 2nd ed. The American College of Emergency Physicians; 2019.
2. LeWinter MM. Acute pericarditis. *N Engl J Med*. 2017;371(25):349-359.
3. Witting MD, Hu KM, Westreich AA, et al. Evaluation of Spodick's sign and other electrocardiographic findings as indicators of STEMI and pericarditis. *J Emerg Med*. 2020;58(4):562-569.
4. Spodick DH. Diagnostic electrocardiographic sequences in acute pericarditis. Significance of PR segment and PR vector changes. *Circulation*. 1973;48(3):575-580.

Case courtesy of ECG Stampede (www.ecgstampede.com).

ECG STAMPEDE

Do You Have Images That Could Offer Valuable Insights to Your Colleagues?

If you have stellar images related to unusual (or just especially interesting) cases that might help your fellow urgent care providers gain insights into providing the best care possible for their patients, consider submitting them for publication in *JUCM*. You can start by describing the case—ultimate diagnosis, patient characteristics, and disposition of the case—and offering us a preview of those images in an email to editor@jucm.com. We'll provide guidance on the next steps.