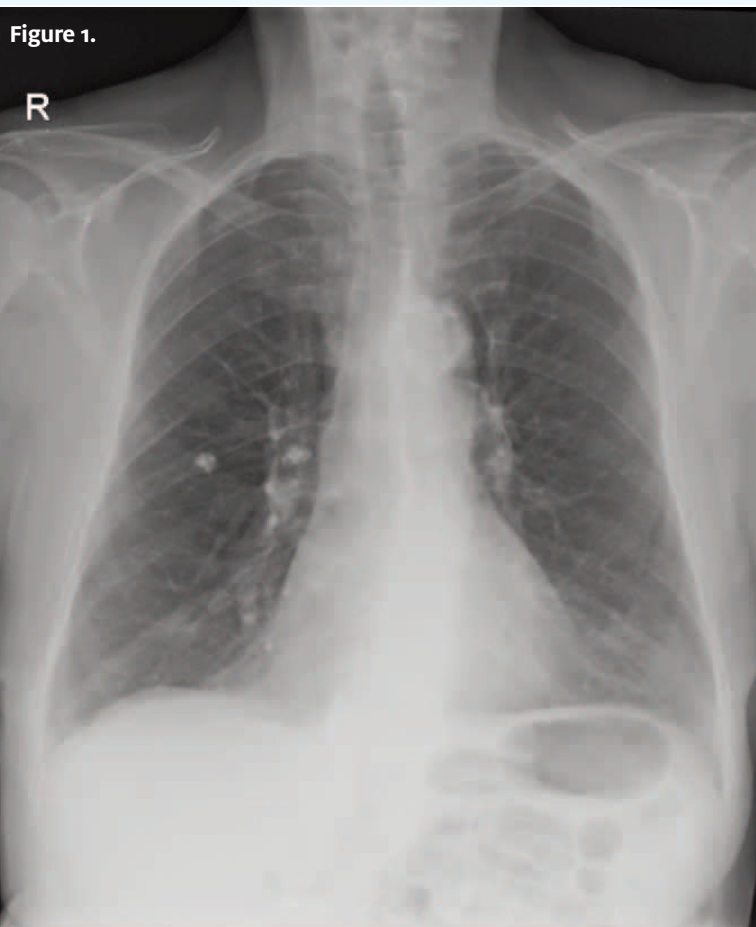




In each issue, *JUCM* will challenge your diagnostic acumen with a glimpse of x-rays, electrocardiograms, and photographs of conditions that real urgent care patients have presented with.

If you would like to submit a case for consideration, please email the relevant materials and presenting information to [editor@jucm.com](mailto:editor@jucm.com).

## A 28-Year-Old Male with a Persistent Dry Cough

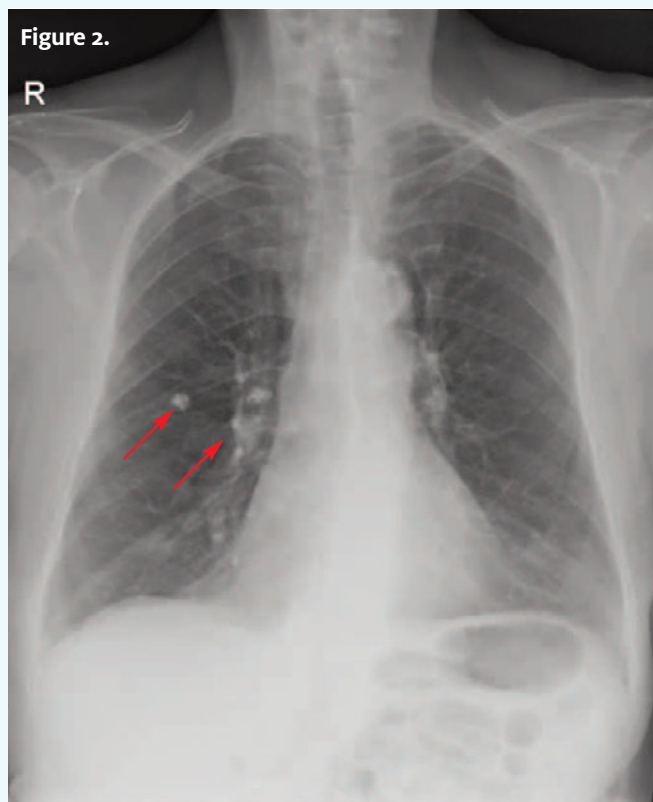


### Case

A 28-year-old male presents with complaint of a dry cough “forever.” He admits to intermittent chest pain. Exam reveals decreased breath sounds on the right.

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

## THE RESOLUTION

**Differential Diagnosis**

- Lymphoma
- Myeloma
- Pyogenic meningitis
- Ranke complex

**Diagnosis**

This patient was diagnosed with Ranke complex from healed and calcified primary tuberculosis lesions. This was an incidental finding.

**Learnings/What to Look for**

- The x-ray shows a 0.9 cm right upper lobe anterior segment peripheral calcified granuloma and multiple right hilar calcified lymph nodes
- Primary tuberculosis consists of a primary inflammatory granulomatous peripheral and often subpleural lesion in periphery of lower part of upper lobes or upper part of lower lobes. Caseation necrosis usually follows with drainage of Mycobac-

terium tuberculosis to the regional hilar lymph nodes and systemic dissemination

- Primary granuloma and secondary hilar lymph nodes are collectively called Ghon's complex. In 95% of cases the disease is contained by the body immunity with subsequent healing, fibrosis, and calcification of primary granuloma and the secondary infected lymph nodes
- The healed calcified Ghon's complex is called Ranke complex

**Pearls for Urgent Care Management and Considerations for Transfer**

- Significance of the Ranke complex is from retained viable Mycobacterium tuberculosis bacteria in this calcified complex, which at times becomes a source of secondary active pulmonary tuberculosis

**Acknowledgment:** Images and case provided by Experity Teleradiology ([www.experityhealth.com/teleradiology](http://www.experityhealth.com/teleradiology)).



# A 20-Year-Old Female with an Array of Gastro Symptoms

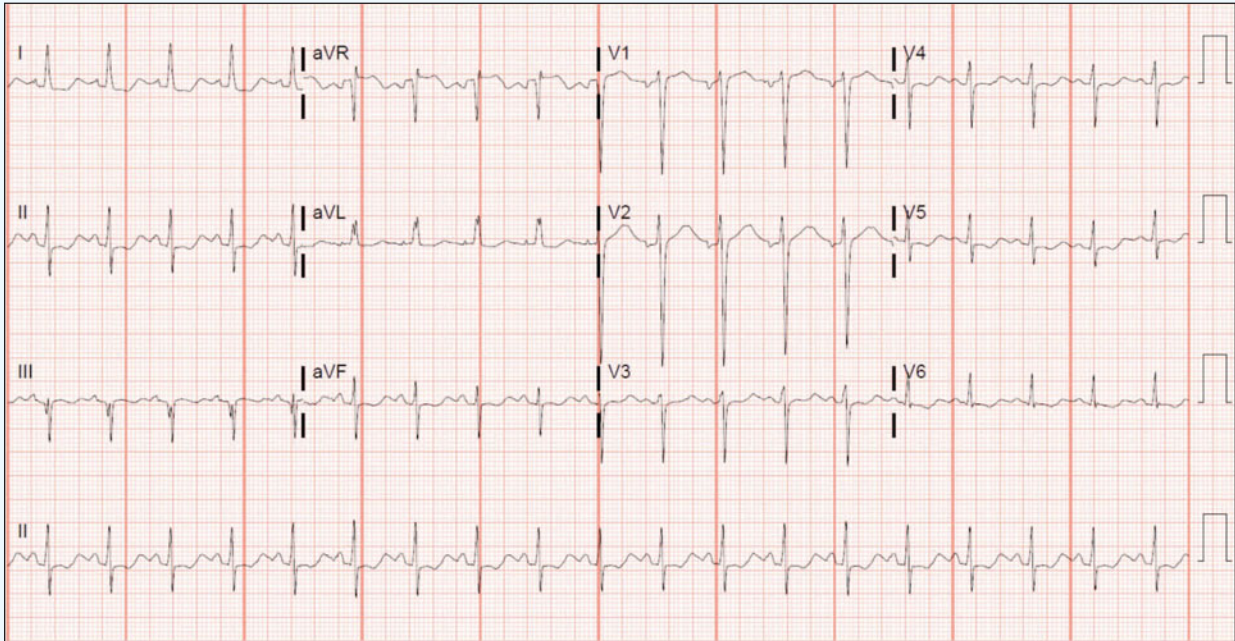


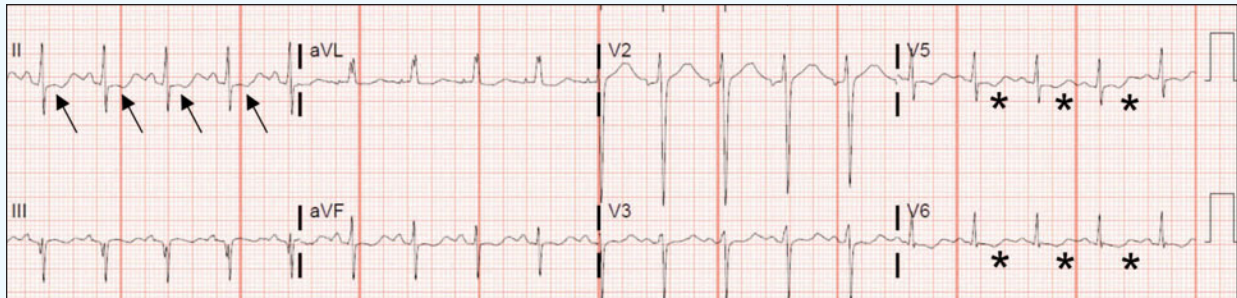
Figure 1.

## Case

The patient is a 20-year-old female who presents to urgent care with 2 days of nausea, vomiting, crampy abdominal pain, and inability to tolerate anything PO. Her personal medical history is remarkable for type I diabetes mellitus.

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

## THE RESOLUTION



**Figure 2.** ST depressions are seen in multiple areas of this ECG, illustrated in lead II with arrows. V5 and V6 demonstrate T-wave inversion with prominent U-waves and a long QU interval (stars).

### Differential Diagnosis

- ST-elevation myocardial infarction (STEMI)
- Non-ST-elevation myocardial infarction (NSTEMI)
- Hypokalemia
- Long QT Syndrome
- Digoxin toxicity

### Diagnosis

The ECG reveals sinus tachycardia at a rate of 115 beats per minute. The increased amplitude and width of the P wave, ST depression, T wave inversion, and prominent U waves in V5 and V6, and apparent long QT (actually QU interval) all suggest the presence of hypokalemia. Prominent U waves will often give the appearance of a biphasic T wave (“down” then “up,” as opposed to the more ischemic appearing “up” then “down” variety).

#### A note about tachycardia

Tachycardia is protective in patients with hypokalemia because as the heart rate decreases, the QT interval lengthens. With profound bradycardia and a long QT interval, the heart may depolarize, or ventricular ectopy may occur, while still in the repolarization phase. This “R-on-T phenomenon” (or R-on-U in this case) may induce polymorphic ventricular tachycardia, or torsades de pointes. Since tachycardia is protective for torsades de pointes, one treatment to intentionally accelerate the heart rate is overdrive pacing—which can be performed via pharmacologic means as well as transvenous or transcutaneous pacing. The presence of a malignant dysrhythmia is the only indication for rapid repletion of potassium. If cardiac arrest is imminent or has occurred, administer an initial infusion of 10 mEq IV over 5 minutes and repeat once if needed.

### Learnings/What to Look for

- With moderate-severe hypokalemia, look for:
  - Increased width and amplitude of the P wave
  - Prolonged PR interval
  - T-wave flattening or inversion
  - ST depression
  - Prominent U-waves
  - Long QU interval
- In severe hypokalemia, patients develop ectopic beats, supraventricular tachyarrhythmias, and eventually ventricular arrhythmias (particularly torsades de pointes)



**Figure 3.** The QU Interval shown here is clearly longer than half of the R-R interval (a simple way to determine if the QT interval is long for the given rate).

### Pearls for Urgent Care Management and Considerations for Transfer

- Hypokalemia is often accompanied by hypomagnesemia—don’t forget to check and replace both to decrease the risk of ventricular arrhythmias
- Treatment of hypokalemia involves oral and/or parenteral routes, as well as identification and treatment of the underlying cause of the electrolyte disorder
- In the setting of hypokalemia and a prolonged QT interval (>500 msec), consider transfer to an emergency department or admitting facility where electrolytes can be replaced while the patient is monitored

### Resources

- Diercks DB, Shumailk GM, Harrigan RA, et al. Electrocardiographic manifestations: electrolyte abnormalities. *J Emerg Med.* 2004;27(2):153–160.
- Glancy DL, Wiklow FE, Rochon BJ. Electrocardiogram after 2 weeks of diarrhea. *Proc (Bayl Univ Med Cent).* 2010;23(2):173–174.
- Levis JT. ECG diagnosis: hypokalemia. *Perm J.* 2012;16(2):57.
- 2005 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. *Circulation.* 2005;112(24 Suppl):IV1-203

**Acknowledgment:** Case presented by Catherine Reynolds, MD, Assistant Professor, Director of Student Clerkships, The University of Texas Health Science Center at Houston.



## A 24-Year-Old Female with a New, Unexplained 'Rash' on Her Leg



### Case

The patient is a 24-year-old woman who presents to urgent care with several linear lesions on her leg, accompanied by a burning skin sensation which developed days after starting a job as an outdoor bartender at a local beach resort.

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



## THE RESOLUTION

Figure 2.

**Differential Diagnosis**

- Irritant contact dermatitis
- Erythema multiforme
- Phytophotodermatitis
- Fixed drug eruption

**Diagnosis**

This patient was diagnosed with phytophotodermatitis, a cutaneous phototoxic eruption caused by the interaction of furocoumarins found in some common plants with solar UVA radiation. It is a common skin complaint in travelers to tropical regions.

**Learnings/What to Look for**

- Approximately 24 hours after plant contact with subsequent exposure to sunlight, a burning erythema develops. Limes, other citrus fruits, celery, figs, meadow grass, certain weeds, and oil of bergamot are frequently causative. In this patient's case, it was likely slicing and squeezing limes, lemons, and oranges for cocktails
- Exposure to the plant sap of wild parsnip (*Pastinaca sativa*; "poison parsnip"), common throughout the United States, can cause severe phytophotodermatitis
- There is no predilection for any age or ethnicity or either sex, although phytophotodermatitis may be more noticeable in lighter skin phototypes

**Pearls for Urgent Care Management and Considerations for Transfer**

- Phytophotodermatitis is benign and self-limited. Treatment is supportive

**Acknowledgment:** Images and case courtesy of VisualDx ([www.VisualDx.com/JUCM](http://www.VisualDx.com/JUCM)).