CLINICAL CHALLENGE: CASE 1

Challenge your diagnostic acumen: Study the following x-rays, electrocardiograms, and photographs and consider what your diagnosis might be in each case. While the images presented here are authentic, the patient cases are hypothetical. Readers are welcome to offer their own patient cases and images for consideration by contacting the editors at editor@jucm.com.

60-Year-Old With Annoying Cough

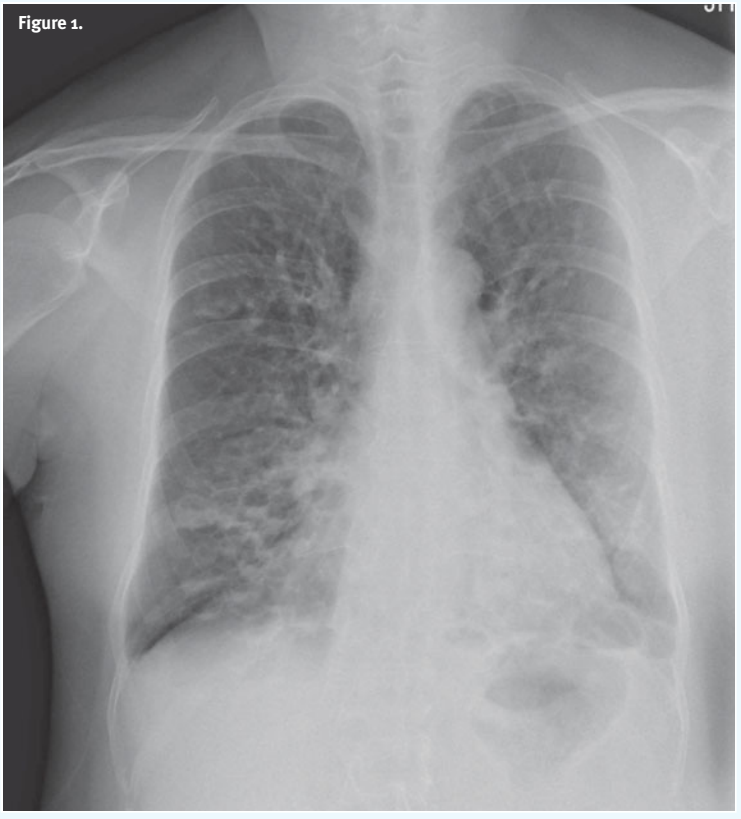

Figure 1.

A 60-year-old man presents to urgent care complaining of an annoying cough for several months. He states that he frequently has sputum production with his cough. He denies any fever, chills, or other symptoms.

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

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

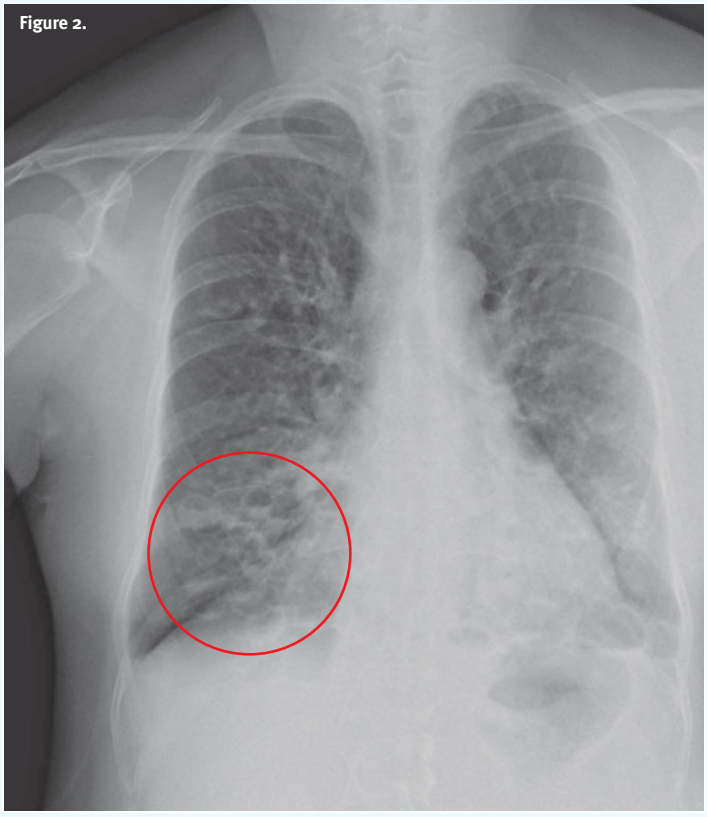
Figure 2.

Differential Diagnosis
- Atypical pneumonia
- Lower lobe cystic bronchiectasis
- Chronic obstructive pulmonary disease
- Pneumonitis

Diagnosis
The x-ray demonstrates multiple basilar thin-walled cystic collections with air fluid levels in the lung bases, right greater than left. The correct diagnosis is probable lower lobe cystic bronchiectasis. Bronchiectasis arises from chronic airway inflammation, which results in wall thickening and airway dilation.

What to Look For
- Lower lobe cystic changes are usually caused by bronchiectasis or cystic lung disease, each of which have many causes
- Patients with bronchiectasis will have cough, productive of mucopurulent sputum for months to years, frequently with exacerbations
- Patients with bronchiectasis may also complain of shortness of breath, wheezing, or pleuritic chest pain

Pearls for Urgent Care Management
- Acute bronchiectasis exacerbations are defined as clinical deterioration with at least 3 of the following symptoms for at least 48 hours: cough, sputum volume/consistency, sputum purulence, shortness of breath, fatigue, and hemoptysis
- A gram stain and sputum culture should be performed prior to initiating antibiotics
- Without recent culture information, first line antibiotic should be a fluoroquinolone
- Referral to pulmonology for further evaluation and treatment is warranted

29-Year-Old With Stinging Sensation

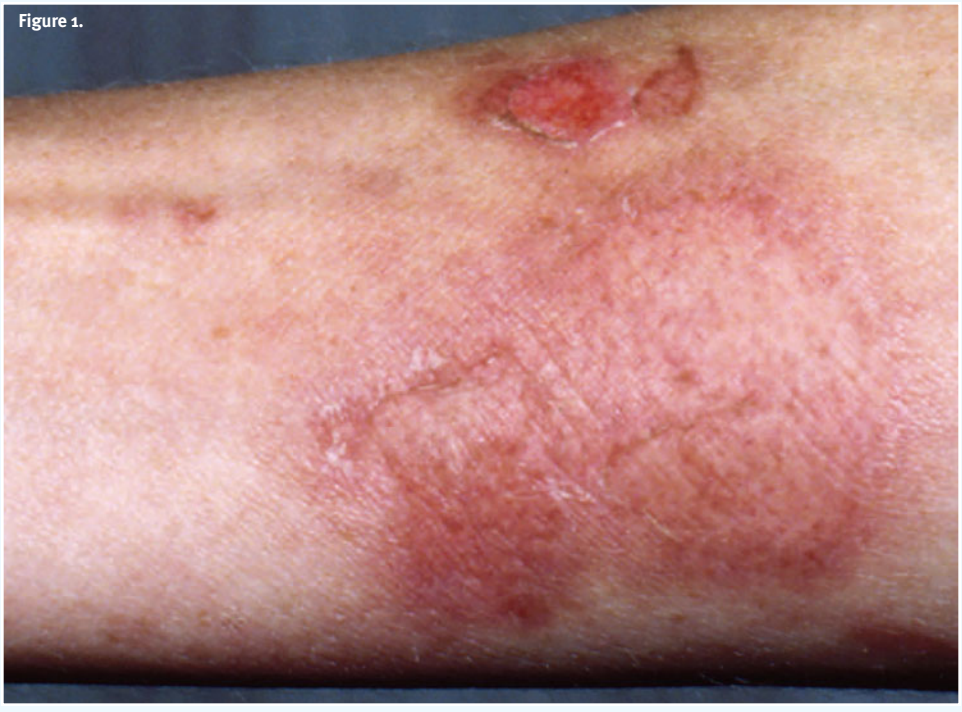
Figure 1.

A 29-year-old woman presents to urgent care for a painful rash that developed on her arm. It started 1 day after working on a landscaping project that involved pulling weeds under intense sunlight. On examination, an edematous, pink, scaly plaque and nearby erosions are seen on her right arm. The patient appears well and has no systemic symptoms.

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

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

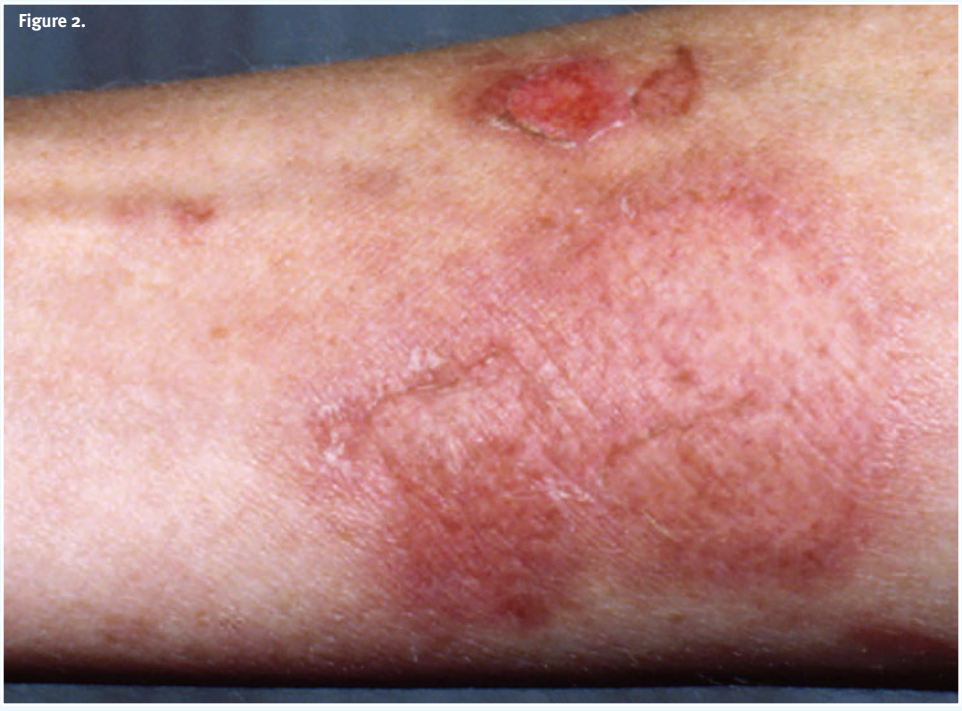
Figure 2.

Differential Diagnosis
- Arthropod bites or stings
- Hogweed dermatitis
- Solar urticaria
- Sunburn

Diagnosis
The correct diagnosis in this case is hogweed dermatitis. Exposure to the giant hogweed plant (*Heracleum mantegazzianum*) can cause phytophotodermatitis, especially in sunlit environments. A toxic psoralen present in the sap, furocoumarin, is highly lipid-soluble and penetrates into the epidermis. Absorption of ultraviolet A by the psoralens leads to nucleic acid damage and formation of free radicals. Subsequent cell death leads to the quick formation of painful blisters.

What to Look For
- Preceding the skin lesions, the patient may experience a burning sensation. This is followed by erythema, edema, and vesicle formation within 24 hours of contact with the hogweed sap
- If severe, patients experience headaches and generalized fatigue; they may also complain of feeling hot
- Contact of the sap with the eyes can cause temporary or even permanent blindness
- Symptoms usually develop within 18-48 hours following contact with the sap and sunlight exposure, and symptoms may continue for a month
- The plant is large with a hollow stem, and children may be inclined to use it as a play telescope or sword

Pearls for Urgent Care Management
- Ensure the area has been cleaned with soap and water to remove all sap
- Initial treatment is with a topical steroid
- Use over-the-counter non-steroidal anti-inflammatories for pain management
- If the patient has severe wounds, demonstrating 2nd or 3rd degree burns, contact a burn center

CLINICAL CHALLENGE: CASE 3

15-Year-Old Gasping for Air

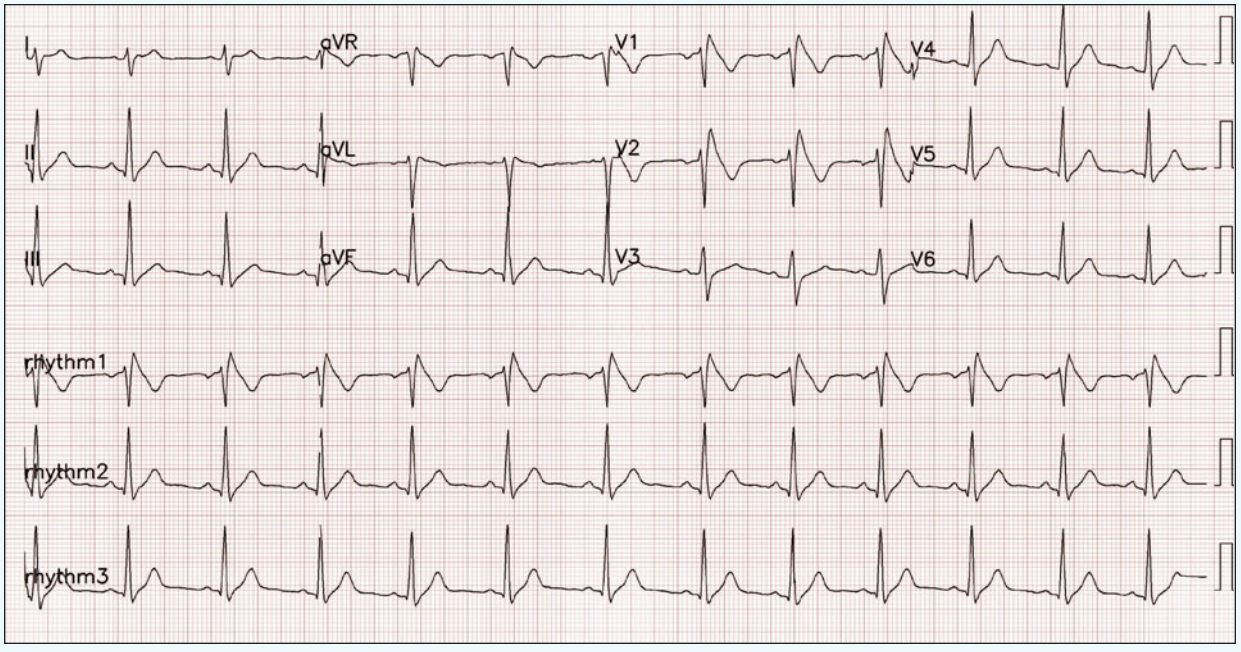

Figure 1: Initial ECG

A 15-year-old male with no significant past medical history presents after he was noted to be gasping for air and difficult to arouse after taking a nap. At the urgent care, an ECG is obtained.

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

Case presented by Erik Alvarado, MD, McGovern Medical School at the University of Texas Health Science Center at Houston.

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

ECG STAMPEDE

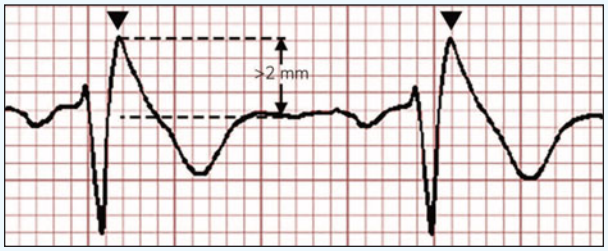

Figure 2: Coved-type Brugada pattern in V1 (arrowheads) with › 2 mm ST-segment elevation.

Differential Diagnosis

- Right bundle branch block (RBBB)
- ST-elevation myocardial infarction (STEMI)
- Brugada syndrome
- Hypokalemia
- Tricyclic antidepressant toxicity

Diagnosis

The correct diagnosis in this case is Brugada syndrome. The ECG reveals a normal sinus rhythm at a rate of 78 beats per minute, normal axis. The right-sided precordial leads (V1 and V2) have an rSR' appearance and a coved ST segment with › 2 mm elevation followed by an inverted T wave.

Discussion

First described in 1992 under the original name of "right bundle branch block, persistent ST segment elevation and sudden death,"[1] Brugada syndrome is a sodium channelopathy that can easily be misdiagnosed as a benign RBBB given the RSR' appearance in V1 and V2. However, upon closer inspection, the ST segments have a peculiar, coved appearance with a J point/ST-segment elevation › 2 mm, not seen in RBBB. Additionally, the QRS complex is narrow (‹120 msec), excluding RBBB. While there is ST-elevation in 2 contiguous leads, the absence of reciprocal ST-segment depressions in anatomically opposing leads (in this case, inferior leads II, III, and aVF) as well as the clinical context should prompt the clinician to consider alternative diagnoses. These findings describe a Type 1 Brugada pattern, which is now recognized as the only type to establish the diagnosis whether seen spontaneously or provoked by drug challenge (usually class I antiarrhythmics/Na+ blockade drugs).[2,3]

The ECG changes can be spontaneous or transiently provoked by fever or drugs[3] and should prompt transfer to an electrophysiology-capable center, especially in the context of syncope.

One interesting presentation for Brugada is nocturnal agonal respirations. Sudden death after these frightening gasps have been reported in Southeast Asia, where it was previously described as sudden unexplained nocturnal death syndrome (SUNDS). This phenomenon was previously known in the Philippines as *bangungut* —"to rise and moan in sleep;" in Japan as *pokkuri*—"sudden and unexpectedly ceased phenomena;" and in Thailand as *Lai Tai*—"death during sleep."[4] This unique presentation of syncope, as in this case, should prompt consideration of Brugada syndrome.

Regarding the other diagnoses listed in the differential, hypokalemia is known to cause a prolonged repolarization phase, leading to a long QT interval, U waves, or a wavy appearance of the repolarization phase secondary to T-U fusion. A tricyclic antidepressant overdose is known to cause findings of sodium channel toxicity including QRS widening, a right axis deviation, and a tall terminal R in aVR. Neither of these diagnoses are consistent with the findings in this ECG.

What to Look For

- The type 1, or coved-type Brugada pattern consists of an rSR' appearance in V1 and V2 combined with downsloping ST-segment elevation (›2mm) followed by a negative T wave.
- When seen in the context of syncope, nocturnal agonal respirations, or a family history of sudden cardiac death, the diagnosis of Brugada syndrome is suggested and the patient is at risk for fatal ventricular dysrhythmias.

Pearls for Initial Management, Considerations For Transfer

- The Brugada Pattern found on routine ECG in an asymptomatic patient does not necessarily warrant transfer, but a discussion for follow up with a cardiologist is prudent.
- If symptomatic, especially with syncope or abnormal breathing pattern, transfer to the emergency department with pacer pads in place.

References

1. Brugada P, Brugada J. Right bundle branch block, persistent ST segment elevation and sudden cardiac death: a distinct clinical and electrocardiographic syndrome. A multicenter report. *J Am Coll Cardiol*. 1992;20(6):1391-1396. doi:10.1016/0735-1097(92)90253-J
2. Sieira J, Brugada P. The definition of the Brugada syndrome. *Eur Heart J*. 2017;38(40):3029-3034. doi:10.1093/eurheartj/ehx490
3. Marsman EMJ, Postema PG, Remme CA. Brugada syndrome: update and future perspectives. *Heart*. 2022;108(9):668-675. doi:10.1136/HEARTJNL-2020-318258
4. Antzelevitch C, Brugada P, Brugada J, Brugada R, Towbin JA, Nademanee K. Brugada syndrome: 1992-2002: A historical perspective. *J Am Coll Cardiol*. 2003;41(10):1665-1671. doi:10.1016/S0735-1097(03)00310-3