INSIGHTS IN IMAGES

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 30-Year-Old with a Painful Neck 'Bump' and Difficulty Swallowing

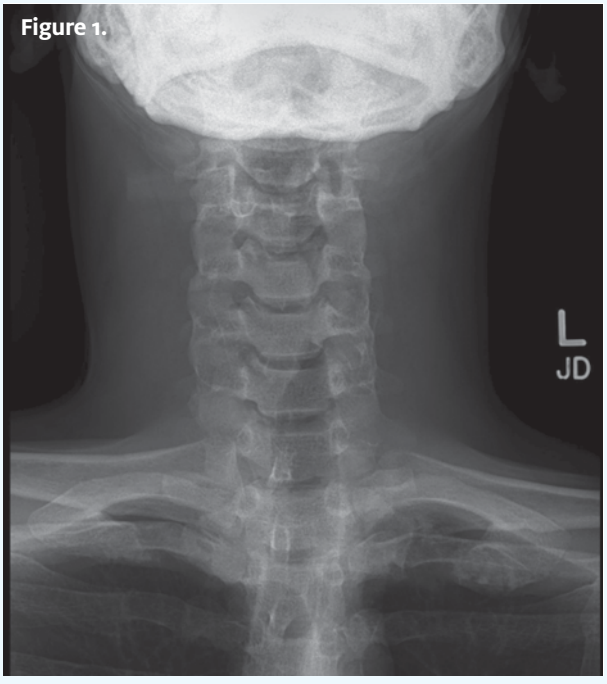

Figure 1.

Figure 2.

Case

The patient is a 30-year-old male who presents with 2 days of difficulty swallowing and what he calls a painful "bump" on the right side of his neck.

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

THE RESOLUTION

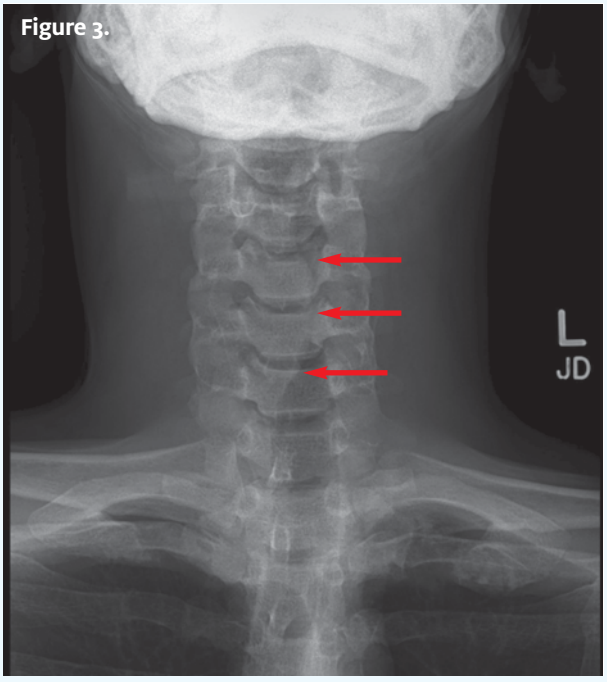

Figure 3.

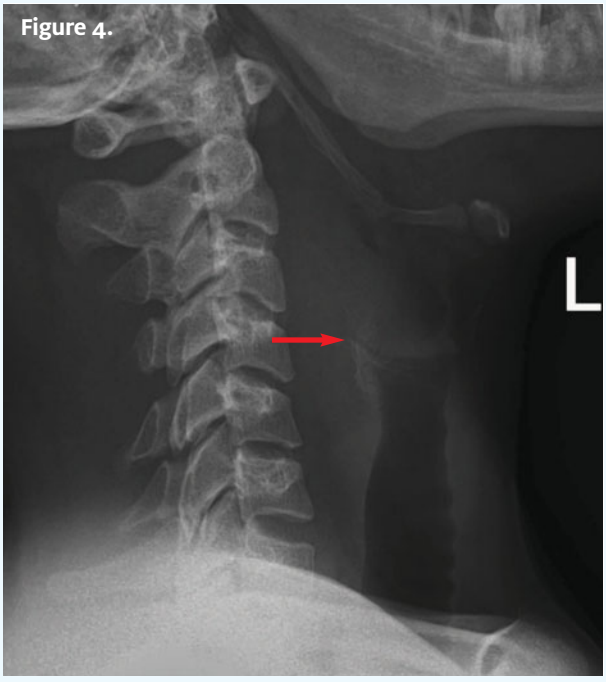

Figure 4.

Differential Diagnosis

- Infection (viral upper respiratory, cytomegalovirus, Epstein-Barr, staphylococcal, streptococcal, toxoplasmosis, *Bartonella*, tuberculosis, HIV)
- Acute sialadenitis
- Right neck mass
- Parotid lymphadenopathy

Diagnosis

The x-rays reveal a large, rounded extrinsic compression of the right-side airway on AP view and prevertebral soft tissue thickening on the lateral view. These findings are consistent with a diagnosis of right neck mass.

Learnings/What to Look for

- Anatomic considerations: This is an anterior process, so likely in anterior aspect of neck

Pearls for Urgent Care Management

- Further imaging evaluation with ultrasound/CT is warranted immediately

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

A 13-Year-Old Girl with Fever, Chills, Dry Cough, and Myalgia


Figure 1.

Case

A mother brings her 13-year-old daughter to your urgent care center with a complaint of fever, chills, dry cough, and myalgia for 3 days. On exam, the patient is febrile (101° F). In addition, there is conjunctival injection and blanching erythematous patches on the face and neck. The mother mentions that the family returned from a trip to Brazil 10 days prior. While traveling they ate local food, drank local (unfiltered) water, sustained a few mosquito bites, and went whitewater rafting.

View the image in this context 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

- Influenza
- Legionellosis
- Leptospirosis
- Malaria

Diagnosis

This patient was diagnosed with leptospirosis, a bacterial zoonotic infection caused by any of the serovarieties of the spirochetes from the *Leptospira* species. There is an incubation period of 5 to 14 days. The geographic distribution is worldwide, but it is endemic in tropical climates and sporadic in temperate climates. It is more common in summer and after floods.

Learnings/What to Look for

- Leptospirosis may be difficult to diagnose because its initial symptoms (remittent fever, chills or rigors, myalgia, headache, low back pain, and conjunctivitis/uveitis) are similar to other diseases. Some cases have few to no symptoms. However, early diagnosis is crucial as successful treatment should be initiated, ideally, within the first 4 days of illness
- Conjunctival suffusion (conjunctival redness without inflammatory exudate) is a classic clinical sign. Some cases may also feature a dry cough, nausea, vomiting, diarrhea, abdominal pain, and a pretibial rash of erythematous papules
- Leptospirosis may progress to Weil disease, a more severe form, which includes jaundice, kidney and/or liver failure, meningitis, pneumonitis with hemoptysis, acute respiratory distress, hemorrhage, shock, and death

Pearls for Urgent Care Management

- Leptospirosis is treated with antibiotics (ie, doxycycline or azithromycin) which should be given early in the course of the disease
- Intravenous antibiotics may be required for persons with more severe symptoms

Acknowledgment: *Images and case presented by VisualDx (www.VisualDx.com/JUCM).*

INSIGHTS IN IMAGES

CLINICAL CHALLENGE: CASE 3

An 81-Year-Old Female with a History of A-Fib and a Recent Syncope Event

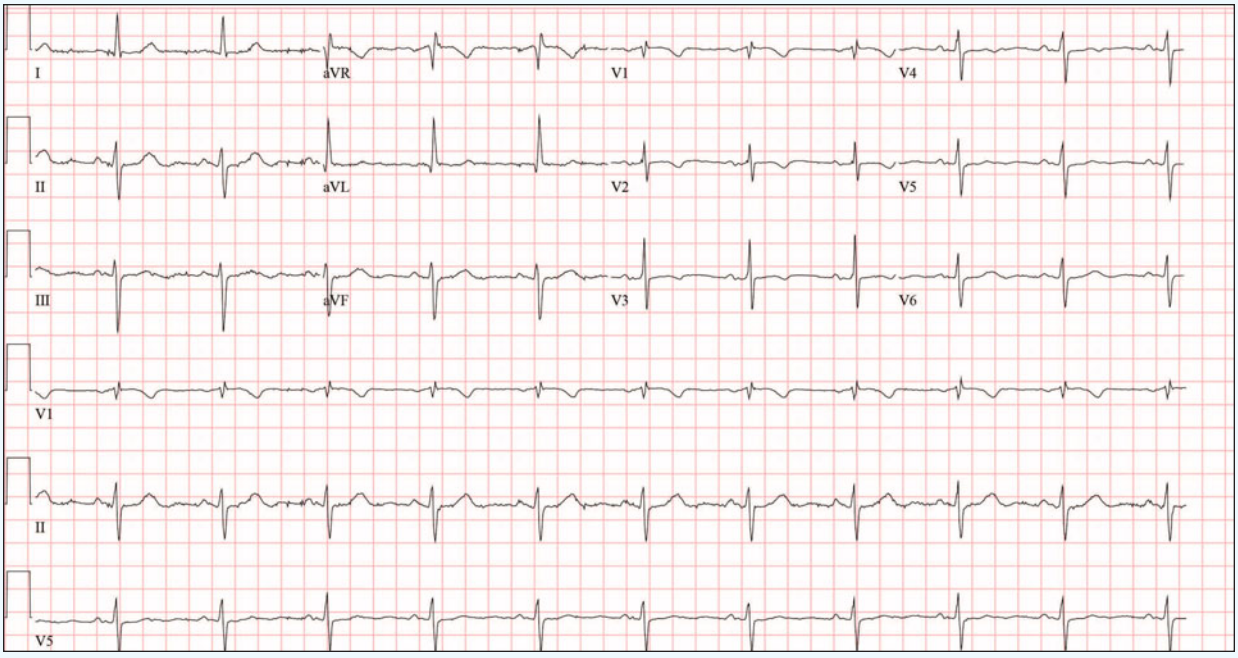

Figure 1. Initial ECG.

The patient is an 81-year-old female with past medical history of atrial fibrillation on apixaban who presents to urgent care after a syncopal episode 30 minutes prior to arrival. The patient felt lightheaded while being pushed in her wheelchair and then lost consciousness. There was no trauma. She returned to baseline approximately 2 minutes after the event. There was no seizure activity. The patient denied associated chest pain, shortness of breath, headache, urinary or fecal incontinence, tongue biting or any other complaints. On evaluation, the patient's vital signs are normal. She is breathing comfortably and speaking in complete sentences.

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

(Case presented by Jonathan Giordano, DO, MS, MEd, McGovern Medical School, Department of Emergency Medicine, The University of Texas Health Science Center of Houston.)

THE RESOLUTION

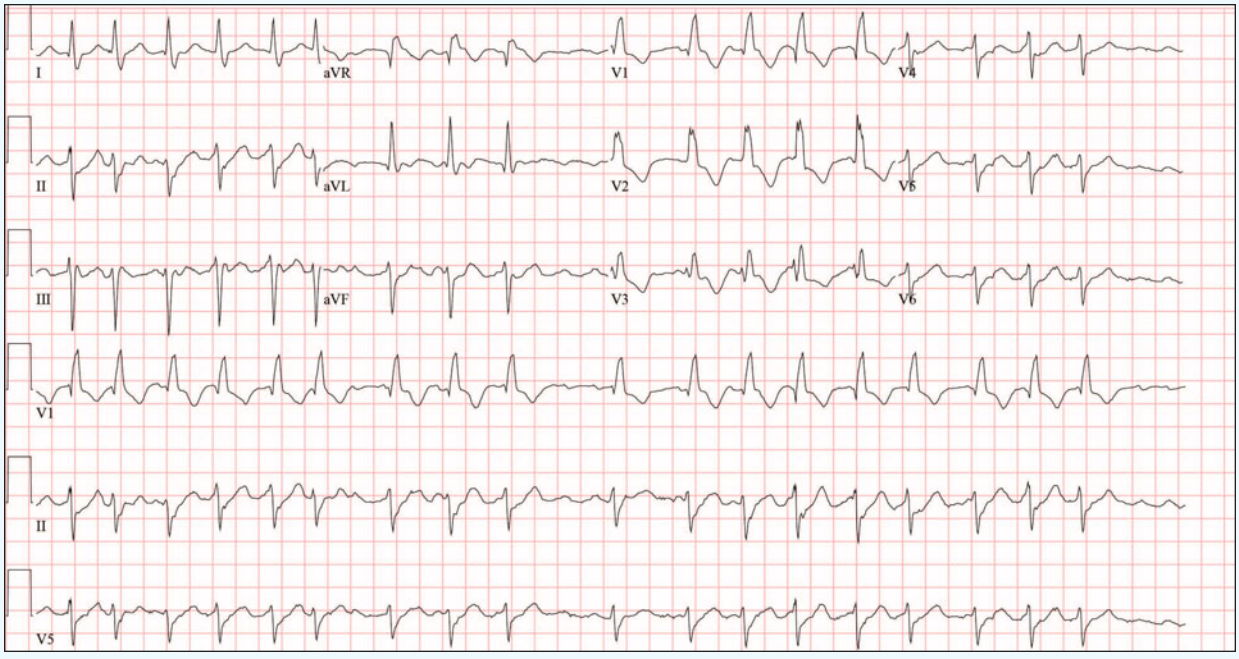

Figure 2. Repeat ECG.

Differential Diagnosis

- ST-Elevation myocardial infarction (STEMI)
- Ventricular tachycardia
- Hyperkalemia
- Atrial fibrillation with rapid ventricular response and rate-related right bundle branch block (RBBB)
- Atrial fibrillation with pre-excitation (Wolf-Parkinson-White syndrome)

Diagnosis

The repeat ECG (**Figure 2**) reveals atrial fibrillation with rapid ventricular response at a rate of 132 beats per minute. There is a left axis deviation and a wide QRS with rSR' in V1-V3 and a broad, slurred S-waves laterally—consistent with RBBB. There are no ST deviations. When comparing with the prior ECG, the RBBB is new.

The current conceptual understanding of the trifascicular framework of the intraventricular conduction system derives from a series of seminal papers by Rosenbaum, et al from 1969 to 1973. These works elucidated three conduction terminals—one in the right ventricle (the right bundle) and two in the left ventricle (the anterior and posterior divisions of the left bundle).[1-3]

Conduction disturbances of any or all three conduction terminals may result from structural abnormalities of the His-Purkinje system caused by necrosis, fibrosis, calcification, infiltrative disease, electrolyte disturbances, or impaired vascular supply.[4]

Rate-related bundle branch blocks were first described in the mid-20th century. In most cases, rate-related bundle branch blocks occur due to a prolonged refractory period of a diseased bundle. When a critical heart rate is exceeded, the diseased bundle fails.[5,6]

Rate-related bundle branch blocks can be especially challenging to diagnose when the rate is regular and fast (eg, supraventricular tachycardia), creating a regular, wide complex tachycardia that appears like ventricular tachycardia. The irregularly irregular rhythm makes ventricular tachycardia unlikely and favors atrial fibrillation. There is no evidence of ST-elevation or findings of hyperkalemia (eg, peaked T waves). Atrial fibrillation with pre-excitation (ie, Wolf-Parkinson-White) characteristically produces a rate that exceeds 250 bpm at times and has variable QRS morphologies, neither of which is present in this ECG.

Clinical Relevance

Syncope is a transient, self-limited loss of consciousness and postural tone, followed by spontaneous recovery back to baseline. It is a common chief complaint in the urgent care environment. While the underlying cause is not often determined in the urgent care setting, it is important to rule out severe or life-threatening etiologies of syncope. This is best done by a thorough history and physical exam, and careful examination of the ECG.

THE RESOLUTION

Cardiac arrhythmias are an extremely important consideration when evaluating a patient with syncope. This patient initially presented in sinus rhythm with a left anterior fascicular block. However, she became symptomatic when she was in atrial fibrillation with rapid ventricular response and demonstrated a new, rate-related RBBB. These ECGs together demonstrate significant underlying conduction disease (ie, RBBB, left anterior fascicular block). This patient should be evaluated by a cardiologist/electrophysiologist urgently.

Learnings/What to Look for

- Right bundle branch blocks can be identified by a QRS >120 msec, rSR' in V1-V3, and a broad, slurred S-wave in the lateral leads (I, aVL, V5, and V6)
- Left anterior fascicular blocks can be identified by left axis deviation, rS complexes in leads II, III, aVF (small R waves and deep S waves), qR complexes in leads I, aVL, (small Q waves and tall R waves)
- Rate-related bundle branch blocks happen when a diseased bundle encounters a critical rate
- Patients with significant conduction disease are at higher risk of dysrhythmias

Pearls for Urgent Care Management

- All patients with syncope should receive an ECG
- Utilize the clinical history and exam in tandem with the ECG to identify the etiology of syncope
- Syncope presumed secondary to cardiac arrhythmia should be transferred to a facility with cardiology capabilities

References

1. Rosenbaum MB. The hemiblocks: diagnostic criteria and clinical significance. *Mod Concepts Cardiovasc Dis*. 1970;39(12):141-146.
2. Rosenbaum MB, Elizari M V, Lazzari JO, et al. Intraventricular trifascicular blocks. Review of the literature and classification. *Am Heart J*. 1969;78(4):450-459.
3. Elizari M V, Acunzo RS, Ferreiro M. Hemiblocks revisited. *Circulation*. 2007;115(9):1154-1163.
4. Surawicz B, Childers R, Deal BJ, Gettes LS. AHA/ACCF/HRS Recommendations for the Standardization and Interpretation of the Electrocardiogram. Part III: Intraventricular Conduction Disturbances a Scientific Statement from the American Heart Association Electrocardiography and Arrhythmias Committee, Council on Clinical Cardiology; the American College of Cardiology Foundation; and the Heart Rhythm Society. *J Am Coll Cardiol*. 2009;53(11):992-1002.
5. Bauer GE. Bundle branch block under voluntary control. Br Heart J. 1964;26:167-179.
6. Vessel H. Critical rates in ventricular conduction: unstable bundle branch block. *Am J Med Sci*. 1952;44(6):830-842.

Acknowledgment: JUCM *appreciates the assistance of ECG Stampede (www.ecgstampede.com) in sourcing content for electrocardiogram-based cases for Insights in Images each month.*

ECG STAMPEDE