

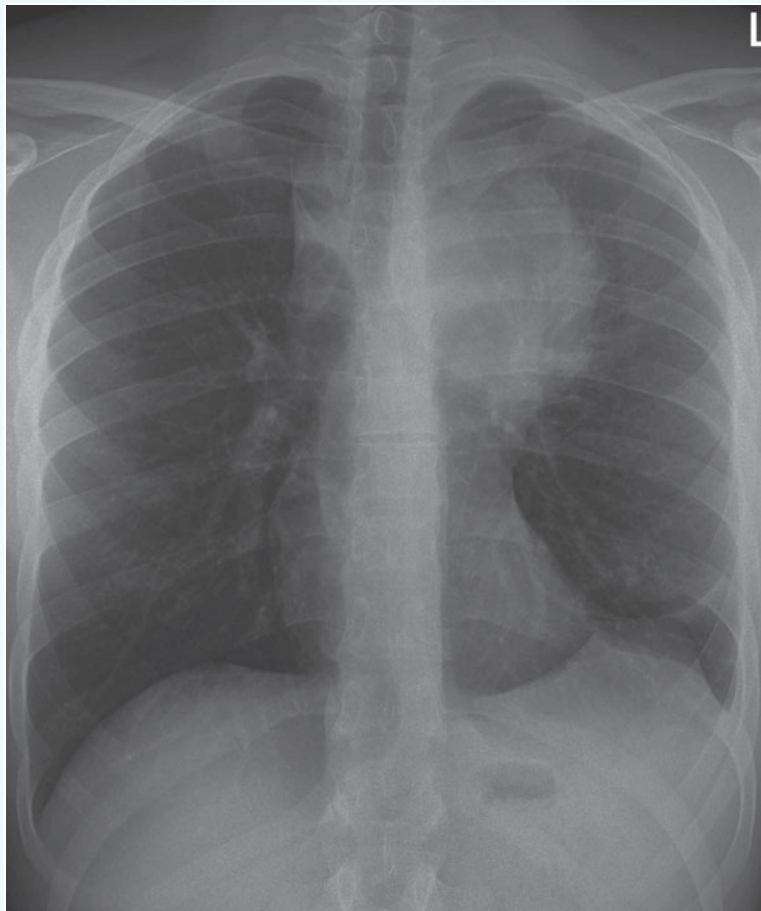


CLINICAL IMAGE CHALLENGE

X-RAY

Editor's Note: While the images presented here are authentic, the patient cases are hypothetical.

21-Year-Old Male With Cough and Night Sweats



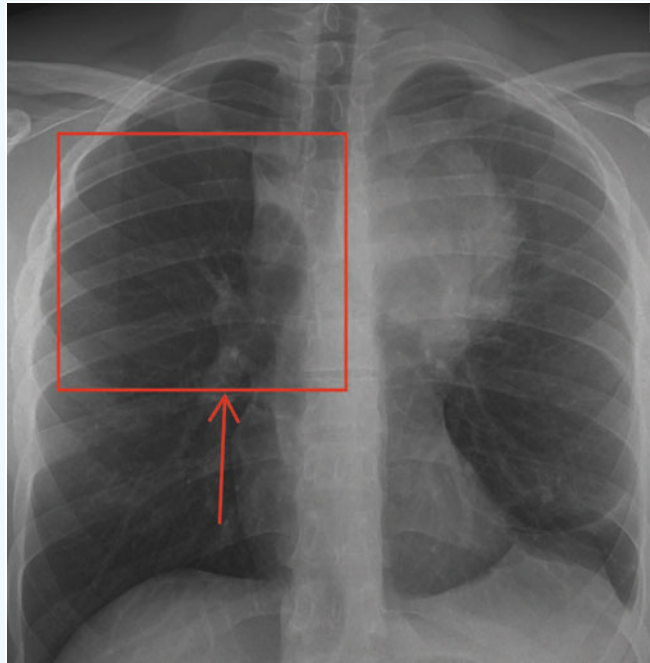
A 21-year-old male with no significant past medical history presents to urgent care with a 3-week history of progressive cough, night sweats, dyspnea, and chest discomfort. He denies sore throat, rhinorrhea, sinus congestion, hemoptysis, weight loss, wheezing, tobacco use, or illicit drug use.

On examination, vital signs are within normal limits. The patient appears well and not in acute distress. Lung aus-

cultation was clear bilaterally, and the remainder of the initial physical exam is unremarkable. A chest radiograph (anteroposterior and lateral views) is obtained.

Review the anteroposterior chest x-ray image 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).



Differential Diagnosis

- Thoracic aortic aneurysm
- Pericardial cyst
- Anterior mediastinal mass
- Metastatic disease
- Lipoma or liposarcoma

Diagnosis

The anteroposterior chest x-ray reveals a large, ovoid mass located just left of the midline, appearing inseparable from the mediastinum. The pulmonary hila and aortic contour remain visible, and the lateral view (not shown) confirmed a clear posterior chest, suggesting the mass is confined to the anterior mediastinum. The anterior mediastinum is located anterior to the pericardium and inferior to the clavicles.

The differential for such a mass is classically remembered by the “4 Ts”:

- **Thymoma**
- **Teratoma/Germ Cell Tumor**
- **Thyroid mass**
- **“Terrible” Lymphoma**

A contrast-enhanced chest computed tomography (CT) is the recommended next diagnostic step. CT imaging provides superior anatomical detail, delineating the size, location, and involvement of adjacent structures—critical for determining etiology and guiding further management. Evaluation should also include assessment for possible extra-thoracic involvement, such as testicular masses in suspected germ cell tumors.

What to Look For

- Widened mediastinum or opacity in the retrosternal clear space on chest x-ray should prompt further imaging.
- History should include systemic symptoms, lymphadenopathy, and a thorough review of systems.
- Physical examination should be comprehensive, including head, neck, supraclavicular and axillary nodes, chest, abdomen, and scrotum in male patients.

Pearls for Urgent Care Management

- Emergent referral to the ED is indicated if there are signs of airway compression or superior vena cava (SVC) syndrome (eg, facial swelling, venous distension).
- Patients with suspected airway compromise should avoid lying supine, as this may exacerbate symptoms.
- Advanced imaging (CT chest) should be arranged promptly.
- Avoid sedation, which may worsen airway obstruction in the setting of tracheal compression.
- Do not perform biopsy in the urgent care setting due to potential complications, including bleeding or airway compromise—refer to emergency or specialty care.



CLINICAL IMAGE CHALLENGE

DERMATOLOGY

A 16-Year-Old Male With Rash to Legs, Altered Mental Status and Fever



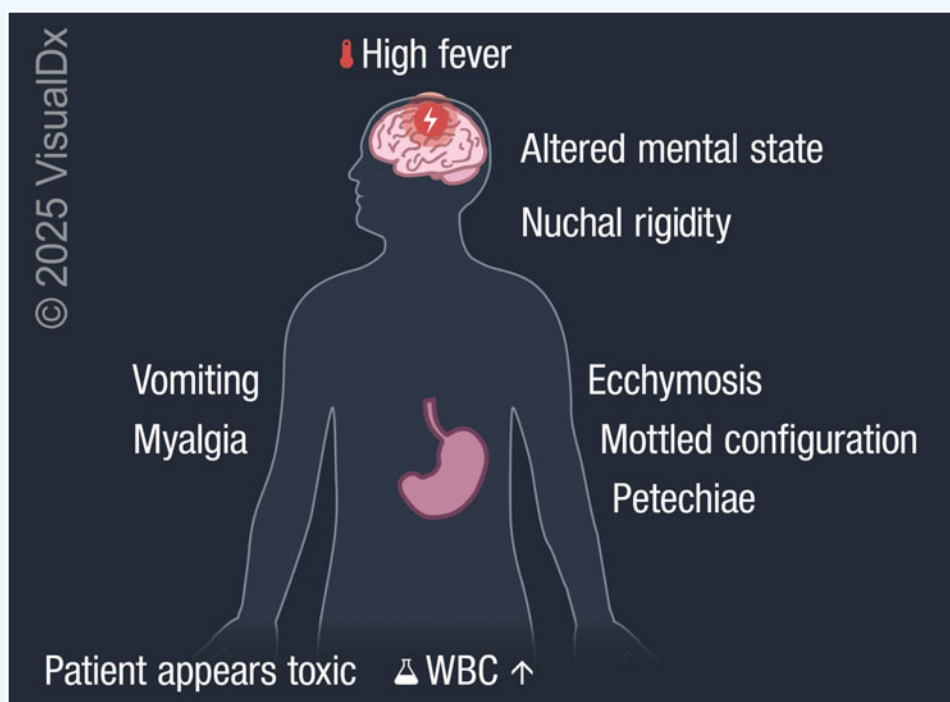
A 16-year-old male presents to urgent care accompanied by his father due to acute onset of fever, abdominal pain, fatigue, altered mental status, and a lower-extremity rash. Symptoms began earlier the same day. The patient denies recent upper respiratory symptoms, medication use, travel, or trauma.

On physical examination, he appears acutely ill and fe-

brile to 103.1°F (39.5°C). Neurologic assessment reveals altered mental status. Dermatologic exam shows retiform, violaceous purpuric plaques with maroon borders on both legs as shown in image provided.

View the image taken 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).



Differential Diagnosis

- Viral exanthem
- Acute meningococemia
- Immunoglobulin A (IgA) vasculitis
- Infectious Mononucleosis
- Multisystem inflammatory syndrome (MIS-C)

Diagnosis

The correct diagnosis is acute meningococemia, a fulminant bloodstream infection caused by *Neisseria meningitidis*. This condition carries a high mortality rate—estimated at 13%—even with prompt treatment. *N. meningitidis* is a leading cause of bacterial meningitis and sepsis in children and young adults and can present as meningitis, septicemia, or both.

Transmission occurs through close contact with respiratory droplets. The clinical course often begins with non-specific viral-like symptoms and may progress rapidly to sepsis, neurologic deterioration, and multiorgan failure within 24 hours.

What to Look For

- Toxic appearance: high fever, tachycardia, hypotension
- Systemic symptoms: headache, vomiting, myalgias, nuchal rigidity, altered mental status
- Characteristic rash:
 - Over 50% of patients present with petechiae, often on the trunk and lower extremities; mucosal and conjunctival involvement is also possible.
 - Retiform purpura or palpable purpura suggests more advanced disease.
 - Petechial lesions correlate with thrombocytopenia and may indicate evolving disseminated intravascular coagulation (DIC).
 - In early disease, a maculopapular eruption mimicking viral exanthem may occur—non-pruritic and transient, sometimes resolving within hours.

Pearls for Urgent Care Management

- Invasive meningococcal disease is a medical emergency.
- Initiate prompt stabilization and immediate transfer to an emergency department.
- Administer IV fluid resuscitation and collect blood cultures if resources allow.
- If transport to definitive care is delayed beyond 1 hour, administer a single dose of ceftriaxone.



CLINICAL IMAGE CHALLENGE

ECG

60-Year-Old With Palpitations

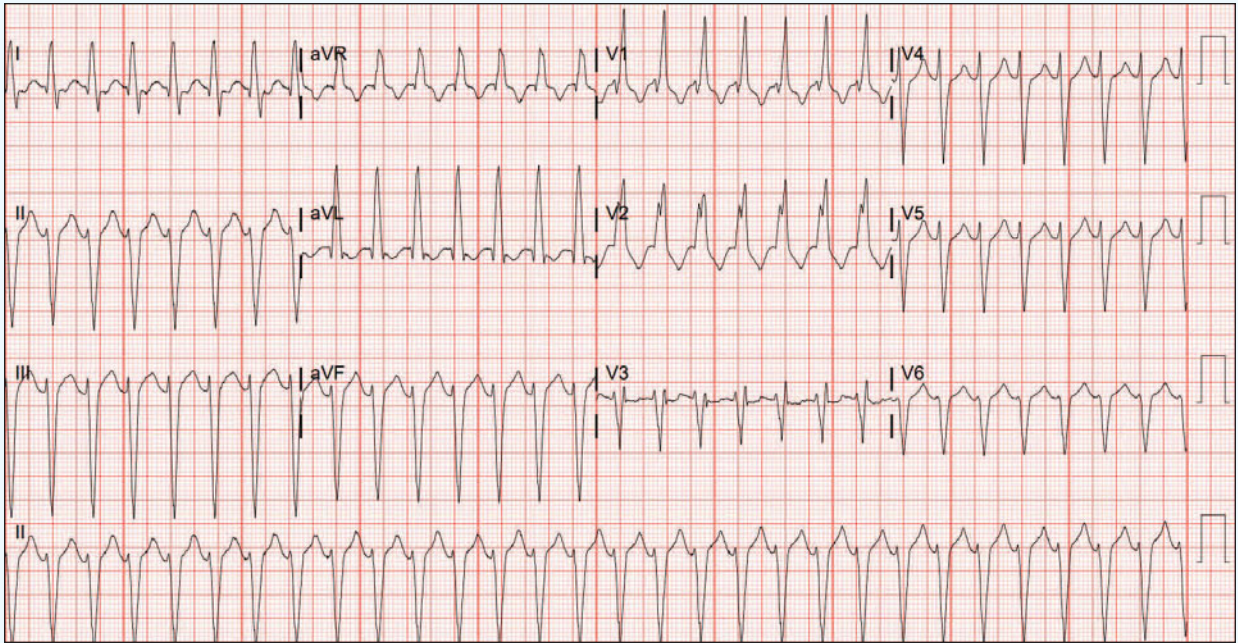


Figure 1: Initial ECG

A 60-year-old female presents to urgent care with palpitations that started abruptly 1 hour prior to arrival. She denies recent illness or cardiac history. An ECG is ordered.

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

Case presented by Catherine Reynolds, MD, McGovern Medical School at UTHealth Houston.

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

ECG  STAMPEDE

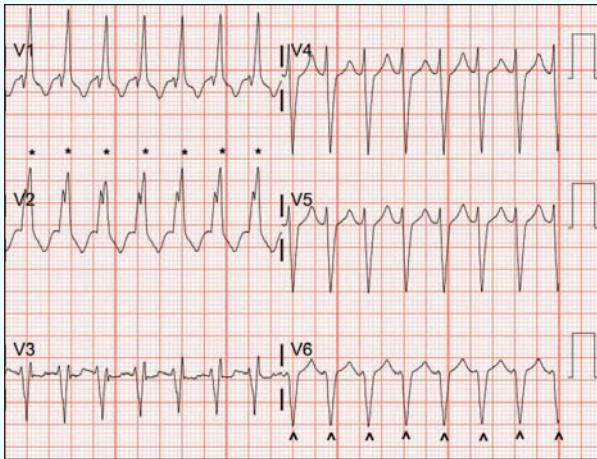


Figure 2: RSR' in V2 indicated here (*) as well as the deep S-wave in V6 (^)

Differential Diagnosis

- Ventricular tachycardia
- Supraventricular tachycardia (SVT) with aberrancy
- Atrioventricular reentrant tachycardia
- Atrial flutter
- Atrial tachycardia

Diagnosis

The diagnosis in this case is supraventricular tachycardia (SVT) with aberrancy. The ECG shows tachycardia with a regular rhythm and a rate of 180 beats per minute. There is leftward axis deviation and a widened QRS complex

(>120ms). There are no overt signs of acute ischemia.

Discussion

The ECG in this case is a regular wide-complex tachycardia. Of the possible etiologies for this pattern, the most likely and most dangerous is ventricular tachycardia (VT). If there is any uncertainty about the definitive diagnosis, the rhythm should be treated as VT to avoid the risk of inappropriate management and potential clinical deterioration.¹⁻³ If the patient is stable, it is safe to evaluate the ECG to determine the underlying rhythm. Note the appearance of an rSR' pattern in the anterior precordial leads (V1, V2) and a deep S-wave in the lateral leads (I, V6) consistent with a right bundle branch block (RBBB) pattern (**Figure 2**). The patient also has a leftward axis deviation. Causes of left axis deviation include: left bundle branch block (or paced rhythm); prior inferior myocardial infarction (ie, due to large inferior Q waves); left ventricular hypertrophy; ventricular preexcitation; and left anterior fascicular block.

Although there is high voltage in aVL, which suggests left ventricular hypertrophy (LVH), the degree of left axis deviation is more extreme than typically seen with LVH alone. In this case, the leftward axis deviation is caused by another disruption to the conduction pathway—left anterior fascicular block.⁴

If there is evidence of a preexisting bundle branch block pattern with similar morphology on a prior ECG, the cause of the wide complex tachycardia is likely to be SVT with aberrancy. Similarly, if the patient has prior evidence of

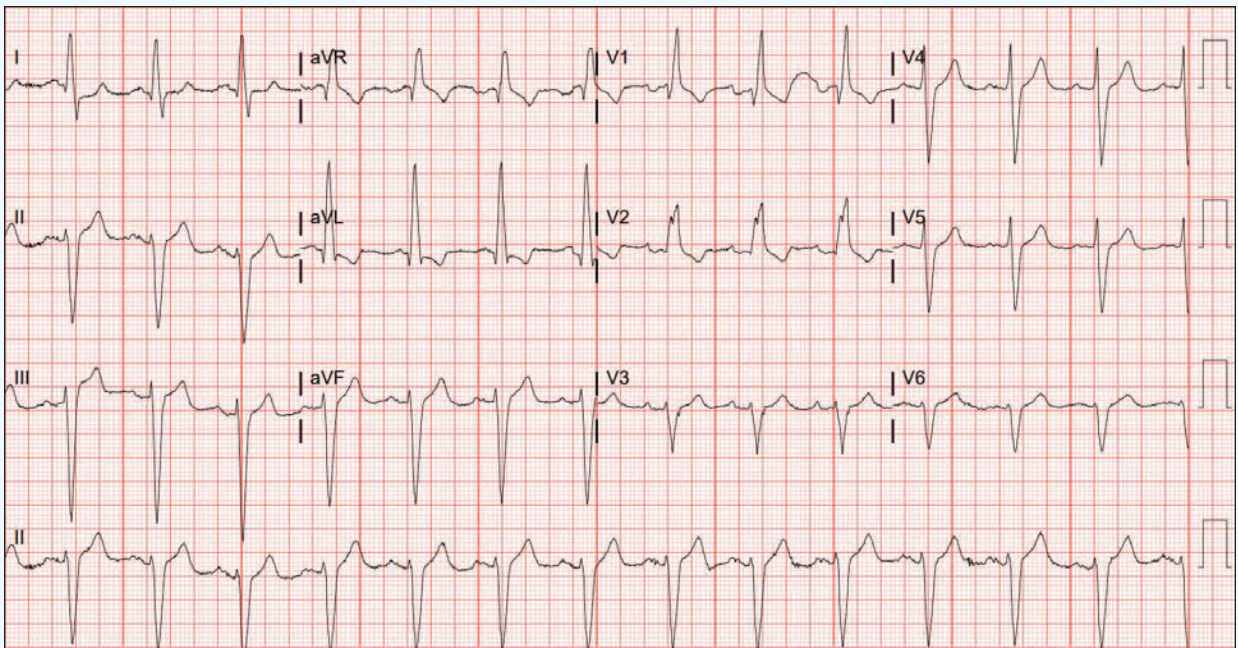


Figure 3: Patient's repeat ECG

pre-excitation (ie, short PR, delta wave, slightly widened QRS), the cause is likely atrioventricular reentrant tachycardia (conducted via an accessory pathway).

The Brugada algorithm is one of several tools used to distinguish between VT and SVT with aberrancy.⁵ More recently, the Basel algorithm is simple and touts good test characteristics.⁶

In our case, the patient was transferred to an emergency department where she was treated with adenosine, resolving the arrhythmia. The ECG performed after adenosine (**Figure 3**) shows the underlying bifascicular block (ie, right bundle branch block and left anterior fascicular block) with a sinus rhythm.

What To Look For

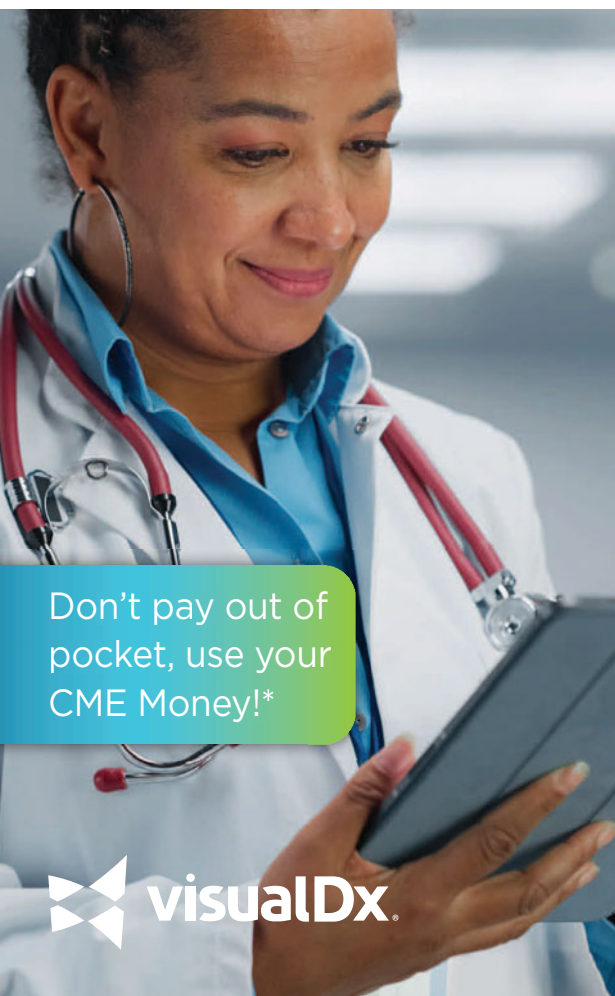
- When evaluating arrhythmias, first determine wide (ie, >120 ms) vs narrow (ie, <120 ms), and regular or irregular.
- Always assume a regular wide complex tachycardia to be VT until proven otherwise.
- Prior ECGs can be helpful to make a distinction between VT and SVT with aberrancy.

Pearls For Initial Management, Considerations For Transfer

- All patients with wide complex tachycardia should be transferred to an emergency department.
- If able, synchronized cardioversion can be attempted in patients with hemodynamic instability.

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