



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@juqm.com.

Neck Pain in a 17-Year-Old

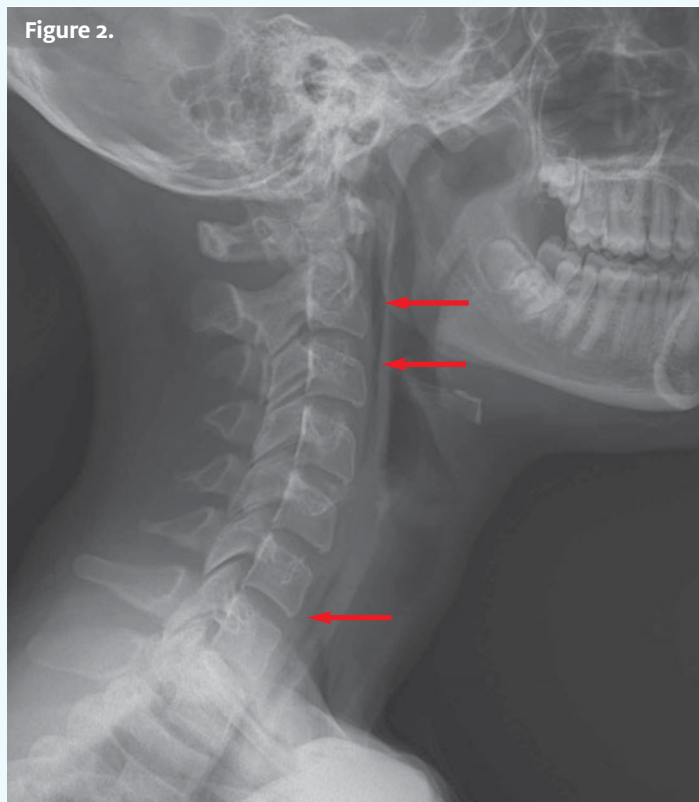


Case

The patient is a 17-year-old female who presents with neck pain a day after attending a rock concert. She denies cigarette smoking, vaping, use of illicit substances, or physical trauma.

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

THE RESOLUTION

**Differential Diagnosis**

- Complication of asthma
- Mediastinitis
- Retropharyngeal air
- Tracheoesophageal fistula

Diagnosis

This patient has retropharyngeal air, which is seen as a linear collection of gas paralleling the spine just posterior to the airway. Typical causes include surgery, trauma, retropharyngeal abscess, bronchial asthma, pneumomediastinum, physical exertion, forced swallowing, or any behavior producing instant positive pressure in the upper airway.

Learnings/What to Look for

- Clinical symptoms vary depending on the involved confined space—from mild sore throat to acute airway obstruction
- Retropharyngeal air *can* be a complication of asthma
- In the absence of physical trauma, cough-inducing illness or environmental exposures, probe for participation in recent shouting, screaming or extreme use of the larynx

Pearls for Urgent Care Management

- If mild, this condition is self-limiting and requires only supportive care
- If severe, this condition can lead to airway compromise necessitating invasive supportive airway maneuvers

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



An 8-Year-Old Boy with Scaly Papules on the Knees and Elbows



Case

During a regular check-up, a mother remarks that her 8-year-old son had developed clusters of follicular, scaly papules bilaterally on his knees and elbows “over the past few weeks.” They didn’t seem to bother him, but because her son is prone to allergies the mother wondered if changes in household substances like soap or laundry detergent could be responsible.

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

THE RESOLUTION

**Differential Diagnosis**

- Keratosis pilaris
- Pityriasis rubra pilaris
- Lichen spinulosus
- Atopic dermatitis

Diagnosis

This patient was diagnosed with lichen spinulosus, a rare and benign cutaneous disorder characterized by sudden onset of localized circumscribed plaques comprised of follicular hyperkeratotic papules. It most frequently occurs in children and adolescents; however, young adults can also be affected.

Learnings/What to Look for

- Etiology and pathogenesis are not known, although atopic, infectious, and genetic factors have been proposed as causes
- Patients often have a history of atopy

- Although usually localized to certain sites of predilection, a more severe generalized variant of lichen spinulosus also exists. It occurs in association with nodulocystic acne and pityriasis rubra pilaris as part of type VI (HIV-associated) pityriasis rubra pilaris
- Rare associations include Crohn's disease, Hodgkin's disease, seborrheic dermatitis, syphilis, id reactions to fungal infections, and heavy metal ingestions
 - Note that these associations are 1) not causal relationships and 2) may be the consequence of ascertainment bias

Pearls for Urgent Care Management

- Lichen spinulosus has a variable course. Most cases tend to resolve spontaneously at puberty, although persistent cases have also been described
- While no treatment is required, effective therapeutic options include topical keratolytic agents and topical retinoids

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



A 70-Year-Old Female with Nonradiating Chest Pain

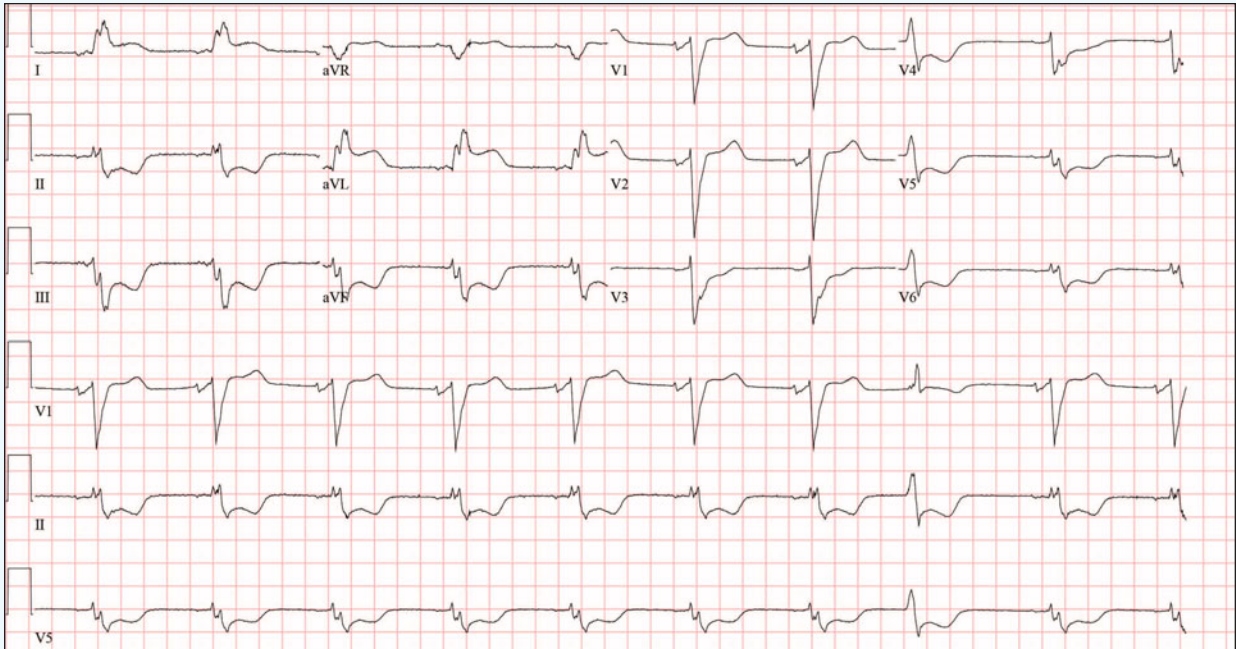


Figure 1.

A 70-year-old female with history of coronary artery disease presents to urgent care with nonradiating chest pain of 2 days' duration. She has a known history of left bundle branch block.

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 Benjamin Cooper, MD, McGovern Medical School, Department of Emergency Medicine, The University of Texas Health Science Center at Houston.)

THE RESOLUTION

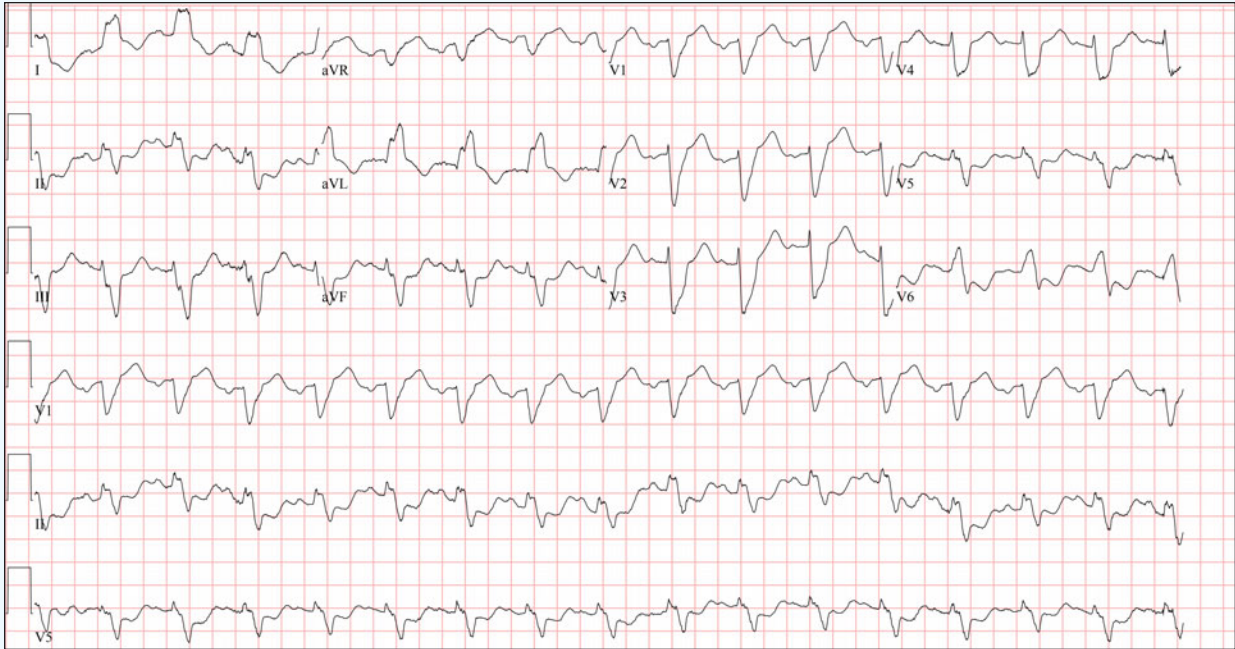


Figure 2. Baseline ECG demonstrating left bundle branch block as indicated by: QRS >120 ms, dominant S wave in V1, broad monophasic or notched R wave in lateral leads (I, aVL, V5, V6), left axis deviation.¹⁻³

Differential Diagnosis

- Normal left bundle branch block
- Acute myocardial infarction with left bundle branch block
- Left ventricular hypertrophy
- Hyperkalemia

Diagnosis

This patient was diagnosed with left bundle branch block. The ECG reveals a wide QRS complex (>120 ms) with a dominant S wave in V1 and notched R wave in the lateral leads I, aVL, and V6, indicating the presence of a left bundle branch block. There is concordant ST-elevation in I and aVL—meaning in the same direction as the QRS complex. The patient's baseline ECG is seen in **Figure 2**.

A left bundle branch block occurs when the left bundle no longer conducts, and the signal must pass to the left ventricle via myocyte-to-myocyte conduction. This pattern of conduction is slower than via the specialized conduction system, and results in a wide QRS complex (>120 ms). Conduction disturbances, like bundle branch blocks, result from structural abnormalities of the His-Purkinje system caused by necrosis, fibrosis, calcification, infiltrative disease, electrolyte disturbances, or impaired vascular supply.³ When conduction is impaired to both left ventricular terminals (the left anterior and posterior fascicles), the result is a left bundle branch block (**Figure 3**).

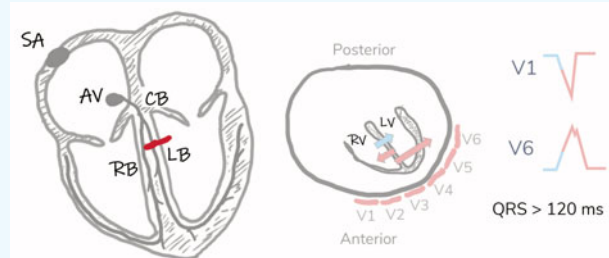


Figure 3. Depiction of depolarization in left bundle branch block. The septum first depolarizes from right to left (blue arrow) followed by near simultaneous depolarization of the right and left ventricles (pink arrows). The resultant vector leads to a negative deflection in V1 and a positive deflection in V6. SA, sinoatrial node; AV, atrioventricular node; RB, right bundle; LB, left bundle; CB, common bundle; RV, right ventricle; LV, left ventricle; red dash represents a block of the left bundle.

Normally, a left bundle branch block demonstrates characteristic discordant changes; ST segments tend to deflect in the opposite (ie, discordant) direction from the QRS complex (as demonstrated on the baseline ECG, **Figure 2**).

For instance, in leads with primarily down-going QRS complexes (ie, V1, V2, V3), slight ST-elevation is expected; and in leads with primarily up-going QRS complexes (ie, I, aVL, V5, V6), slight ST-depression is expected (along with repolarization abnormalities).

For decades, it was believed that the presence of a left bundle branch block obscured findings of acute myocardial infarction

THE RESOLUTION

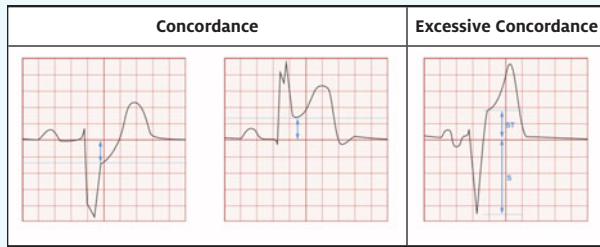


Figure 4. Demonstration of Sgarbossa criteria. For modified Sgarbossa criteria, the ST/S ratio should be greater than 0.25 for excessive discordance.

on the surface ECG. However, in 1996, Elena Sgarbossa identified electrocardiographic findings that suggested acute myocardial infarction in the presence of left bundle branch block, the so-called “Sgarbossa criteria.”⁴ The original Sgarbossa criteria heavily relied on the phenomenon of concordance—ST-segment deflection in the same direction as the QRS complex—as a powerful predictor of myocardial infarction, and is an indication for emergent reperfusion.⁵

In 2015, the original Sgarbossa criteria were modified to the following (as illustrated in **Figure 4**):⁶

1. Concordant ST-elevation of ≥ 1 mm
2. Concordant ST-depression of ≥ 1 mm in V₁, V₂, or V₃, or
3. Excessively discordant ST-elevation defined as the ST/S ratio > 0.25

If any single modified Sgarbossa criterion is met, acute myocardial infarction is diagnosed and the emergent reperfusion pathway should be activated.⁶ The term *intraventricular conduction delay* describes any disturbance that delays conduction through the ventricles (eg, bundle branch blocks, hyperkalemia, sodium-channel blockade, left ventricular hypertrophy, etc.). It is termed “nonspecific” when bundle branch criteria are not met, which is not the case here. Hyperkalemia can cause all manner of conduction disturbances, but other features to suggest hyperkalemia are absent (eg, peaked T waves, flattened or absent P wave, or PR prolongation). While left ventricular hypertrophy can cause QRS widening, discordant ST changes, and repolarization abnormalities (although all to a lesser extent than left bundle branch block), these changes are better explained by the presence of a left bundle branch block in this case.

Back to the case: This patient was taken to the catheterization lab for emergent percutaneous coronary intervention to the left anterior descending and left circumflex arteries.

Learnings/What to Look for

- The criteria for left bundle branch block are: QRS > 120 ms, dominant S wave in V₁, broad monophasic or notched R wave in lateral leads (I, aVL, V₅, V₆), +/- left axis deviation
- Sgarbossa criteria describe ST changes that suggest acute myocardial infarction in the presence of left bundle branch block
- Concordance—ST-segment deflection in the same direction as the QRS complex—is a powerful predictor of myocardial infarction and is an indication for emergent reperfusion
- Excessive discordance describes ST-segment elevation with ST/S ratio greater than 0.25 (Figure 4) and should also be considered an indication for emergent reperfusion

Pearls for Initial Management

- All patients with left bundle branch block and symptoms concerning for acute coronary syndrome should be transferred to a percutaneous coronary intervention-capable facility
- Patients meeting modified Sgarbossa criteria should be immediately transferred via emergency medical services for emergent reperfusion. If capable, activate emergent reperfusion pathways

References

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ECG STAMPEDE