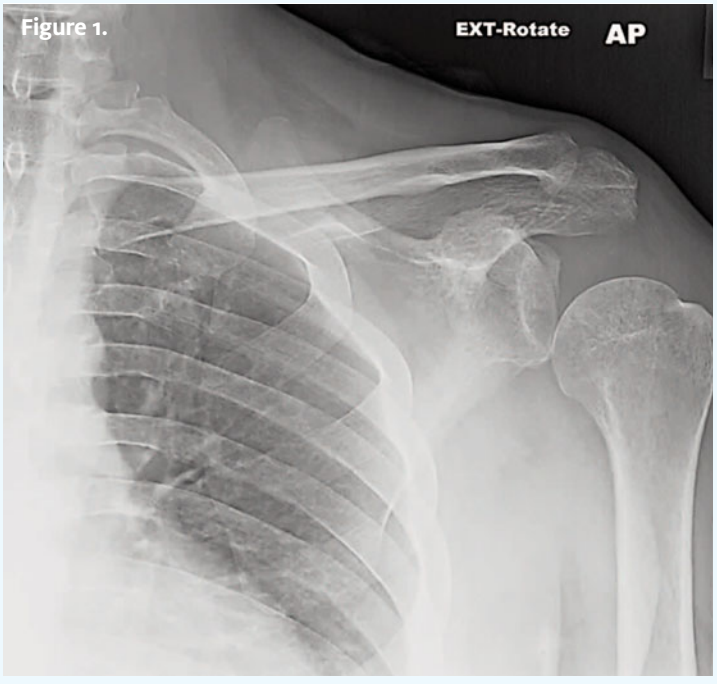
INSIGHTS IN IMAGES

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 email the relevant materials and presenting information to *editor@jucm.com*.

A 35-Year-Old Man with Shoulder Pain Weeks After a Car Accident

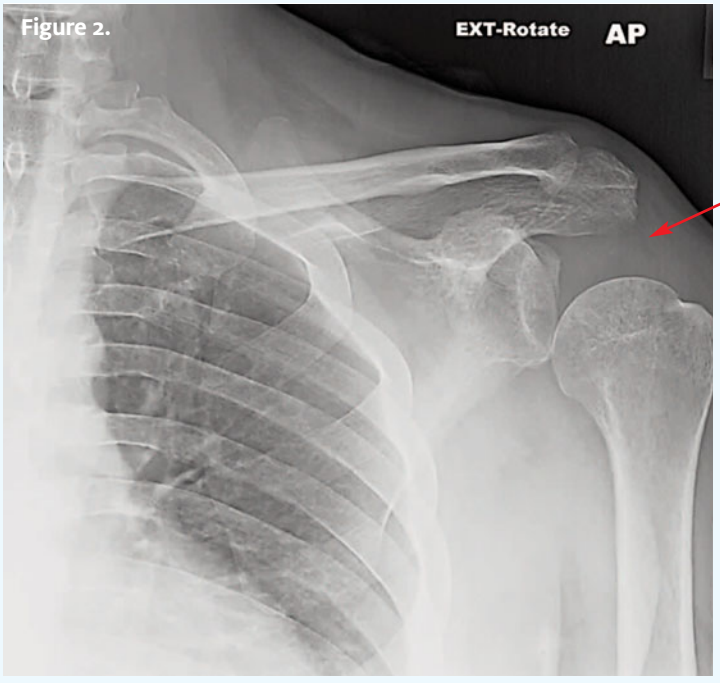


Case

The patients is a 35-year-old male who presents with shoulder pain and weakness. He reports that the pain began when he had a "fender bender" 3 weeks ago. At the time, he didn't think the pain was severe enough to warrant attention but he's concerned that it's "taking too long to get over this."

View the images taken and consider what your diagnosis and next steps would be.

THE RESOLUTION



Differential Diagnosis

- Bicipital tendonitis
- Clavicle fracture
- Inferior subluxation of the shoulder
- Labrum tear

Diagnosis

This patient suffered an inferior subluxation of the shoulder—a partial dislocation of the glenohumeral joint or translation between the humeral head and the glenoid fossa while the humeral head is in contact with the glenoid fossa. This injury is uncommon compared with anterior and posterior dislocations. It usually is transient following trauma, but could be permanent. The subluxation is secondary to the muscle fatigue or neurogenic etiology with muscle weakness.

Learnings/What to Look for

- Subluxation typically develops over a few weeks following trauma and becomes apparent as pain and swelling in the region subsides and atrophy and weakness of the shoulder girdle muscles become clinically apparent
- Clinical findings include an inferiorly displaced humeral head, increased gap between the acromion process and humeral head, and atrophy of the shoulder muscles
- Radiographic findings include inferior displacement of the humeral head from the glenoid fossa without a frank dislocation, increased distance between the acromion process under surface and the humeral head, muscle atrophy, and a fracture in shoulder girdle region

Pearls for Urgent Care Management and Considerations for Transfer

- Treatment is usually conservative, with immobilization (application of an elbow sling for 3 weeks) followed by physical therapy
- In patients with the humeral fracture, immobilization for 6 weeks is needed
- Recovery usually occurs over 3 to 8 weeks and takes longer in patients with neurological injury

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

CLINICAL CHALLENGE: CASE 2

A 33-Year-Old Woman with Blanching on Her Lower Legs

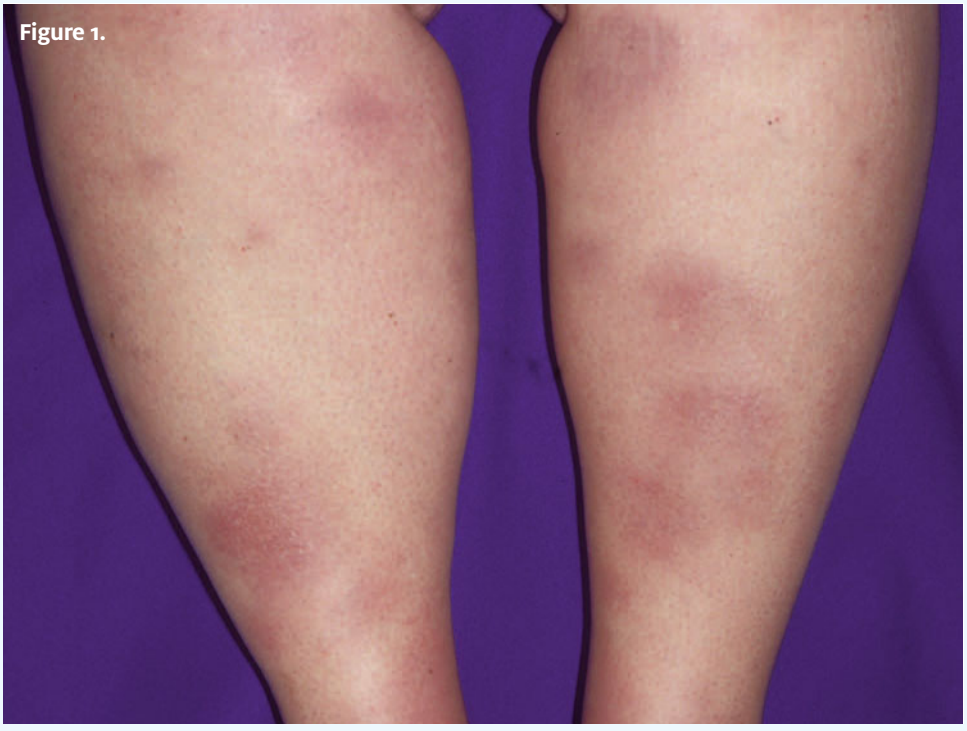


Figure 1.

Case

A 33-year-old woman presents to urgent care with symmetrical multiple blanching nodules that developed on her lower legs over the course of 2 weeks. The lesions were round and tender. She had also been fighting a fever, fatigue, and joint pain over the same period. Her only current prescription was for oral contraceptives.

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

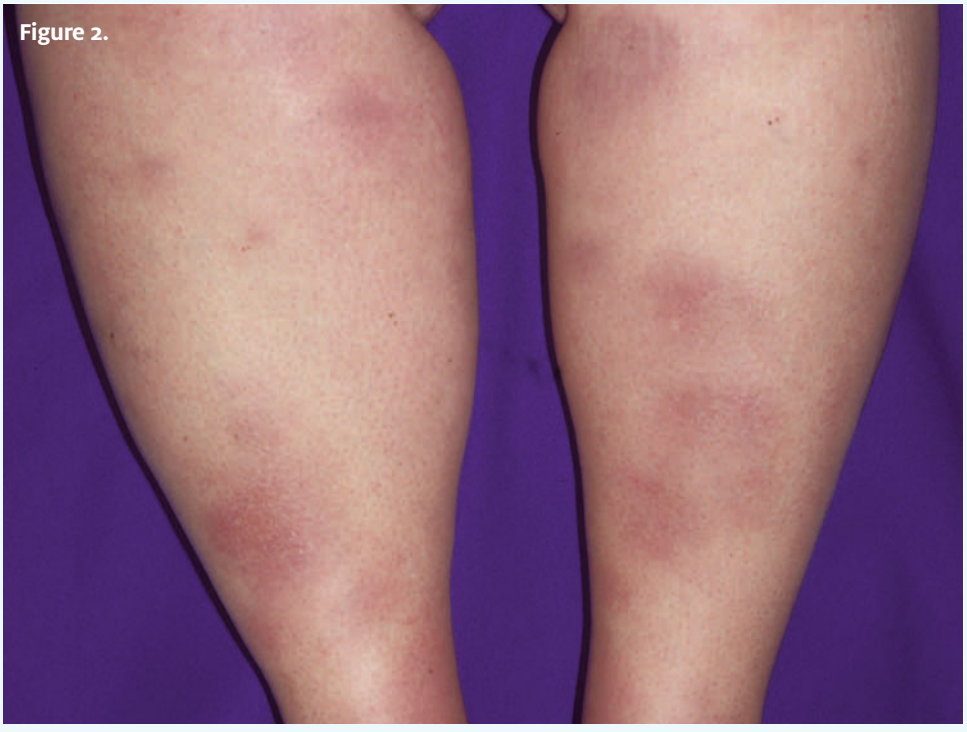


Figure 2.

Differential Diagnosis

- Cellulitis
- Erysipelas
- Erythema multiforme
- Erythema nodosum

Diagnosis

This patient was diagnosed with erythema nodosum (EN), the most common type of inflammatory panniculitis (inflammation of the fat). This is an inflammatory process, typically symmetrical, and located on the pretibial region. It represents a form of hypersensitivity reaction precipitated by infection, pregnancy, medications, connective tissue disease, or malignancy; often, however, a trigger is never found.

Learnings/What to Look for

- Eruptions typically persist for 3-6 weeks and spontaneously regress without scarring or atrophy
- Recurrences are sometimes seen, especially with reoccurrence of the precipitating factors
- Arthralgias are reported by a majority of patients, regardless of the etiology of EN
- Upper respiratory tract infection or flu-like symptoms may precede or accompany the development of the eruption
- EN can occur at any age, but most cases occur between the ages of 20 and 45, particularly in women

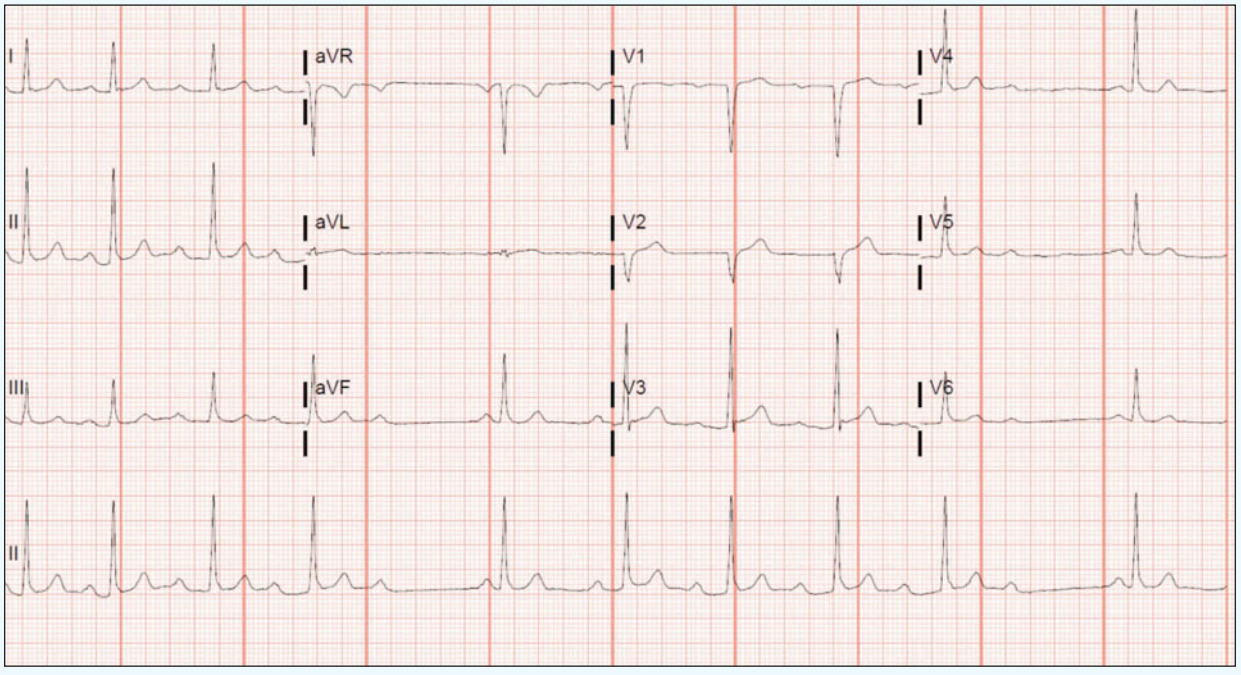
Pearls for Urgent Care Management and Indications for Transfer

- EN is self-limited, though antibiotics may be indicated to treat underlying infection
- If the nodules are painful, nonsteroidal anti-inflammatory medications may also be helpful

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

CLINICAL CHALLENGE: CASE 3

A 46-Year-Old Man with 'Burning' Epigastric Pain of Several Hours Duration



Case

The patient is a 46-year-old male who presents with epigastric pain that started several hours ago after a large meal. He describes the pain as a "burning" sensation. His personal medical history is notable for seizures.

View the ECG and consider what your diagnosis and next steps would be.

(Case presented by Benjamin Cooper, MD, FACEP, The University of Texas Health Science Center at Houston.)

THE RESOLUTION

Figure 1.

Conduction defects above the pink line are typically the result of delayed or intermittent conduction through the atrioventricular node; those below the pink line are the result of conduction disease below the atrioventricular node and carry a worse prognosis. (SA, sinoatrial node; AV, atrioventricular node; BoH, bundle of His; LB, left bundle; RB, right bundle; HB, heart block; CHB, complete heart block)

Differential Diagnosis

- First-degree atrioventricular block
- Left bundle branch block
- Normal sinus rhythm
- Second-degree atrioventricular block, Mobitz type I (Wenckebach)
- Second-degree atrioventricular block, Mobitz type II

Diagnosis

The ECG reveals a second-degree atrioventricular block, Mobitz type I (Wenckebach).

ECG Analysis

This ECG shows a ventricular rate of 60 BPM, but careful examination reveals an atrial rate of 72 BPM. The presence of more p waves than QRS complexes should prompt consideration of an atrioventricular block. In this case, p waves precede most QRS complexes, but the PR interval progressively prolongs until a QRS complex is "dropped."

Atrioventricular conduction block refers to a set of disturbances in which conduction from the atria to the ventricles is delayed, intermittently blocked, or completely blocked—classified as first-degree, second-degree, or third-degree block, respectively.[1] Identifying the type of block has important prognostic implications (**Figure 1**).

First-degree atrioventricular block

First-degree atrioventricular block is represented by prolongation of the atrioventricular conduction time (PR interval) beyond 0.2 s, while every atrial impulse is conducted to the ventricle. First-degree block usually suggests delayed conduction through the atrioventricular node, and is generally considered to be a benign phenomenon when not associated with other conduction deficits (ie, right bundle branch block with a concomitant left anterior or posterior fascicular block, a so-called "bifascicular block").[1,2]

Third-degree atrioventricular block

Third-degree atrioventricular block occurs when there is complete atrioventricular dissociation (ie, failure of conduction between the atria and the ventricles). In third-degree block, the level of escape rhythm determines not only the heart rate, but also the reliability of the rhythm. For example, when the atrioventricular node is diseased and fails to conduct, a junctional escape rhythm (at the level of the bundle of His) emerges, usually producing a more reliable rate between 40 and 60 BPM. However, when infra-Hisian conduction disease exists (ie, below the bundle of His), the escape rhythms are ventricular in origin and tend to be slower and less reliable.[3] Patients with third-degree block should be immediately referred to an emergency department.

Second-degree atrioventricular block, Mobitz type I

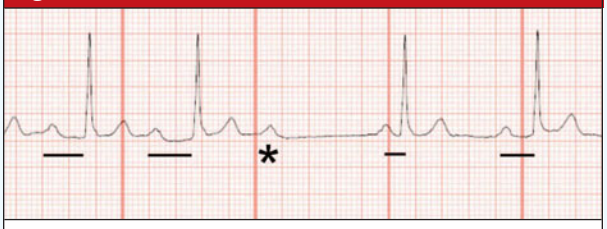
Second-degree atrioventricular block occurs when there is intermittent atrioventricular conduction and can represent conduction deficits at the level of the atrioventricular node or at the infra-Hisian level. Electrocardiographically, it is characterized by a progressively prolonging PR interval until conduction from the atria to the ventricle fails (**Figure 2**). Second-degree Mobitz type I blocks are often asymptomatic and seen in active, healthy patients without heart disease—and usually represents disease within the atrioventricular node itself, which is unlikely to progress to complete heart block.[3] Immediate referral to an emergency department is not necessary in patients with second-degree Mobitz type I block not accompanied by bundle branch block or symptoms to suggest bradycardia (eg, syncope or presyncopal lightheadedness). However, Mobitz type I block can in-

Figure 2.

Dashes represent the progressively prolonging PR interval until a ventricular beat is "dropped" (asterisk), characteristic of second degree atrioventricular block, Mobitz type I.

THE RESOLUTION

Figure 3.



Second-degree atrioventricular block, Mobitz type II. Dashes represent a constant PR interval; a ventricular beat is "dropped" (asterisk), characteristic Image adapted with permission from ddxof.com.

dicate infra-Hisian conduction disease when accompanied by preexisting conduction disease (eg, right bundle branch block, left bundle branch block, or bifascicular block). Immediate referral to an ED is warranted when patients present with symptoms suggesting intermittent bradycardia.

Second-degree atrioventricular block, Mobitz type II

Second-degree atrioventricular block, Mobitz type II almost always occurs when there is infra-Hisian conduction disease and is characterized electrocardiographically by a constant PR interval with dropped beats (**Figure 3**). Patients with this rhythm should be immediately referred to the ED for consideration of a permanent pacemaker, since this conduction deficit is likely to progress to complete heart block.[3]

Learnings/What to Look for:

- The presence of more p waves than QRS complexes should prompt consideration of an atrioventricular block
- The recognition between Mobitz I and II is important, as there are prognostic implications
- First-degree atrioventricular block and second-degree Mobitz type I block generally represent delayed conduction through the atrioventricular node and are not likely to progress to complete heart block
- Second-degree Mobitz type II block and third-degree block (ie, complete heart block) represent infra-Hisian conduction disease and warrant emergent consideration

Pearls for initial management and considerations for transfer:

- Patients with atrioventricular blocks thought to represent infra-Hisian disease should be immediately referred to an ED
- Patients with atrioventricular blocks thought to represent atrioventricular nodal conduction delay do not need immediate referral to an ED
- In patients with unstable bradycardia secondary to atrioventricular block, consider transcutaneous pacing and immediate referral to the emergency department

References

1. Costa D Da, Brady WJ, Edhouse J. Bradycardias and atrioventricular conduction block. *Br Med J*. 2002;324(March):535-538.
2. de Pádua F, Pereirinha A, Marques N, et al. In: Macfarlane PW, van Oosterom A, Pahlm O, Kligfield P, et al, eds. *Comprehensive Electrocardiology*. London: Springer London; 2010:547-604.
3. Kusumoto FM, Schoenfeld MH, Barrett C, et al. 2018 ACC/AHA/HRS Guideline on the Evaluation and Management of Patients With Bradycardia and Cardiac Conduction Delay: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm. *Circulation*. 2019;140(8):e382-e482.