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 16-Year-Old Boy with Arm Pain After a Baseball Game

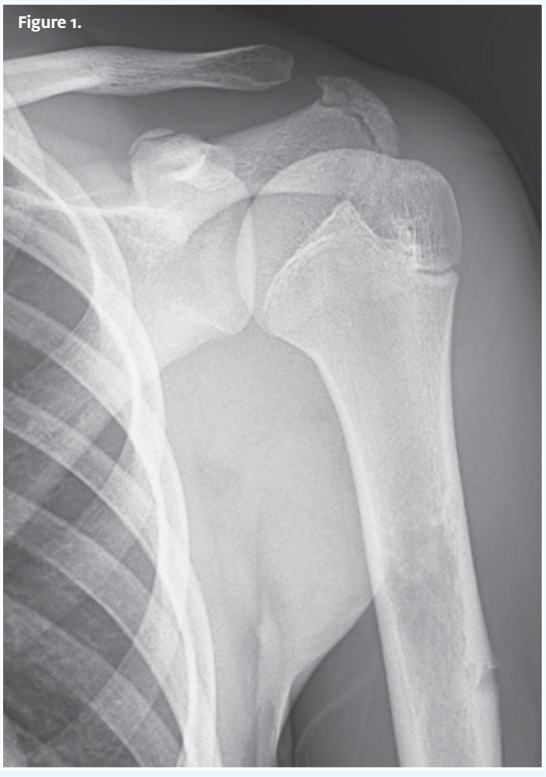
Figure 1.

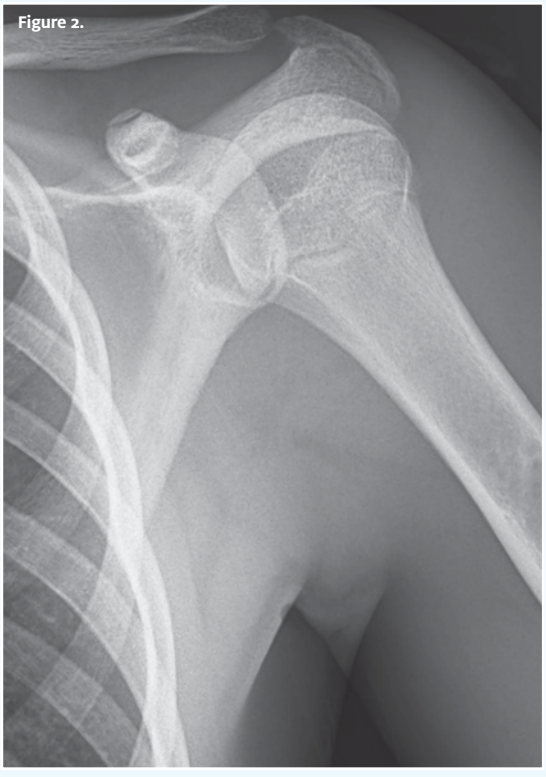
Figure 2.

Case

The patient is a 16-year-old male who presents to urgent care with pain in the humerus area hours after finishing a baseball game.

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

THE RESOLUTION

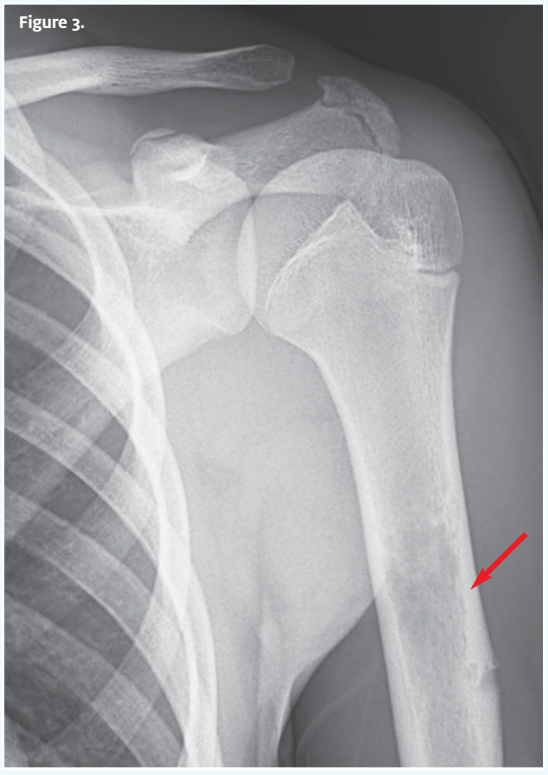
Figure 3.

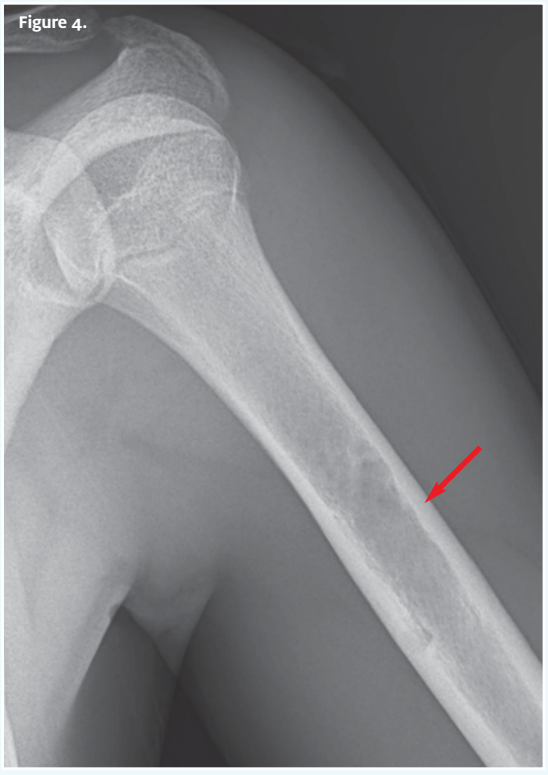
Figure 4.

Differential Diagnosis

- Fibrous dysplasia
- Enchondroma
- Lytic diaphyseal lesion
- Osteomyelitis

Diagnosis

The x-ray reveals an area of mottled lucency mid-diaphysis with endosteal scalloping and cortical breakthrough of the lateral humeral margin. This area corresponded to the site of the patient's pain. Ill-defined margins were noted (wide zone of transition).

This patient was diagnosed with lytic diaphyseal lesion of the humerus with some aggressive features.

Learnings/What to Look for

- Bony lesions such as osteochondromas and bone cysts can be lead-points for pathologic fractures or injury
- X-ray is often sufficient to differentiate different bony lesions, but sometimes further imaging studies are required. On a simple radiograph, an ill-defined border with a broad zone of transition is a sign of aggressive growth that is suggestive of either osteomyelitis, eosinophilic granuloma, or a malignant bone tumor

Pearls for Urgent Care Management

- The acute management for pain/injury to bony lesions is similar to fracture management of the same sites, in this case requiring immobilization with a sling similar to a proximal humerus fracture
- It's critical for the urgent care provider to refer these cases for further evaluation to differentiate a benign lesion from either an infection or malignancy that requires acute management. If the patient is having systemic features (eg, fever, weight loss, etc.), they should be referred immediately to the ED. Without systemic features, the patient can follow-up with an orthopedic specialist as an outpatient.

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

CLINICAL CHALLENGE: CASE 2

A 43-Year-Old with a New Rash on the Trunk

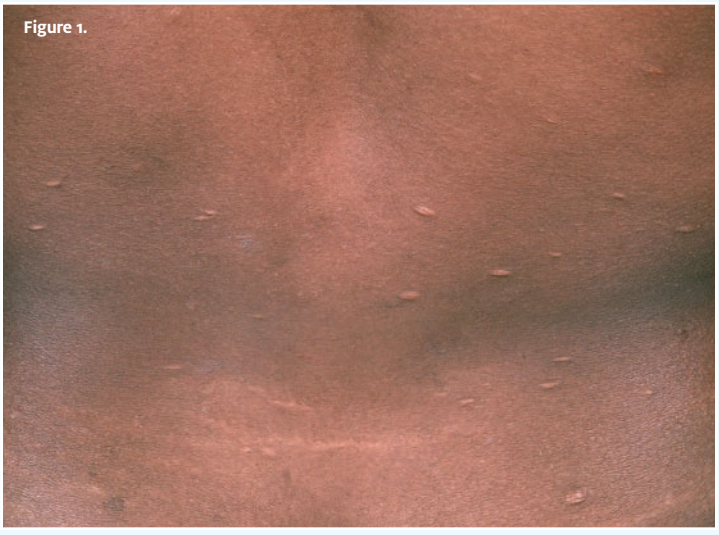
Figure 1.

Case

A 43-year-old man presents to urgent care with a rash that he noticed a couple of days ago on his trunk. On exam, there is skin atrophy and multiple smooth papules and hypopigmented oval macules. Upon palpation of the lesions, you find that the examining finger "sinks" into a pit with distinct edges, like the ring of a hernia.

The patient is immunocompetent, and his medical history is unremarkable except for lichen planus. He appears well, denies systemic symptoms, and does not take any medications.

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

THE RESOLUTION

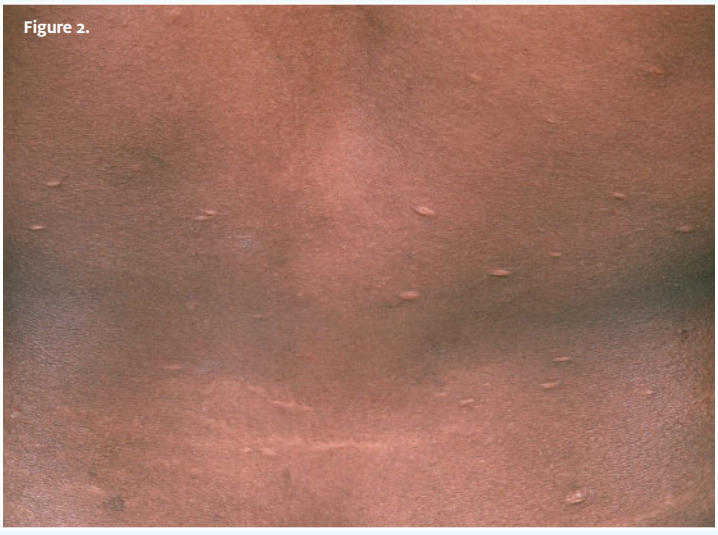
Figure 2.

Differential Diagnosis

- Atrophoderma
- Lichen sclerosus
- Anetoderma
- Steatocystoma multiplex

Diagnosis

This patient was diagnosed with anetoderma, a disorder of focal loss of dermal elastic tissue characterized by small areas of flaccid skin. These present clinically as skin-colored wrinkled macules or patches that may or may not form bulging sac-like protrusions.

Anetoderma may be primary or secondary. Primary anetoderma occurs in normal skin whereas secondary occurs in areas of previous skin eruptions. The condition is benign, and the pathogenesis is not well understood. It is most common in adults in their 20s to 40s and is slightly more prevalent in women. Rarely, it is seen in children.

Learnings/What to Look for

- Primary anetoderma is associated with various autoimmune diseases and infectious diseases, and may be associated with cardiac, ocular, bony, and other abnormalities
- The lesions of secondary anetoderma are identical to those of primary anetoderma but appear at the same sites as a preceding dermatosis
- A multitude of conditions are associated with the development of secondary anetoderma. Some common examples include varicella, folliculitis, acne vulgaris and lichen planus

Pearls for Urgent Care Management

- There is no effective treatment for anetoderma; patient reassurance is recommended
- Treatment of the underlying cause of secondary anetoderma can help prevent new lesions from forming

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

INSIGHTS IN IMAGES

CLINICAL CHALLENGE: CASE 3

A 45-Year-Old Male with Palpitations

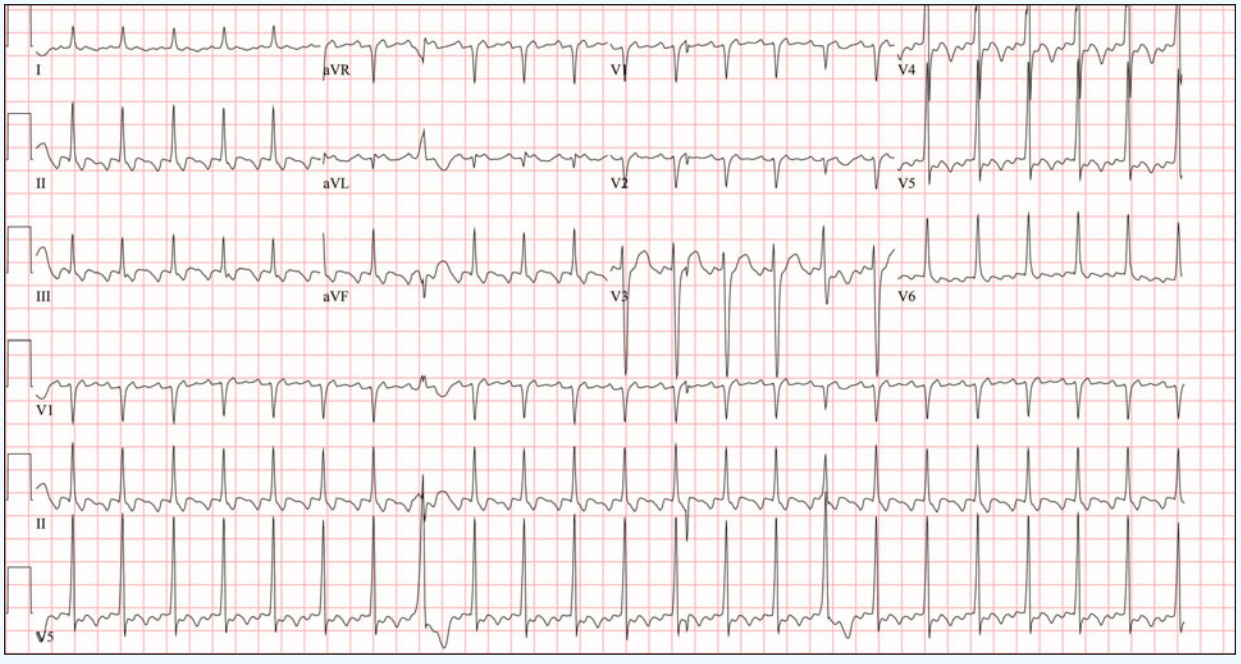

Figure 1. Initial ECG

The patient is a 45-year-old male who presents with palpitations for the past 30 minutes. He denies chest pain, dizziness, or syncope. His vital signs are normal aside from tachycardia and he appears to be in no acute distress.

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

(Case presented by Tom Fadial, MD, McGovern Medical School at UTHealth Houston Department of Emergency Medicine.)

THE RESOLUTION

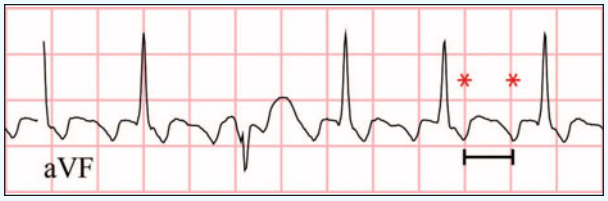

Figure 2. Asterisks mark P waves with an atrial rate of approximately 300 bpm. Note the characteristic "sawtooth" pattern.

Differential Diagnosis

- Sinus tachycardia
- AV nodal reentrant tachycardia (AVNRT)
- AV reentrant tachycardia (AVRT)
- Atrial tachycardia
- Atrial flutter with fixed conduction block

Diagnosis

This patient was diagnosed with atrial flutter, 2:1 conduction. The ECG illustrates a regular, narrow-complex tachycardia at a rate of 150 bpm. There are P waves preceding every QRS complex, most clearly identified in the anterior precordial leads (V1-V3). The intervals are normal and there are no obvious signs of ischemia. There are occasional premature ventricular contractions.

Following identification of a narrow-complex tachycardia and a determination of clinical stability (absence of hypotension or signs/symptoms suggestive of poor perfusion), a detailed evaluation of the ECG can narrow the differential.

First, a regular rhythm as seen in our patient can quickly exclude atrial fibrillation, multifocal atrial tachycardia, and atrial flutter with variable conduction block.

Next, proceed with a careful inspection for the presence of P waves and, if identified, the atrial rate. Accelerated atrial rates (>250 bpm) are associated with atrial flutter or atrial tachycardia. For our patient, we noted initially that P waves were visible preceding every QRS complex in V1-V3; however, there is an atypical appearance to P waves in the limb leads (specifically II, III and aVF) where the expected isoelectric baseline is replaced by identical-appearing "sawtooth" waves (**Figure 2**). These atrial flutter waves occur at a rate of approximately 300 bpm, complemented by a ventricular rate of 150 bpm, suggesting 2:1 AV conduction.

The morphology of the P wave can offer additional information regarding the origin of tachycardia. P waves suspected to arise from the sinus node are suggested by sharing a similar morphology to a historical ECG in sinus rhythm when available, or having a normal axis (upright in lateral, inferior leads, inverted in aVR). In these cases, sinus tachycardia (appropriate or otherwise), atrial tachycardia, or sinoatrial nodal reentrant tachycardia (SANRT) should be suspected.

The same evaluation of P wave morphology may identify retrograde P waves, where atrial activity originates at the AV node and proceeds backwards (inferior-to-superior), producing inverted P waves in inferior leads. Narrow-complex tachycardias originating at the AV node (producing retrograde P waves) include AVRT and AVNRT.

If P waves are difficult to identify, vagal maneuvers (eg, Valsalva, carotid sinus massage) or adenosine administration and resultant slowing of SA nodal activity and delayed AV nodal conduction may help unmask atrial activity, terminate the arrhythmia, or otherwise offer diagnostic clarity (eg, temporary slowing of sinus tachycardia).

Learnings/What to Look for

- For stable patients with narrow complex tachycardia, begin by determining if the rhythm is regular or irregular. The latter suggests atrial fibrillation, multifocal atrial tachycardia, or atrial flutter with variable conduction block
- When P waves are identifiable:
  - Atrial rates greater than 250 bpm suggest atrial flutter or atrial tachycardia
  - Look for retrograde P waves; these indicate AVRT or AVNRT
- If P waves are not identifiable, vagal maneuvers or adenosine can aid with diagnosis or terminate certain tachyarrhythmias

Pearls for Initial Management and Considerations for Transfer

- Assess for stability; hypotension or signs/symptoms suggestive of poor perfusion (eg, altered mental status, dyspnea, chest pain) require stabilization and transfer

Resources

- Link MS. Clinical practice. Evaluation and initial treatment of supraventricular tachycardia. *N Engl J Med.* 2012;367(15):1438-1448.
- Shah RL, Badhwar N. Approach to narrow complex tachycardia: non-invasive guide to interpretation and management. *Heart.* 2020;106(10):772-783.
- Kumar R, Gupta A, Isser HS. Narrow complex tachycardias-therapeutic and diagnostic role of adenosine. *JAMA Intern Med.* 2022;182(4):436-437.

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

ECG STAMPEDE