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 71-Year-Old Woman with Femur Pain After a Fall

Figure 1.

Case

The patient is a 71-year-old female who presents with proximal femur pain after losing her balance and sustaining a "soft" fall onto a carpeted surface.

She has a past history of hypertension, hypercholesterolemia, and osteoporosis. She takes a statin, an ACE inhibitor, and a bisphosphonate.

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

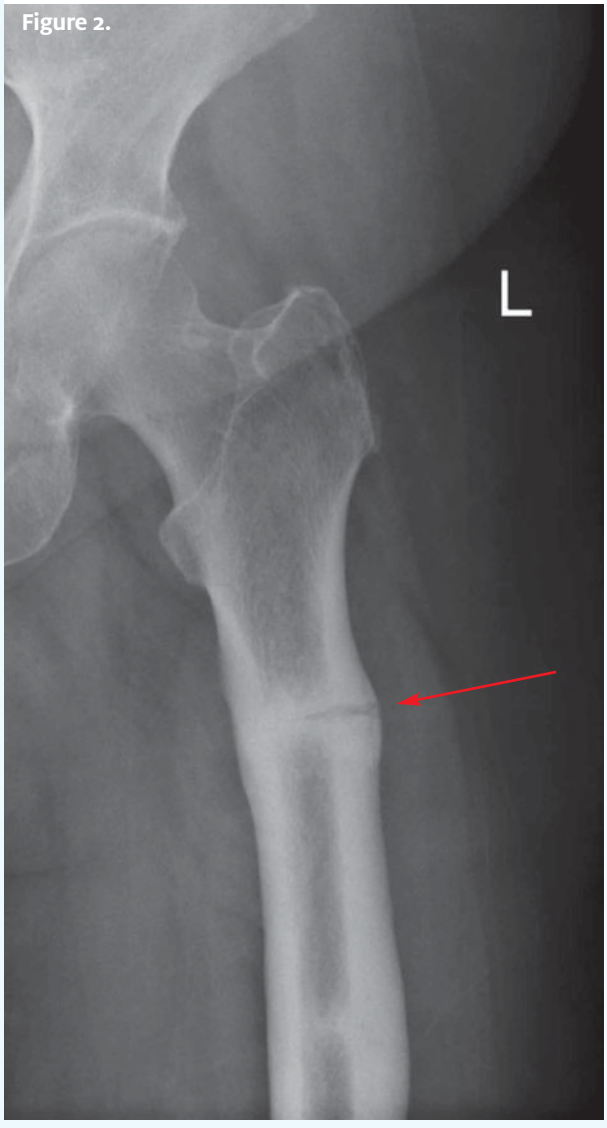


Figure 2.

Differential Diagnosis

- Hip dislocation
- Ipsilateral femoral neck fracture
- Osteoid osteoma
- Proximal femoral insufficiency fracture

Diagnosis

The AP view shown reveals transverse incomplete lucency of the vocally thickened lateral cortex of the proximal femoral diaphysis. This patient experienced a proximal femoral insufficiency fracture related to bisphosphonate therapy.

Bisphosphonates are used for osteoporosis therapy and act by inhibiting bone resorption by suppressing osteoclasts. Although this results in increased bone mineral density, it also decreases bone turnover and prevents remodeling and healing of cracks that occur in bone as a result of normal activity.

Learnings/What to Look for

- A transverse fracture of the proximal femur (distal to lesser trochanter) with associated localized thickening of the lateral cortex due to "minimal trauma" in a postmenopausal woman receiving long-term bisphosphonate therapy should be considered diagnostic for a bisphosphonate-therapy related insufficiency fracture
- Stress fractures occur in young military recruits and athletes and involve the medial cortex of the proximal femur
- Bland osteoporotic insufficiency femoral fractures are typically more proximal (ie, femoral neck)

Pearls for Urgent Care Management and Considerations for Transfer

- In older patients, femoral neck fractures may be treated with percutaneous pinning, a sliding hip screw, or arthroplasty
- Crutch-assisted weightbearing will be necessary pending further evaluation by an orthopedist

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

CLINICAL CHALLENGE: CASE 2

A 13-Year-Old Girl with Scaling and Fissures on Her Lips

Figure 1.

Case

The patient is a 13-year-old girl who presents to a pediatric urgent care clinic with 1 month of scaling and fissures on her lips which began after she started using a retinoid cream prescribed for acne.

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

- Contact dermatitis
- Cheilitis
- Acne vulgaris
- Urticaria

Diagnosis

The patient has cheilitis, which appears as dry, scaly patches on the lips. There may also be edema and erythema. Many cases represent a factitial disorder related to lip-licking habits, and it can be difficult to convince patients that the vermilion zone of the lip should be dry (the "wet line" is the demarcation between the labial mucosa and vermilion zone).

Learnings/What to Look for

- Cheilitis may be related to contact hypersensitivity reactions to compounds found in products that commonly come into contact with the vermilion zone of the lip, including cosmetics, lip balms, toothpastes, and sunscreens (oxybenzone [benzophenone-3]). Other causative factors include:
  - Candidal infection related to chronic lip-licking or to the use of petrolatum-based materials that are applied to the lips. (The petrolatum seals in moisture, allowing the candidal organism to thrive in the moist keratin that results)
  - Retinoids (isotretinoin and acitretin)
  - High doses of vitamin A, lithium, chemotherapeutic agents (busulfan and actinomycin), d-penicillamine, isoniazid, and phenothiazine

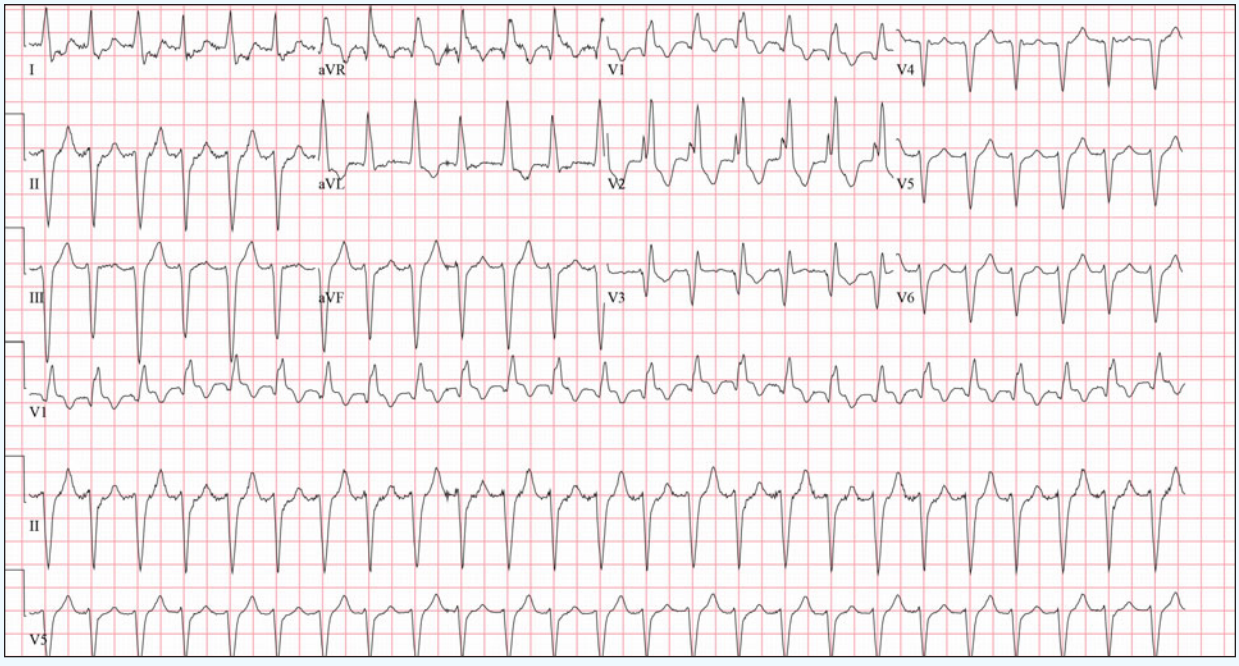
Pearls for Urgent Care Management and Considerations for Transfer

- Treatment of infection with clotrimazole troches, miconazole mucoadhesive tablets, or nystatin swish and swallow
- Counsel the patient to resist licking their lips
- Consider use of lip moisturizers and emollients

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

CLINICAL CHALLENGE: CASE 3

A 96-Year-Old Male with Palpitations and a History of CAD



Case

The patient is a 96-year-old man who is brought to your urgent care center by his daughter, with whom he lives. She reports that he has been feeling light-headed for "a few days." The patient confirms this, adding that he has felt his heart "fluttering," as well. He denies chest pain and shortness of breath, but acknowledges a history of coronary artery disease.

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

(Case presented by Benjamin Cooper, MD, FACEP, McGovern Medical School Department of Emergency Medicine. Dr. Cooper is also lead author of ECG Stampede: A Case-Based Curriculum in Electrocardiography Triage, available on Amazon.)

THE RESOLUTION

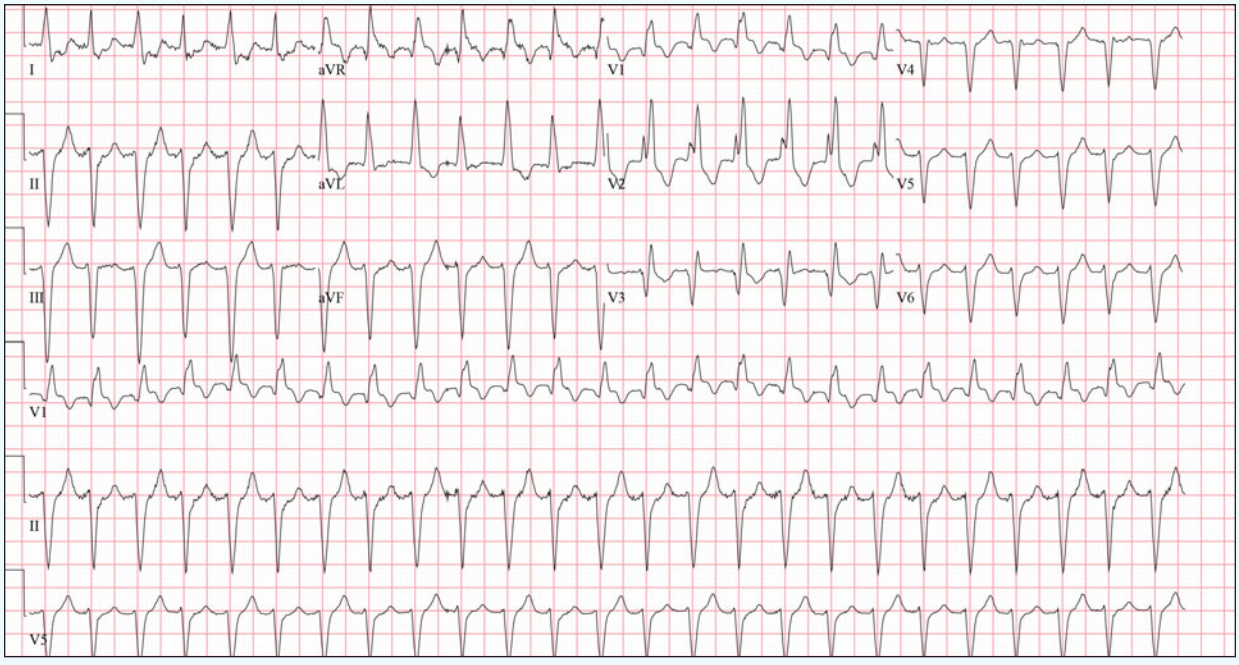


Figure 2. Baseline ECG demonstrating bifascicular block (right bundle branch block and left anterior fascicular block).

Differential Diagnosis

- Ventricular tachycardia
- Supraventricular tachycardia with aberrancy
- Atrioventricular reentrant tachycardia
- Sodium channel toxicity
- Hyperkalemia

Diagnosis

This patient was diagnosed with supraventricular tachycardia with aberrancy. The ECG reveals wide complex tachycardia (WCT) with ventricular rate 150 beats/minute.

The QRS duration is prolonged, measuring >120 ms. The QRS complex has a right bundle branch block (RBBB) pattern with an "M"-shaped QRS complex in the anterior precordial leads (V_1-V_3) and a slow, slurred S-wave in the lateral leads (I, aVL, V_6). Additionally, there is an extreme left axis deviation (>45° of leftward deviation), suggesting left anterior fascicular block (ie, bifascicular block).

This rhythm is either arising from a supraventricular focus (ie, atrioventricular node or higher) with aberrancy (ie, bundle branch block) or is ventricular in origin (ie, ventricular tachycardia).

Ventricular tachycardia (VT) is the most life-threatening WCT and should be the presumed diagnosis unless there is a very compelling reason to suggest otherwise. Up to 80% of all WCT is VT,[1] and the diagnosis is even more likely in an elderly patient with known coronary artery disease (as with this case).

There are established algorithms to help differentiate supraventricular tachycardia (SVT) with aberrancy versus VT. SVT includes atrial flutter (2:1 conduction is a strong consideration in a patient with a heart rate of 150 beats/min like this one), atrial tachycardia, and atrioventricular nodal reentrant tachycardia.

When a patient has underlying conduction disease (ie, bundle branch block) at baseline, supraventricular tachycardia will have the appearance of WCT. The most cited algorithm to help differentiate SVT with aberrancy from VT is the Brugada algorithm.[2] It involves a series of four criteria; VT is diagnosed when any single criterion is met. The criteria include:

1. Absence of an rS complex across the precordium
2. Beginning of the R to the nadir of the S wave greater than 100 msec
3. Signs of atrioventricular dissociation (ie, fusion complexes or capture beats)
4. Absence of typical bundle branch morphology

It should be noted than none of the established criteria perform well in the acute setting.[1,3,4] Therefore, it is safest to treat WCT as VT because the consequences of treating WCT as SVT could be devastating if the diagnosis is incorrect. Atrioventricular nodal blocking agents like beta blockers or non-dihydropyridine calcium channel blockers could result in cardiac decompensation in patients with ventricular tachycardia.

THE RESOLUTION

Cardioversion is the preferred management. Synchronized electrical cardioversion is safest, although pharmacologic cardioversion can be attempted. Procainamide 10 mg/kg over 20 minute is likely to be the most effective for VT,[5] but other pharmacologic options exist. Adenosine is a short-acting atrioventricular nodal-blocking agent that can be attempted and may be both diagnostic and therapeutic. If the patient converts with adenosine (6 mg intravenously followed by 12 mg if ineffective), the diagnosis is likely to be SVT with aberrancy, although adenosine-sensitive VT does exist.[6]

While this patient was ultimately diagnosed with SVT with aberrancy, the presumed diagnosis should be VT in the acute setting for the aforementioned reasons. This patient spontaneously converted out of the rhythm and into sinus rhythm with underlying bifascicular block (Figure 2). When the QRS morphology in the WCT exactly matches that of their baseline ECG (assuming one is available), SVT with aberrancy can be more reliably diagnosed (as with this case).

Sodium channel toxicity can cause WCT, although there was no history of ingestion with this case. Sodium channel-blocking toxicity was initially described in tricyclic overdoses,[7] but other sodium channel-blocking agents include antiarrhythmics (lidocaine, phenytoin, propafenone, flecainide, amiodarone, sotalol), antiepileptic medications (carbamazepine, lamotrigine), selective serotonin reuptake inhibitors (citalopram, fluoxetine), antihistamines (diphenhydramine), propranolol, cyclobenzaprine, and others.[8] Hyperkalemia can also cause WCT, but this was not the case here. Atrioventricular reentrant tachycardia, when conducted in an antidromic fashion, is a cause of WCT. It is a phenomenon that can happen in patients with ventricular pre-excitation (ie, the Wolf-Parkinson-White syndrome)[9] and was not the case here.

Learnings/What to Look for

- WCT is VT up to 80% of the time
- Algorithms for differentiating VT from SVT with aberrancy exist, but none are reliable in the acute setting
- Consider all WCT to be VT unless a compelling alternative exists

Pearls for Urgent Care Management and Considerations for Transfer

- The safest approach to management of WCT is electrical synchronized cardioversion
- If the patient is unstable, cardioversion should be pursued immediately
- If stable, patients with WCT should be immediately transferred to the nearest emergency department with defibrillation pads in place

References

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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