CLINICAL IMAGE CHALLENGE
X-RAY

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

24-Year-Old Male With Hand Pain After a Golf Game

A 24-year-old male patient presents to urgent care with right wrist pain that started while playing golf 2 days ago. The patient recalls swinging the club and hitting the ground rather than the ball, after which he felt a sharp pain in his hand which has been constant since the incident. He has not tried any treatments at home.

The provider notes increased pain when the patient flexes his hand, along with a weakened grip compared to the left side. Tenderness is noted to the hypothenar eminence of the palm. Allen's test is negative; sensation is normal to fingertips. There is slightly decreased strength with flexion and extension to ring and little fingers.

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

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

Differential Diagnosis

- Hamate fracture
- Fractures and/or dislocations of other carpal bones
- Distal radial fracture
- Metacarpal fracture
- Wrist sprain
- Hypothenar hammer syndrome

Diagnosis

The correct diagnosis is a hamate fracture, which is the third most common type of hand fracture. Among these, fractures of the hook of the hamate are more frequent than those involving the body of the bone. This injury often occurs either from a fall onto an outstretched hand or during sports activities when the end of a club, racquet, or bat is driven into the palm, applying direct pressure to the hypothenar eminence. It can affect either the dominant or non-dominant hand. Chronic, high-tension gripping may also contribute to the development of this fracture.

What to Look For

- High suspicion in athletes using bats, clubs, or racquets.
- Symptoms include ulnar-sided wrist pain, pain with gripping, and decreased grip strength.
- On examination, pain and tenderness is either localized over the hypothenar eminence or diffusely over the volar surface of the wrist and hand; swelling may be minimal or absent.
- On x-ray imaging, you may see subtle hypodensity and cortical indistinctness of the hamate bone, but plain films have poor sensitivity and specificity for hamate fracture.

Pearls for Urgent Care Management

- Often misdiagnosed as a soft tissue injury given sometimes subtle findings on presentation.
- If high clinical suspicion and indeterminate imaging, send for a computed tomography scan of the wrist for definitive diagnosis.
- Immobilize in short arm volar splint and provide basic fracture care including rest, ice, elevation, and analgesia.
- Avoid overuse or weight-bearing on hand.
- Refer to orthopedic hand specialist. Hook of the hamate fractures may require surgical excision if non-union develops.
- Provide anticipatory guidance about ulnar nerve irritation which may feel like numbness in 4th/5th digits.

75-Year-Old Male With Facial Lesion

A 75-year-old male presents to the walk-in clinic with the chief complaint of an asymptomatic rash on the left temple of his face that developed over the past 2 months. On examination, a shiny deep red papule is visible with scaly macules (actinic keratoses) surrounding. The patient is on rituximab for chronic lymphocytic leukemia (CLL).

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).

THE RESOLUTION

Differential Diagnosis

- Atypical fibroxanthoma
- Merkel cell carcinoma
- Pyogenic granuloma
- Keratoacanthoma
- Amelonatic melanoma
- Squamous cell carcinoma
- Microcystic adnexal carcinoma
- Nodular basal cell carcinoma

Diagnosis

This patient is diagnosed with Merkel cell carcinoma (MCC), also known as cutaneous neuroendocrine carcinoma. MCC is a rare aggressive skin malignancy that typically appears on the face, head or neck of adults between the age of 75-80 years. MCC most commonly arises in fair-skinned males and often appears on the head and face, upper extremities, and torso. Lower extremity presentation is more common for darker skinned individuals with erythema appearing more subtle. Key risk factors include older age, ultraviolet light exposure, immunosuppression, concurrent hematologic malignancy and infection with the Merkel cell polyomavirus (MCPyV). Even with aggressive treatment, reoccurrence probability is high with metastases common. The 5-year relative survival is approximately 60% in the United States.

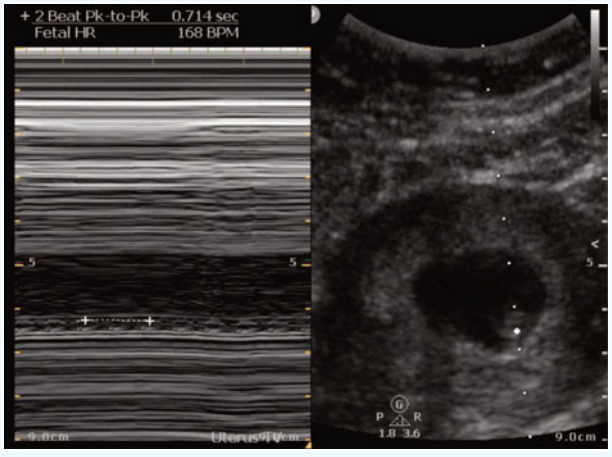
What to Look For

- Presents as an asymptomatic, flesh-colored or bluish-red, firm, non-tender, shiny, solitary, rapidly growing nodule, usually between 0.5-5.0 cm in size. Ulceration and crusting are relatively infrequent.
- Neurologic symptoms such as ataxia, weakness, and confusion may be present.

Pearls for Urgent Care Management

- MCC is often misdiagnosed as a benign skin lesion, therefore a high clinical suspicion is required to diagnose it in its early stages.
- Remember AEIOU when considering history and exam findings: Asymptomatic/lack of tenderness, Expanding rapidly (doubling in <3 months), Immunosuppression, Older than 50 years, Ultraviolet exposed skin site.
- Prompt biopsy is indicated for definitive diagnosis; either narrow-margin punch biopsy in clinic or urgent referral to dermatology is appropriate.

28-Year-Old With Abdominal Pain



A 28-year-old female presents to urgent care with mild left lower quadrant (LLQ) abdominal pain that began earlier in the day. The discomfort is dull, intermittent, and non-radiating. She denies vaginal bleeding, fever, nausea, vomiting, or urinary symptoms. Her last menstrual period was approximately 2 months ago, although she reports a history of irregular cycles.

She appears well and is hemodynamically stable. An abdominal exam reveals mild LLQ tenderness without rebound or guarding. A pelvic exam shows no discharge, bleeding, adnexal tenderness, or cervical motion tenderness. No masses are appreciated. A urine pregnancy test performed in the clinic returns positive. Given concern for ectopic pregnancy, a transabdominal point-of-care ultrasound (POCUS) is performed.

View the POCUS images above and consider the likely diagnosis and next steps. The resolution of the case is described on the following page.

Case provided by Tatiana Havryliuk, MD, emergency physician in New York, New York, and founder of Hello Sono.

Differential Diagnosis

- Normal early intrauterine pregnancy
- Ectopic pregnancy
- Heterotopic pregnancy
- Gastrointestinal causes (eg, constipation, diverticulitis)
- Urinary tract infection
- Ureterolithiasis
- Ovarian cyst or mass

Diagnosis

Transabdominal POCUS revealed an intrauterine gestational sac containing a fetal pole with a crown-rump length (CRL) measurement of 1.61 cm, consistent with an 8 week and 0 day gestation. M-mode (motion mode) imaging confirmed fetal cardiac activity with a fetal heart rate (FHR) of 168 beats per minute (bpm). No adnexal masses or free fluid were seen. The POCUS findings confirmed a live intrauterine pregnancy. Based on this, the provider was able to safely exclude ectopic pregnancy, avoiding an emergency department (ED) referral, and instead provided outpatient obstetrics-and-gynecology follow-up.

Discussion

Abdominal pain in early pregnancy, even if mild and without bleeding, warrants evaluation for ectopic pregnancy. Visualization of an intrauterine pregnancy (IUP) essentially excludes ectopic pregnancy in patients without risk factors for heterotopic pregnancy, which is the simultaneous occurrence of an intrauterine and an ectopic pregnancy.[1,2] IUP is confirmed when the intrauterine gestation sac contains either a yolk sac or a fetal pole.[3] Heterotopic pregnancy, while rare (incidence of 1 in 30,000 spontaneous pregnancies), must be considered in patients with the following characteristics:

- Actively receiving assisted reproductive technologies (ART)
- Prior ectopic pregnancy
- Pelvic inflammatory disease
- Tubal surgery or pathology
- Endometriosis

The incidence increases to 0.9 to 1% in patients undergoing ART.[4] POCUS was critical in confirming an IUP and thus excluding ectopic pregnancy in our patient without any heterotopic pregnancy risk factors.

On transabdominal ultrasound, a yolk sac, the earliest definitive sign of an IUP, is typically visible around 6.5-7 weeks of gestation when the mean gestational sac diameter is at least 20 mm. A fetal pole and cardiac activity usually become visible after 7 weeks on transabdominal ultrasound, and at 6 weeks on transvaginal ultrasound.[4]

In our patient, fetal pole and cardiac activity were both seen, placing the pregnancy at a minimum of 7 weeks of gestation. CRL measurement dated the pregnancy to approximately 8 weeks and 0 days of gestation. FHR of 168 bpm was measured using M-Mode and fell within the normal range for an 8-week gestation.[5] The normal range of fetal heart rate during the first trimester is approximately 110–180 bpm, with the lower end seen at the earliest detection and the upper end peaking around 8–9 weeks of gestation.[5,6] In this case, POCUS was used to confirm an IUP, thus essentially ruling out an ectopic pregnancy and avoiding ED referral.

What to Look For

- Intrauterine gestational sac containing a yolk sac or a fetal pole confirms an IUP.
- Measurement of CRL estimates the gestation age.
- The presence of free fluid in the pelvis or an adnexal mass should raise suspicion for ectopic pregnancy.

Pearls for Urgent Care Management

- Evaluate all reproductive-age women with abdominal pain for pregnancy.
- Patients undergoing fertility treatment are at increased risk for heterotopic pregnancy and should be evaluated with same-day transvaginal ultrasound and referred for gynecologic follow-up if they present with abdominal pain, even when an IUP is identified.
- In well-appearing patients with a confirmed IUP on transabdominal POCUS and no risk factors for heterotopic pregnancy, ED transfer is often unnecessary.

References

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CLINICAL IMAGE CHALLENGE
ECG

60-Year-Old With 2 Weeks of Dyspnea

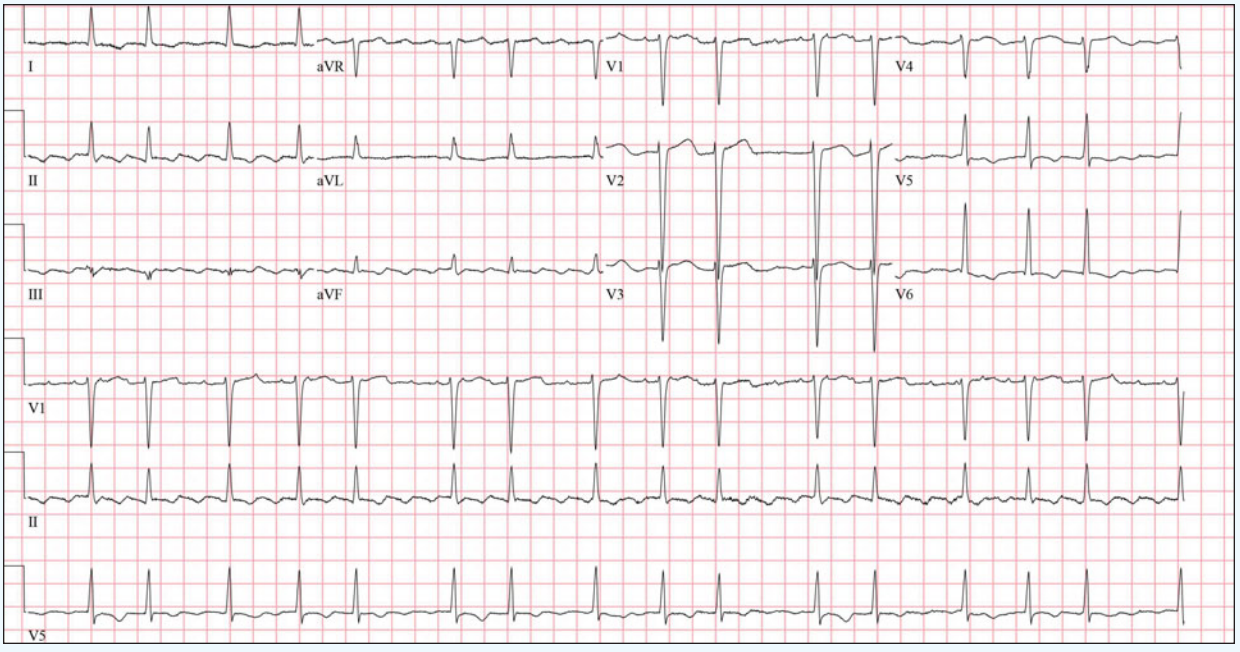

Figure 1: Initial ECG

A 60-year-old male presents to urgent care with progressive dyspnea for 2 weeks associated with lower extremity edema. The patient is afebrile and slightly tachypneic with rales at the bilateral bases. An ECG is obtained.

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 Benjamin Cooper, MD, MEd, FACEP, McGovern Medical School at the University of Texas Health Science Center at Houston

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

ECG STAMPEDE

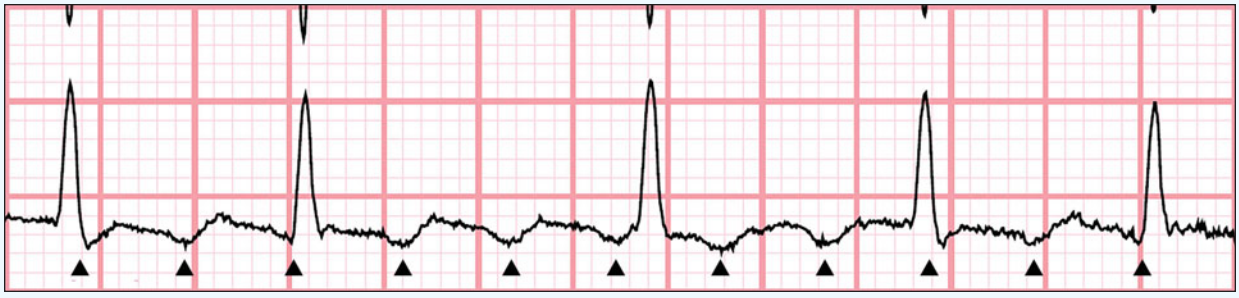

Figure 2: Lead II rhythm strip showing the "sawtooth" appearance of the atrial flutter waves (▲).

Differential Diagnosis

- Atrial fibrillation
- Atrial flutter with 2:1 conduction
- Atrial flutter with variable conduction
- ST-elevation myocardial infarction
- Ventricular pre-excitation

Diagnosis

The diagnosis in this case is atrial flutter with variable conduction. The ECG reveals an irregularly irregular rhythm with atrial flutter waves best seen in lead II and in the lead II rhythm strip. There is variable ventricular conduction with a ventricular rate of 96. There are T-wave inversions in the lateral leads (I, aVL, V5, and V6) that were present on prior ECGs but no signs of significant ST-elevation or ventricular pre-excitation.

Discussion

The differential for an irregularly irregular rhythm includes: atrial fibrillation; atrial flutter with variable conduction; and multifocal atrial tachycardia. Atrial fibrillation lacks organized atrial activity (ie, no P waves), whereas atrial flutter is an organized rhythm that occurs when a re-entrant circuit forms in the right atrium, usually in a counterclockwise fashion, leading to inverted flutter waves in the inferior leads (II, II, and aVF, **[Figure 2]**).[1]

It is characterized by an atrial rate of approximately 300 beats per minute (bpm). In the absence of treatment or atrioventricular block, the most common atrial to ventricular response is 2:1.[1,2] This patient had known atrial flutter and was on carvedilol for blood pressure and rate control.

The presence of atrial flutter itself does not warrant any acute intervention if appropriately rate controlled (heart rate < 110 bpm),[3] but this patient's clinical presentation is concerning for heart failure exacerbation. An emergency department transfer is indicated. Other indications include non-rate controlled or symptomatic atrial flutter. In unstable patients, synchronized cardioversion is indicated.

What to Look For

- "Sawtooth" appearing P waves that tend to be negatively deflected and best seen in the inferior leads.
- The atrial rate tends to approximate 300 bpm.
- 2:1 conduction is the most common type of atrial flutter, and the ventricular rate tends to be around 150 bpm.

Pearls For Initial Management, Considerations For Transfer

- Refer to an emergency department for heart rates > 110 bpm, if symptomatic, or with signs/symptoms of heart failure.
- If able, synchronized cardioversion is indicated when unstable while arranging for emergency referral via ambulance.

References

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