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*.

Young Football Player with Sudden Chest Pain

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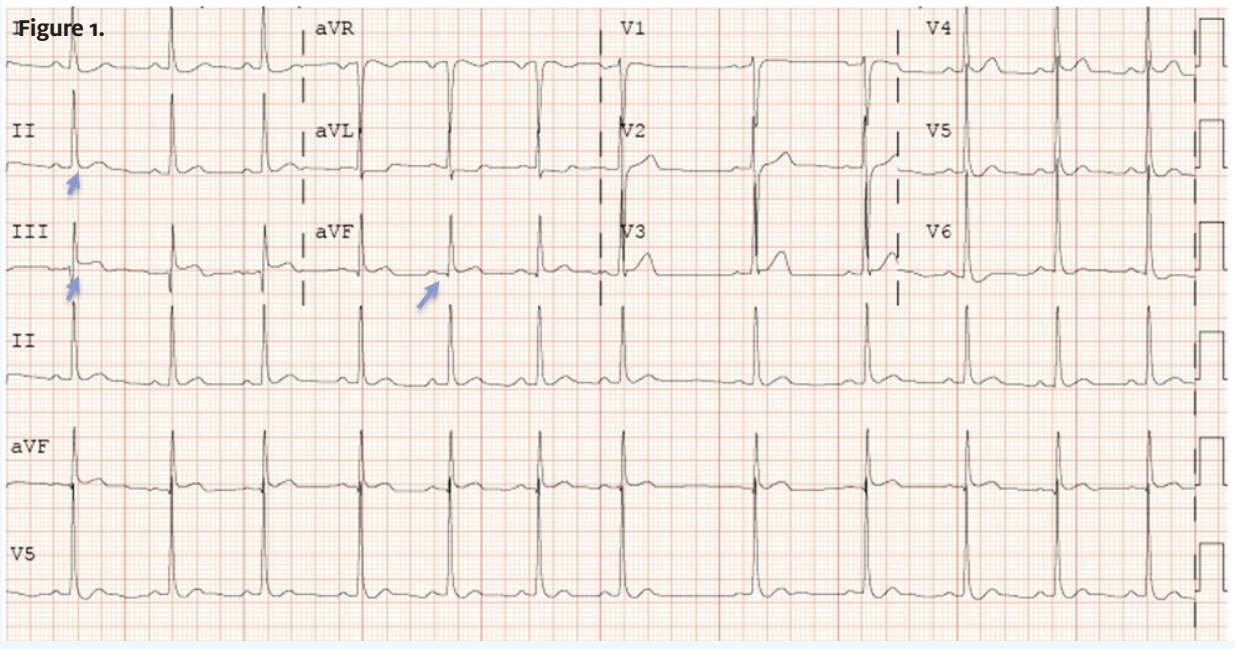

Figure 1.

Case

A 20-year-old previously healthy man presents with sudden onset of substernal chest pressure after completing football practice. His chest pain is nonradiating, nonreproducible, and nonpositional. He does not have associated palpitations, dyspnea, or diaphoresis. He reports that he has not had recent upper respiratory tract infections or contact with ill people. He does not have a history of using alcohol, tobacco, or illicit drugs. He has no family history of sudden cardiac death or early coronary artery disease.

View the electrocardiogram obtained (**Figure 1**) and consider what your diagnosis would be.

Resolution of the case is described on the next page.

THE RESOLUTION


Figure 2.

Differential Diagnosis

- ST-elevation myocardial infarction (STEMI)
- Coronary vasospasm
- Acute pericarditis
- Stressed-induced cardiomyopathy
- Left ventricular aneurysm

Diagnosis

The patient had had a STEMI. Testing showed an elevated troponin-I level, peaking at 65 ng/mL. His cardiovascular examination showed a regular rate and rhythm with intermittent premature beats on auscultation without a pericardial rub. He had congruent ST-segment elevations (see *arrows* in Figure 1) in the inferior leads on electrocardiography (ECG). Catheterization of the right coronary artery revealed an acute thrombus (**Figure 2**).

Learnings

Several medical conditions can result in ST elevations on ECG:

- **Acute coronary syndrome** (ACS) is composed of unstable angina, non-ST-segment elevation myocardial infarction (NSTEMI), and ST-segment elevation myocardial infarction (STEMI). Chest pain associated with ACS occurs when myocardial oxygen demand exceeds supply. Classic angina is substernal discomfort precipitated by exertion and relieved with rest or nitroglycerin within 10 minutes of symptom onset. *STEMI* refers to acute transmural myocardial ischemia, commonly due to a thrombotic occlusion of an epicardial coronary artery, with elevation in cardiac biomarkers.
- **Coronary vasospasm** is intense vasoconstriction of coronary arteries causing total or subtotal vessel occlusion. Common precipitating factors include physical or mental stress, alcohol use, hyperventilation, and pharmacologic agents such as cocaine, sympathomimetic agents, β-blockers, and ergot alkaloids. Significant risk factors include smoking, being middle-aged or older, and the presence of high-sensitivity C-reactive protein.
- In **acute pericarditis**, 80% to 90% of cases are idiopathic (viral), and the remaining 10% to 20% are associated with post–cardiac injury syndrome, connective-tissue diseases, or malignancy. Pleuritic chest pain is relieved by sitting forward. There is pericardial friction rub on cardiac auscultation.
- **Stress-induced cardiomyopathy** is a transient systolic dysfunction of mid and apical segments of the left ventricle, causing the left ventricle to balloon during systole. Stress cardiomyopathy frequently occurs after acute critical illness or intense emotional or physical stress.
- **Left ventricular aneurysms** (LVAs) are thin, scarred, or fibrotic portions of muscle wall containing necrosis, often because of a transmural acute myocardial infarction. LVAs are commonly located in anterior or apical walls after total occlusion of the left anterior descending artery without the development of collateralization. Patients often present with cardiac enlargement felt with displacement of the apical impulse, with a third and/or fourth heart sound, and with a mitral regurgitation systolic murmur.

Treatment

Treatment is as follows:

- **STEMI:** Percutaneous coronary intervention should be performed as soon as possible. While awaiting emergency medical services, administer aspirin (chewable, 325 mg), establish intravenous access, bring a defibrillator into the room, and keep staff members with the patient.
- **Coronary vasospasm:** Calcium-channel blockers are typically given.
- **Acute pericarditis:** Patients are given nonsteroidal anti-inflammatory drugs and colchicine.
- **Stress-induced cardiomyopathy:** Treatment is based on the patient's clinical presentation and involves supportive care plus goal-directed medical therapy for left ventricular systolic dysfunction.
- **LVAs:** Small to moderate asymptomatic LVAs are generally managed medically, which includes anticoagulation if a mural thrombus is present. Transfer for surgical repair should be considered for symptomatic patients with akinetic or dyskinetic segments or those with intractable ventricular arrhythmias. ■

INSIGHTS IN IMAGES

CLINICAL CHALLENGE: CASE 2

Knee Pain in a 78-Year-Old

Figure 1.

Case

A 78-year-old man presents to an urgent care center with bilateral knee pain that he has had for 1 week. The pain is worse in his right knee and is worse with ambulation. He says that he has not experienced any recent trauma, but he does note that he has been helping his son move into an apartment. He reports no fever, dizziness, chest pain, or shortness of breath. He has hypertension, for which he takes lisinopril. He is a nonsmoker.

View the image taken (**Figure 1**) and consider what your diagnosis would be.

Resolution of the case is described on the next page.

THE RESOLUTION


Figure 2.

Differential Diagnosis

- Patella fracture
- Fracture of the tibial spine
- Osteomyelitis of the femur
- Knee dislocation
- Osteoarthritis
- Tibial plateau fracture

Physical Examination

On physical examination, his vital signs are as follows: temperature, 99.2°F (37.3°C); pulse rate, 114 beats/min; respiration rate, 28 breaths/min; blood pressure, 162/94 mm Hg; and oxygen saturation, 99% on room air. He is alert and oriented, is not in acute distress, and is breathing comfortably.

The patient's right knee has some minimal generalized swelling. The skin on the knee is normal in appearance without erythema. The right knee is found to be stable (there is no laxity when testing for ligamentous integrity), and findings on the Lachman test (for an anterior cruciate ligament injury) are negative. The patella is mobile. The patient has pain with palpation of the medial aspect of the knee over the medial collateral ligament.

His left knee also is swollen, slightly more than the right knee, and there is a small effusion, but the skin is normal in appearance without erythema. Like the other knee, the left knee is stable. Findings on the Lachman test are negative. The patella is mobile. In this knee, the patient has generalized pain with palpation, but it is minimal.

Diagnosis

An x-ray (**Figure 2**) is obtained that shows arthritic changes in both knees. The patient has osteoarthritis. Note the presence of osteophytes, narrowing of the joint space (*black arrow*), and increased subchondral bone density (*white arrow*).

Learnings

Osteoarthritis of the knee is a common condition, with prevalence of 12.2% in one study, and with higher rates in women (14.9%) than men (8.7%). It is a common cause of morbidity and disability.

What to Look For

When obtaining the medical history, determine the onset of pain, whether it occurred from an impact or started suddenly during an activity. Evaluate for swelling, and ask whether the swelling is predictably present at certain times of the day or after certain motions of the knee (e.g., after walking or after engaging in sports).

- Immediate swelling implies acute disruption from a fracture, strained or torn ligament, or dislocation.
- Delayed swelling is more suggestive of a meniscus injury.

Locking or buckling of the knee suggests a meniscal injury. Typical findings with knee osteoarthritis include intermittent swelling, a sensation of grinding and locking, pain with range of motion, and pain that is exacerbated with specific activities. A history of fracture or previous surgery, especially in conjunction with recurrent pain, is more suggestive of osteoarthritis.

Inquire about arthralgias in other joints, which may be present with inflammatory or reactive arthritis. Calf muscle pain or swelling may be present with deep vein thrombosis. Paresthesias or a unilateral cool sensation, especially with a history of peripheral vascular disease, may indicate vascular insufficiency or obstruction. Symptoms of systemic illness such as polyarthralgia, fever, and morning stiffness may suggest gout, hyperuricemia, rheumatoid arthritis, or pseudogout.

When performing the physical examination, document the patient's general appearance, position, and ability to ambulate. Inspect *and* palpate for skin changes such as erythema, ecchymosis, abrasions, lacerations, fluctuance, necrosis, and crepitus, as well as for surgical scars. Determine the location of pain: Does the pain localize, on palpation, to the medial or lateral collateral ligaments? Evaluate for exacerbators of pain such as movement through the range of motion.

Treatment in the urgent care setting can involve dispensing medication for pain (acetaminophen, oral or topical nonsteroidal anti-inflammatory drugs, gabapentin or pregabalin, or capsaicin cream). If the patient is to be discharged home, refer the patient to an orthopedist for further assessment.

Indications for transfer to an emergency department include dislocation, open fracture, intractable pain, and the possibility of septic arthritis. ■

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