Case report

Takotsubo cardiomyopathy: An Unusual Presentation Mimicking STEMI

Abstract:

Takotsubo syndrome, also known as stress cardiomyopathy, is a rare and often underdiagnosed condition that presents with symptoms similar to acute coronary syndrome. We present the case of a 58-year-old female with no significant past medical history who presented to the emergency department with chest pain, shortness of breath, and electrocardiographic changes suggestive of acute myocardial infarction. Coronary angiography was negative for obstructive coronary artery disease, and transthoracic echocardiography showed characteristic apical ballooning of the left ventricle consistent with Takotsubo syndrome. The patient was managed with supportive care and beta-blocker therapy, and follow-up imaging demonstrated complete resolution of her ventricular dysfunction. This case highlights the importance of considering Takotsubo syndrome in the differential diagnosis of patients presenting with symptoms of acute coronary syndrome and underscores the need for prompt diagnosis and management of this potentially life-threatening condition.

Keywords: Takutsubo, ischemic cardiomyopathy, ST elevation, stress cardiomyopathy.

Introduction:

Takotsubo cardiomyopathy (TTC) is a reversible form of left ventricular dysfunction that typically occurs in response to emotional or physical stressors (1). TTC was first described in Japan in the early 1990s, and its name is derived from the Japanese word for an octopus trap, as the shape of the left ventricle during TTC resembles the trap (2). The exact pathophysiology of TTC is still not fully understood, but it is thought to be related to sympathetic overstimulation and subsequent myocardial stunning (3). TTC is more common in postmenopausal women, although it has been reported in men and younger women (4). The diagnosis of TTC can be challenging, and a high clinical suspicion is necessary to distinguish it from acute coronary syndrome (5).

Case presentation:

A 58-year-old female with no significant past medical history presented to the emergency department with sudden-onset chest pain, shortness of breath, and diaphoresis. Electrocardiography showed ST-segment elevation in leads DI,V2-V6 with ST depression in lead DIII and aVF (Figure 1), and troponin was elevated at 3.2 ng/mL.

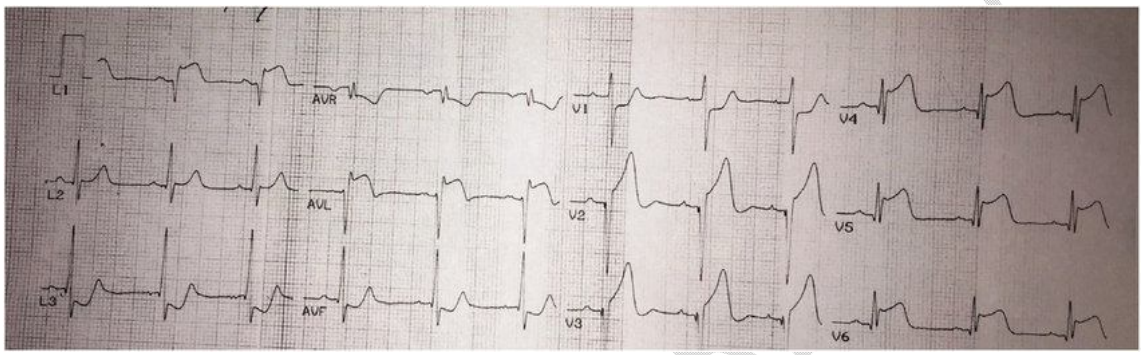

Figure 1: Electrocardiogram of the patient showing ST-segment elevation in leads DI,V2-V6 with ST depression in lead DIII and aVF.

The patient was diagnosed with acute myocardial infarction, and emergent coronary angiography was performed, which showed no obstructive coronary artery disease (Figure 2). Transthoracic echocardiography showed characteristic apical ballooning of the left ventricle with hyperkinesis of the basal segments, consistent with Takotsubo syndrome (Figure 3).

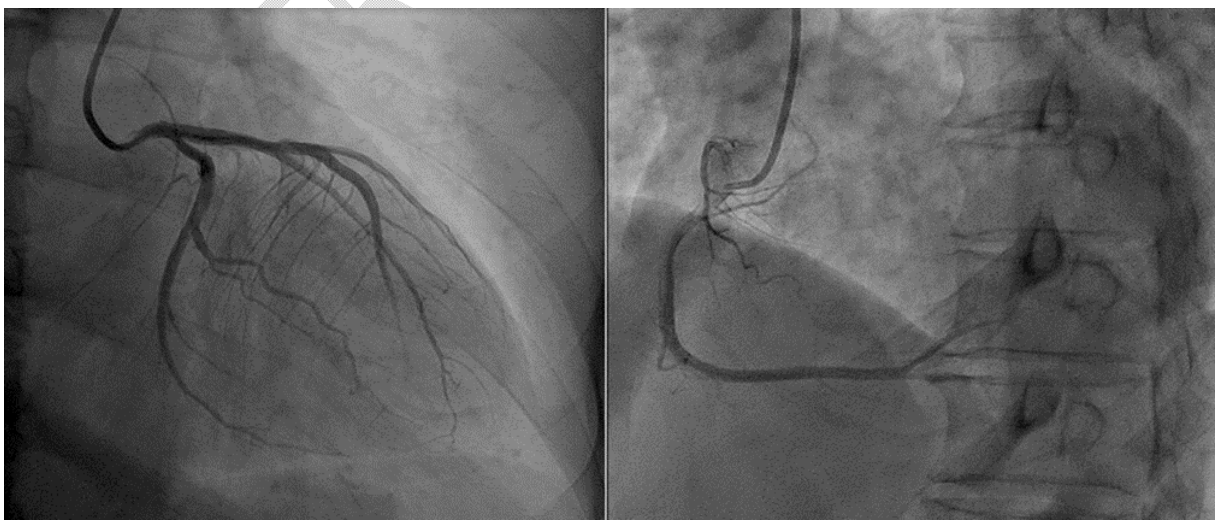

Figure 2: coronary angiography of the patient showing normal coronary arteries.

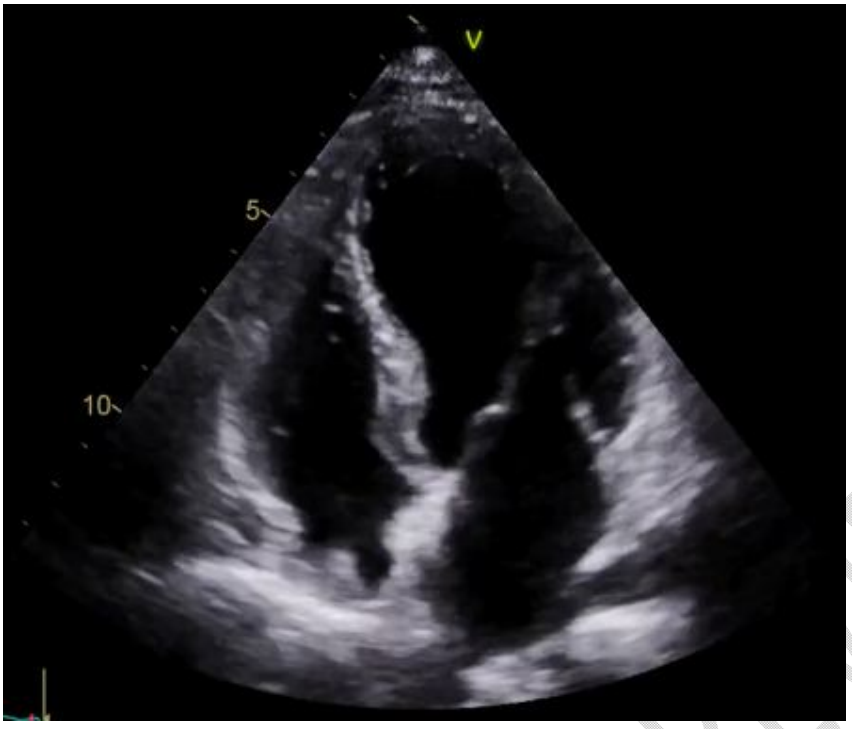

Figure 3: Transthoracic echocardiography demonstrating characteristic apical ballooning of the left ventricle.

The patient was managed with supportive care (Oxygen therapy, Monitoring: Continuous cardiac monitoring and frequent assessments of vital signs, Fluid management)and beta-blocker therapy (bisoprolol 2.5mg increased to 5mg after 1 week), and her symptoms improved gradually over the next few days. After 17 days,Follow-up imaging showed complete resolution of her ventricular dysfunction, with normalization of left ventricular ejection fraction. The patient was discharged with instructions to follow up with her primary care physician and to avoid triggers for stress.

Discussion:

The diagnosis of TTC can be challenging, and a high clinical suspicion is necessary to distinguish it from acute coronary syndrome. Electrocardiography typically shows ST-segment elevation or T-wave inversion in the precordial leads, which can mimic acute ST-elevation myocardial infarction (6). However, unlike acute coronary syndrome, TTC is characterized by the absence of obstructivecoronary artery disease on coronary angiography (7). Echocardiography can be particularly useful in the diagnosis of TTC, as it can show the characteristic transient left ventricular dysfunction and absence of significant valvular disease or ventricular hypertrophy (8).

The exact pathophysiology of TTC is still not fully understood, but it is thought to be related to sympathetic overstimulation and subsequent myocardial stunning (1). This leads to the characteristic appearance of a transient ballooning of the left ventricle, similar in shape to a Japanese octopus trap, on echocardiography or left ventriculography (3). Emotional stressors, such as grief, anger, and fear, are commonly reported triggers, but physical stressors, such as surgery and medical illnesses, can also precipitate TTC (9).

Management of TTC is primarily supportive and aims to alleviate symptoms, monitor for complications, and promote recovery. Since TTC is a reversible condition, the mainstay of management revolves around supportive measures. Here are some key aspects of supportive care in the management of TTC (1):

- ✓ Symptom relief: Medications such as analgesics (e.g., opioids or NSAIDs).
- ✓ Hemodynamic monitoring: Continuous cardiac monitoring is essential to assess heart rate, rhythm, blood pressure, and oxygen saturation. This allows for the early detection of any hemodynamic instability or arrhythmias that may require intervention.
- ✓ Fluid management: Optimal fluid balance is maintained by closely monitoring the patient's hydration status, urine output, and hemodynamic parameters. Intravenous fluids may be administered to ensure adequate hydration and perfusion.
- ✓ Oxygen therapy: Supplemental oxygen may be provided to maintain adequate oxygenation in cases of hypoxemia or respiratory distress. Oxygen therapy helps improve oxygen supply to the myocardium and alleviate associated symptoms.
- ✓ Psychological support: Patients with TTC may benefit from psychological support, as the condition is often triggered by emotional stress. Counseling or referral to mental health professionals can assist patients in coping with the emotional impact of the diagnosis and any underlying stressors.

Typically, patients recover from ventricular dysfunction within weeks to months. However, in some cases, complications such as heart failure, arrhythmias, and cardiogenic shock can occur and may require more aggressive management. In such cases, mechanical circulatory support or extracorporeal membrane oxygenation may be considered (10). Beta-blockers and angiotensin-converting enzyme inhibitors are commonly used to prevent recurrent TTC episodes (11).

Conclusion:

Takotsubo syndrome is a rare and often underdiagnosed condition that can present with symptoms similar to acute coronary syndrome. Prompt recognition and diagnosis of this condition is important to avoid unnecessary invasive procedures and to provide appropriate management, which is primarily supportive. This case highlights the importance of considering Takotsubo syndrome in the differential diagnosis of patients presenting with symptoms of acute coronary syndrome, and the need for further research to better understand its pathophysiology and optimal management.

Ethical Approval:

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent

As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

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