RESEARCH PAPER

Atypical Presentation of Takotsubo Syndrome Triggered by Acute Emotional Stress in a Young Female: A Case Report

Dr. Snega Rajini Laxmi[1], Dr. N. N. Anand[2], Dr. Viknesh Prabhu[3], Dr. Anis Preethi[4], Dr. Aswathy T. Menon[5], Dr. Suhas Goud[6], Dr. Manasvi Periyandavar[7]

[1] Junior Resident, Department of General Medicine, Sree Balaji Medical College and Hospital, India.

[2] Professor & Head of Department, Department of General Medicine, Sree Balaji Medical College and Hospital, India.

[3] Associate Professor, Department of General Medicine, Sree Balaji Medical College and Hospital, India.

[4] Assistant Professor, Department of General Medicine, Sree Balaji Medical College and Hospital, India.

[5] Assistant Professor, Department of General Medicine, Sree Balaji Medical College and Hospital, India.

[6] Junior Resident, Department of General Medicine, Sree Balaji Medical College and Hospital, India.

[7] Junior Resident, Department of General Medicine, Sree Balaji Medical College and Hospital, India.

ABSTRACT

Takotsubo syndrome (TTS), also known as stress-induced cardiomyopathy, is a reversible form of acute heart failure characterized by transient left ventricular dysfunction in the absence of obstructive coronary artery disease. It often mimics acute myocardial infarction in its clinical presentation. Although classically described in post-menopausal women, atypical presentations in younger individuals are increasingly recognized. We report a case of a young female who presented with acute coronary syndrome-like features following severe emotional stress and was subsequently diagnosed with Takotsubo syndrome, with complete recovery on supportive management.

Keywords: Takotsubo syndrome, Cardiomyopathy, heart failure

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INTRODUCTION

Takotsubo syndrome is an acute cardiac condition characterized by transient regional wall motion abnormalities of the left ventricle, most commonly involving apical ballooning. It typically presents with chest pain, electrocardiographic changes, and elevated cardiac biomarkers, closely resembling acute myocardial infarction, yet without evidence of obstructive coronary artery disease. The underlying pathophysiology is believed to involve catecholamine-mediated myocardial stunning, although the exact mechanisms remain incompletely understood. While the condition predominantly affects post-menopausal women, recent literature has expanded its clinical spectrum to include atypical triggers and younger populations . This diagnostic challenge is compounded by the fact that cardiac catheterization often reveals normal coronary vessels, further distinguishing it from typical acute coronary syndromes .

CASE PRESENTATION

A 34-year-old previously healthy woman presented to the emergency department with sudden onset chest pain and dyspnea shortly after experiencing a significant emotional stressor, namely the loss of a close family member. On admission, she was hypotensive with a blood pressure of 90/60 mmHg and tachycardic with a heart rate of 112 beats per minute. Electrocardiography revealed ST-segment elevation in the anterior leads along with QT interval prolongation. Laboratory evaluation demonstrated elevated cardiac biomarkers, with high-sensitivity troponin T levels of 820 ng/L and NT-proBNP of 1100 pg/mL.

Given the high suspicion for acute ST-elevation myocardial infarction, the patient underwent urgent coronary angiography, which revealed normal coronary arteries without evidence of obstruction. Left ventriculography demonstrated classical apical ballooning with basal hyperkinesis, consistent with Takotsubo syndrome. Transthoracic echocardiography further confirmed reduced left ventricular systolic function, with

an ejection fraction of approximately 30% and regional wall motion abnormalities involving the apical and mid-ventricular segments. The patient was admitted to the coronary care unit and managed with supportive therapy, including short-term inotropic support, beta-blockers, and angiotensin-converting enzyme inhibitors. No electrolyte imbalance or metabolic abnormalities were identified, distinguishing this presentation from metabolically triggered variants such as hypocalcemia-induced Takotsubo syndrome described in prior reports .

The patient demonstrated rapid clinical improvement following initiation of supportive therapy. Hemodynamic stability was achieved within 48 hours, allowing discontinuation of inotropic support. Serial electrocardiograms showed gradual normalization, with resolution of ST-segment changes and correction of QT prolongation by the fourth day of hospitalization. A repeat transthoracic echocardiogram performed on the seventh day revealed significant recovery of left ventricular function, with an ejection fraction of 60% and complete resolution of regional wall motion abnormalities. The patient was subsequently discharged in stable condition on guideline-directed medical therapy, with advice for regular follow-up.

DISCUSSION

Takotsubo syndrome is characterized by transient left ventricular systolic dysfunction in the absence of significant coronary artery disease and is frequently precipitated by emotional or physical stress. The syndrome is thought to result from a surge in catecholamines leading to myocardial stunning, microvascular dysfunction, and direct myocardial toxicity. While the exact pathogenesis remains an active area of research, proposed mechanisms include coronary artery spasm, inflammation, and genetic predispositions . This complex interplay of factors contributes to the distinctive left ventricular apical ballooning morphology observed in the majority of cases . Regional differences in β-adrenergic receptor distribution within the myocardium may account for the characteristic pattern of apical ballooning. Although traditionally associated with post-menopausal women, this case highlights that younger individuals can also develop the condition, particularly in the setting of intense emotional stress. This underscores the importance of considering Takotsubo syndrome in the differential diagnosis for acute coronary syndrome-like presentations, even in younger patient demographics . The transient nature of the left ventricular dysfunction, typically resolving within days to weeks, is a hallmark of Takotsubo syndrome, differentiating it from other acute cardiomyopathies .

The referenced case exemplifies a rare metabolic precipitant—specifically, severe hypocalcemia—inducing Takotsubo syndrome with concomitant transient dilated cardiomyopathy. By contrast, the present case arose from a conventional emotional stressor and displayed the archetypal apical ballooning morphology, thereby affirming the prevailing clinical phenotype of Takotsubo syndrome . In contrast, our case represents a classic stress-induced variant without identifiable metabolic derangements, thereby reinforcing the heterogeneity of triggers involved in the pathogenesis of Takotsubo syndrome. Recognition of these diverse triggers is essential, as management strategies may differ depending on the underlying cause.

CONCLUSION

Takotsubo syndrome should be considered in patients presenting with features suggestive of acute coronary syndrome but with normal coronary arteries on angiography, irrespective of age. Emotional stress alone can serve as a potent trigger for this condition even in younger individuals. Prompt recognition and supportive management are crucial, as the condition is typically reversible with an excellent prognosis.

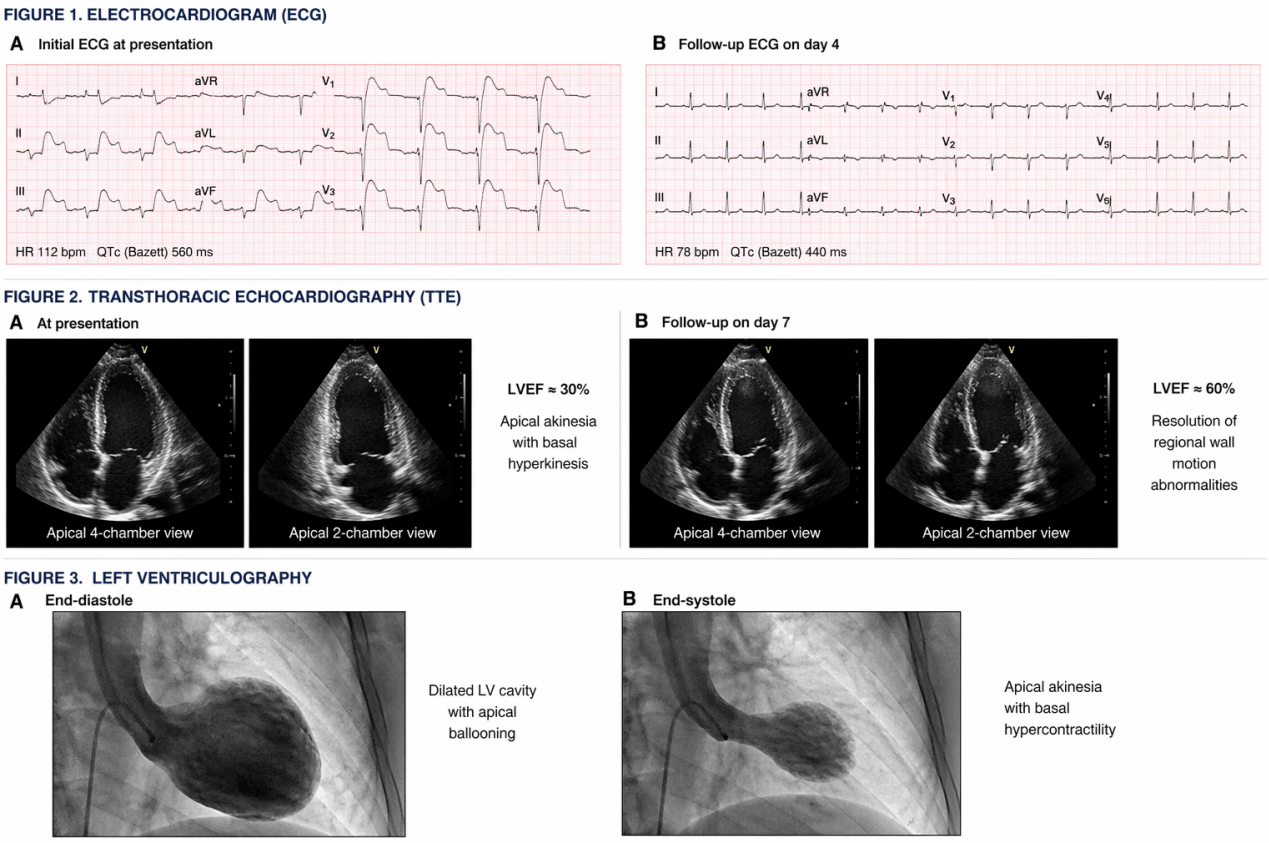

Figure Legend

Figure 1. Multimodality imaging in Takotsubo syndrome demonstrating reversible left ventricular dysfunction.

(A) Initial electrocardiogram (ECG) at presentation showing sinus tachycardia with ST-segment elevation in anterior leads and prolonged corrected QT interval. (B) Follow-up ECG on day 4 demonstrating normalization of ST-segment changes and QT interval, consistent with clinical recovery.

(C) Transthoracic echocardiography (TTE) at presentation (apical four-chamber and two-chamber views) demonstrating apical akinesia with basal hyperkinesis and reduced left ventricular ejection fraction (≈30%). (D) Repeat TTE on day 7 showing recovery of left ventricular systolic function (ejection fraction ≈60%) with resolution of regional wall motion abnormalities.

Figure 2

(A) Left ventriculography during end-diastole demonstrating a dilated left ventricular cavity with characteristic apical ballooning morphology. (B) Left ventriculography during end-systole showing persistent apical akinesia with basal hypercontractility, consistent with the classical Takotsubo pattern.

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