

Atypical Chest Pain: A Diagnostic Challenge for Takotsubo Cardiomyopathy

Lisa Marie Babiak¹, Khachig K. Ishkhan²

Review began 02/06/2026

Review ended 03/09/2026

Published 03/11/2026

© Copyright 2026

Babiak et al. This is an open access article distributed under the terms of the Creative Commons Attribution License CC-BY 4.0., which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

DOI: 10.7759/cureus.105044

1. Clinical Sciences, Saint James School of Medicine, Chicago, USA 2. Interventional Cardiology, Community First Medical Center, Chicago, USA

Corresponding author: Lisa Marie Babiak, imbabiak@gmail.com

Abstract

Takotsubo cardiomyopathy (TTC) typically presents in post-menopausal females with chest pain, dyspnea, or palpitations and often mimics acute coronary syndrome. This case report describes a unique presentation of TTC in an elderly patient who exhibited gastrointestinal and musculoskeletal symptoms without cardiopulmonary complaints. This constellation of symptoms has not been previously described in the literature. The patient was ultimately diagnosed with TTC with evidence of ST-T wave abnormalities on ECG, elevated serum troponin levels, a reduced left ventricular ejection fraction, the absence of significant coronary artery disease on cardiac catheterization, and regional wall abnormalities on transthoracic ultrasound and left ventriculography. It contributes to our current understanding of the varied clinical presentation seen in TTC, which may help clinicians refine their differential diagnoses, provide earlier treatment, prevent misdiagnosis, and enhance patient care outcomes.

Categories: Cardiology, Emergency Medicine**Keywords:** broken heart syndrome, stress cardiomyopathy, stress-induced cardiomyopathy, takotsubo cardiomyopathy, takotsubo syndrome

Introduction

Takotsubo cardiomyopathy (TTC), commonly referred to as stress cardiomyopathy, involves transient left ventricular systolic dysfunction in the absence of obstructive coronary artery disease (CAD). First described in Japan in 1990, TTC is known to mimic acute coronary syndrome (ACS) and accounts for 1-2% of patients with elevated troponin levels [1-4]. It occurs most regularly in post-menopausal women and is frequently precipitated by emotional or physical stress [2,5-11]. Despite its reversible nature, TTC has been associated with potentially serious complications and mortality rates comparable to those seen in ST-segment elevation myocardial infarction (STEMI) [4,6,8,10]. As such, prompt diagnosis and treatment are of utmost importance.

The most widely accepted diagnostic criteria were proposed by the Mayo Clinic and comprise transient hypokinesis, akinesis, or dyskinesis of the left ventricle that extends beyond the territory supplied by a single coronary artery and occurs in the presence of emotional or physical stress, absence of significant CAD, ST-elevation and/or T-wave inversion on ECG or elevated cardiac troponin serum levels, and the absence of myocarditis or pheochromocytoma [3,12,13]. Patients classically present with symptoms suggestive of ACS, including chest pain, dyspnea, syncope, and palpitations [3,6,8,9].

There are currently few published case reports of patients with atypical or non-cardiac presentations. Recent studies have detailed patients with unilateral shoulder pain, exertional retrosternal chest pain, altered mental status, vomiting and diarrhea, facial droop, slurred speech, seizures, dyspnea with wheezing and sputum production, fatigue, and extreme thirst [14-22]. These cases underscore the diagnostic challenges posed by TTC when hallmark symptoms are absent. Despite these additions to our overall understanding of the varied presentations of TTC, those dominated by gastrointestinal and musculoskeletal pain are exceedingly rare. A comprehensive literature search in UpToDate, PubMed, and Google Scholar did not identify any prior cases with a similar case presentation.

Case Presentation

A 72-year-old Hispanic female with a past medical history of hypertension, hyperlipidemia, gastritis, hiatal hernia, and GERD presented to the emergency department with decreased appetite, generalized abdominal pain, and intermittent atraumatic lower back pain of one week's duration. During this period, she experienced approximately 10 episodes of nausea, non-bilious vomiting, and non-bloody diarrhea. She denied any fever, chest pain, shortness of breath, light-headedness, or dizziness. Her daughter reported mild alterations in the patient's mental status but was unable to identify an inciting event. The patient affirmed adherence to her usual medications: metoprolol tartrate 25 mg, simvastatin 40 mg, and pantoprazole 40 mg daily.

How to cite this article

Babiak L, Ishkhan K K (March 11, 2026) Atypical Chest Pain: A Diagnostic Challenge for Takotsubo Cardiomyopathy. Cureus 18(3): e105044. DOI 10.7759/cureus.105044

On arrival, her vital signs were stable with a temperature of 36.9°C, blood pressure of 131/82, heart rate of 97/min, and oxygen saturation of 95% on room air. Gastroenterology services were consulted, and an abdominal CT and ultrasound were unremarkable. Initial cardiac testing revealed cardiomegaly on CXR and an elevated troponin I level of 373 ng/L (reference range = 0-10 ng/L). An ECG demonstrated diffuse ST-T wave abnormalities with T-wave inversion (Figure 1), representing a significant change from previous tracings and concern for non-ST elevation myocardial infarction (NSTEMI).

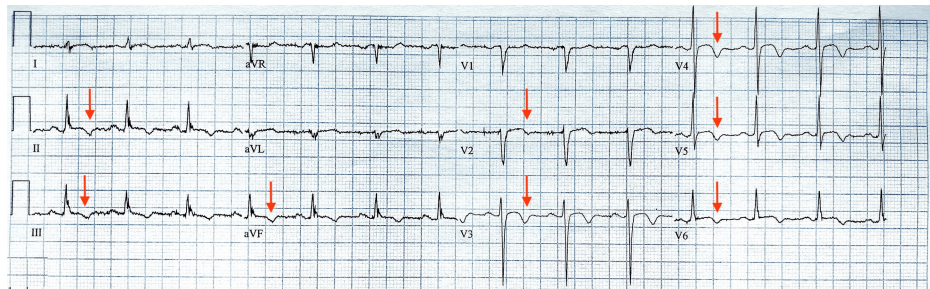


FIGURE 1: Electrocardiogram on arrival with diffuse ST-T abnormalities and T-wave inversions in leads II, III, aVF, and V2-V6 (red arrows).

Cardiology services were consulted and recommended initiation of intravenous unfractionated heparin. A markedly prolonged partial thromboplastin time of 181 seconds was obtained, and heparin was held. Repeat troponin I measurement three hours later showed an upward trend to 497 ng/L, prompting scheduling of cardiac catheterization the following morning. Transthoracic echocardiogram (TTE) revealed a left ventricular ejection fraction (LVEF) of 24.53% and moderate anterior and septal wall hypokinesia of the mid and apical segments (Figure 2). Subsequent coronary angiography was performed with no evidence of significant coronary artery or flow-limiting disease (Figure 3). Left ventriculography revealed hypokinesia of the apical and mid segments (Figure 4) and confirmed the diagnosis of TTC.

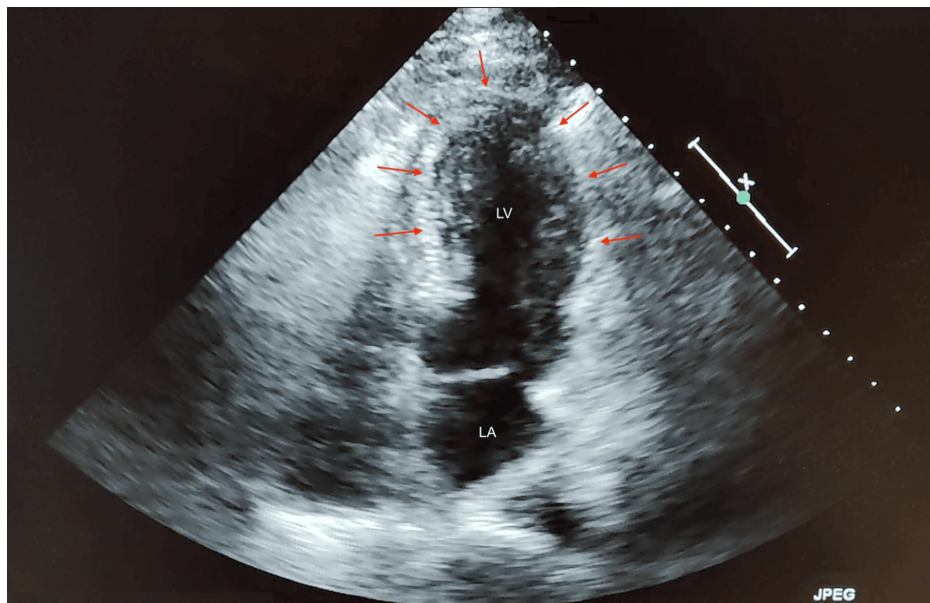


FIGURE 2: Echocardiogram without contrast medium in apical two-chamber view. Left ventricular (LV) systole showing hypokinesia of the mid and apical segments (red arrows).

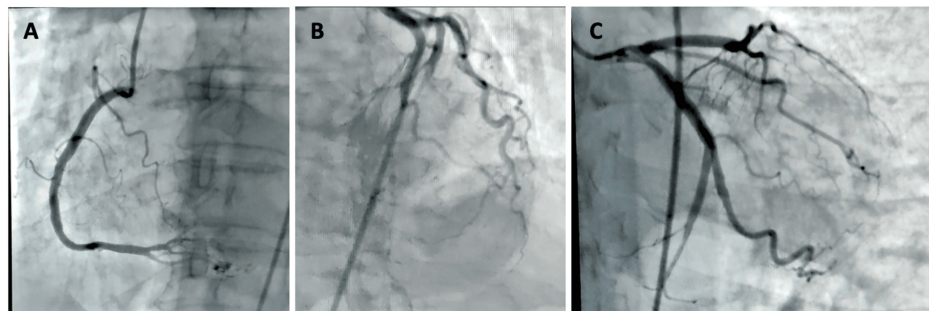


FIGURE 3: Coronary angiography revealed (A) right coronary artery without evidence of obstructive coronary artery disease, (B) left anterior descending artery without evidence of obstructive coronary artery disease, and (C) left circumflex and obtuse marginal branch without flow-limiting disease.

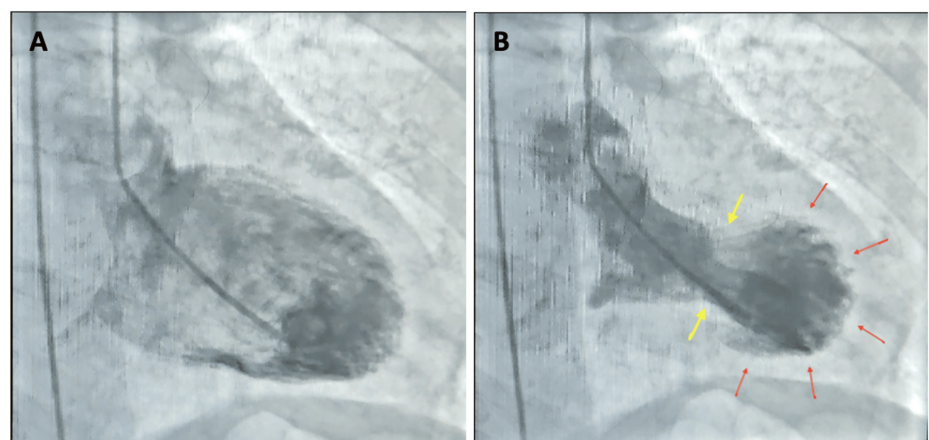


FIGURE 4: Left ventriculography. (A) End-diastolic image. (B) End-systolic image showing hyperkinesis of the left ventricular base (yellow arrows) and hypokinesis of the mid and apical segments (red arrows).

Diagnosis was supported by the following: ECG findings showing diffuse ST-T wave abnormalities with T-wave inversion in leads II, III, aVF, and V2-V6, elevated cardiac enzymes (troponin I of 373 ng/L up trending to 497 ng/L), left heart catheterization with no evidence of significant CAD, and a LVEF of 24.53% with moderate anterior and septal wall hypokinesis of the mid and apical segments on TTE.

Further conversations with the patient and her daughter revealed the presence of pronounced emotional stress and anxiety due to the pending release and cohabitation of her incarcerated son.

Spironolactone and lisinopril were added to her treatment regimen. The patient remained hemodynamically stable throughout admission, and her hospital course was uncomplicated. She was transferred to the extended care unit on hospitalization day five and discharged after one week of hospitalization on aspirin 81 mg once daily, atorvastatin 40 mg once daily, lisinopril 10 mg once daily, metoprolol succinate 25 mg twice daily, and spironolactone 25 mg once daily.

Discussion

This case features an atypical presentation of TTC in an elderly Hispanic female whose predominant symptoms of atraumatic lower back pain, decreased appetite, generalized abdominal pain, nausea, emesis, and diarrhea were initially suggestive of a gastrointestinal etiology. While TTC is classically associated with chest pain, dyspnea, syncope, and palpitations, the absence of cardiopulmonary symptoms underscores the clinical challenges in recognizing and diagnosing TTC.

The underlying mechanisms of TTC are not completely understood. Current theories implicate coronary vasospasm, microcirculatory dysfunction, and catecholamine-mediated myocardial stunning, which are

believed to contribute to the transient regional systolic impairment and left ventricular ballooning that is pathognomonic of the syndrome [12,13]. Excess sympathetic stimulation during periods of emotional or physical stress is thought to result in neurohormonal activation and an associated surge in catecholamines and neuropeptide Y [12,13,23,24]. These mediators exert toxic effects on the myocardium, resulting in myocardial stunning [11–13,23,25]. Autonomic dysregulation may also influence gastrointestinal motility through effects on the brain-gut axis [25]. The catecholamine-mediated theory may contribute to the unique gastrointestinal symptoms observed in this case. This patient disclosed substantial emotional distress related to the pending release and return of her incarcerated son, which is consistent with the described associations between acute and chronic psychological triggers and the development of TTC [6,8,11].

This case highlights the importance of evidence on racial and socioeconomic disparities in the clinical presentation and outcome of patients diagnosed with TTC [8,22,26]. A study conducted by Ang et al. (2024) found that 35.9% of Hispanic patients diagnosed with TTC were also found to be living in the lowest median household income neighborhoods and experienced higher costs of hospitalization. Hispanic patients were associated with higher odds of developing dialysis-dependent acute kidney injury, as well as the highest inpatient mortality rates when compared to other racial groups [26]. These findings may reflect differences in the prevalence of comorbid conditions, including diabetes and obesity, among Hispanic populations and likely contribute to TTC's varied clinical presentation.

This patient's favorable hospital course is consistent with the current literature, noting an excellent prognosis of TTC with an in-hospital mortality rate of 4–8% and complete recovery in more than 90% of patients within four to eight weeks with supportive care [4,6–8,10,12,24]. The potential for serious complications, including arrhythmias, thromboembolism, and cardiogenic shock, requires clinicians to maintain diagnostic flexibility and vigilance in suspected ACS and TTC cases [6,7,10,12]. Increased awareness of the atypical presentations of TTC can reduce diagnostic delays and ultimately improve patient outcomes.

Cardiac magnetic resonance imaging (CMR) can play a valuable role in the diagnosis, management, and prognostication of TTC. It offers a comprehensive and non-invasive means of distinguishing TTC from acute myocardial infarction or myocarditis through the detection of myocardial edema and regional wall-motion abnormalities in the absence of irreversible myocardial injury [9,12,23,27,28]. A lack of late gadolinium enhancement on CMR has been associated with preserved myocardial viability and has been shown to reliably predict recovery of left ventricular function [23,27,28]. CMR was not performed in this case due to significant resource limitations at our safety-net hospital and the patient's financial constraints. Diagnosis was therefore based on the available clinical and imaging data according to established diagnostic criteria proposed by the Mayo Clinic [3,12,13]. This case highlights how limited access to advanced cardiac imaging influences diagnostic evaluation in underserved populations.

Differentiating TTC from anterior STEMI continues to pose a clinical challenge due to their overlapping clinical presentations. The use of non-invasive tools, including ECG and speckle-tracking echocardiography (STE), has shown promising results in improving early diagnostic discrimination between these differential diagnoses. ECG provides one of the most accessible and timely tools in the evaluation of suspected ACS; however, proposed ECG patterns for distinguishing TTC from anterior STEMI lack sufficient sensitivity and specificity for standalone use [6,29]. Recent studies investigating the combined use of STE with ECG in the diagnosis and differentiation of TTC have found significantly lower LVEF and reduced global radial strain in patients with TTC compared to their STEMI counterparts [11,29].

Conclusions

This case demonstrates the diagnostic challenges posed by TTC's varied clinical presentations and the potential for delayed or missed diagnosis. In this patient, the predominance of gastrointestinal and musculoskeletal symptoms, in the absence of cardiopulmonary complaints, represents an undocumented presentation that may obscure early recognition of the condition. It further underscores the importance of considering TTC in atypical clinical scenarios. Continued research may reduce TTC-associated morbidity and mortality while also limiting the need for invasive procedures and unnecessary testing.

Despite diagnostic advances, the underlying pathophysiology of TTC remains unclear, and evidence-based treatment guidelines are still evolving. Prospective studies and controlled clinical trials are needed to clarify population-specific risk factors, establish standardized treatment protocols, and identify preventive strategies. Future research should focus on the potential role of strain analysis and ECG patterns in the diagnosis of TTC and its differentiation from anterior STEMI. Improved diagnostic accuracy and the development of standardized diagnostic scoring systems are essential for timely recognition, efficient management, and improved access to care.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the

work.

Concept and design: Lisa Marie Babiak

Drafting of the manuscript: Lisa Marie Babiak

Critical review of the manuscript for important intellectual content: Lisa Marie Babiak, Khachig K. Ishkhan

Acquisition, analysis, or interpretation of data: Khachig K. Ishkhan

Supervision: Khachig K. Ishkhan

Disclosures

Human subjects: Informed consent for treatment and open access publication was obtained or waived by all participants in this study. **Conflicts of interest:** In compliance with the ICMJE uniform disclosure form, all authors declare the following: **Payment/services info:** All authors have declared that no financial support was received from any organization for the submitted work. **Financial relationships:** All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work. **Other relationships:** All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

References

- Kurowski V, Kaiser A, von Hof K, et al.: Apical and midventricular transient left ventricular dysfunction syndrome (tako-tsubo cardiomyopathy): frequency, mechanisms, and prognosis. *Chest*. 2007, 132:809-16. [10.1378/chest.07-0608](https://doi.org/10.1378/chest.07-0608)
- Prasad A, Dangas G, Srinivasan M, Yu J, Gersh BJ, Mehran R, Stone GW: Incidence and angiographic characteristics of patients with apical ballooning syndrome (takotsubo/stress cardiomyopathy) in the HORIZONS-AMI trial: an analysis from a multicenter, international study of ST-elevation myocardial infarction. *Catheter Cardiovasc Interv*. 2014, 83:343-8. [10.1002/ccd.23441](https://doi.org/10.1002/ccd.23441)
- Scafa-Udriste A, Horodinschi RN, Babos M, Dinu B: Diagnostic challenges between takotsubo cardiomyopathy and acute myocardial infarction-where is the emergency?: A literature review. *Int J Emerg Med*. 2024, 17:22. [10.1186/s12245-024-00595-4](https://doi.org/10.1186/s12245-024-00595-4)
- Redfors B, Vedad R, Angerås O, et al.: Mortality in takotsubo syndrome is similar to mortality in myocardial infarction — a report from the SWEDEHEART registry. *Int J Cardiol*. 2015, 185:282-9. [10.1016/j.ijcard.2015.03.162](https://doi.org/10.1016/j.ijcard.2015.03.162)
- Deshmukh A, Kumar G, Pant S, Rihal C, Murugiah K, Mehta JL: Prevalence of takotsubo cardiomyopathy in the United States. *Am Heart J*. 2012, 164:66-71.e1. [10.1016/j.ahj.2012.03.020](https://doi.org/10.1016/j.ahj.2012.03.020)
- Templin C, Ghadri JR, Diekmann J, et al.: Clinical features and outcomes of takotsubo (stress) cardiomyopathy. *N Engl J Med*. 2015, 373:929-38. [10.1056/NEJMoa1406761](https://doi.org/10.1056/NEJMoa1406761)
- Laghlam D, Touboul O, Herry M, et al.: Takotsubo cardiomyopathy after cardiac surgery: a case-series and systematic review of literature. *Front Cardiovasc Med*. 2022, 9:1067444. [10.3389/fcvm.2022.1067444](https://doi.org/10.3389/fcvm.2022.1067444)
- Nascimento FO, Santana O, Perez-Caminero M, Benjo AM: The characteristics of stress cardiomyopathy in an ethnically heterogeneous population. *Clinics (Sao Paulo)*. 2011, 66:1895-9. [10.1590/s1807-59322011001100008](https://doi.org/10.1590/s1807-59322011001100008)
- Eitel I, von Knobelsdorff-Brenkenhoff F, Bernhardt P, et al.: Clinical characteristics and cardiovascular magnetic resonance findings in stress (takotsubo) cardiomyopathy. *JAMA*. 2011, 306:277-86. [10.1001/jama.2011.992](https://doi.org/10.1001/jama.2011.992)
- Movahed MR, Javanmardi E, Hashemzadeh M: High mortality and complications in patients admitted with takotsubo cardiomyopathy with more than double mortality in men without improvement in outcome over the years. *J Am Heart Assoc*. 2025, 14:e037219. [10.1161/JAHA.124.037219](https://doi.org/10.1161/JAHA.124.037219)
- Sonaglioni A, Nicolosi GL, Lombardo M, Baravelli M, Muti P: Comparative meta-analysis of left ventricular mechanics in takotsubo syndrome and anterior STEMI due to left anterior descending artery occlusion. *J Clin Med*. 2025, 14:8748. [10.3390/jcm14248748](https://doi.org/10.3390/jcm14248748)
- Bairashevskaya AV, Belogubova SY, Kondratiuk MR, Rudnova DS, Sologova SS, Tereshkina OI, Avakyan EI: Update of takotsubo cardiomyopathy: present experience and outlook for the future. *Int J Cardiol Heart Vasc*. 2022, 39:100990. [10.1016/j.ijcha.2022.100990](https://doi.org/10.1016/j.ijcha.2022.100990)
- Singh T, Khan H, Gamble DT, Scally C, Newby DE, Dawson D: Takotsubo syndrome: pathophysiology, emerging concepts, and clinical implications. *Circulation*. 2022, 145:1002-19. [10.1161/CIRCULATIONAHA.121.055854](https://doi.org/10.1161/CIRCULATIONAHA.121.055854)
- Khan I, Atoot A: An unusual presentation of takotsubo syndrome in an elderly patient. *Oxf Med Case Reports*. 2024, 2024:omad144. [10.1093/omcr/omad144](https://doi.org/10.1093/omcr/omad144)
- Arunachalam P, Manian N, El Nihum LI, Toro S, Buerger JM: Atypical presentation of takotsubo cardiomyopathy in an elderly woman. *Methodist Debakey Cardiovasc J*. 2022, 18:17-22. [10.14797/mdcvj.1100](https://doi.org/10.14797/mdcvj.1100)
- Takla A, Mahmoud A, Mostafa MR, Jain D: Transient mid-ventricular ballooning syndrome: an atypical variant of stress cardiomyopathy. *Cureus*. 2023, 15:e35537. [10.7759/cureus.35537](https://doi.org/10.7759/cureus.35537)
- Cambronero F, Peñafiel P, Moreno V, Nolte C, Valdés M: An atypical presentation of tako-tsubo cardiomyopathy. *Int J Cardiol*. 2010, 138:e53-5. [10.1016/j.ijcard.2008.06.071](https://doi.org/10.1016/j.ijcard.2008.06.071)

18. Martin J, Wallingford A, Dhami D, Sood A: Atypical takotsubo cardiomyopathy presentation in an adult patient. *J Community Hosp Intern Med Perspect*. 2022, 12:75-9. [10.55729/2000-9666.1042](#)
19. Muratsu J, Morishima A, Ueda H, Hiraoka H, Sakaguchi K: Takotsubo cardiomyopathy in two patients without any cardiac symptom on maintenance hemodialysis. *Case Rep Nephrol*. 2013, 2013:640976. [10.1155/2013/640976](#)
20. Clark LC, Khunger A, Aji W: Takotsubo cardiomyopathy in a female presenting with status asthmaticus: a case report and review of literature. *Egypt Heart J*. 2022, 74:72. [10.1186/s43044-022-00310-9](#)
21. Surapaneni P, Vittala SS, Vinales KL, Najib MQ, Chaliki HP: Atypical presentation of takotsubo cardiomyopathy. *Eur J Echocardiogr*. 2011, 12:E31. [10.1093/ejehoccard/je008](#)
22. Patel HM, Kantharia BK, Morris DL, Yazdanfar S: Takotsubo syndrome in African-American women with atypical presentations: a single-center experience. *Clin Cardiol*. 2007, 30:14-8. [10.1002/clc.21](#)
23. Ojha V, Khurana R, Ganga KP, Kumar S: Advanced cardiac magnetic resonance imaging in takotsubo cardiomyopathy. *Br J Radiol*. 2020, 93:20200514. [10.1259/bjr.20200514](#)
24. Amin HZ, Amin LZ, Pradipta A: Takotsubo cardiomyopathy: a brief review. *J Med Life*. 2020, 13:3-7. [10.25122/jml-2018-0067](#)
25. Tardo DT, Cortes-Canteli M, Fuster V, Sachdev PS, Kovacic JC: The heart-brain-metabolism axis in cardiovascular and neurologic disease. *J Am Coll Cardiol*. 2025, 86:2663-86. [10.1016/j.jacc.2025.09.1602](#)
26. Ang SP, Chia JE, Krittanawong C, et al.: Racial disparities in trend, clinical characteristics and outcomes in takotsubo syndrome. *Curr Probl Cardiol*. 2024, 49:102826. [10.1016/j.cpcardiol.2024.102826](#)
27. Citro R, Okura H, Ghadri JR, et al.: Multimodality imaging in takotsubo syndrome: a joint consensus document of the European Association of Cardiovascular Imaging (EACVI) and the Japanese Society of Echocardiography (JSE). *Eur Heart J Cardiovasc Imaging*. 2020, 21:1184-207. [10.1093/ehjci/jeaa149](#)
28. Mitchell JH, Hadden TB, Wilson JM, Achari A, Muthupillai R, Flamm SD: Clinical features and usefulness of cardiac magnetic resonance imaging in assessing myocardial viability and prognosis in takotsubo cardiomyopathy (transient left ventricular apical ballooning syndrome). *Am J Cardiol*. 2007, 100:296-301. [10.1016/j.amjcard.2007.02.091](#)
29. Borkowski P, Hanif W, Torrado J, et al.: LAD electromechanical mismatch index: comparative analysis of EKG and left ventricular strain in stress cardiomyopathy and LAD-territory STEMI. *J Am Coll Cardiol*. 2025, 85:2053. [10.1016/S0735-1097\(25\)02537-9](#)