


# Takotsubo Cardiomyopathy: A Case of Young Male with Broken Heart

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## ABSTRACT

**Background:** Takotsubo cardiomyopathy (TC), also known as broken heart syndrome, is a transient cardiac condition often triggered by emotional or physical stress. Although predominantly seen in postmenopausal women, this case reports a rare occurrence in a young male following intubation and mechanical ventilation for status asthmaticus.

**Objective:** To describe a rare case of TC in a young male post-intubation and mechanical ventilation and to emphasize the importance of early diagnosis and appropriate management.

**Methods:** A 32-year-old male with a history of bronchial asthma was admitted unresponsive, requiring CPR and intubation. Baseline investigations included ECG, cardiac enzymes, echocardiography, and coronary angiography. Data were analyzed descriptively with a focus on clinical presentation, diagnostic findings, and management outcomes.

**Results:** The patient exhibited ST-segment elevation on ECG and elevated troponin levels (2134.1 ng/L at 12 hours), with echocardiography showing apical hypokinesia. Coronary angiography revealed normal coronary arteries. The patient was successfully weaned from mechanical ventilation on day 3 and showed full recovery with normalization of left ventricular function by discharge.

**Conclusion:** This case highlights the importance of considering TC in patients with acute coronary syndrome-like symptoms following intubation. Early recognition and management are crucial for favorable outcomes.

## INTRODUCTION

Takotsubo cardiomyopathy (TC), also referred to as broken heart syndrome, stress cardiomyopathy, or apical ballooning syndrome, is a transient cardiac condition characterized by a temporary impairment of the left ventricular function, often triggered by significant emotional or physical stress. First described by Sato et al. in Japan in 1990, this condition derives its name from the Japanese words “tako” meaning octopus and “tsubo” meaning pot, as the shape of the left ventricle during systole in affected patients resembles a traditional Japanese pot used to catch octopuses (1). TC typically presents with clinical features similar to acute coronary syndrome (ACS), including chest pain, ST-segment elevation on electrocardiogram (ECG), elevated cardiac enzymes, and hypokinesia observed on echocardiography. However, unlike ACS, patients with TC demonstrate normal coronary arteries upon angiography, differentiating it from true ischemic events (2). While TC predominantly affects postmenopausal women exposed to intense emotional or physical stress, its occurrence in younger males is considerably rare, making this case particularly notable (3). The pathogenesis of TC is not fully understood, though it is widely believed that catecholamine-induced myocardial stunning plays a crucial role in its development, triggered by acute stressors such as physical trauma, medical procedures, or extreme emotional events (4).

Intubation and mechanical ventilation are critical interventions in the management of patients with severe respiratory distress, such as status asthmaticus, and are performed routinely in emergency and intensive care settings. However, these procedures are not without risks, and they can sometimes precipitate severe cardiac events, particularly in individuals with predisposing factors. In this context, the development of TC following intubation and mechanical ventilation, as observed in our patient, is an exceedingly rare phenomenon. To date, no cases of TC following intubation and mechanical ventilation have been reported in our clinical setup, highlighting the uniqueness of this case. The case presented emphasizes the importance of awareness among healthcare professionals, particularly those working in emergency and intensive care units, of the potential for such rare but reversible cardiac conditions following high-stress medical interventions. Early recognition and appropriate management of TC are paramount to ensure full recovery and avoid complications such as inappropriate administration of thrombolytic therapy, which could result in catastrophic hemorrhage given the initial clinical resemblance of TC to acute coronary syndrome (5). This report contributes to the growing body of literature on the diverse presentations of TC and underscores the need for vigilance in the post-procedural care of high-risk patients.

## MATERIAL AND METHODS

The case study was conducted at a tertiary care hospital, focusing on a single patient diagnosed with Takotsubo cardiomyopathy (TC) following intubation and mechanical ventilation. The patient, a 32-year-old male with a history of bronchial asthma, was admitted to the emergency department in an unresponsive state, requiring immediate cardiopulmonary resuscitation (CPR) and subsequent intubation to secure the airway and ensure adequate oxygenation. Following the return of spontaneous circulation, the patient was transferred to the intensive care unit (ICU) for further management.

Comprehensive baseline investigations were performed upon admission, including a complete blood count (CBC), renal function tests (RFTs), liver function tests (LFTs), cardiac enzyme measurements, and an electrocardiogram (ECG). The initial ECG did not indicate any significant abnormalities, and the coronary angiography performed subsequently confirmed the absence of obstructive coronary disease, consistent with the diagnosis of TC. Transthoracic echocardiography was used to assess left ventricular function, revealing hypokinesia in the apical and interventricular segments, with a reduced ejection fraction, further supporting the diagnosis of TC.

The clinical management of the patient followed standard protocols for the treatment of TC, including supportive care with inotropic agents to manage hypotension and bronchodilators to address bronchospasm. The patient's condition improved gradually, with successful weaning from mechanical ventilation on the third day of hospitalization and transfer to the pulmonology ward on the fifth day. Repeat echocardiography performed two weeks post-

discharge demonstrated normalization of left ventricular function, confirming the reversible nature of TC.

Ethical approval for the publication of this case report was obtained from the hospital's Institutional Review Board, and the study was conducted in accordance with the principles outlined in the Declaration of Helsinki. Informed consent was obtained from the patient for the use of clinical data and imaging studies in this report, ensuring confidentiality and respect for the patient's privacy.

Data analysis for this case was descriptive, focusing on the clinical presentation, diagnostic workup, and management outcomes. The laboratory and imaging results were reviewed in the context of existing literature on Takotsubo cardiomyopathy, and the findings were compared with previously reported cases to highlight the unique aspects of this case. The aim was to contribute to the understanding of TC, particularly in the context of its occurrence following intubation and mechanical ventilation, a rare and underreported scenario in the current medical literature.

## RESULTS

The patient, a 32-year-old male, was admitted to the emergency department in an unresponsive state with a Glasgow Coma Scale (GCS) score of 3/15. Immediate cardiopulmonary resuscitation (CPR) was initiated, followed by intubation to secure the airway and maintain oxygenation. Return of spontaneous circulation (ROSC) was achieved after 25 minutes of CPR. Initial laboratory investigations, including arterial blood gases (ABGs), complete blood count (CBC), renal function tests (RFTs), liver function tests (LFTs), and cardiac enzyme measurements, were performed in the emergency department.

**Table 1: Initial Laboratory Investigations**

Investigation	Result	Reference Range
ABGs		
pH	6.90	7.34 - 7.45
PO <sub>2</sub>	40 mmHg	35 - 45 mmHg
PCO <sub>2</sub>	100 mmHg	90 - 100 mmHg
HCO <sub>3</sub>	23.9 mmol/L	22 - 24 mmol/L
Cardiac Enzymes		
Troponin (0 hours)	1354.4 ng/L	<10 ng/L
Troponin (6 hours)	1493.8 ng/L	<10 ng/L
Troponin (12 hours)	2134.1 ng/L	<10 ng/L
Coronary Angiography	Normal coronaries	Normal

The patient's initial electrocardiogram (ECG) performed in the emergency department did not reveal significant abnormalities (Image I). However, on the second day in the Intensive Care Unit (ICU), the patient developed

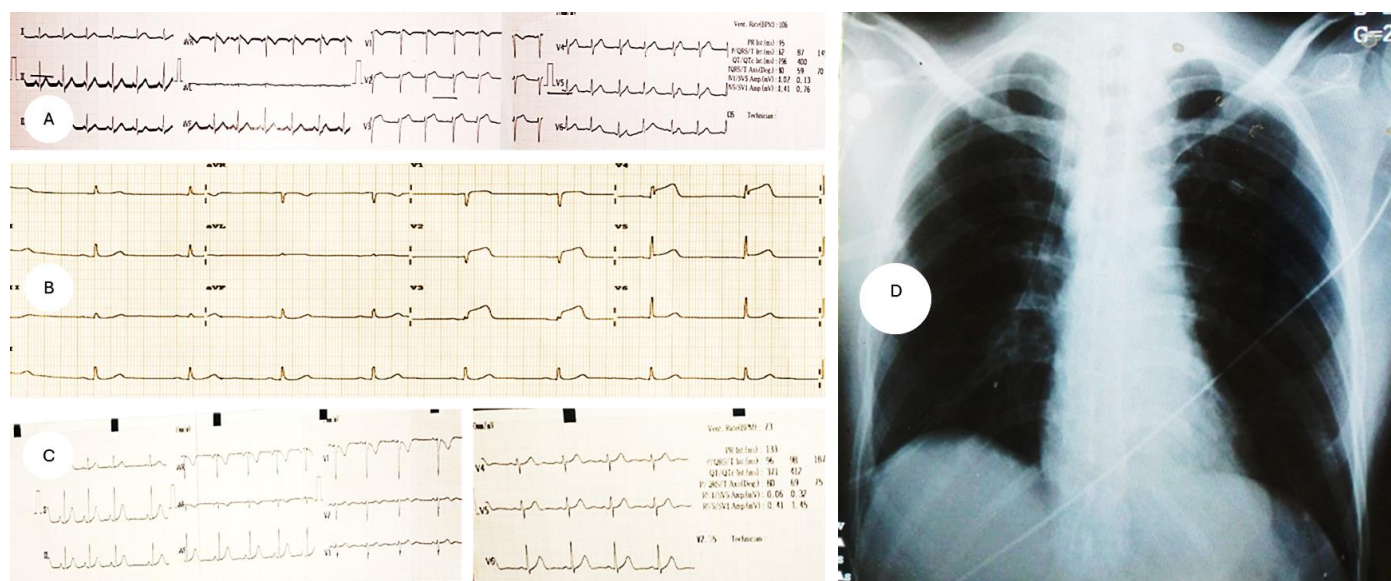
hypotension unresponsive to intravenous fluids, necessitating inotropic support. A repeat 12-lead ECG at this time showed ST-segment elevation in the chest leads (V1-V4) (Image II), suggestive of acute myocardial ischemia..

**Table 2: Serial Troponin Levels**

Time Post-Admission	Troponin Level (ng/L)
0 hours	1354.4
6 hours	1493.8
12 hours	2134.1

Serial measurements of cardiac enzymes, including troponin, demonstrated a rising trend, further indicating myocardial injury. A transthoracic echocardiogram performed at the bedside revealed hypokinesia of the apical and interventricular segments with a reduced ejection

fraction. The patient was subsequently transferred to the cardiac catheterization laboratory, where coronary angiography confirmed the presence of normal coronary arteries, thereby excluding an acute coronary syndrome and supporting the diagnosis of Takotsubo cardiomyopathy.



**Figure 1** Electrocardiogram progression showing initial emergency presentation (A), ST-elevation in VI-V4 on day 2 (B), and resolution after one week (C), with a chest X-ray showing hyperinflated lungs without pneumothorax (D).

By the third day of hospitalization, the patient's bronchospasm and hypotension had improved, allowing for the gradual tapering of inotropic support. The patient was successfully weaned from mechanical ventilation and was subsequently transferred to the pulmonology ward on the fifth day. Repeat ECG prior to transfer showed the resolution of the previously noted ST-segment elevation (Image III).

Follow-up echocardiography performed two weeks after discharge demonstrated a normalization of left ventricular function, with an ejection fraction returning to within normal limits. The patient was discharged with optimized asthma management and continues to do well on follow-up.

## DISCUSSION

Takotsubo cardiomyopathy (TC) is a unique form of cardiomyopathy that typically presents as an acute coronary syndrome (ACS) but is characterized by transient left ventricular dysfunction in the absence of significant coronary artery disease. The patient described in this case report, a 32-year-old male, exhibited classic features of TC following intubation and mechanical ventilation, a scenario that has been infrequently reported in the literature. This case contributes to the growing body of evidence highlighting the potential for TC to occur even in atypical populations, such as young males, and under unusual stressors like mechanical ventilation.

The pathophysiology of TC is not fully understood, though it is widely believed that excessive catecholamine release in response to acute stressors plays a central role in the development of myocardial stunning and subsequent ventricular dysfunction (4). In this patient, the combination of severe bronchospasm, respiratory failure, and the physiological stress associated with prolonged

resuscitation and mechanical ventilation likely acted as the precipitating factors. This aligns with previous studies that have identified physical stressors, including surgical procedures and acute medical emergencies, as significant triggers for TC (8-13).

A notable aspect of this case is the successful differentiation of TC from acute myocardial infarction (AMI), which is critical given the similar clinical presentation. The initial ECG findings, which showed ST-segment elevation, coupled with rising troponin levels, initially suggested an acute coronary event. However, the absence of significant coronary artery disease on angiography, along with the characteristic apical ballooning seen on echocardiography, confirmed the diagnosis of TC. This case underscores the importance of considering TC in the differential diagnosis of patients presenting with features of ACS, particularly in the context of recent significant stressors, even in populations not typically considered at high risk, such as young males (11-16).

The strengths of this case report include the comprehensive diagnostic approach, which ensured the accurate identification of TC, and the timely management that resulted in a favorable outcome for the patient. The successful weaning from mechanical ventilation and the full recovery of left ventricular function on follow-up echocardiography demonstrate the reversibility of TC when appropriately managed. Additionally, the report highlights the importance of awareness among healthcare providers of the potential for TC in critically

This figure (Figure 1) illustrates the progression of electrocardiographic changes and a chest X-ray in a patient with acute coronary syndrome, highlighting the initial presentation, development of ST-elevation, and subsequent

resolution over one week, along with chest X-ray findings of hyperinflation.

However, this case also has certain limitations. As a single case report, the findings cannot be generalized to all populations or clinical scenarios. The exact mechanism by which mechanical ventilation may have precipitated TC in this patient remains speculative, and further research is needed to explore this potential association in greater detail. Additionally, the lack of long-term follow-up data limits the ability to comment on the recurrence risk or long-term outcomes for the patient (18, 19).

## CONCLUSION

In conclusion, this case underscores the need for heightened clinical awareness of Takotsubo cardiomyopathy, particularly in patients exposed to significant physiological stressors, such as intubation and mechanical ventilation. While TC is often considered a condition predominantly affecting older females, this report adds to the growing evidence that it can also occur in younger males under specific circumstances. Clinicians should maintain a high index of suspicion for TC in patients presenting with features of ACS following significant stress, and early recognition and appropriate management are crucial for ensuring favorable outcomes. Further research is recommended to better understand the pathophysiological mechanisms underlying TC in this context and to explore potential preventive strategies for high-risk patients.

## REFERENCES

- Amin HZ, Amin LZ, Pradipta A. Takotsubo Cardiomyopathy: A Brief Review. *J Med Life*. 2020;13(1):3. doi: 10.25122/jml-2018-0067.
- Boyd B, Solh T. Takotsubo Cardiomyopathy: Review of Broken Heart Syndrome. *JAAPA*. 2020;33(3):24-9. doi: 10.1097/01.JAA.0000654368.35241.fc.
- Kariyanna PT, Chandrakumar HP, Jayarangaiah A, Khan A, Vulkanov V, Ashamalla M, et al. Apical Takotsubo Cardiomyopathy in a COVID-19 Patient Presenting With Stroke: A Case Report and Pathophysiologic Insights. *Am J Med Case Rep*. 2020;8(10):350.
- Cau R, Pisu F, Porcu M, Cademartiri F, Montisci R, Bassareo P, et al. Machine Learning Approach in Diagnosing Takotsubo Cardiomyopathy: The Role of the Combined Evaluation of Atrial and Ventricular Strain, and Parametric Mapping. *Int J Cardiol*. 2023;373:124-33. doi: 10.1016/j.ijcard.2022.11.021.
- Brenner B, Corbridge T, Kazzi A. Intubation and Mechanical Ventilation of the Asthmatic Patient in Respiratory Failure. *Proc Am Thorac Soc*. 2009;6(4):371-9. doi: 10.1513/pats.P09ST4.
- Agarwal S, Sanghvi C, Odo N, Castresana MR. Perioperative Takotsubo Cardiomyopathy: Implications for Anesthesiologist. *Ann Card Anaesth*. 2019;22(3):309. doi: 10.4103/aca.ACA\_71\_18.
- Bairashevskaja AV, Belogubova SY, Kondratiuk MR, Rudnova DS, Sologova SS, Tereshkina OI, et al. Update of Takotsubo Cardiomyopathy: Present Experience and Outlook for the Future. *IJC Heart Vasculature*. 2022;39:100990. doi: 10.1016/j.ijcha.2022.100990.
- Lu X, Li P, Teng C, Cai P, Jin L, Li C, et al. Prognostic Factors of Takotsubo Cardiomyopathy: A Systematic Review. *ESC Heart Fail*. 2021;8(5):3663-89. doi: 10.1002/ehf2.13531.
- Angelini P, Uribe C, Tobis JM. Pathophysiology of Takotsubo Cardiomyopathy: Reopened Debate. *Tex Heart Inst J*. 2021;48(3). doi: 10.14503/THIJ-20-7490.
- Hanif M, Haider MA, Xi Q, Ali MJ, Khan MA. Takotsubo Cardiomyopathy Triggered by the Death of Pets (Cats): Two Case Reports. *Cureus*. 2020;12(9). doi: 10.7759/cureus.10690.
- Laghari AH, Khan AH, Kazmi KA. Takotsubo Cardiomyopathy: Ten Year Experience at a Tertiary Care Hospital in Pakistan. *BMC Res Notes*. 2014;7:932. doi: 10.1186/1756-0500-7-932.
- Maron BJ, Towbin JA, Thiene G, Antzelevitch C, Corrado D, Arnett D, et al. Contemporary Definitions and Classification of the Cardiomyopathies: An American Heart Association Scientific Statement From the Council on Clinical Cardiology, Heart Failure and Transplantation Committee; Quality of Care and Outcomes Research and Functional Genomics and Translational Biology Interdisciplinary Working Groups; and Council on Epidemiology and Prevention. *Circulation*. 2006;113(14):1807-16. doi: 10.1161/CIRCULATIONAHA.106.174287.
- Madias JE. Left Ventricular Outflow Tract Obstruction/Hypertrophic Cardiomyopathy/Takotsubo Syndrome: A New Hypothesis of Takotsubo Syndrome Pathophysiology. *Current Problems in Cardiology*. 2024 May 24:102668.
- Omiya M, Morii Y, Mukai M, Mitsuhashi Y, Kato K, Isogai T. Myasthenic Crisis and Concomitant Takotsubo Syndrome Complicated by Shock: A Case Report. *Internal Medicine*. 2024;3306-23.
- Muto T, Kyono H. A woman with schizophrenia who died due to Takotsubo cardiomyopathy occurring after electroconvulsive therapy. *BMC psychiatry*. 2024 Feb 19;24(1):139.
- Vu VH, Nguyen TC, Nguyen BT, Tran H, Truong BQ. Clinical characteristics and risk factors of in-hospital

mortality in patients with Takotsubo syndrome. *MedPharmRes.* 2024;8(1):64-73.

17. AlShehabi N, Hallak Y, Battistin U, Faraji H, Othman M, Alkawatli H, Butt M, Hallak YO. Takotsubo Cardiomyopathy Complicating Diabetic Ketoacidosis, Hypothermia and Hyponatremia in a Comatose Patient. *Cureus.* 2024 Jul 20;16(7).
18. Mishra T, Saha R, Paramasivam G. Takotsubo cardiomyopathy in India and its electrocardiography (ECG) comparison to myocardial infarction. *The Egyptian Heart Journal.* 2024 Feb 21;76(1):26.
19. Hanif M, Vasigh M, Malik M, Jaiswal V, Shrestha A, Kozman H. Acute myocardial infarction due to coronary artery embolism in atrial fibrillation in Takotsubo cardiomyopathy patient: A case report. *Authorea Preprints.* 2024 Apr 28.