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Case Report

CARDIOLOGY AND CARDIOVASCULAR MEDICINE

ISSN: 2572-9292

Caught in the Trap: Takotsubo Cardiomyopathy Masquerading as Acute Hypoxic Respiratory Failure" a case report

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Abstract

Takotsubo syndrome (TTS), also known as Gebrochenes-Herz syndrome or "octopus trap" by Japanese fishermen, is a reversible non-ischemic cardiac pathology characterized by regional wall motion abnormalities visible on echocardiogram. While its etiology remains unknown, factors such as sudden catecholamine surges and emotional stress have been implicated. Here, we present a case of TTS in a 73-year-old female who presented with acute hypoxic respiratory failure requiring intubation. Initially suspected to be anaphylaxis or stroke, further evaluation revealed classic findings of TTS on transthoracic echocardiogram. Despite initial challenges in obtaining a detailed history due to intubation, the patient's recent severe emotional distress following the death of her pet cat emerged as a significant stressor. Management involved guideline-directed medical therapy, and the patient was discharged to a rehab facility on the eighth post-admission day. This case underscores the importance of considering TTS in patients presenting with acute hypoxic respiratory failure, particularly in elderly females with recent stressful events, and highlights the need for prompt evaluation with point-of-care ultrasound to facilitate early diagnosis and appropriate management.

Keywords: Takotsubo syndrome; Gebrochenes-Herz syndrome; Octopus trap; Non-ischemic cardiac pathology; Regional wall motion abnormalities; Echocardiogram; Catecholamine surges; Emotional stress; Hypoxic respiratory failure; Anaphylaxis.

Introduction

Japanese fishermen refer to it as an octopus trap, whereas physicians call it Gebrochenes-Herz syndrome. Takotsubo syndrome (TTS) is a reversible non-ischemic cardiac pathology characterized by regional wall motion abnormalities easily detectable on an echocardiogram. These abnormalities affect areas supplied by more than one vessel. Despite an unknown etiology, multiple associated factors have been identified. These include sudden catecholamine surges, both endogenous (secondary to anaphylaxis and severe emotional stress) and exogenous (administration of catecholamines routinely used to treat anaphylactic reactions) [1] as well as stimulant drug use like amphetamines, cocaine [3], and acute ischemic stroke [2]. We report a case of Takotsubo cardiomyopathy presenting as acute hypoxic respiratory failure requiring invasive ventilation.

Case presentation: A 73-year-old female with a past medical history significant for hypertension, brain aneurysm status post coiling x 2, ventriculoperitoneal shunt placement, hyperlipidemia, GERD, vocal cord

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Citation: Bilal Muhammad, Cindy Nguyen, Khurram Arshad, Rabia Latif, Farman Ali, Yazan Alamro, Siri Vallabah Reddy, and Mohsin Ahmad. Caught in the Trap: Takotsubo Cardiomyopathy Masquerading as Acute Hypoxic Respiratory Failure" a case report. Cardiology and Cardiovascular Medicine. 8 (2024): 227-231.

Received: April 05, 2024
Accepted: April 12, 2024
Published: May 21, 2024

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DOI:10.26502/fccm.92920383

polyps, and generalized anxiety disorder presented to our hospital with concerns of angioedema and anaphylactic reaction.

Events before arrival at the hospital: The patient was found by her son in her room, experiencing shortness of breath and inability to speak, prompting a call to emergency medical services. The patient received 0.6 mg of epinephrine during transport and nebulized ipratropium and albuterol twice without significant improvement. The patient's last known normal baseline was reported at 11:30 AM, with her son discovering her around 4 PM, drooling. Family members suggested possible recent exposure to fiberglass during construction work, raising concerns of an allergic reaction.

Hospital course: Upon arrival at the emergency room, the patient was still drooling, reported throat swelling, and appeared disoriented but responsive. She could easily follow commands and requested a pen and paper to write her medical history. With worsening symptoms and hypoxia, her saturation dropped to the low 80s, prompting elective intubation because of concerns of worsening angioedema and suspected stroke.

She was admitted to the ICU for further evaluation and management as there were concerns for angioedema and suspected cerebrovascular events. A stroke workup, including a CT scan of the head without contrast, showed a right ventricular shunt in place without evidence of hydrocephalus or any acute changes. Lab work on presentation showed an unremarkable complete blood count, slightly elevated thromboplastin time of 42.5, clear urinalysis, metabolic profile concerning elevated glucose of 199, elevated cholesterol 263, lipoprotein HDL 161, LDL 72, troponin 517. Serial EKGs were done, and troponins were trended, with the highest value recorded at 3222 (normal upper limit of 66). Loading doses of aspirin and high-dose statin were initiated.

Further workup, including carotid ultrasound, showed no significant stenosis, and a CT angiogram of the head and neck did not show any occlusive changes, vascular stenosis, or hemorrhages. Upon contacting the family on day 2, it was later revealed that the patient had a cat that she had been taking care of for the last ten years, and it had passed approximately a week ago. She was in severe emotional distress, secondary to that.

As a part of the stroke workup, a transthoracic echocardiogram was ordered to rule out any ASD or PFO. However, to our surprise, it revealed the classic findings of apical ballooning with a hyperdynamic base suggestive of Takotsubo cardiomyopathy versus triple-vessel disease and an ejection fraction of 35 to 40% with grade 1 diastolic failure.

The left ventricle can be visualized with a normal diastolic filling pattern in Figure 1, whereas Figure 2 shows classic apical ballooning during systole, resembling an inverted octopus trap, as seen in Figure 3.

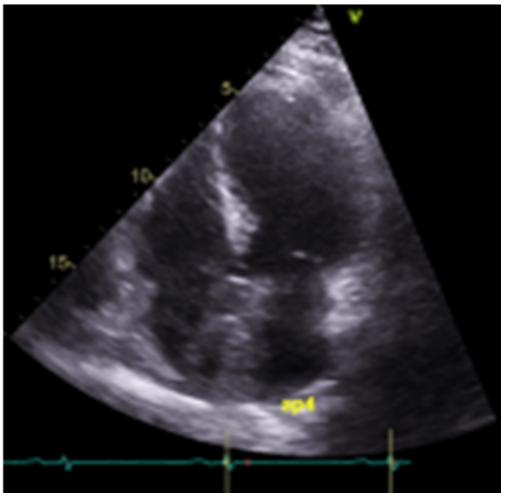

Figure1: The left ventricle can be visualized with a normal diastolic filling pattern

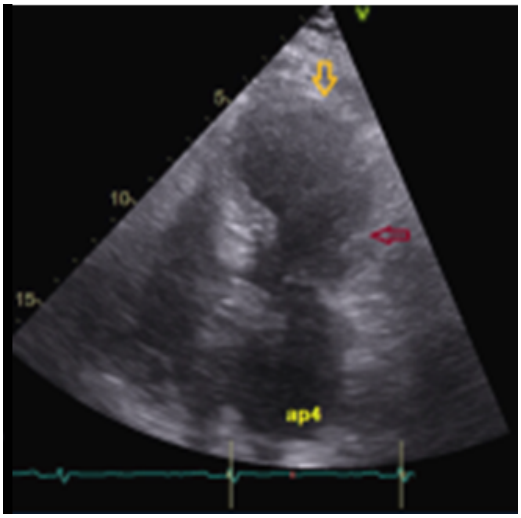

Figure 2: Shows classic apical ballooning during systole

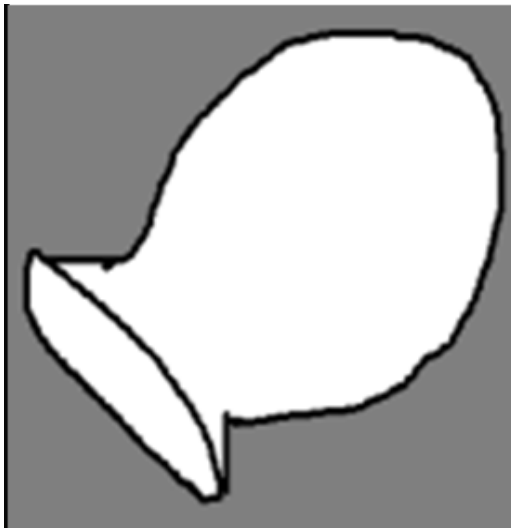

Figure 3: Resembling an inverted octopus trap

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DOI:10.26502/fccm.92920383

Cardiology was consulted and recommended to continue aspirin and statin, and performed a left heart catheterization to rule out ischemic cardiomyopathy, which showed no obstructive coronary artery disease and decreased ejection fraction and classical findings of TTS as shown in the following images.

Figure-4 demonstrates normal coronary arteries without any significant obstruction. Figure 5-6 shows classical apical ballooning during systole.

The diagnosis of Takotsubo cardiomyopathy was established. The following morning, she was extubated with no post-extubation complications, and the cardiology team started her on guideline-directed medical therapy, including ACE, ARB, and spironolactone, and she was discharged to a rehab facility on the eighth post-admission day.

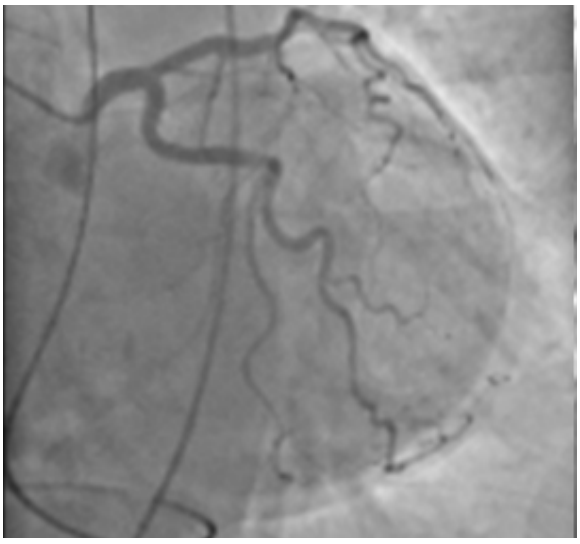

Figure 4: Demonstrates normal coronary arteries without any significant obstruction

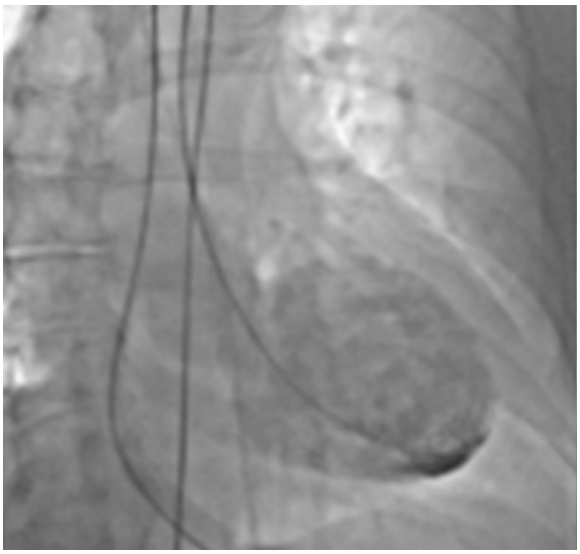

Figure 5: Shows classical apical ballooning during systole

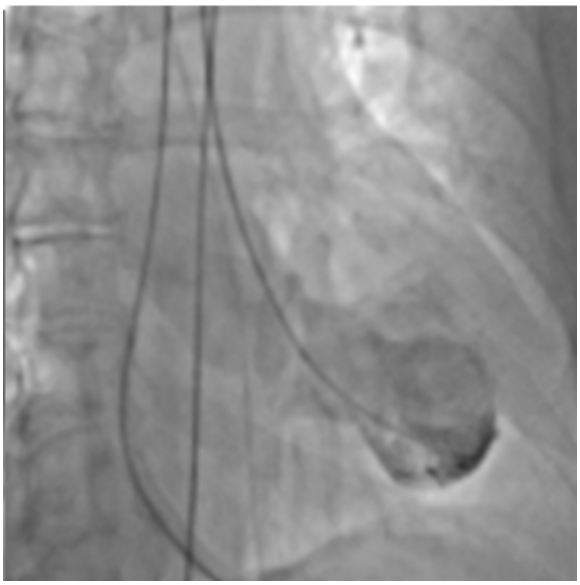

Figure 6: Shows classical apical ballooning during systole

Discussion

Takotsubo syndrome, first described by [4] in 1990, has an estimated incidence of 1-3% [5], with a predilection for elderly females [6, 7, 8]. Although age itself doesn't significantly impact outcomes, extremes in age present predictable risks, such as arrhythmias in younger patients and heart failure in older adults [9]. The pathophysiology remains unclear, with proposed mechanisms including coronary vasospasm, microcirculatory dysfunction, and catecholamine excess [10]. One of the most commonly presenting and worked-up symptoms in the hospital is chest pain, which is usually linked to cardiac events. Physicians are prone to overlook hypoxic respiratory failure with dyspnea as a cardiac symptom, instead attributing it to some underlying pulmonary pathology secondary to confirmation bias. Interestingly, one of the common presenting symptoms of TTS is new-onset dyspnea. While reliable scoring systems such as InterTak [11] score exist, they are rarely used in the hospital setting to evaluate someone presenting with new onset dyspnea. Our patient presented with new onset dyspnea with hypoxic respiratory failure requiring intubation, which raised concerns for anaphylaxis or stroke secondary to the history provided by family members. Both were later ruled out as CT scan head, CTA head, and neck were unremarkable, and there was no visible laryngeal edema during intubation. Being intubated during the presentation, it was challenging for us to obtain a detailed medical history from the patient and establish a timeline of events, which we could do later as we had more details from different family members and the patient herself. She had some mild troponin elevation to 513, which later up-trended to 3222. However, her serial EKGs were unremarkable, and she denied any chest pain. Takotsubo has been linked with the exogenous administration of epinephrine for allergic reactions in the past [12]. This could

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DOI:10.26502/fccm.92920383

be the case for our patients. However, the recent stressor of her cat dying could have also led to her symptoms. We are reporting this case as we believe that TTS can present with hypoxic respiratory failure with new onset dyspnea, which anyone can easily confuse with an anaphylactic reaction or a stroke. Luca et al. [13] evaluated the GIEST (German Italian Takotsubo) registry and hypothesized that the dyspnea on the presentation could be used as a prognostic factor for patients. While most cases present with chest pain with associated dyspnea, there have been multiple case reports in the past where TTS diagnosis was elusive and the only presenting symptom was dyspnea [14-36], and there has been a similar case to our patient where an elderly female presented with dyspnea [19]. Mention the timeline table for our patient. In these cases, the main presenting symptom was new onset dyspnea instead of chest pain.

Management

Depending on its presentation, TTS is usually managed conservatively, with the most important factor being the removal of the stressor. If a patient presents with cardiogenic shock, a trial of dopamine and dobutamine can be used, keeping left ventricular out-flow in mind.

Conclusion

TTS is a well-known condition, and multiple cases have been reported since its initial description in 1990. The primary presenting symptom in the majority of cases is chest pain. However, a subset of patients presents solely with worsening hypoxic respiratory failure, which can be mistaken for anaphylaxis, airway compromise, or a new onset cerebrovascular accident (CVA). There should be a high index of suspicion for Takotsubo cardiomyopathy in these patients, particularly if they match a specific patient profile, such as elderly post-menopausal females with recent stressful events. TTS is reversible and is typically managed similarly to heart failure. We recommend that all elderly females with otherwise unexplained new-onset dyspnea in the context of recent stressful life events undergo screening with point-of-care ultrasound for TTS upon presentation.

Conflicts of interest for all authors:

None to declare

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Citation: Bilal Muhammad, Cindy Nguyen, Khurram Arshad, Rabia Latif, Farman Ali, Yazan Alamro, Siri Vallabah Reddy, and Mohsin Ahmad. Caught in the Trap: Takotsubo Cardiomyopathy Masquerading as Acute Hypoxic Respiratory Failure" a case report. Cardiology and Cardiovascular Medicine. 8 (2024): 227-231.

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