International Journal of Academic Health and Medical Research (IJAHMR)
ISSN: 2643-9824
Vol. 8 Issue 10 October - 2024, Pages: 78-81

Postpartum Takotsubo Syndrome: Unveiling the Heartbreak of New Motherhood

IDRISSI Hicham, FDILI ALAOUI Fatimazahrae, BELHAJ Yassine, JAYI Sofia, CHAARA Hikmat, MELHOUF My Abdelilah

Service de Gynécologie Obstétrique II ,
CHU Hassan II de Fés
Fés, Maroc

Abstract: *Takotsubo cardiomyopathy (TCM), commonly known as stress-induced cardiomyopathy, is typically triggered by psychological or physical stress and is most frequently observed in postmenopausal women. However, cases of TCM related to pregnancy are exceedingly rare. First described in the 1990s, this condition remains poorly understood. While it is known to be triggered by acute stressors, the precise underlying mechanisms of TCM are not well defined. Proposed etiologies include excessive catecholamine release, hormonal influences, microvascular ischemia, or vasospasms. Clinically, TCM often mimics an acute coronary syndrome (ACS), presenting with angina-like chest pain, ischemic ECG changes, and elevated cardiac biomarkers. A key feature of TCM is the echocardiographic finding of severe left ventricular dysfunction, typically characterized by regional hypokinesia or apical ballooning. ECG abnormalities, such as ST-segment elevations, diffuse T-wave inversions, and occasionally prolonged QTc or ST-segment depressions, are also common. Although cardiac biomarkers are elevated in TCM, they tend to be less pronounced than in ST-segment elevation myocardial infarction (STEMI). We report a unique case of a 46-year-old woman who developed TCM two hours postpartum. This case underscores the need for awareness of TCM as a potential complication in the postpartum period, even in younger women.*

Keywords— Takotsubo cardiomyopathy, stress-induced cardiomyopathy, acute coronary syndrome, echocardiography, left ventricular dysfunction, catecholamines, microvascular ischemia, EKG abnormalities, cardiac biomarkers.

1. INTRODUCTION

Cardiomyopathy refers to a disorder affecting the structure and function of the heart muscle, occurring independently of coronary artery disease (CAD), hypertension, valvular disease, or congenital heart defects. It can be either acquired or genetic, encompassing several forms, including hypertrophic, restrictive, and dilated cardiomyopathy (DCM). Takotsubo cardiomyopathy (TTCM) and Peripartum cardiomyopathy (PPCM) are often categorized under DCM.

TTCM, frequently mimicking acute coronary syndrome (ACS), is characterized by transient apical ballooning of the left ventricle (LV) without significant coronary artery stenosis, as observed in angiography. This condition, often triggered by acute emotional stress, is also known as "stress cardiomyopathy" or "broken-heart syndrome."

While TTCM is predominantly recognized as a condition affecting elderly postmenopausal women, its occurrence during pregnancy is not as well known. This limited awareness underscores the principle that "one cannot see what the mind does not know." This article presents a brief overview of TTCM's diagnosis, clinical presentation, and management in the postpartum period through a case report, emphasizing its distinctions from PPCM.

2. CASE PRESENTATION

A 46-year-old woman, with an unremarkable medical history, presented for a scheduled cesarean section in Sefrou. This was her third cesarean section, and she delivered a healthy term baby. However, during the procedure, she experienced an acute onset of rhythm disturbances and dyspnea. Postoperatively, her dyspnea progressed to New York Heart Association (NYHA) Class IV, with no accompanying orthopnea, chest pain, or palpitations.

On admission, her clinical examination revealed a blood pressure of 124/81 mmHg in the right arm and 110/75 mmHg in the left arm, a heart rate of 125 beats per minute, and an oxygen saturation of 98% on room air. Cardiovascular examination was unremarkable, and her pleuropulmonary assessment showed no crackles. Postpartum examination findings included a clean cesarean scar with minimal lochia and good uterine involution.

Given the severity of her symptoms, the patient was immediately admitted for urgent monitoring with oxygen supplementation via nasal cannula. Initial investigations included an electrocardiogram (EKG) that demonstrated a normal sinus rhythm, a heart rate of 100 beats per minute, ST segment elevation with circumferential necrotic Q waves, left ventricular hypertrophy (LVH), as shown in the figure below and a markedly elevated troponin level of 3284 ng/L. Chest computed tomography (CT) excluded pulmonary embolism.

International Journal of Academic Health and Medical Research (IJAHMR)
ISSN: 2643-9824
Vol. 8 Issue 10 October - 2024, Pages: 78-81

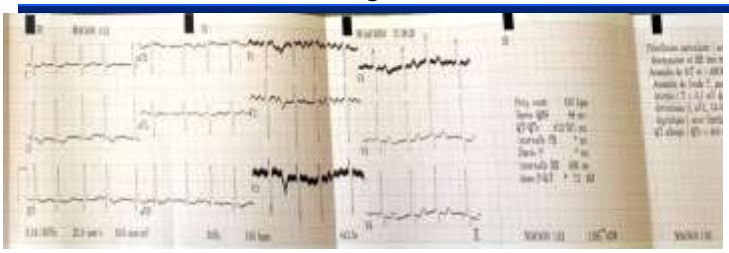
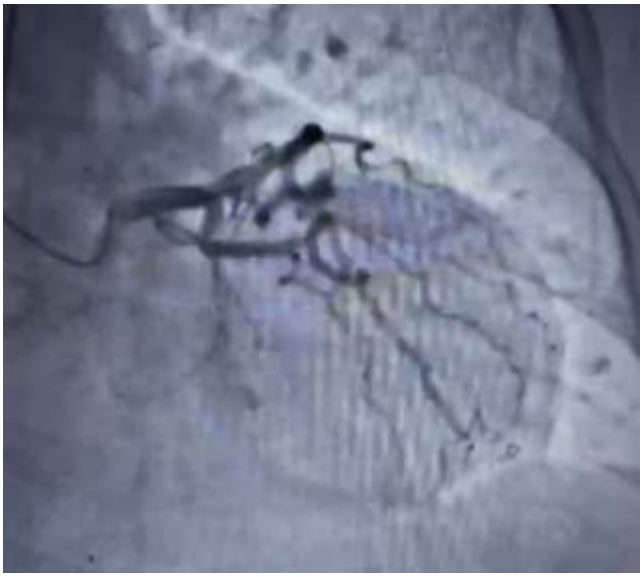


Figure 1 : EKG

A transthoracic echocardiogram revealed a left ventricle with non-dilated morphology and moderately impaired systolic function, with a left ventricular ejection fraction (LVEF) of 40%. The echocardiogram also showed antero-septal akinetic motion, non-dilated right heart chambers, a non-dilated and compliant inferior vena cava, and a dry pericardium.

The patient's medication regimen included clopidogrel, aspirin, a curative dose of low-molecular-weight heparin (LMWH), bisoprolol, rosuvastatin, and omeprazole. A venous Doppler study was performed and returned normal results. Additionally, a cardiovascular risk factor assessment confirmed that the patient does not smoke or consume alcohol.

A scheduled coronary angiogram showed no evidence of significant coronary artery disease, coronary dissection, spasm, or myocardial bridging as shown in the figure bellow (figure 2).



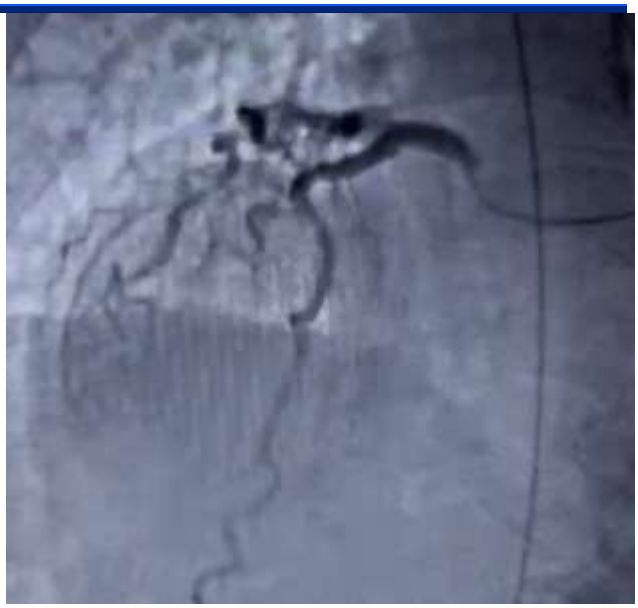


Figure 2: Left and right heart catheterization demonstrating angiographically normal coronary arteries.

3. Discussion

Despite being identified in the 1990s, Takotsubo cardiomyopathy (TCM) remains an enigmatic condition. While it is known that acute stressors often trigger TCM, the underlying mechanisms are still not fully understood. Several potential etiologies have been proposed, including excessive catecholamine release during stress, hormonal factors, microvascular ischemia, or coronary spasms.

The clinical presentation of TCM closely resembles that of acute coronary syndrome (ACS), often manifesting as angina-like chest pain, ischemic changes on the EKG, and elevated cardiac biomarkers, but their levels are generally more modest compared to those seen in ST-elevation myocardial infarctions.

A distinguishing feature of TCM is the echocardiographic finding of severe left ventricular dysfunction, typically characterized by regional wall motion abnormalities, with the apex being hypokinetic or showing apical ballooning. EKG abnormalities are prevalent, including ST-segment elevations, diffuse T wave inversions, and prolonged QT intervals, with ST depressions being observed less frequently.

TCM is relatively rare in pregnancy or the peripartum period, contrasting with its occurrence in postmenopausal women. Post-partum cardiomyopathy (PPCM), on the other hand, is specifically associated with pregnancy, typically presenting in the last month of pregnancy or in the early postpartum period. (Pelliccia F., 2017).

Peripartum cardiomyopathy (PPCM) is well-documented, with established risk factors including advanced maternal age, African descent, history of preeclampsia, multiparity, and twin pregnancies (Yaqub Y., 2009). Our patient exhibited one

of these risk factors associated with PPCM, such as advanced maternal age.

It is crucial to distinguish between PPCM and Takotsubo cardiomyopathy (TCM) due to their differing management approaches and follow-up requirements. For instance, beta-adrenergic inotropic agents are beneficial in PPCM but are contraindicated in TCM (Citro R., 2017). Moreover, left ventricular function typically demonstrates complete and more rapid recovery in TCM compared to PPCM (Itagane M., 2021), (Citro R., 2017).

The terminology and diagnostic criteria for Takotsubo cardiomyopathy (TCM) have undergone evolution over time. Initially, TCM was defined by Mayo Clinic's diagnostic criteria established in 2004 (Oindi F. M., 2019). These criteria include characteristic findings such as hypokinesis of the left ventricular mid segment, with or without involvement of the apex, absence of obstructive coronary artery disease on angiography, new EKG abnormalities or elevated troponin levels, and the exclusion of myocarditis or pheochromocytoma (Oindi F. M., 2019), (Templin C., 2015). Our patient met all these criteria, confirming the diagnosis of TCM.

Recent research has further refined the diagnostic approach to TCM, delineating it into "primary" and "secondary" forms. Primary TCM occurs when the initial stressor leading to cardiac symptoms is not immediately identifiable, and the patient typically seeks medical attention primarily for cardiac concerns. In contrast, secondary TCM occurs in patients already hospitalized for other reasons, such as surgical procedures, psychiatric conditions, or obstetric events (Lyon A. R., 2016). In our patient's case, the presumed inciting stressor was her pregnancy, which imposed significant emotional and physical stressor.

This distinction is crucial as TCM should be considered in the differential diagnosis of various pregnancy-related complications, including peripartum cardiomyopathy, spontaneous coronary artery dissection (SCAD), and eclampsia. Understanding these distinctions aids in appropriate management and treatment strategies tailored to the specific underlying cause. TCM is associated with a relatively good long-term prognosis, as complete recovery of LV systolic function occurs within days or weeks (Templin C, 2015), However, heart failure, cardiogenic shock, and other serious cardiac complications have been reported during the acute phase (Citro R., 2017).

There is a lack of established guidelines for managing Takotsubo cardiomyopathy (TTCM), largely due to the absence of prospective randomized trial data. Current treatment strategies are primarily informed by clinical experience and expert consensus. An expert committee has suggested a diagnostic approach for non-pregnant adults.

For patients presented with chest pain and dyspnea, ECG is the primary diagnostic tool to detect ST-segment changes. If no ST-segment elevation is observed, the InterTAK Diagnostic Score is applied. A score below 70 suggests a low to intermediate likelihood of Takotsubo cardiomyopathy (TTCM), requiring a coronary angiogram (CAG) to rule out acute coronary syndrome (ACS). Scores above 70 indicate a high suspicion of TTCM, leading to the use of Transthoracic Echocardiography (TTE). Specific ECG findings such as T-wave inversion, Q waves, peaked T waves, and a prolonged QT interval are more common in Reverse Takotsubo Cardiomyopathy (rTTCM), with bradycardia and first-degree AV block noted in postpartum cases.

CAG and left ventriculography in TTCM typically show akinetic segments in the mid and left ventricular apex with hyperdynamic basal segments, alongside normal coronary arteries or atherosclerosis not aligning with the extent of LV dysfunction or regional wall motion abnormalities.

Acute management of Takotsubo cardiomyopathy (TTCM) in the peripartum period should initially focus on excluding and treating possible acute coronary syndrome (ACS) with a multidisciplinary approach and intensive monitoring during the first 48 hours. Standard AMI treatments like morphine, oxygen, and aspirin are necessary, though morphine should be used cautiously near delivery due to risks to the neonate. The use of antiplatelets in TTCM lacks strong evidence in the absence of CAD.

For acute heart failure, a combination of ACE inhibitors (ACEI), angiotensin II receptor blockers (ARB), beta-blockers, diuretics, and nitroglycerin is recommended, although ACEI and ARBs are contraindicated during pregnancy. Beta-blockers like labetalol, metoprolol, and propranolol are advised for rate control but must be used with caution in bradycardia or prolonged QT intervals. Calcium channel blockers like amlodipine are safe for hypertension during pregnancy.

In cases of cardiovascular collapse, management depends on the presence of left ventricular outflow tract obstruction (LVOTO). LVOT gradients should be assessed, and pulmonary edema excluded. Fluid therapy and beta-blockers are recommended, with inotropes reserved for shock or cardiac arrest due to the risk of triggering TTCM (D'Amato N, 2008). Mechanical circulatory support may be necessary for refractory cases.

Levosimendan, a calcium sensitizer, is effective but costly, making fluid resuscitation and short-acting beta-blockers alternative options. ECMO has been reported in severe cases. Bromocriptine, used in PPCM treatment, can cause coronary vasospasm, highlighting the need to differentiate between PPCM and TTCM for proper management (Kandah F, 2022).

4. Conclusion

Takotsubo cardiomyopathy (TTCM) is more prevalent during pregnancy and the postpartum period than previously recognized. A high level of clinical suspicion, along with a comprehensive understanding of the disease's diagnosis,

progression, and management, is crucial for reducing maternal morbidity and mortality. Future research should aim to elucidate the relationship between declining estrogen levels and catecholamine surges at the onset of TTCM symptoms. The establishment of definitive guidelines for the diagnosis and management of TTCM is essential for achieving successful outcomes.

5. REFERENCES

Citro R., B. M. (2017). *Subsequent safe pregnancy with cesarean delivery in a patient with a history of peripartum takotsubo syndrome complicated by cardiogenic shock.* Journal of Cardiovascular Echography .

D'Amato N, C. P. (2008). *Tako-Tsubo syndrome in a pregnant woman.* Eur J Echocardiogr .

Itagane M., N. J. (2021). *Postpartum pheochromocytoma-induced takotsubo syndrome.* . BMJ Case Reports.

Kandah F, D. T. (2022). *A case of postpartum takotsubo (Stress) cardiomypathy.* Case Rep Cardiol .

Lyon A. R., B. E. (2016). *Current state of knowledge on Takotsubo syndrome: a position statement from the Taskforce on Takotsubo Syndrome of the Heart Failure Association of the European Society of Cardiology.* European Journal of Heart .

Oindi F. M., S. E. (2019). Takotsubo cardiomyopathy in pregnancy: a case report and literature review. .

Pelliccia F., K. J. (2017). *Pathophysiology of takotsubo syndrome.*

Templin C, G. J. (2015). *Clinical features and outcomes of Takotsubo (Stress) cardiomyopathy.* N Engl J Med.

Templin C., G. J. (2015). *Clinical features and outcomes of Takotsubo (stress) cardiomyopathy.* The New England Journal of Medicine .

Yaqub Y., J. L. (2009). *Postpartum depression and apical ballooning syndrome (takotsubo syndrome)* . Journal of Obstetrics and Gynaecology Canada .