



Stress Induced Cardiomyopathy (Takotsubo) in a Post-Operative Pregnancy Induced Hypertension Patient Operated for Caesarean Section: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. 'All authors read and approved the final manuscript.'

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Case Report

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ABSTRACT

This is a case of a 30 year old female, with Pregnancy Induced Hypertension and history of psychiatric illness in the past, subsequently developed TCM in the intra-operative period. ECG showed subtle fresh changes. There were multiple stressors for our patient namely acute blood loss, spinal anaesthesia and history of psychiatric illness. The decision on the timing and mode of delivery should be guided by obstetrical reasons. A multidisciplinary team of cardiologists, obstetricians, neonatologists, and psychologists should be involved. This case highlights the importance of being extra vigilant in patients having psychiatric disorders undergoing any surgical procedure especially caesarean section.

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1. INTRODUCTION

In the absence of coronary artery disease, Takotsubo cardiomyopathy (TCM), also known as stress induced cardiomyopathy, is described by new onset left ventricular dysfunction with variable wall motion abnormalities [1]. Takotsubo cardiomyopathy (TCM), also known as stress induced cardiomyopathy, Clinically is characterized by new onset left ventricular dysfunction with variable wall motion defects in the absence of coronary artery disease (CAD) [2]. Cardiac function normally returns in a matter of days or weeks. Emotional or psychological stress is a frequent TCM cause, with a high incidence seen in patients with psychiatric disorders [3]. The so-called stress response to trauma and surgery often includes preoperative anxiety in anticipation of surgery [4]. Cardiogenic shock and cardiac arrhythmias may be present at the time of presentation. Although the exact cause of the syndrome is unclear, it is thought to be caused by exaggerated sympathetic crises exacerbated by severe emotional and physical stress, which result in catecholamine storm and myocardial stunning [5]. Majority of TCM cases in pregnancy are described in the peripartum period irrespective of the mode of delivery making it difficult to differentiate TCM from peripartum cardiomyopathy [6].

2. CASE REPORT

A 30 year old primi patient with 37 weeks gestational age with PIH, came with fetal tachycardia and was taken for emergency caesarean section. Apart from having Pregnancy induced hypertension; her medical history included some psychiatric disorder in the past for which she was on antipsychotic medications since 3 years, the records for the same were not available as the patient was not a booked case and had come in emergency. She discontinued the medication after she conceived. Cardiovascular and Respiratory clinical examination were within normal limits. BP was 134/86, Pulse was 76/m and SPO₂ was 98% on room air. Preoperative lab investigations like CBC, PT, INR were within normal limits. Baseline 12 lead ECG was not available as the patient presented in emergency. On arrival to the OT, her vitals were BP: 136/76, P: 84b/m; SPO₂: 97% on room air. Patient was anxious but cooperative. Successful Subarachnoid Block was

performed with 2 ml 0.5% hyperbaric Bupivacaine with 60 mcg Buprenorphine. Incision was given and the baby was delivered within 5 mins. The patient complained of chest pain and shortness of breath and haemodynamic instability appeared immediately following baby delivery. BP increased to 160/100 mm of Hg and patient had tachycardia of 150/m. Occasional ectopics appeared. Saturation dropped to 94%. O₂ by Hudson's mask @ 5 L/m was started. Patient continued to complain of chest discomfort. The level of anaesthesia was confirmed to rule out high spinal level. Level achieved was T6, 10 units Iv Oxytocin started post baby delivery, haemostasis achieved and closure was done within 20 mins. Ecg changes in the form of ST depression and T wave inversion appeared in lead II on the monitor. Meanwhile after 15 mins the saturation increased to 99% and BP settled to 106/68 mmHg. Tachycardia settled to 96/m. Oxygenation was continued. Auscultation of lungs and heart revealed no pathological sounds. 12 lead ECG was done immediately which showed t wave inversion and ST depression in Lead 2, avf, V2-V4 suggestive of anterior and inferior wall ischemia.

Patient was shifted to cardiology centre for intensive cardiac monitoring. Cardiac enzymes were done; troponin levels were normal. ECHO was done for this patient, which revealed apical ballooning. The patient had similar episode in the ICU on the next day. She was intensively monitored and discharged after 3 days.

3. DISCUSSION

TCM mimics myocardial infarction or peripartum cardiomyopathy. It should be considered as a medical emergency as it typically presents as Acute Coronary Syndrome. TCM is commonly triggered by psychosocial stressors [7]. Our patient had a history of depressive illness which may have predisposed to TCM. Hypertension increases afterload, this may cause a demand-supply mismatch leading to a type 2 non-ST-elevation myocardial infarction (NSTEMI) [8]. Diagnosis of TCM requires an electrocardiogram (ECG), cardiac biomarkers, echocardiography and left heart angiography [9]. The ECG changes in the form of ST segment elevation in the anterior and precordial leads with some having ST segment depression are present. Few

patients may present with QT interval prolongation, T wave inversion, abnormal Q waves [10]. The majority of patients will have slightly elevated cardiac troponin levels with normal to mildly elevated creatinine kinase. The Transthoracic echocardiography findings show a

large area of regional wall motion akinesia of the LV extending beyond the territory of a single coronary artery [11] and also apical ballooning of the LV with normal basal contractility. The LV ejection fraction is often reduced ranging from 20 to 49%.



Fig. 1. Immediate post op 12 lead ecg of the patient

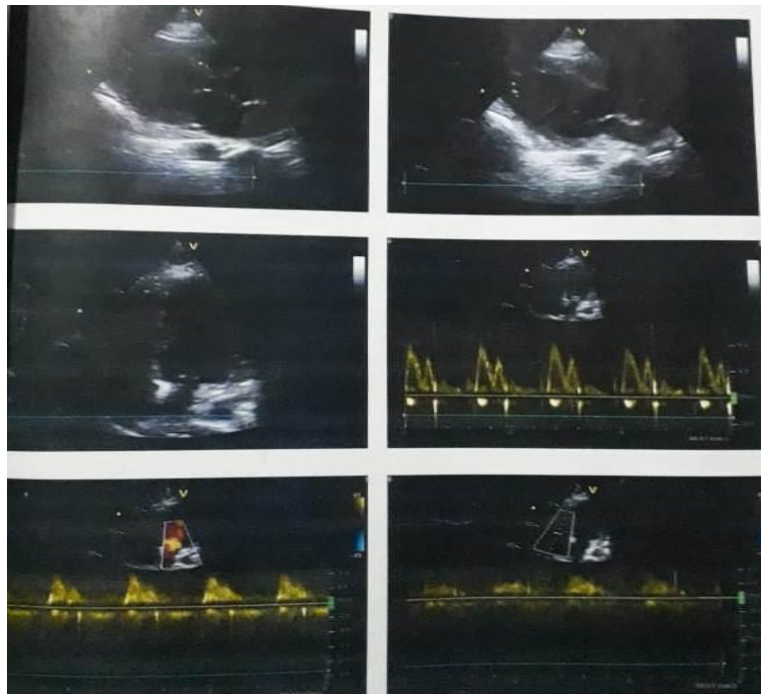


Fig. 2. ECHO Image of the patient in ICU

The Mayo Clinic diagnostic criteria are used to make a TCM diagnosis:

- (A) Presence of transient left ventricular akinesia, hypokinesia, or dyskinesia with or without apical involvement; this regional ventricular wall motion abnormality spreads beyond a single epicardial vascular perfusion territory.
- (B) Absence of obstructive coronary disease
- (C) Angiographic evidence of acute plaque rupture

ECG anomalies such as ST-segment elevation with or without T-wave inversion) or moderately elevated cardiac troponin levels may also be present [12]. Finally, myocarditis and pheochromocytoma must be ruled out. Our patient's ECG abnormalities were sporadic, and there was no angiographic evidence of acute plaque breakup or vessel occlusion, so he met the Mayo criterion for TCM. Because of the increased contractility of the base of the heart, about 25% of TCM cases may develop Left Ventricular Outflow Tract (LVOT) obstruction. The use of echocardiography for early diagnosis and treatment results in outcomes that are equivalent to those that do not have LVOT [13]. Within 4 to 8 weeks, the majority of patients regain normal cardiac function. By one week after birth, our patient's heart failure signs had disappeared, and he had fully recovered. Diuretics, angiotensin-converting enzyme inhibitors, and beta blockers are used to treat these patients. If taking beta blockers, pregnant women should have ultrasounds every four weeks to control fetal growth because of the connection to fetal growth restriction [14].

Physical or emotional stress is normally relieved quickly, but some patients can experience severe complications such as acute heart failure or cardiogenic shock, necessitating admission to a coronary cardiac unit and the use of invasive procedures such as an intra-aortic balloon pump and cardiopulmonary support [15]. Recurrence of TCM in premenopausal women is rare. Since certain patients are at risk for significant adverse cardiac and cerebrovascular events after discharge, close monitoring is needed. The adrenergic response in a psychiatric patient is often heightened by preoperative anxiety [16]. There is no consensus about the best anaesthetic management for a patient who has had stress induced cardiomyopathy in the past. Regional anaesthesia is considered the best and most effective technique for such patients,

despite the lack of evidence. Because of the reduced stress response, proper anxiolytic premedication before surgery results in a lower incidence of surgical site infection and up to 30 days after surgery [17-20].

4. CONCLUSION

The past history of psychiatric illness could have led to the catecholaminergic storm and exaggerated the adrenergic response. Stress increases circulating catecholamine resulting in more persistent physiological changes in women rather than men. So due consideration and proper vigilance should be kept on patient's suffering from any psychotic disorder in any surgery especially caesarean section. Further studies are needed to understand the relationship between PIH with psychiatric illness and TCM. Role of prophylactic anxiolytic drugs in such patients to prevent TCM needs consideration.

CONSENT AND ETHICAL APPROVAL

Ethical clearance taken from institutional ethics committee & patient's written consent has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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