Case report

Broken heart syndrome in a new mother with HELLP syndrome: a case report

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Abstract
Introduction
Takotsubo cardiomyopathy, more commonly known as broken heart syndrome, is increasingly being recognized as a clinical phenomenon and reported in the medical literature. It is a type of nonischaemic cardiomyopathy usually precipitated by acute emotional stress, in which there is sudden temporary weakening of the myocardium with potentially serious sequelae. From our review of the present literature, we believe this case is unique as it is the first reported case where severe preeclampsia/hypertension, elevated liver enzymes, low platelets (HELLP) syndrome is postulated as the acute precipitant for Takotsubo cardiomyopathy. This interesting case highlights the importance of retaining an inquisitive mind in obstetrics as to possible differential diagnoses and involving relevant medical specialists early to achieve the best outcome for the patient.

Case report
A 26-year-old primigravida developed acute-onset severe chest and epigastric pain 2 h after normal vaginal delivery. Investigations revealed that she had developed severe preeclampsia with HELLP syndrome (hypertension, elevated liver enzymes, low platelets) and acute renal failure. A marked rise in serial troponins was noted, and ECHO (echocardiogram) revealed hypokinesis of the basal segments of the heart. Cardiac MR (magnetic resonance) was consistent with catecholamine-induced Takotsubo cardiomyopathy. A multidisciplinary team was involved in the management. She made a good recovery, and follow-up with ECHO at 4 months revealed normal cardiac function.

Conclusion
Takotsubo cardiomyopathy is a rare reversible cardiac condition that should be differentiated from ischemic and peripartum cardiomyopathy. In pregnancy, it has an excellent prognosis with prompt multidisciplinary management.

Introduction
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Case report
A 26-year-old primigravida with no prior medical or surgical history was admitted for induction of labour at term. Antenatally she was low risk with BMI of 24 and booking blood pressure of 118/70. Her blood pressure was mildly elevated during the induction process, but no antihypertensive treatment was required. She delivered normally and immediate postdelivery blood pressure was elevated at 146/96 mm of Hg. Two h postnataally, she complained of sudden-onset bilateral subcostal pain, radiating into the epigastrium and back. The pain was described as severe, ‘worse than labour pain’ and like a ‘heavy weight’. There was associated dyspnoea, exacerbated by lying flat. Over the next 4 h, the pain intensified requiring morphine. Observations revealed elevated blood pressure of 180/120 mm of Hg with moderate proteinuria and epigastric tenderness, establishing a probable diagnosis of severe preeclampsia. Respiratory and cardiac examination was normal. Initial blood results revealed haemoglobin of 15.1 g/dl and low platelets of 102 x 10^9/l (units). Urea and electrolytes were normal. ALT (alanine transaminase) was 794 IU/l and uric acid elevated at 0.56 mmol/l. A presumptive diagnosis of severe preeclampsia with HELLP syndrome was made based on hypertension, proteinuria, elevated transaminases and low platelets. As such, intravenous hydralazine was commenced to lower blood pressure, and magnesium sulphate was given as a loading dose followed by infusion to minimize the risk of an eclamptic seizure. Initial highly sensitive troponin T level was noted to be elevated at 67 μg/l, ECG showed sinus rhythm with ventricular rate of 56 bpm and saddle-shaped ST elevation of 0.5 mm in lead III only, and the cardiology team was contacted for review. Repeat bloods after 4 h revealed a drop in haemoglobin to 12.5 g/dl and significant drop in platelets to 50x10^9/l. Transaminases remained raised with ALT of 727 IU/l and AST (aspartate transaminase) 774 IU/l, and she had developed acute renal failure with urea of 7.5 mmol/l and creatinine of 96 μmol/l. Repeat highly sensitive troponin T at 6 h was grossly elevated at 1198 μg/l consistent with acute myocardial injury. The cardiology team performed bedside ECHO, which revealed hypokinesis of the basal to mid-septal, basal lateral and anterior cardiac walls, with preservation of the contractility of apical segments. The patient was transferred to HDU for more intensive monitoring. Repeat ECG when she was pain free
was normal, and at this time blood began to return to baseline. Repeat ECG (electrocardiogram) 4 days later revealed sinus rhythm, with ventricular rate of 75 bpm and ST elevation of up to 1 mm in the inferolateral leads (II, III, aVF, V5 and V6). Cardiac MRI on day 5 revealed an undilated left ventricle with borderline impairment of left ventricular systolic function and subtle regional wall motion abnormalities in the septal wall and inferior apical wall. There was no oedema and no significant enhancement, suggesting no active inflammation. The right ventricle was normal, and there were no significant valvular abnormalities. The differential cardiac diagnoses included Takotsubo/stress-induced cardiomyopathy, postpartum cardiomyopathy or aortic dissection. The clinical history, ECG changes, raised troponin and ECHO were thought to be in keeping with catecholamine-induced cardiomyopathy (possible Takotsubo). A small-dose beta blocker was commenced, and the patient was discharged when clinically well and ECG back to baseline. The patient was reviewed at 4 months in the cardiology clinic, and follow-up ECHO showed resolution of regional wall hypokinesis and normal cardiac function.

**Discussion**

Takotsubo cardiomyopathy, also known as transient apical ballooning syndrome\(^1\), is a type of nonischaemic cardiomyopathy, in which there is a sudden temporary weakening of the myocardium. As this weakening can be triggered by acute emotional or physical stress, the condition is also known as broken heart syndrome or stress-induced cardiomyopathy. It can occur in women with no previous cardiac problems. The name ‘tako tsubo’, meaning ‘octopus pot’ in Japanese, was suggested to reflect the typical echocardiographic findings of apical ballooning of the heart, which is supposed to resemble the shape of the octopus pot. The cause is likely to be multifactorial and proposed to include an amount of vasospasm, failure of the microvasculature and an abnormal response to catecholamines\(^2\). The diagnosis of Takotsubo cardiomyopathy is made by the pathognomonic cardiac wall motion abnormalities, in which the base of the left ventricle is contracting normally or is hyperkinetic while the remainder of the left ventricle is akinetic or dyskinetic\(^3\). In the absence of significant coronary artery disease, ECHO is pathognomonic of Takotsubo cardiomyopathy like our case. In the medical literature, few cases of Takotsubo cardiomyopathy in association with pregnancy or the puerperium have been discussed. Our case is the first case reported where severe preeclampsia with HELLP syndrome has been associated with the acute onset of Takotsubo cardiomyopathy. It is not clear if HELLP syndrome was the only acutely stressful event that led to cardiomyopathy or if there were other unidentified contributory factors. The treatment of Takotsubo cardiomyopathy is generally supportive in nature. Although patients with Takotsubo heart disease may be hypotensive, treatment with inotropes will usually exacerbate the disease. Since the disease is due to a high catecholamine state, patients should not be given inotropes. Treatment recommendations include intra-aortic balloon pump, fluids and negative inotropes such as beta blockers or calcium channel blockers. In many individuals, left ventricular function normalizes within 2 months. Despite the grave initial presentation, most of the patients survive the initial acute event, with a very low rate of in-hospital mortality or complications. Multidisciplinary input with consultant involvement at an early stage is associated with increased survival. The patients are expected to have a favourable outcome once recovered from the acute stage of the syndrome, and the long-term prognosis is excellent\(^3,4\).

**Conclusion**

Takotsubo cardiomyopathy is a rare reversible cardiac condition that should be differentiated from ischemic and peripartum cardiomyopathy. In pregnancy, it has an excellent prognosis with prompt multidisciplinary management. Since Takotsubo cardiomyopathy is related to emotional and physical stress, the environment during labour and delivery should be kept quiet and calm. Acute cardiac complications occur infrequently during pregnancy and in the immediate postpartum period. Some of these cardiac scenarios are rare and provide a diagnostic challenge. If any suspicion of cardiac problems in pregnancy, obstetricians should have low threshold to involve the cardiac team for advice and management.

**References**