



## TAKATSUBO CARDIOMYOPATHY AFTER CAESAREAN SECTION – A CASE REPORT.

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**ABSTRACT** **BACKGROUND** : Acute cardiac complications in peripartum period provide a diagnostic challenge. Takatsubo cardiomyopathy occurs most frequently in postmenopausal women exposed to emotional and physical stress. We report a case of apical ballooning syndrome, also known as Takatsubo Cardiomyopathy (TCM) or broken-heart syndrome, in a preeclamptic patient post operatively. **CASE** : 44 year preeclamptic primi presented with dyspnoea three hours after sub arachnoid block for caesarean. On evaluation, trans thoracic echo revealed apical ballooning with global hypokinesia along with raised NT-Pro BNP level. ECG and cardiac enzymes were normal. She was intubated, ventilated and treated with inotropes and anti failure medications by a multidisciplinary team. She was extubated on Postoperative day (POD) 3 and discharged on POD 13 with stable vitals. Her echo done on third month was completely normal with adequate left ventricular function. **CONCLUSION** : Physical, emotional stress and oestrogen deficiency in immediate post partum period may be the predisposing risk factors for TCM even if regional anaesthesia is given. Trans thoracic echo plays a vital role in differentiating TCM from other peripartum cardiac complications like pulmonary thrombo embolism, peripartum cardiomyopathy or acute coronary syndrome.

**KEYWORDS** : acute stress induced cardiomyopathy; takatsubo; spinal anaesthesia ; left ventricular apical ballooning ; caesarean

**INTRODUCTION**

Takatsubo cardiomyopathy also known as stress cardiomyopathy or neurogenic myocardial stunning<sup>1</sup>, is a transient left ventricular apical ballooning syndrome causing left ventricular dysfunction without any evidence of coronary artery disease.<sup>2</sup> The term takatsubo was first used by Sato and colleagues in 1990 because of similarities between the morphologic features of the LV and the shape of a Japanese octopus trap.<sup>3</sup> It may be triggered by an acute medical illness or intense physical, emotional stress. It is often confused with myocardial infarction and will be much more difficult to diagnose in perioperative period. We present here a rare case of takatsubo cardiomyopathy, after sub-arachnoid block, for emergency caesarean section.<sup>3</sup>

**CASE REPORT**

44 years, primi, 33 weeks, intracytoplasmic sperm insemination (ICSI) conception, with intra uterine growth retardation, referred for safe confinement. On admission patient was found to have elevated blood pressure (190/110), with normal pre eclampsia profile and no fundal changes. Pre term counselling was done and prophylactic steroids were given. As blood pressure was fluctuating, cardiologist opinion was obtained and echo was done which showed adequate left ventricular (LV) function. Emergency LSCS was done in view of decreasing trend in platelets. Intra operatively, there was adherent placenta and posterior wall degenerated fibroid. Estimated blood loss was around 1.5 litres, so 1 unit PRBC was given. 3 hours after surgery, patient became dyspnoic, tachycardic and saturation was 96% with oxygen 6 litres. Patient had bilateral crepts on auscultation. ECG showed Atrial Fibrillation with rapid ventricular response. Bedside echo was done which showed global hypokinesia of LV with apical ballooning, moderate to severe MR. Provisional diagnosis of post partum cardiomyopathy or takatsubo cardiomyopathy was made and patient was started on inotropes and anti failure measures. ABG showed acidosis and raised lactate. Her NT-Pro BNP level was elevated. Patient was started on Non Invasive ventilation. On POD 1, patient became haemodynamically unstable, so intubated and ventilated. She was managed by a multidisciplinary team which included cardiologist, anaesthesiologist and obstetrician. She was extubated on POD 3. On POD 6, echo showed mild hypokinesia of LV and borderline LV function. On POD 13 echo showed adequate LV function with mild hypokinesia of apex. Her vitals were stable and discharged. She was asked to review again after a week and follow up with a cardiologist. Her echo done at the 3<sup>rd</sup> month review was completely normal and was asked to review after 6 months as a routine.

**DISCUSSION**

TCM is a transient cardiomyopathy characterised by segmental wall motion abnormalities and apical ballooning.<sup>3</sup> Perioperative stress, pain and light plane of anaesthesia has been identified as major risk factors. Recent study found that two third of the patient diagnosed from

TCM had either anxiety or depression as a causative factor.<sup>3</sup> Very few cases have been reported after spinal anaesthesia. Several mechanisms precipitate TCM during the peripartum period. Pain during caesarean section or labour, bleeding, hypovolaemia and emotional stress may induce a catecholamine surge, leading to myocardial dysfunction. Sudden drop in oestrogen levels after delivery may make the myocardium more susceptible to the catecholamine surge, which activates beta and alpha adrenergic receptors and cause microvascular spasm leading to myocyte injury.<sup>4,5</sup> The reduced estrogen levels may alter endothelial function, making them more vulnerable to sympathetic-mediated myocardial stunning and perhaps stress-related myocardial dysfunction.<sup>10</sup> The basal hypokinesia and apical ballooning suggest that these areas of myocardium have different efferent sympathetic innervation. Though apex is more sensitive to catecholamine surge, it does not have a three layered myocardium and has a limited coronary circulation, hence it is most vulnerable.<sup>5,6,7</sup>

The main symptoms include sudden chest pain, shortness of breath or fainting, arrhythmias on haemodynamic instability mimicking MI.<sup>3</sup> Temporary hypo or akinesia in LV with or without apical involvement, regional wall motion abnormality exceeding a single vessel distribution, no significant coronary artery disease, raised NT-pro BNP levels with changes in ECG suggest TCM.<sup>8</sup> The pathognomonic finding of TCM during echocardiography is apical ballooning involving LV. This unique morphology was reported to appearing in 75% of patients.<sup>8</sup>

Beta blockers are used due to possible high catecholamine state. Angiotensin-converting enzyme inhibitor and angiotensin receptor blockers are used for regional wall motion abnormality management. Anticoagulation therapy is useful to prevent LV apical thrombosis and embolic events. Initial management in the acute phase is supportive and symptomatic.<sup>7</sup> Hemodynamically unstable patients may need cardiopulmonary support, continuous venovenous hemofiltration, intra-aortic balloon pump etc. Patients with TCM have great prognosis, the recovery rate being 96%.<sup>9</sup> The LV function may begin to recover in days and fully recover within four to eight weeks, with symptomatic treatment.<sup>9</sup>

The differential diagnosis includes myocardial infarction, myocarditis, dilated cardiomyopathy, peripartum cardiomyopathy, and severe congestive heart failure. Recurrence rate ranges from 0% to 15%. Recurrence rate is 10% over a mean follow-up of 4.4±4.6 years, and that recurrence was highest within the first 4 years, subsequently decreasing over the remainder of their follow-up.<sup>10</sup>

If psychological risk factors, e.g., death in the family or divorce, have been identified during the preoperative assessment, then delaying an elective surgery may be prudent.<sup>9</sup> For non elective cases, extra focus on

allaying anxiety and stress may help in preventing a TCM episode. If feasible, regional anesthesia with appropriate sedation should be employed since it affords the ability to avoid general anesthesia-associated stress (with intubation and extubation) and provides postoperative pain control. Irrespective of the anesthetic management employed, avoidance of stressors that could trigger a catecholamine surge is vital through appropriate pain management and preoperative anxiety as well as smooth induction and emergence.<sup>9</sup>

## CONCLUSION

In our patient perioperative anxiety, stress related to IUGR baby, preeclampsia and increased blood loss would have contributed to TCM. Apical ballooning syndrome is a rare reversible cardiac condition that should be differentiated from ischemic and peripartum cardiomyopathy, especially in the immediate postpartum period when oestrogen deficiency along with physical and emotional stress may be the predisposing risk factors.

Prospective studies are needed in order to determine more accurately the incidence of takotsubo cardiomyopathy and to ascertain the long-term outcomes.

## REFERENCES

1. Y-Hassan S, Tornvall P. Epidemiology, pathogenesis, and management of takotsubo syndrome. *Clin Auton Res*. 2018 Feb;28(1):53-65. doi: 10.1007/s10286-017-0465-z. Epub 2017 Sep 15. PMID: 28917022; PMCID: PMC5805795.
2. Kono T, Sabbah HN. Takotsubo cardiomyopathy. *Heart Fail Rev*. 2014 Sep;19(5):585-93. doi: 10.1007/s10741-013-9404-9. PMID: 23928852.
3. Andrade AA, Stainback RF. Takotsubo cardiomyopathy. *Tex Heart Inst J*. 2014;41(3):299-303. Published 2014 Jun 1. doi:10.14503/THIJ-14-4108
4. Kim DY, Kim SR, Park SJ, Seo JH, Kim EK, Yang JH, Chang SA, Choi JO, Lee SC, Park SW. Clinical characteristics and long-term outcomes of peripartum takotsubo cardiomyopathy and peripartum cardiomyopathy. *ESC Heart Fail*. 2020 Sep 8;7(6):3644-52. doi: 10.1002/ehf2.12889. Epub ahead of print. PMID: 32896987; PMCID: PMC7754891.
5. Kato K, Lyon AR, Ghadri JR, Templin C. Takotsubo syndrome: aetiology, presentation and treatment. *Heart*. 2017 Sep;103(18):1461-1469. doi: 10.1136/heartjnl-2016-309783. PMID: 28839096.
6. Virani SS, Khan AN, Mendoza CE, Ferreira AC, de Marchena E. Takotsubo cardiomyopathy, or broken-heart syndrome. *Tex Heart Inst J*. 2007;34(1):76-9. PMID: 17420797; PMCID: PMC1847940.
7. Sealove BA, Tiyyagura S, Fuster V. Takotsubo cardiomyopathy. *J Gen Intern Med*. 2008 Nov;23(11):1904-8. doi: 10.1007/s11606-008-0744-4. Epub 2008 Aug 8. PMID: 18688681; PMCID: PMC2585677.
8. Amin HZ, Amin LZ, Pradipta A. Takotsubo Cardiomyopathy: A Brief Review. *J Med Life*. 2020 Jan-Mar;13(1):3-7. doi: 10.25122/jml-2018-0067. PMID: 32341693; PMCID: PMC7175432.
9. Agarwal S, Sanghvi C, Odo N, Castresana MR. Perioperative takotsubo cardiomyopathy: Implications for anesthesiologist. *Ann Card Anaesth*. 2019 Jul-Sep;22(3):309-315. doi: 10.4103/aca.ACA\_71\_18. PMID: 31274495; PMCID: PMC6639891.
10. Kurisu S, Kihara Y. Clinical management of takotsubo cardiomyopathy. *Circ J*. 2014;78(7):1559-66. Epub 2014 Jun 12. PMID: 24964980.