

## Case of cardiac arrest from Takotsubo Cardiomyopathy during hip surgery

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### Abstract

Takotsubo cardiomyopathy or 'broken heart syndrome' is a diagnosis of sudden stress induced left ventricular dilated cardiomyopathy with apical ballooning. The condition is self-limiting but may be severe enough to cause fatality and mimics an acute Myocardial infarction in presentation. It is mostly described in Japanese post menopausal women but lately is increasingly reported in Western literature. We share the case of a 63 year old lady with no prior history of ischemic heart disease who was undergoing a left hip hemiarthroplasty for a neck of femur fracture and suffered an intraoperative cardiac arrest.

### Keywords

Takotsubo cardiomyopathy; acute Myocardial infarction; intraoperative cardiac arrest

### Introduction

Takotsubo cardiomyopathy or 'broken heart syndrome' is a diagnosis of sudden stress induced left ventricular dilated cardiomyopathy with apical ballooning [1]. The condition is self-limiting but may be severe enough to cause fatality and mimics an acute Myocardial infarction in presentation. It is mostly described in Japanese post menopausal women but lately is increasingly reported in Western literature [2]. We share the case of a 63 year old lady with no prior history of ischemic heart disease who was undergoing a left hip hemiarthroplasty for a neck of femur fracture and suffered an intraoperative cardiac arrest.

In an editorial in BJA in 2010 A. Preti,etal suggested that anaesthesia related stress cardiomyopathy should be suspected in post-menopausal women with perioperative cardiac symptoms [3]. First described in Japan in 1990 there have been numerous case reports and a descriptive article by Hessel and London in Anesthesia and Analgesia a decade later whereby it was noted that there is no clear explanation for individual susceptibility to takotsubo cardiomyopathy after exposure to a similar degree of stress or catecholamines that usually do not adversely affect most patients [4]. In general they recommended a low threshold of suspicion, intraoperative echocardiography and differentiation from ischaemia. They also suggested a better clinical outcome for such patients. There have been a few reports of hip fracture patients developing this syndrome perioperatively [5]. It seems that the kind of

anaesthesia or surgery does not make any difference to the development and outcomes of the syndrome. It is a diagnosis of exclusion after ischemic cardiomyopathy is ruled out and presents with apical ballooning of the left ventricle on echo and symptoms of severe acute heart failure.

## Case Presentation

Our case was a 63 year old lady with a history of hypertension, diabetes and hyperlipidemia who presented after a fall with an intertrochanteric fracture of the hip. She was listed for a left hip hemiarthroplasty within 48 hours after receiving a peripheral nerve block. Spinal anaesthesia was performed with 2.5 ml of bupivacaine and 15 micrograms of fentanyl intrathecally at L3-4 in a lateral decubitus position and surgery commenced. There was a total blood loss of 500 ml, vital were stable throughout and she did not require sedation. No cementing was done during the surgery. As the surgeons were closing the wound she suddenly developed severe bradycardia followed by pulseless electrical activity and became obtunded. She was immediately turned supine and CPR commenced within a minute. She was intubated and return of circulation was obtained after 3 rounds of 1 mg adrenaline and CPR in 5 minutes. Initially after intubation her oxygen saturation remained low but returned to 100% after 2-3 minutes of ventilation. She had runs of ventricular tachycardia successfully treated with IV amiodarone 150 mg. Arterial and central lines were placed and a noradrenaline infusion was started. An intraoperative echocardiogram showed regional wall motion abnormality, apical ballooning of the left ventricle and an ejection fraction of 30%. She had no previous cardiac symptoms or echo done. Her right ventricle was not dilated indicating the absence of a pulmonary embolus. An urgent cardiology consult was obtained and she was taken for urgent angiography from the ICU where she was stabilised for a few hours post arrest with dual vasopressors after temporary closure of the wound. She also had pulmonary edema on chest X-ray. She was found to have right dominant coronaries which were unobstructed and an intra-aortic balloon pump was inserted for cardiogenic shock. The cause of her cardiac arrest was felt to be an overwhelming stress response and catecholamine drive. Possibly fluid overload may have contributed to the shock. She subsequently woke up and was successfully weaned from mechanical ventilation and cardiac support after 4 days. Her highest serum troponin level reached 854.8 ng/L. Fig 1. shows her Chest X ray showing pulmonary edema in the ICU. Fig 2 shows her echo picture showing apical LV ballooning and Fig 3. shows her ECG showing ST elevations in the immediate post operative period.

After her ICU stay and a 2 week stay in the general ward she was ultimately discharged home with an improved cardiac function.

## Discussion

With an ageing population and a high rate of falls as well as a recent thrust by the Ministry of health for early hip fracture surgery many elderly patients are rushed for hip stabilisation. This has been shown to reduce post injury complications in literature [6]. Our center has a hip fracture pathway that adopts the UK standard and after optimising pain with regional anaesthesia early hip fracture surgery is performed usually under spinal anaesthesia [7]. This surgery potentially can cause a huge amount of catecholamine surge in elderly patients due to the nature of the instrumentation and force used. Spinal anaesthesia offers an added advantage in elderly patients by reducing the risks of general anaesthesia and possibly post operative cognitive dysfunction [8]. However, the risk of takotsubo cardiomyopathy needs to be assessed particularly in post-menopausal women who undergo stressful procedures post

trauma under regional anaesthesia without sedation.

Further research is needed and a review of literature to evaluate the merits of GA vs regional anaesthesia with or without sedation and possibly preoperative risk stratification based on the reports available in literature. A multidisciplinary approach including cardiology opinion and 2D echo in susceptible patients may be required and possibly perioperative catecholamine blunting with esmolol infusion or sedation with dexmetomidine may be advisable in high risk patients.

With an increasing rate of hip fractures being performed in our hospitals and many case reports of such a syndrome it becomes important to generate debate on the co management of such patients perioperatively. Especially since no screening tests exist and common defining features have not been discovered except being a post menopausal female [9]. Management strategies of Takotsubo cardiomyopathy should be included in all hip fracture pathways, a low threshold of suspicion must be maintained and research to study the disease prevalence and pathophysiology is required.

### Figures

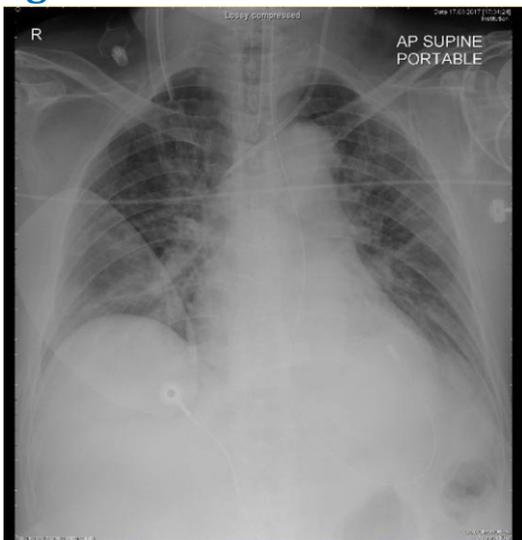


Figure 1: Chest Xray

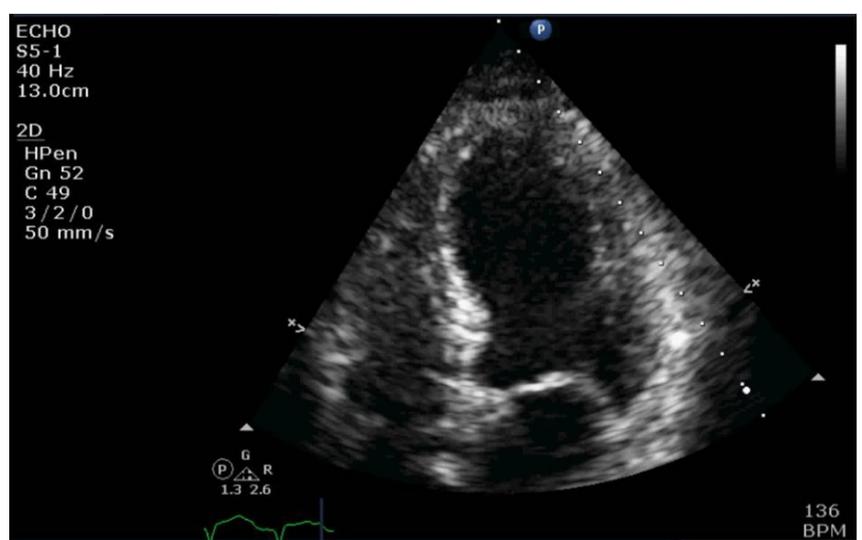


Figure 2: 2D echocardiograph

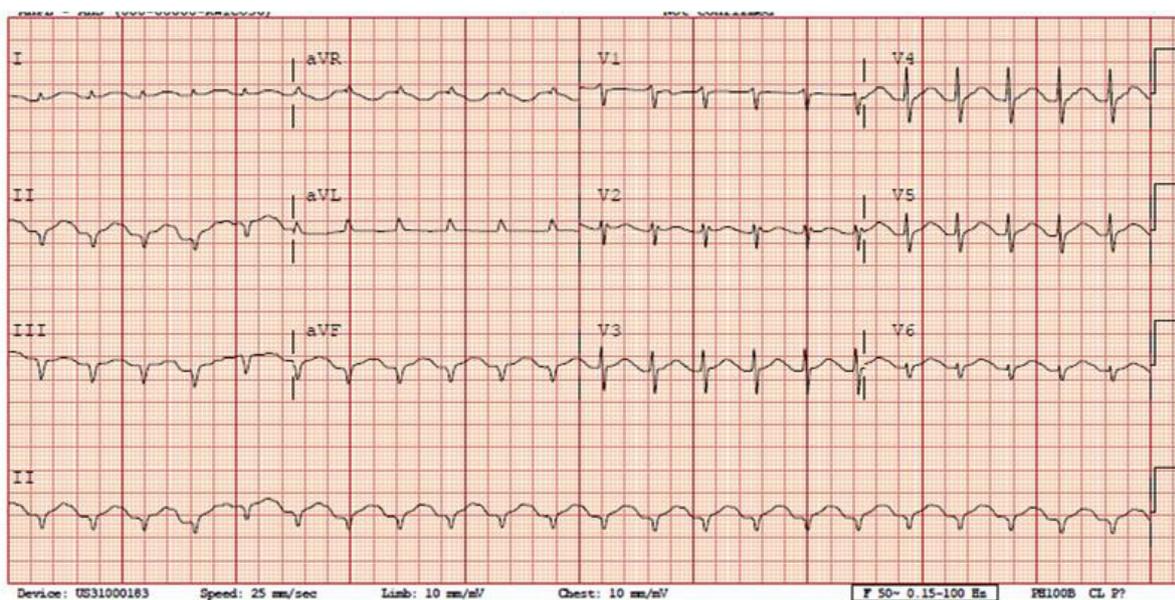


Figure 3: ECG

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