Takotsubo stress-induced cardiomyopathy following robotic radical cystectomy

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Cardiac complications following surgery can be devastating especially if it is unrecognized. We present a case of a stress-induced cardiomyopathy that occurred in postoperative period following a robotic radical cystectomy and urinary diversion. While most cases of stress-induced cardiomyopathy, also known as Takotsubo cardiomyopathy, are transient and with little to no long term clinical effects, a small number of patients can develop severe complications. This has not been reported in urologic literature and the unique characteristics of this cardiac condition are reviewed.

Key Words: Takotsubo cardiomyopathy, stress-induced cardiomyopathy, robotically assisted radical cystectomy, postoperative complications

Introduction

Stress-induced cardiomyopathy, also known as Takotsubo's cardiomyopathy, apical ballooning syndrome or "broken-heart syndrome", is poorly understood but is becoming a well-defined clinical entity. Patients present with signs and symptoms consistent with an acute coronary syndrome making it a diagnostic challenge. Major emotional and physical stressors typically precede the clinical symptoms which can include chest pain, dyspnea, ECG changes, cardiac enzyme elevations and motion abnormalities on echocardiogram.[1]

This report describes a patient with evidence of Takotsubo's cardiomyopathy in the postoperative period following a robotically assisted laparoscopic radical cystoprostatectomy, and ileal conduit diversion for bladder cancer. This case highlights its clinical importance, especially in the post-surgical recovery period.

Case report

A 71-year-old male was referred for management of high grade T1 urothelial cancer refractory to intravesical

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BCG. His past medical history was remarkable for benign prostatic hyperplasia, hypertension and intermittent atrial fibrillation. Preoperative cardiac evaluation demonstrated an ejection fraction (EF) on echocardiogram of 65% along with a normal exercise stress test and no further work up was deemed necessary. Following clearance, he underwent a robot assisted laparoscopic cystoprostatectomy with ileal conduit at our academic center.

This procedure was completed entirely intracorporeally with no major intraoperative issues. On POD #3, a 30 second time period of non-conducted p waves was noted on telemetry with a 12 lead ECG demonstrating no acute pathology or ischemic changes. During this episode, the patient reported a transient coughing fit and feeling lightheaded. Cardiology was consulted and he had transcutaneous pacer pads placed as a precaution against any further arrhythmia. Based on their evaluation, cardiology determined there was no evidence of myocardial infarction and felt the arrhythmia was secondary to increased vagal tone from the coughing episode. However, an echocardiogram was obtained and the EF was noted to be only 10% with apical wall motion abnormalities consistent with the classic findings of Takotsubo's cardiomyopathy, Figure 1. His home beta blocker dosage was increased following the echocardiogram results and he continued his recovery on the general surgical floor with close telemetry monitoring. Three days later he was found to be in atrial fibrillation with a rapid ventricular response with increased oxygenation requirements. A CT angiogram demonstrated bilateral

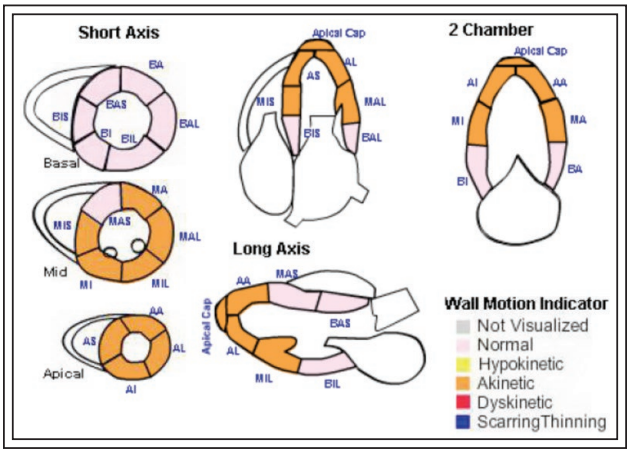

Figure 1. Wall motion diagram from transthoracic echocardiogram on POD#4. There were significant akinetic portions of the ventricular wall that resolved over several days consistent with a reversible cardiomyopathy known as Takotsubo cardiomyopathy.

pulmonary emboli and a small collection next to the ileoileostomy concerning for anastomotic breakdown. He was started on a heparin drip and underwent an exploratory laparotomy with the finding of ischemic breakdown of the ileal anastomotic suture line. The anastomosis was resected and an end-ileostomy was performed. Serial echocardiograms demonstrated a return to his baseline EF of 72% by POD #10 consistent with the standard clinical course for Takotsubo's cardiomyopathy. Unfortunately, the patient expired POD #17 from complications related to the removal of an internal jugular central line.

Discussion

Open radical cystoprostatectomy has been the standard of care of non-metastatic invasive bladder cancer but the robotically assisted laparoscopic approach is becoming much more common. Data on the results for a totally laparoscopic (intracorporeal) approach are limited. Initial 30 day perioperative complication rates for intracorporeal urinary diversions range from 40%-48% and can include cardiac issues.[2,3]

Stress induced cardiomyopathy was first described in in Japan in the early 1990s.[4] The disease process was given the name Takutosubo which means "Lobster Pot" in Japanese based on the left ventricle's unique appearance on imaging and demonstrated in this patient. It is uncommon and thought to account for 1%-2% of all cases of suspected acute myocardial infarction. It is most commonly reported in postmenopausal women and usually with a preceding stressful emotional or physical event.[1] Common presenting complaints are chest pain and dyspnea, with typical associated ECG findings with one series noting that up to 60% of patients had no ECG changes.[5] While the exact risk factors for this entity are unclear, a recent large meta-analysis found that patients tend to have a high prevalence of cardiovascular disease risk factors including hypertension, dyslipidemia, diabetes and tobacco use.[6] Additionally, there is an association with conditions associated with high circulating catecholamine's (i.e. pheochromocytoma) and a higher rate in patients with malignancy than the general population.[6]

The pathophysiology of Takutosubo cardiomyopathy has been hypothesized to include myocardial stunning of a large area secondary to coronary artery vasospasms and coronary microvascular impairment from circulating catecholamines.[7] Overall, prognosis is good with most patients recovering in days to weeks with no long term side effects, though a small percentage of patients can develop severe cardiogenic

shock and sudden cardiac death.[8] Management is usually conservative with beta blockers and ace-inhibitors sometimes administered for patients who are hemodynamically stable. For unstable patients, cardiovascular support with intraaortic balloon pumps may be needed. Inotropes may be necessary in unstable patients, but their benefits in a condition that may be precipitated by catecholamines are unclear.[8]

Literature describing patients with this type of reversible cardiomyopathy in the immediate postoperative course is sparse and mostly reported after cardiac surgery. For non-cardiac surgery, this entity has been reported following cesarean section, gastrectomy and after laparoscopic Heller myotomy.[9] This case report adds to the body of literature that a precipitating stressful event can include a urologic surgical procedure.

This patient had a documented normal preoperative echocardiogram with subsequent evidence of postoperative ventricular heart failure and classic wall motion abnormality consistent with stress-induced cardiomyopathy. If the patient had not been on telemetry monitoring, this could have easily been missed.

In patients with risk factors, cardiac anomalies in the perioperative period must be evaluated appropriately. Non-invasive work up including an EKG and a transthoracic echocardiogram are relatively simple non-invasive tests to perform in patients with non-specific and transient cardiovascular findings. This condition has not been previously described in the urologic surgical literature and suspicion for Takutosubo cardiomyopathy should be considered in the differential of patients with acute cardiac changes in the perioperative period. □

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