

Takotsubo Cardiomyopathy Following Head and Neck Oncologic Surgery: Two Case Reports

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INTRODUCTION

- Takotsubo cardiomyopathy (TTC) is a rare and relatively new distinct type of acquired cardiomyopathy.
- It is characterized by reversible but profound left ventricular contraction abnormalities that lead to acute cardiac failure in the absence of obstructive coronary disease.
- It has also gone by the names "stress-induced cardiomyopathy" or "broken heart syndrome" due to its association with triggers of physical or emotional stressors.
- **There are no reports in the otolaryngology literature of TTC following surgery. We present one definite and one possible case of TTC following head and neck surgery.**

METHODS

- Retrospective chart review of medical records from two patients

CASE REPORT

Patient 1: Definite TTC. A 64 year-old Caucasian female with advanced supraglottic squamous cell carcinoma (T4aN1M0), chronic obstructive pulmonary disease, prior tobacco use, and no previous cardiac history underwent total laryngectomy and bilateral selective neck dissection. She did well the first few days after surgery, but developed chest pain and dyspnea on post-operative day (POD) #6.

Diagnostic work-up revealed electrocardiogram (EKG) findings of new anterior Q waves (**Figure 1**) and a troponin level of 2.1. The inpatient cardiology service was consulted and she was transferred to the intensive care unit (ICU) for further evaluation and management. She was started on a heparin drip and nitroglycerin drip given the concern for acute coronary syndrome. A bedside echocardiogram demonstrated anterior and apical cardiac wall hypokinesis (**Figure 2A-B**) with a severely decreased left ventricular ejection fraction (LVEF) of 25%. She underwent urgent coronary angiography which showed no evidence of obstructive coronary disease (**Figure 3**).

Her clinical picture was determined to be most consistent with TTC given the classic echocardiogram findings and lack of obstructive coronary artery disease. She was treated supportively with medical therapy including aspirin, atorvastatin, metoprolol, and lisinopril. Over the next several days she had resolution of symptoms with normalization of lab and imaging abnormalities. She was discharged home on POD#12 on the above medications. At approximately 1 year follow-up, the patient was doing well with no further evidence of adverse cardiac sequelae.

Figure 1. EKG. V1 and V2 leads demonstrating Q waves (red arrows.)

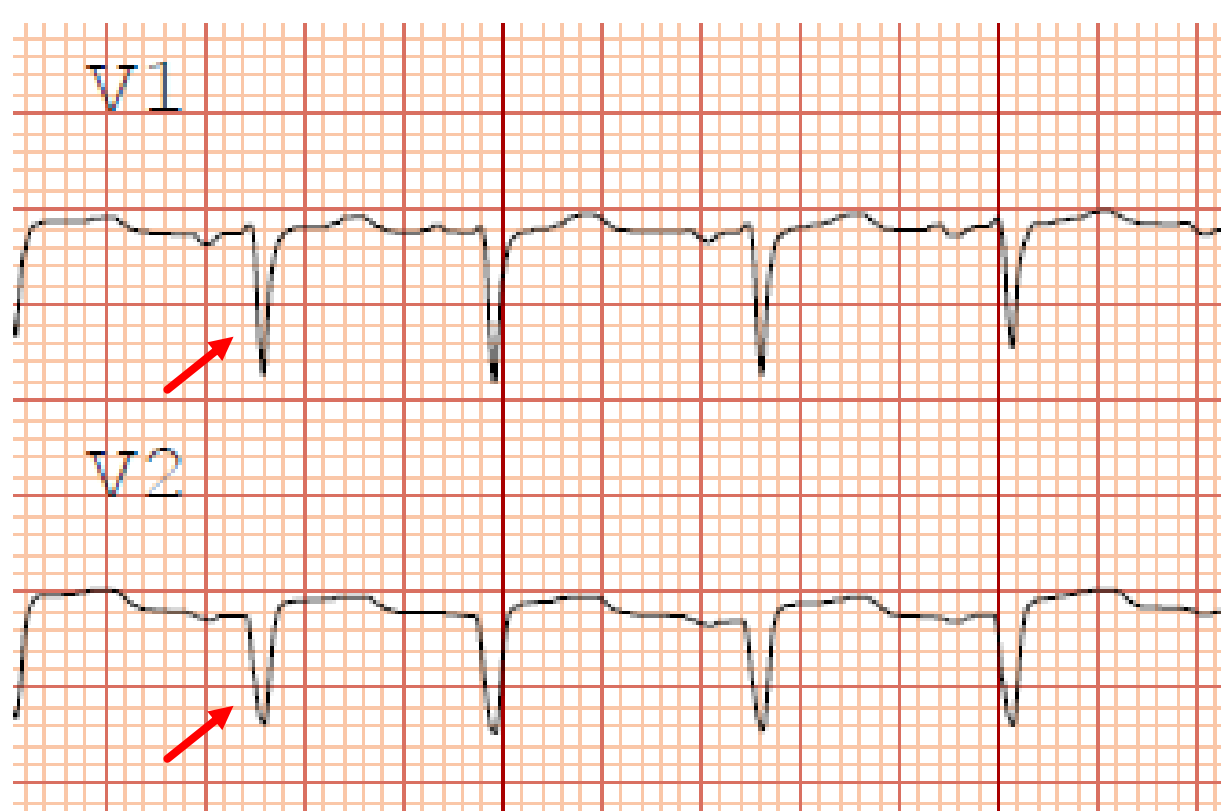


Figure 3. Coronary angiogram. Representative image demonstrating no evidence of obstructive coronary disease.

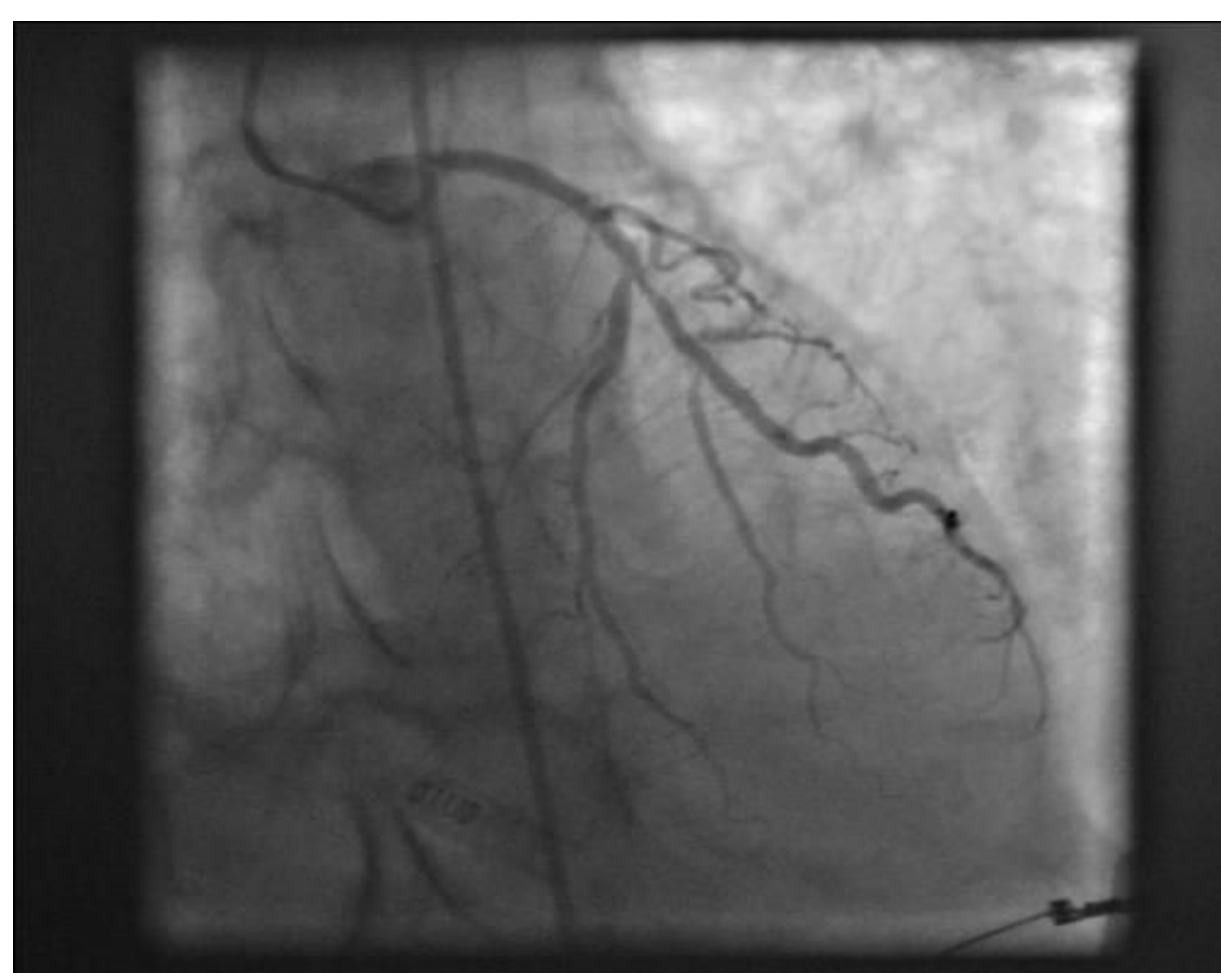
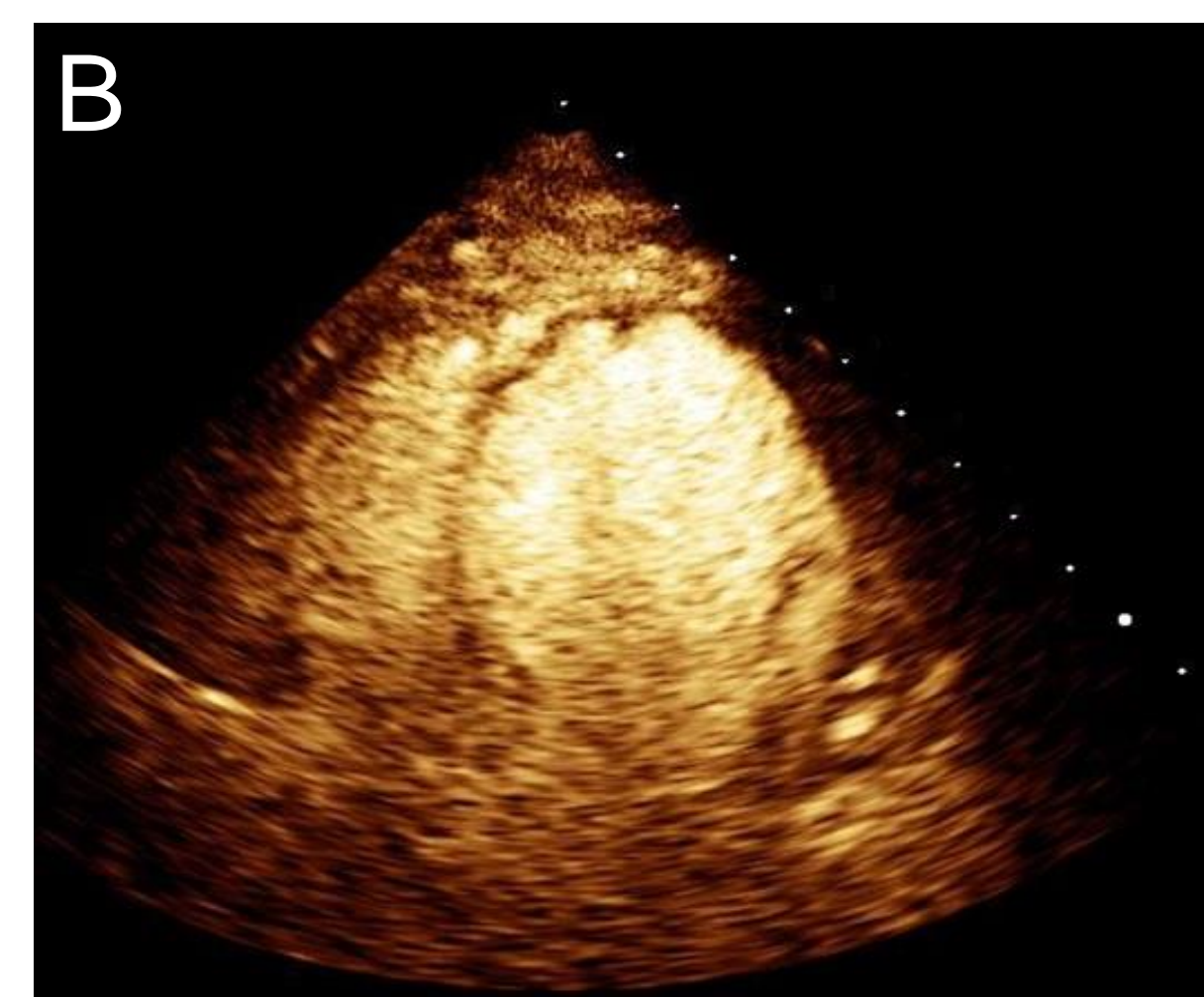


Figure 2A-B. Echocardiogram. Representative images with anterior and apical ballooning and hypokinesis classic for Takotsubo cardiomyopathy.



CASE REPORT

Patient 2: Possible TTC. A 63 year-old Caucasian male with a recurrent squamous cell carcinoma of the oral tongue (T1N0M0), hypertension, hyperlipidemia, active tobacco use, and history of stroke but no previous cardiac history, underwent hemiglossectomy with microvascular reconstruction. Intra-operatively, he developed acute cardiogenic shock requiring vasopressor support and atrial fibrillation with rapid ventricular rate requiring synchronized cardioversion.

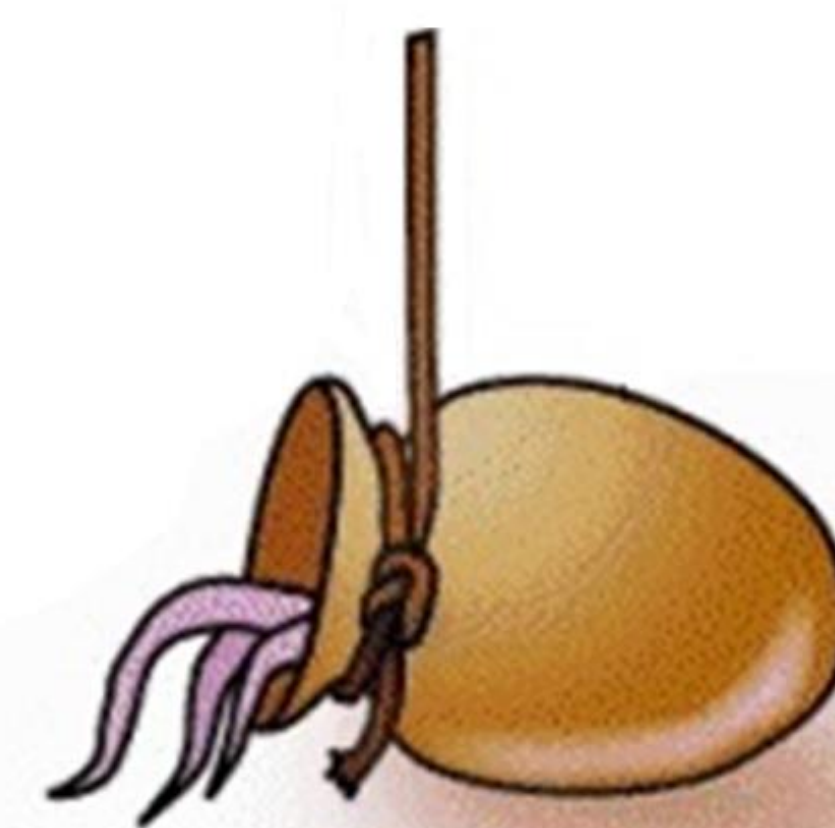
He was directly admitted to the ICU and on POD#1 had continued hemodynamic instability despite vasopressor support. Bedside echocardiogram revealed global hypokinesis and a significantly reduced LVEF <20%. He underwent urgent intra-aortic balloon pump (IABP) placement for management of cardiogenic shock. His vasopressor support and IABP settings were weaned over the course of several days and his IABP removed on POD#6. He had a prolonged hospital course but clinically recovered cardiac function and had improved left ventricular function on repeat echocardiogram. Takotsubo cardiomyopathy was considered as a diagnosis, however since coronary angiography had not been performed, diffuse obstructive coronary disease could not be ruled out. It was recommended that the patient undergo coronary angiography as an outpatient once fully recovered from surgery.

He was discharged to a skilled nursing facility on POD#22 on aspirin, simvastatin, enalapril and metoprolol. Unfortunately the patient had recurrence of his cancer and was hospitalized for aspiration pneumonia approximately 3 months after discharge. He met the palliative care service during that admission and after an acute hypoxic event and respiratory distress he was transitioned to comfort care and passed away during that admission. Per chart review, it does not appear that the patient underwent coronary angiography or cardiology follow-up as an outpatient.

KEY POINTS

- Takotsubo Cardiomyopathy (TTC) is named after the Japanese octopus trapping pot due to similarity in shape (**Figure 4**)¹
- Rare (1-2% of hospital admissions for acute coronary syndrome)²
- Affects mostly women (>90%)
- Mean age 61-76 years old
- Thought to be due to catecholamine induced myocardial stunning³
- Diagnosis of exclusion, made using Mayo Clinic Criteria (**Table 1**)⁴
- Clinical sequelae: cardiogenic shock, arrhythmias, cardiac arrest, embolic events
- 95% of patients have complete recovery⁴
- 5-10% have a recurrent diagnosis of TTC (caused by a separate trigger)

Figure 4. Illustration of a "Takotsubo" Japanese octopus trapping pot. Note the shape of a broad base and narrow neck.



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Table 1. Mayo Clinic Criteria for Takotsubo Cardiomyopathy (TTC)

Diagnostic Criteria ^{*All four must be met}
1. Transient hypokinesis, akinesis, or dyskinesis of the left ventricular mid-segments with or without apical involvement; the regional wall motion abnormalities extend beyond a single epicardial vascular distribution; a stressful trigger is often, but not always present.
2. Absence of obstructive coronary disease or angiographic evidence of acute plaque rupture.
3. New electrocardiographic abnormalities (either ST-segment elevation and/or T-wave inversion) or modest elevation in cardiac troponin.
4. Absence of: a. Pheochromocytoma b. Myocarditis

CONCLUSION

Takotsubo Cardiomyopathy (TTC) is a distinct form of acute cardiac failure characterized by profound, reversible left ventricular contraction abnormalities in the absence of obstructive coronary artery disease. Although rare, it is important for otolaryngologists to be aware of as it can be triggered by emotional or physical stressors, including head and neck surgery and can cause significant morbidity in patients without pre-existing cardiac disease. **This is the first report of TTC following head and neck surgery in the otolaryngology literature.**

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