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# Takotsubo Cardiomyopathy - More Than Just a Broken Heart?

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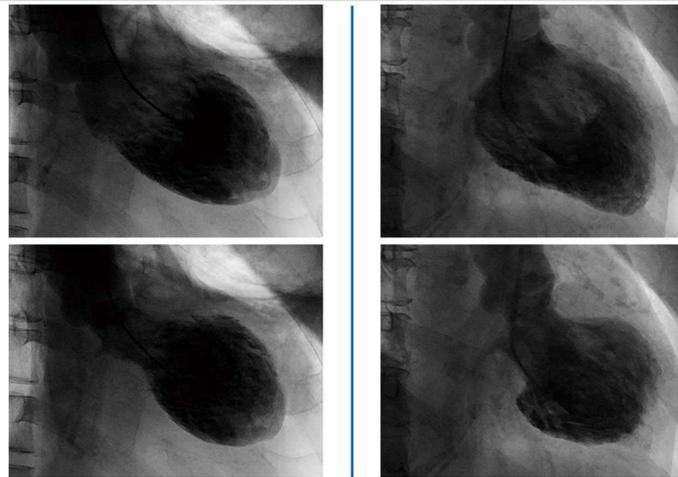
### Introduction

Takotsubo cardiomyopathy or its more infamous moniker broken heart syndrome, was first discussed in 1990 in Japan and has been increasingly diagnosed since that time. Symptoms are often preceded by a physical or emotional stress. Patients typically present as someone with acute coronary syndrome. Patients are eventually diagnosed with Takotsubo's after a thorough work up which includes EKG, troponins, echocardiogram and coronary angiography. It is characterized by ventricular wall motion abnormalities with normal coronary arteries. The patients can develop sequelae of acute coronary syndrome such as shock and pulmonary edema. The pathogenesis of the disease is not well known, but it is believed that catecholamines play an integral role. Most patients recover to baseline and treatment is usually supportive unless there are sequelae present that require directed therapy.

### Case Description

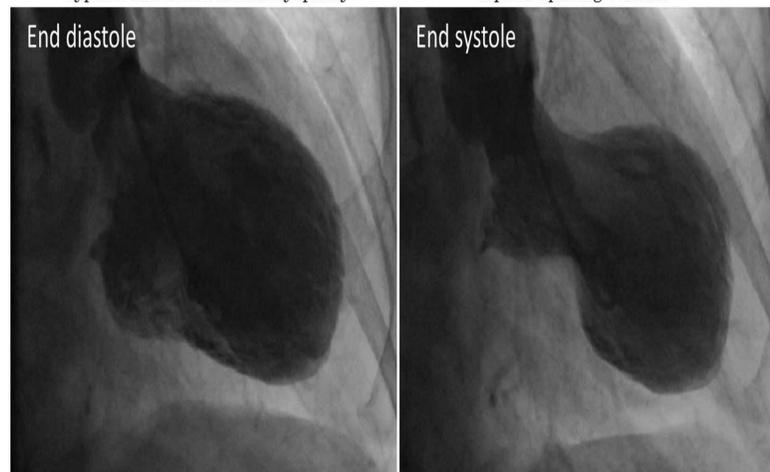
The patient is a 71 y/o female with hx of HTN, polycythemia vera, hyperlipidemia and diabetes mellitus that presents of diarrhea with occasional rectal bleeding for 1 week. She was seen for similar issues 2 months prior with negative colonoscopy. On work up in the ED, she was found to have significant hypokalemia, hypomagnesaemia with prolonged QT on EKG. She was started on IV electrolyte replacement and admitted for further repletion. On hospital day 1 the patient complained of chest pressure that cleared with coughing. EKG at that time was negative for acute changes but troponins were elevated. She was subsequently started on heparin for an NSTEMI. Repeat EKG showed changes in the anterior leads with continued rising of troponins. The patient was also found to have new pulmonary edema on the chest x-ray with significantly elevated BNP and was transferred to the ICU for continued management. She had an echocardiogram which showed dyskinesia of the mid and distal segments of the left ventricle and an EF of 35%. Her cardiac catheterization showed no obstructive coronary artery disease. She was treated for acute pulmonary edema with lasix, metoprolol, imdur, and hydralazine. The patient's pulmonary edema and shortness of breath resolved on hospital day 5 and she was discharged home on hospital day 7 with a new prescription for lasix but continued her previous blood pressure medications. Patient was advised to follow up with her PCP, nephrologist, gastroenterologist and cardiologist.

### Diagrams



Typical takotsubo cardiomyopathy

Apical-sparing variant



Left ventriculogram demonstrating the classic pattern of takotsubo cardiomyopathy; akinesis of the left ventricular apex with preserved function at the base.

Table 1. Mayo Clinic Criteria for ABS/TTC20

1. Transient hypokinesis, akinesis, or dyskinesia 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

ABS, apical ballooning syndrome; TTC, takotsubo cardiomyopathy; ACS, acute coronary syndrome.

\*There are rare exceptions to these criteria such as those patients in whom the regional wall motion abnormality is limited to a single coronary territory.

†It is possible that a patient with obstructive coronary atherosclerosis may also develop ABS. However, this is very rare in our experience and in the published literature, perhaps because such cases are misdiagnosed as ACS.

In both of the above circumstances, the diagnosis of ABS should be made with caution and a clear stressful precipitating trigger must be sought.

### Discussion

Takotsubo cardiomyopathy, also known as "stress cardiomyopathy" or "broken heart syndrome" will likely not be definitely diagnosed in the emergency department. However the typical patient is a common ED visitor: post-menopausal females presenting with chest pain or difficulty in breathing leading to an ACS work-up. Patients should receive an EKG upon arrival to the ED which, typically shows signs of ischemia or injury. EKG findings on initial EKG can show elevated ST segments, deep T waves and finally QT prolongation, which is very similar to the pathogenesis of an EKG in acute myocardial infarction, although recent studies have shown more varied presentations. Troponins will be elevated in patients due to injury to the myocardium. The elevations do not peak as they do in a STEMI but there is a moderate amount of elevation present. To diagnose Takotsubo's, a patient will need a cardiac catheterization and an echocardiogram. The cardiac catheterization is performed to rule out occlusive disease. The criteria for performing a catheterization is much like the criteria for a typical acute coronary syndrome diagnostic work up. If a patient is found to have no occlusive disease, Takotsubo's may be more likely a diagnosis. The echocardiogram in these patients will show a decreased ejection fraction with abnormal wall motion. The akinesis of the heart musculature will extend to more than one specific coronary artery distribution. Performing a catheterization is important to rule out multi vessel disease which can present as abnormal wall motion in more than one area of the heart. The condition has seen a significant rise in diagnosis since it was first described. This is believed to be due to the increased awareness of the condition. Although the table above gives guidelines for diagnosis of this condition there is not one specific set of criteria that is used for diagnosis. Reviewing multiple articles, the common themes are: myocardial injury without significant obstructive disease with reversible akinesis of the ventricular walls. The pathophysiology of this disease is currently evolving at this time but the leading hypothesis for this condition is thought to be an increase in catecholamines.

### Conclusion

As more people are diagnosed with Takotsubo cardiomyopathy, I believe that there will be a better understanding of the pathophysiology. Due to the initial presentation of this disease being similar to an acute myocardial infarction, therapy and work up is directed as such. This disease is diagnosed through a thorough diagnostic work up and after other life threatening diseases are ruled out. Although life threatening complications can occur such as CHF, cardiogenic shock, thrombosis, arrhythmias and ventricular rupture, patients generally receive supportive care and have a favorable prognosis. As further research progresses, management of this condition will undoubtedly improve.

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