



## Diagnosis of Stress-Induced Cardiomyopathy in a Patient with an Abnormal Myocardial SPECT Imaging

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### Abstract

We present a case of stress-induced cardiomyopathy in a 66 year old male precipitated by electroconvulsive (ECT) for catatonia related to severe recurrent depression. Patient suffered from decades of bipolar syndrome with severe depression that is refractory from medication therapies. As the frequency of the recent admissions increases, the patient's guardian consented to ECT to treat his depression. During the ECT procedure, he developed non-sustained ventricular tachycardia (NSVT). The onset of the clinical symptoms coincide with a stressful event and findings of the single-photon emission computed tomography (SPECT) stress myocardial perfusion imaging (MPI) with Tc-99m tetrofosmin are compatible with stress-induced cardiomyopathy after an unsuccessful attempt to treat depression with ECT.

### Keywords

Classic Takotsubo cardiomyopathy, Myocardial perfusion SPECT, Akinetic apex wall motions.

Takotsubo cardiomyopathy was first described in Japan with an incidence of 0.02 and predilection for females [1]. In North America, Takotsubo cardiomyopathy is more commonly known as stress-induced cardiomyopathy or transient apical ballooning syndrome. Stress-induced cardiomyopathy is a reversible cardiomyopathy, typically involving the left ventricular apex and its adjacent areas after an insult of sudden emotional or physical stressors (Figure 1). The pathophysiology of the non-ischemic cardiomyopathy suggests that a sudden stressor temporarily weakens the myocytes contractility (Figure 2 and Figure 3) (AV101) [2,3]. The removal of the offending stressor, the transient vasospasm presumably will be resolved.

The most common ECG changes seen are diffuse T-wave inversions with prolonged QTc. Serum troponin T typically is only mildly elevated. The hallmark findings are apical ballooning of the left ventricle with reduced ejection fraction typically seen on transthoracic echocardiogram or invasive ventriculography [4,5]. Stress-induced cardiomyopathy is a diagnosis of exclusion and often requires anatomic evaluation of the coronary arteries to exclude

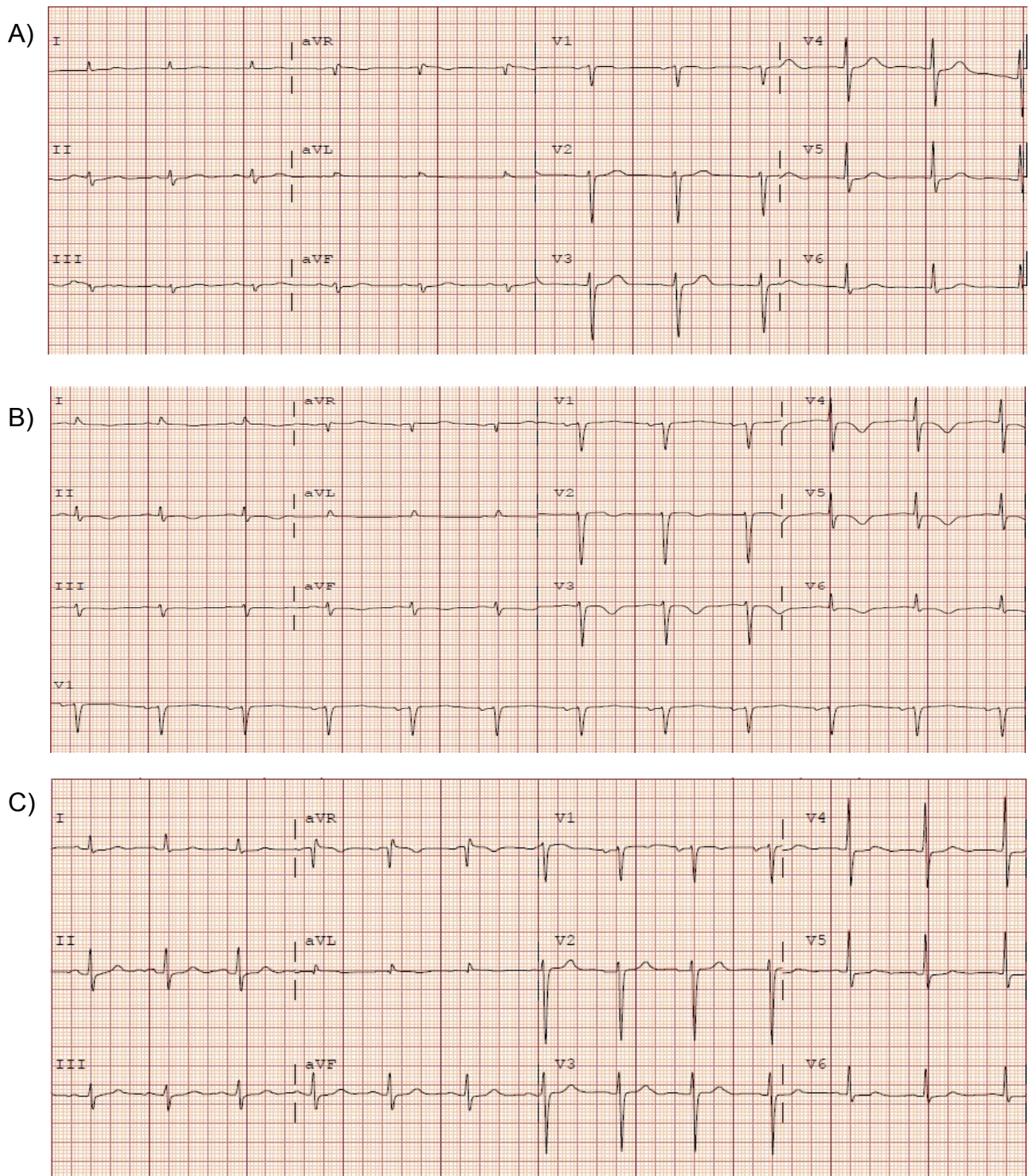
obstructive disease. Left ventricle systolic function and wall motion abnormalities typically normalize in 4-6 weeks following the event [6,7].

### Supplementary file

### References

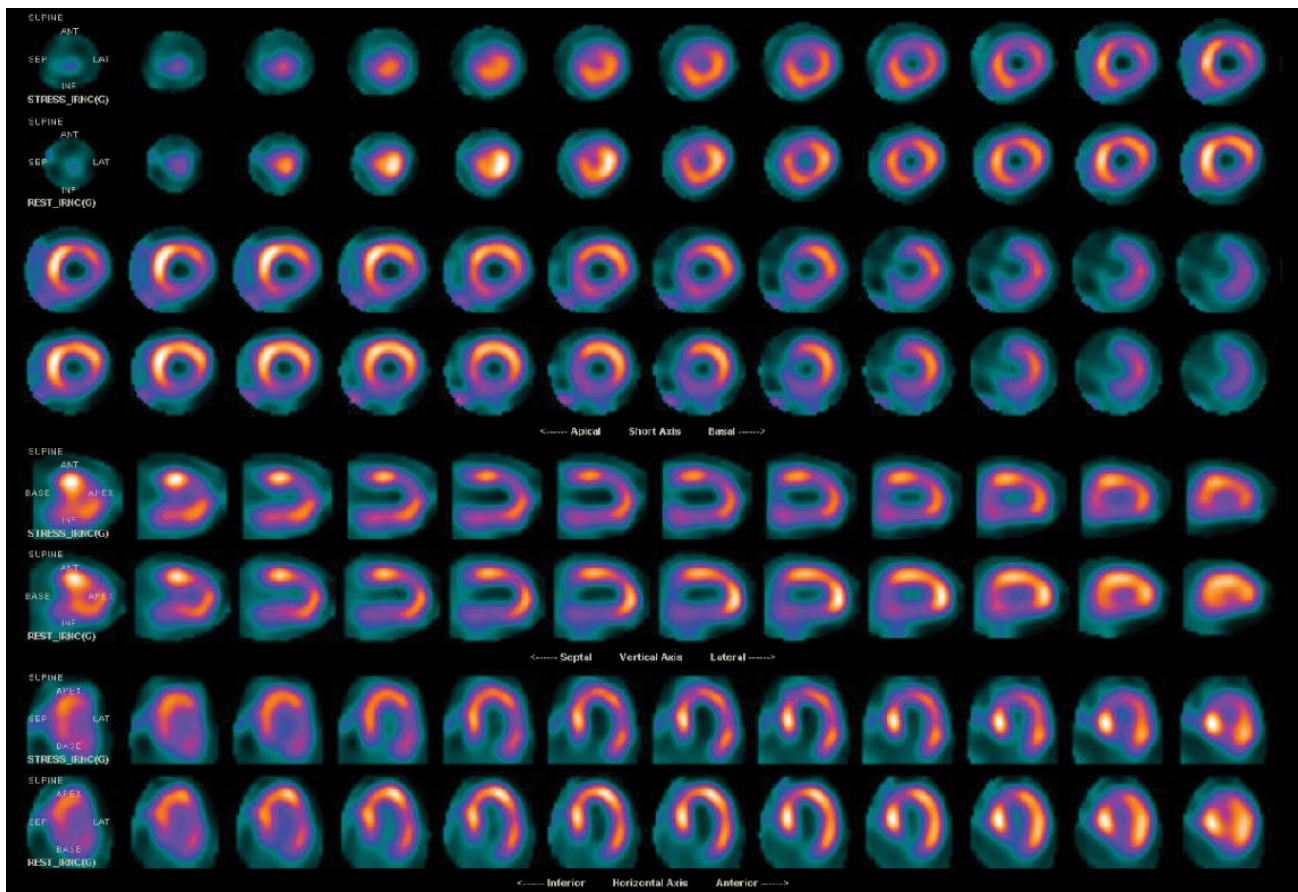
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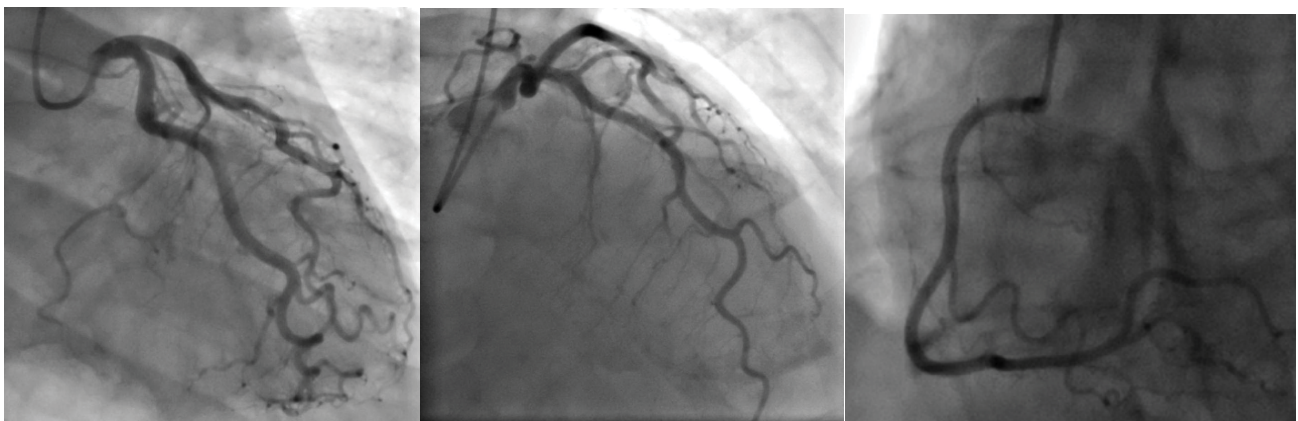


**Figure 1:** (A) Baseline ECG showed normal sinus rhythm, normal axis and normal R wave progression. (B) ECG following ECT and NSVT event showed sinus bradycardia, and T wave inversions in the precordial leads. (C) Follow-up ECG approximately 6 weeks after the event showed normal sinus rhythm with resolution of T-wave inversions turned to baseline).





**Figure 2:** Myocardial perfusion SPECT images. Gated myocardial perfusion SPECT images are also supplemented.



(A) RAO caudal view

(B) RAO craniocaudal view

(C) LAO caudal view

**Figure 3:** Cardiac catheterization. (A) RAO caudal view showing patent left main (LM), left anterior descending (LAD), and left circumflex (LCX) arteries. (B) RAO cranial view showing patent LAD. (C) LAO view showing patent RCA.