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Case Report

Left ventricular apical ballooning syndrome after pacemaker implantation in a male

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KEYWORDS

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Summary Left apical ballooning syndrome, also known as Takotsubo cardiomyopathy (TTC), characterized by transient left ventricular dysfunction is increasingly recognized worldwide. Predominantly affecting females, this condition mimics myocardial infarction and often occurs in the setting of emotional or physical stress. We report the case of a 77-year-old male who was admitted to the hospital for complete heart block and developed TTC after pacemaker implantation. To our knowledge, this is the first report of TTC development after pacemaker implantation in a male.

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Introduction

First described in Japan [1], left ventricular apical ballooning syndrome, or Takotsubo cardiomyopathy (TTC), is increasingly recognized worldwide [2]. Named after its resemblance to a *takotsubo*, or Japanese octopus trap, this condition is characterized by transient left apical and mid-ventricular systolic dysfunction with basal area hyperkinesis in the absence of significant coronary artery disease. TTC is often provoked by intense physical or emotional stress thus dubbing it the “broken heart syndrome” [3].

Patients presenting with this condition can be particularly alarming as their symptoms can mimic an acute coronary syndrome (often ST elevation myocardial infarction), with electrocardiographic (ECG) findings including ST elevations and T wave inversions, and elevations in cardiac-specific enzymes [2].

While the pathogenesis of this condition is not well-understood, theories including excess catecholamine stimulation, coronary artery spasm, and microvascular dysfunction have been proposed [3]. Also unexplained is the overwhelming predominance of this syndrome in elderly women as compared to men [3].

In recent years, a few reports have documented the occurrence of TTC after pacemaker implantation and have proposed TTC as a possible complication of this procedure [4,5]. To our knowledge the case described below is the first case of TTC occurring in a male after pacemaker implantation.

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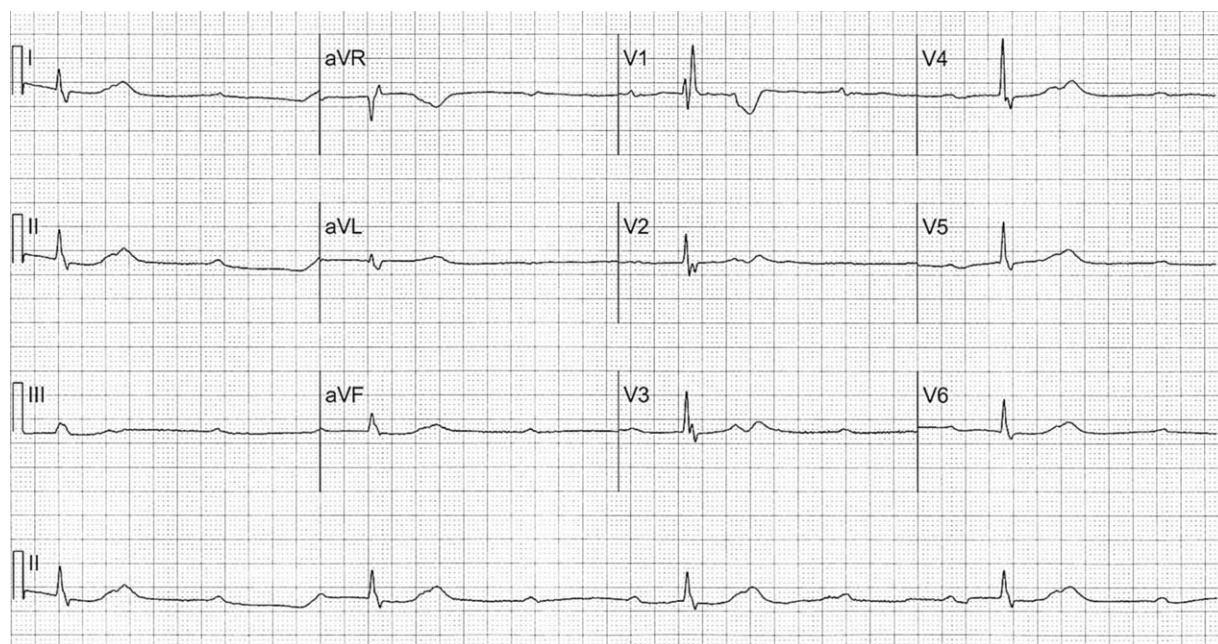


Figure 1 Baseline electrocardiogram revealed complete heart block with a ventricular escape at 22 bpm and right bundle branch morphology.

Case report

A 77-year-old Dominican male with a history of diabetes mellitus, hypertension, and stroke presented to the emergency department after experiencing intermittent dizziness and increasing fatigue for the preceding two weeks. During this interval, the patient visited a doctor in the Dominican Republic on two occasions and was told to stop taking his anti-hypertensive medication (lisinopril and hydrochlorothiazide). On the day prior to presentation, the patient experienced near-syncope while arising from bed. The symptoms resolved, but the patient decided to come to the USA for further evaluation.

On presentation, the patient denied complaints of chest pain, shortness of breath, or dizziness. On examination his blood pressure was 150/57 mmHg with a heart rate of 25 beats per minute (bpm). He had no evidence of jugular venous distension or peripheral edema, his lungs were clear bilaterally and his heart examination was notable for bradycardia and a systolic flow murmur at the left lower sternal border. He was alert and oriented and in no apparent distress. A portable chest X-ray revealed no significant pulmonary edema or cardiomegaly. ECG revealed sinus rhythm with an atrial rate at 80 bpm, complete heart block, and a ventricular escape at 22 bpm with right bundle branch morphology (Fig. 1). Laboratory evaluation was remarkable only for a creatinine of 1.8 mg/dL. An echocardiogram to assess left ventricular (LV) function revealed normal LV systolic function [ejection fraction (EF) 76%] and no evidence of wall motion abnormalities (Fig. 2A and B).

The patient was asymptomatic and hemodynamically stable so he was referred for pacemaker implantation later that morning. A dual chamber pacemaker (atrial pacing lead, Guidant, # 4136, pulse generator, Boston Scientific, # 5603, St. Paul, MN, USA) was placed with a right atrial lead and a right ventricular septal lead. Conscious sedation

was used during the implantation for patient comfort. Post-implantation ECG showed a paced rhythm at 80 bpm with a left bundle branch block pattern. The patient was transferred to the cardiac intensive care unit (CICU) for further observation.

Shortly after returning to the CICU the patient began complaining of extreme shortness of breath. Audible stridor was present without significant wheezing on lung exam. The patient became hypoxic despite receiving supplemental oxygen (100% FIO₂ via nonrebreather mask) and became very agitated, noting pain in his throat and chest. The patient was intubated in light of his worsening respiratory status and a chest X-ray and echocardiogram were obtained. Chest X-ray revealed significant pulmonary edema. The echocardiogram was without evidence of pericardial effusion or tamponade, but was significant for mid-apical, interventricular, septal, apical, anterior and inferior wall akinesis and an EF of 32% (Fig. 2C and D). An ECG was performed and unchanged. Troponin-I and creatine kinase were 0.69 µg/L and 144 U/L, respectively. Later that day, the patient was transferred for cardiac catheterization in light of the above echocardiographic findings.

Cardiac catheterization showed LV end-diastolic pressure to be 20 mmHg, and non-obstructive stenosis of the mid-left anterior descending (LAD) artery with thrombolysis in myocardial infarction 3 flow (Fig. 3). Left ventriculogram showed overall preserved LV function with hyperdynamic basal LV segments (Fig. 4A and B).

The patient was extubated successfully soon after catheterization and mild diuresis. Echocardiography performed the following day revealed preserved LV systolic function with an EF of 55% and persistent mid to apical septal akinesis. Repeat cardiac biomarkers also trended toward normal. While hospitalized, the patient was initiated on aspirin, clopidogrel, simvastatin, furosemide, and lisinopril therapy, with the addition of metoprolol on the day

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