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Acute myocarditis morphologically mimicking reverse takotsubo cardiomyopathy

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ABSTRACT

We report a case of acute myocarditis in a middle aged woman in which the left ventricle morphologically mimics reverse takotsubo cardiomyopathy. The two conditions typically mimic acute coronary syndrome and have to be differentiated early. Our case emphasizes the importance of multimodal cardiac evaluation in suspected cases to achieve a correct diagnosis.

Introduction

Acute myocarditis is the most common etiology in patients presenting with features of acute coronary syndrome (ACS) and normal coronaries. Takotsubo cardiomyopathy is commonly diagnosed in this scenario based on the morphology of the left ventricle (LV) in angiocardiogram or echocardiography. The two conditions need to be differentiated early as the clinical course, management, outcomes and prognosis vary widely. Though, stress cardiomyopathy usually has a good outcome, the initial presentation can be stormy requiring advanced life supports.[1] Multiparametric tissue characterization involving cardiac magnetic resonance imaging (CMR) aids to identify the pathology in a majority of cases. We report a case of acute myocarditis in which the LV morphologically resembles reverse takotsubo cardiomyopathy.

Case report

A 48 year old pre-menopausal woman, with no pre-existing illness or conventional risk factors for coronary artery disease (CAD), presented with symptoms of acute onset dyspnea and chest pain for a duration of one day. Her presenting symptoms were preceded by fatigue for a week. She denied history of fever, emotional stress or chronic medications. Her last child birth was 16 years prior to the presentation. Examination in the ER recorded a BP of 110/80 mmHg, heart rate was regular at 100/mt. The patient was tachypneic and her room air saturation was 80% which improved to 90% with 4L of oxygen by mask. There was an audible left ventricular S_3 (LVS_3) on precordial examination and crepitations on the base of both lung fields. Electrocardiogram (ECG) revealed ST depression in leads II, III, aVF, V_4–V_6 with ST elevation in V_1, V_2, aVR and aVL (Fig. 1). Troponin I level was 30.6 ng/ml. A diagnosis of ACS was made initially with the suspected culprit vessel as left main (LM) or proximal left anterior descending artery (LAD). The trachea was intubated and the patient was immediately transferred for revascularization. However her coronary angiogram (CAG) revealed normal epicardial coronaries (Fig. 2). Angiocardiogram could not be performed as the LVEDP was raised at 22 mmHg. Laboratory values revealed normal level of serum electrolytes and normal renal, hepatic and thyroid parameters. Her total leukocyte count was 21,400 with 74% neutrophils and 24% lymphocytes. CKMB level was 55 IU/L and CRP was 60 mg/L.

Acute myocarditis was considered as the probable diagnosis and the patient was transferred to intensive care and supportive measures initiated. Echocardiographic evaluation in the parasternal long axis (PLAX), parasternal short axis (PSAX) and apical four chamber view (A4C) showed preserved contraction of LV apex with akinetic mid and basal LV segments, resembling reverse takotsubo cardiomyopathy (video 1). There were no valvular lesions. A thin

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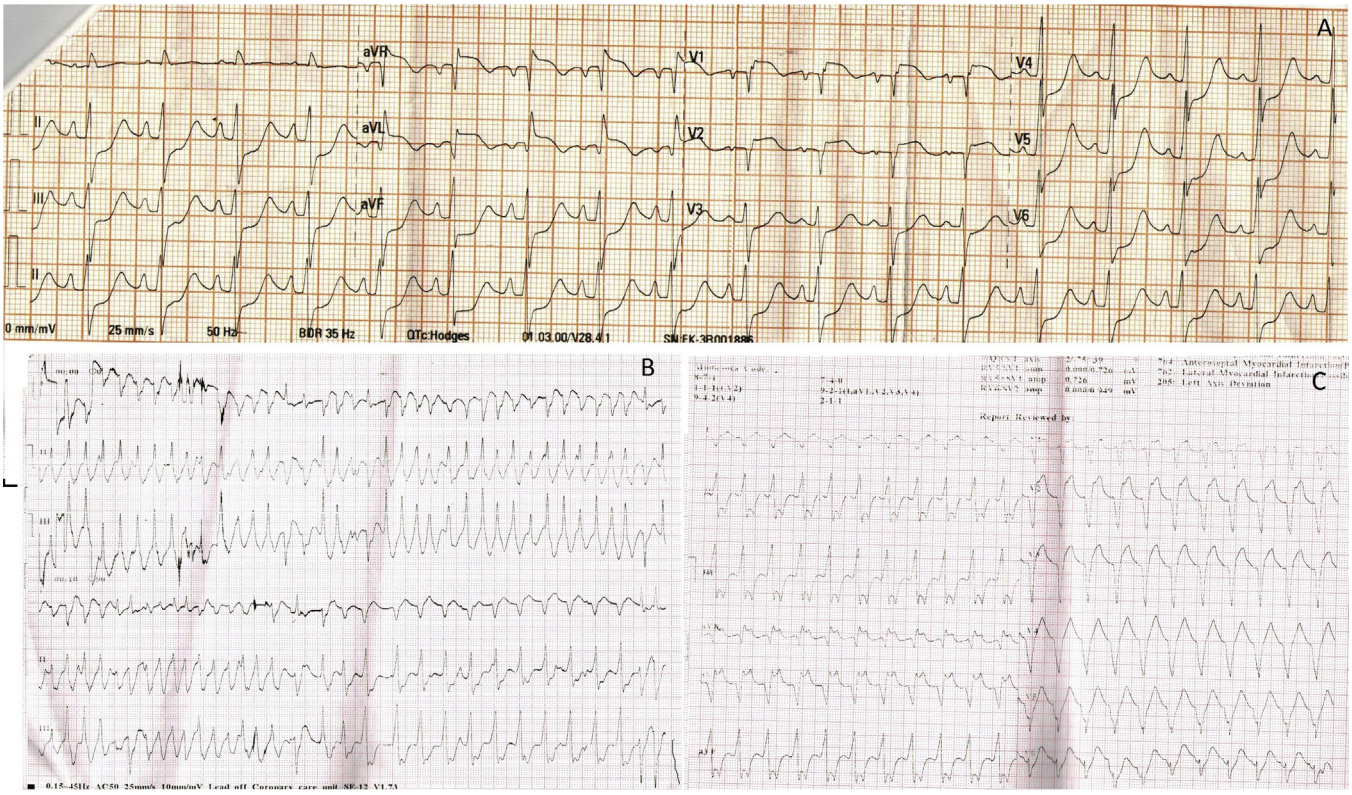

Fig. 1. (A) ECG showing ST deviations suggestive of ACS. (B) ECG showing polymorphic VT. (C) ECG showing monomorphic VT.

rim of pericardial effusion was noted initially which resolved spontaneously. Strain by speckle tracking echocardiography revealed preserved strain in the LV apex with significant reduction of strain in other segments (Fig. 3). Subsequently a cardiac magnetic resonance imaging (CMR) was performed on day 15 which confirmed the reverse takotsubo pattern (videos 2,3). CMR revealed areas of mid myocardial and transmural late gadolinium enhancement (LGE) involving the basal and mid LV segments in a pattern not restricted to a coronary territory). Viral serology reported positive for IgM Parvovirus B19–5.5 (0–0.89) index. IgG levels were negative on day 5 and was positive at 2 months. Her hospital course was complicated by recurrent episodes of monomorphic and polymorphic ventricular tachycardia (VT)) Fig. 1B, 1C from day 3 to day 6 which required multiple direct current (DC) shocks and intravenous (iv) anti arrhythmics. The patient also had transient hemodynamic instability which required iv inotropes. An endomyocardial biopsy (EMB), was not done as the patient did not consent. She was discharged on day 16. At 6 months follow up she was found to have LV dysfunction and persistent reverse takotsubo pattern.

Discussion

Among the patients presenting with features of ACS, normal coronaries are found in 7–10%.[2] Myocarditis is the most common etiology (63%) in such patients.[3] Takotsubo cardiomyopathy is a differential diagnosis. ECG, cardiac enzymes are less useful in differentiating the two. Further, Patients with acute myocarditis seldom report prodromal symptoms, unlike those with fulminant myocarditis. Takotsubo cardiomyopathy is commonly diagnosed in this setting based on the morphology of LV. Any of the several stressors (including myocarditis) can lead to the LV morphology characteristic of takotsubo cardiomyopathy.[4] Myocarditis has to

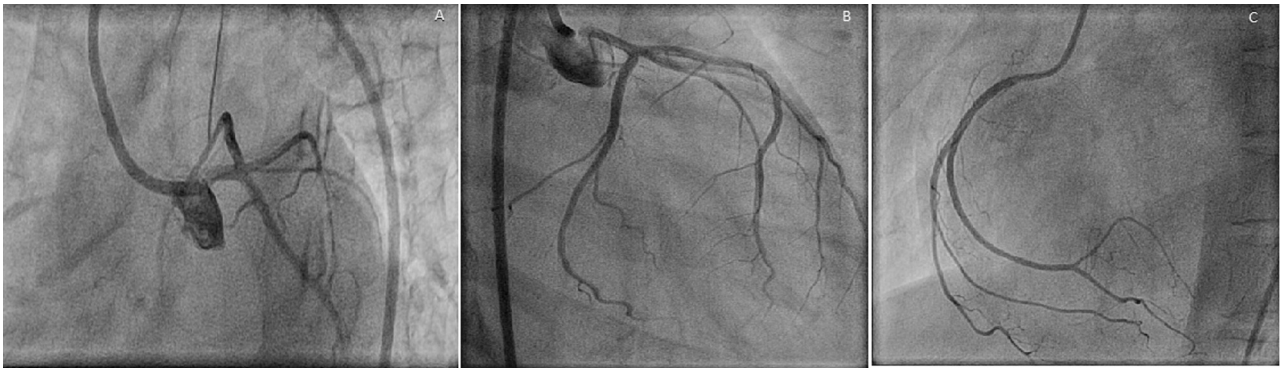

Fig. 2. CAG showing normal LMCA (A), left coronaries (B) and RCA (C).