

Dobutamine Stress Echocardiography-Induced Broken Heart Syndrome (Takotsubo Syndrome)

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We report a case of dobutamine stress echocardiography-induced Takotsubo syndrome in a 76-year-old hypertensive patient with clinical complaints of chest pain in an elective visit to the cardiologist. Dobutamine-stress-echocardiography was requested to rule out chest pain of coronary origin. During the test, at peak exercise, echocardiogram showed apical akinesia and electrocardiogram showed ST-segment elevation in D1, AVL, and V2. The patient was hospitalized and underwent coronary angiography, which showed normal coronary arteries and left ventricular apical ballooning. During follow-up, the patient's condition remained stable, with regression of the manifestations 21 days after the initial presentation.

Case Report

A long-term hypertensive 76-year-old female patient regularly taking enalapril 20 mg/day plus hydrochlorothiazide 25 mg/day presented with history of atypical chest pain for three months. She denied other risk factors for coronary artery disease. She sought medical assistance, and dobutamine-stress echocardiography was requested to rule out coronary insufficiency. Other tests previously performed were: chest radiography, Doppler echocardiography, biochemical tests and electrocardiography, all with normal results. Physical examination was also normal. Dobutamine-stress echocardiography was initiated with no signs of complications. However, at the final phase of the test (peak exercise), electrocardiogram showed ST-segment elevation in D1, AV, and V2. Also, there was left ventricular mid-apical segment akinesia, which persisted in the recovery phase (Figure 1). The patient did not present chest pain or any other symptom, and the electrocardiogram performed after the test had reverted to the initial pattern. She was referred for cardiac catheterization, which did not show significant obstruction; left ventriculography demonstrated apical ballooning with basal segment hyperkinesia consistent with

Key Words

Takotsubo Syndrome; echocardiography, stress; dobutamine.

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Takotsubo syndrome (Figure 2). The enzyme profile showed elevated cardiac enzymes: CK-MB mass: 12.64 ng/mL (normal < 5.1 ng/mL); troponin: 0.800 μ g/L (normal < 0.01 μ g/L). The patient remained clinically stable; however, she received intravenous infusion of dobutamine at 10 μ g/kg/min for 48 hours. She was discharged on the fifth day of hospitalization using furosemide 40 mg/day + carvedilol 3.125 mg bid + enalapril 5 mg bid + aldactone 25 mg/day. Echocardiography performed 20 days after discharge showed normal LV segmental motion.

Discussion

The first report by a Japanese group (Satoh et al¹), in the early 1990's, described that, after severe stress, middle-aged patients, especially women, presented symptoms similar to those of acute myocardial infarction (chest pain, abnormal cardiac enzymes, left ventricular segmental impairment), however with normal coronary arteries. The syndrome was called "broken heart syndrome" or Takotsubo syndrome^{1,2}, because, during ventricular systole, left ventriculography showed that the heart presented the shape of an octopus trap used in Japan.

The etiology and clinical characteristics of this syndrome remain not fully understood³. Several factors have been cited as triggering factors: psychological conditions, exacerbation of systemic, neurogenic, pulmonary, gastrointestinal, and renal diseases, as well as other unspecific conditions.

Despite the unknown etiology, excessive sympathetic stimulation has been proposed as a key factor in its pathophysiology. Patients with this syndrome have higher catecholamine levels than those with myocardial infarction of the same Killip class.

A variant of transient left ventricular ballooning has been recently described, in which only the mid ventricle is affected, with hypercontractility of the basal and apical segments, named reverse Takotsubo syndrome⁴.

Although its real prevalence has not been defined, retrospective surveys suggest that 2% of the cases treated as acute coronary syndrome are actually Takotsubo syndrome⁵.

In the case reported, we present an uncommon case of dobutamine stress echocardiography-induced Takotsubo syndrome which had a favorable clinical outcome and recovery of the left ventricular function, as demonstrated by the echocardiographic control performed in the 20th day of follow-up. In the medical literature, no more than

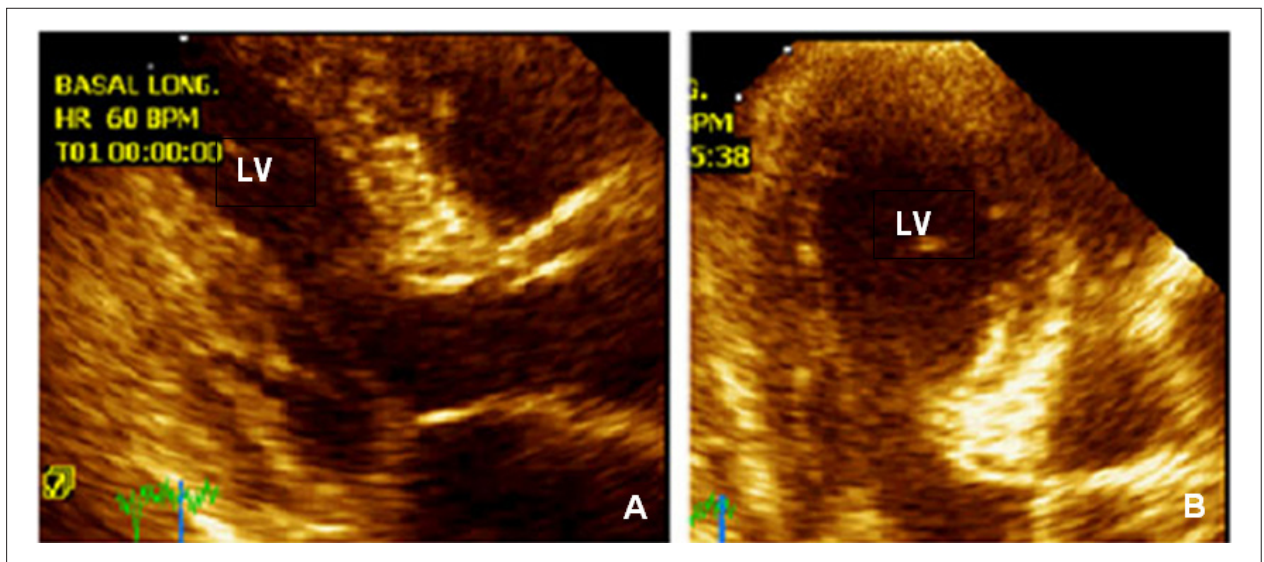


Figure 1 - A - Resting longitudinal parasternal LV view image (systole). B - LV parasternal view at peak exercise. LV - left ventricle.

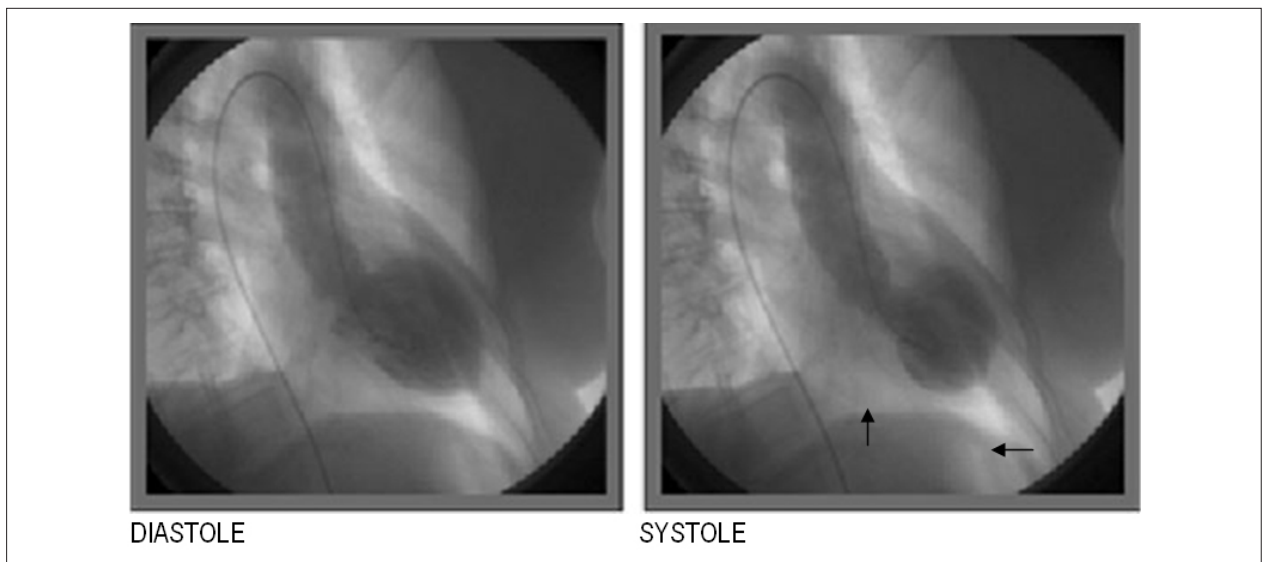


Figure 2 - Left ventriculography: LV apical ballooning (→) with hyperkinesia of the basal wall (↑) during ventricular systole.

three cases of dobutamine-induced Takotsubo syndrome are described.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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Study Association

This study is not associated with any post-graduation program.

Case Report

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