

Tako-tsubo syndrome and hypovolemia

Sindrome Tako-tsubo e ipovolemia

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ABSTRACT: *Tako-tsubo syndrome and hypovolemia. O. Vriz, R. Citro, S. Martina, L. Mos, F. Pertoldi, D. Pavan, F. Antonini-Canterin, E. Bossone.*

Tako-tsubo syndrome (TTS) is a rare disorder characterized by reversible apical left ventricular ballooning usually triggered by an emotional and/or physical stress and often mimicking an acute myocardial infarction. We describe a case of 78 year old woman with TTS associated

with hypovolemia and hyponatraemia. The hypovolemic state could have activated the sympathetic system and in turn catecholamine overload with consequent myocardial stunning.

Keywords: hyponatraemia, hypovolemia, tako-tsubo syndrome.

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Case report

During hot summer day a 78 year old woman was referred to the emergency department in acute confusional state. Medical history consisted of systemic arterial hypertension (on treatment with diuretics and vasodilators), hypothyroidism and chronic obstructive pulmonary disease. She was smoker of 20 cigarettes a day. At the emergency department she was hypotensive (90/60 mmHg) and tachycardic (104 bpm); neurological examination was negative for focal signs. A 3/6 midsystolic cardiac murmur was heard on the aortic area. Her serum sodium was low (114 mmol/L), potassium normal (3.4 mmol/L), chlorine low (81 mmol/L), serum creatinine (1.29 mg/dL) and lactate (2.7 mmol/L) were increased. The electrocardiogram (ECG) showed anterior ST segment elevation and T wave inversion on precordial leads (Fig. 1). Cardiac markers were mildly elevated: troponin I 2.66 ng/mL (cut-off <0.1), CK-MB 31.2 ng/mL (cut-off <3.5). Two-dimensional echocardiography (TTE) (Fig. 2) showed apical left ventricular akinesia and basal hyperkinesis. Left ventricular ejection fraction was moderately depressed (37%). The interventricular septum had a sigmoid aspect due to hypertrophy of the basal and mid segment (1.35 cm). During colour flow mapping on left ventricular outflow tract (LVOT) an aliasing was appreciated. By using continuous wave Doppler an end-systolic pressure gradient of 31 mmHg was detected. Systolic anterior motion of the anterior mitral leaflet with mild mi-

tral regurgitation was recorded. Oxygen, unfractionated heparin (bolus of 3000 IU) and acetylsalicylic acid (500 mg) were administered in the emergency department and the patient underwent coronary angiography which showed apical ballooning with "normal" coronary arteries (Fig 3). Left ventriculography (Fig. 4) showed an extensive akinesia-diskinesia of the LV antero-apical wall. Computed tomography scan of the head was unremarkable. According to the Mayo Clinic criteria Tako-tsubo syndrome (TTS) was diagnosed (3). Volume replacement by administering hypertonic saline therapy was promptly started. The patient's haemodynamic and the neurological status gradually improved. After an uneventful hospital course she was discharged. On day 10 the echocardiogram showed apical hypokinesia while ECG changes disappeared. Cardiac enzymes were within normal limits. At 2 month follow-up left ventricular contractility was completely normalized.

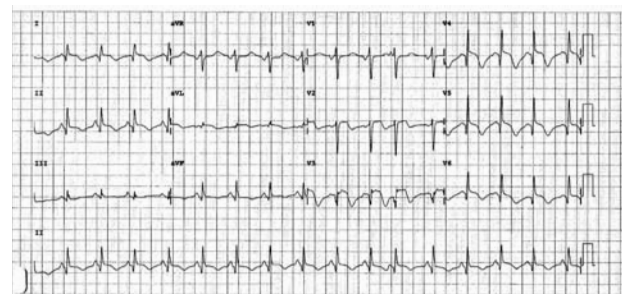


Figure 1. - Electrocardiogram on hospital admission.

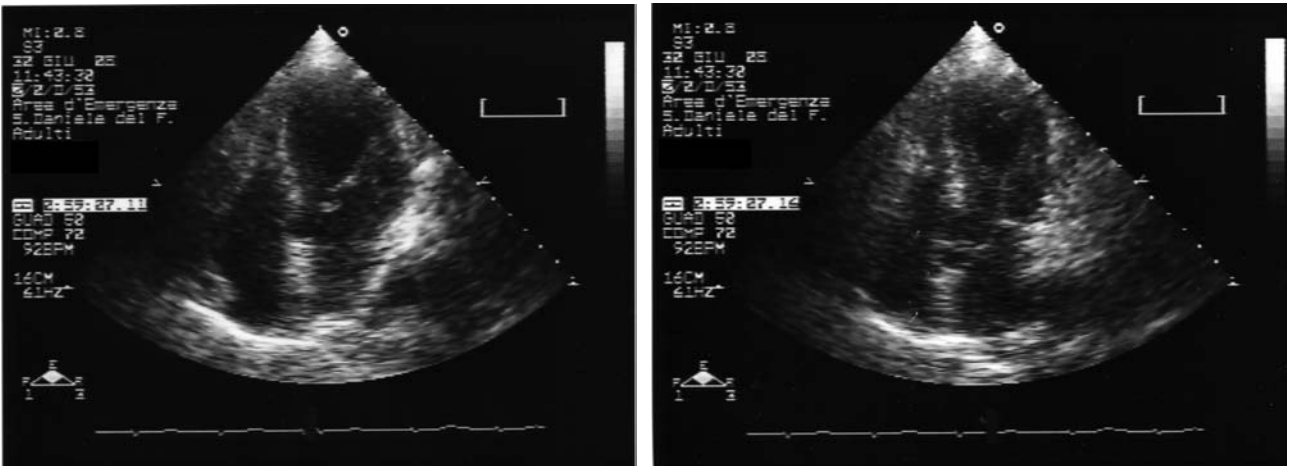


Figure 2. - Echocardiogram in diastole (left panel) and in systole (right panel).



Figure 3. - Coronary arteriography: left coronary artery (left panel) and right coronary artery (right panel).

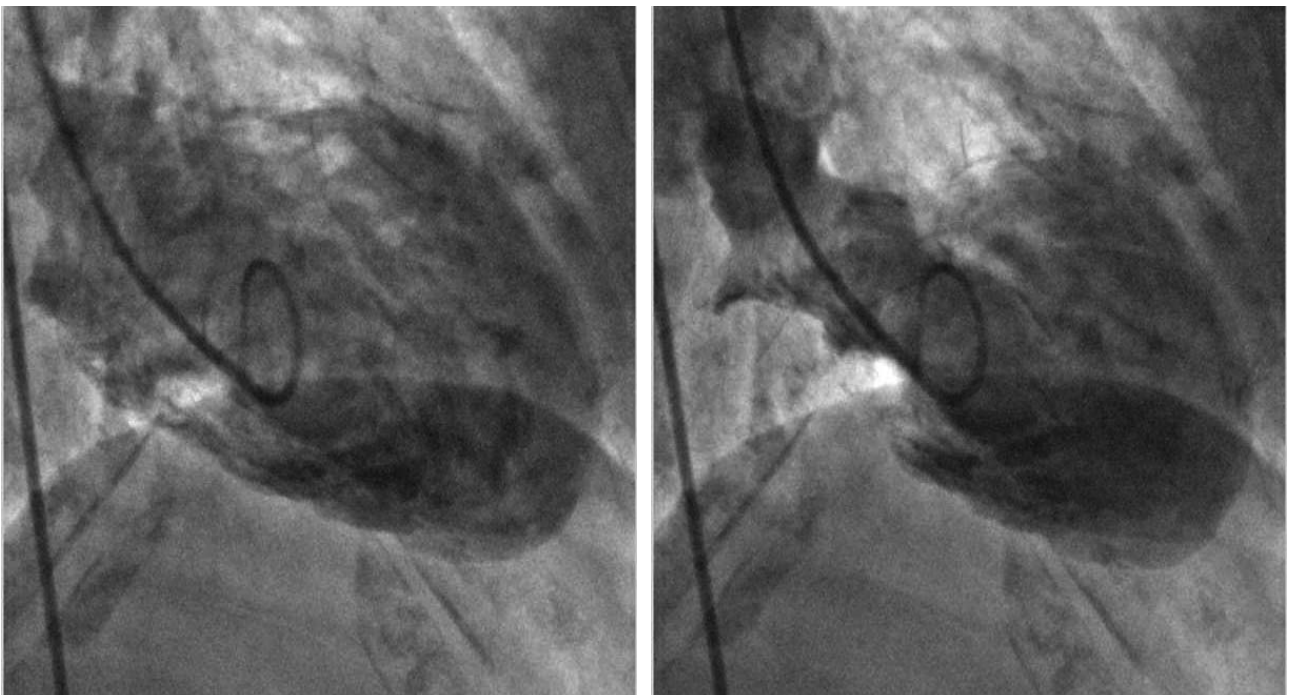


Figure 4. - End-diastolic (left panel) and end-systolic (right panel) left ventriculogram in right anterior view during the acute phase.

Discussion

We have described a case of TTS presenting with an "atypical clinical scenario" characterized by neurological symptoms and hypovolemia probably related to inappropriate diuretic-vasodilators therapy in particular environment such as an hot summer day. The hypovolemic state may have (a) triggered catecholamine release with consequent myocardial stunning and (b) induced LVOT gradient which was no longer present after volume load (4,5,6) The occurrence of LVOT obstruction (described in about 20% of TTS patients) seems to be prevalent in older patients and requires the presence of a small ventricle and hypertrophic basal interventricular septum (both observed in our case) in order develop dynamic mid-cavity pressure gradient. TTS remains a challenging clinical condition with a wide spectrum of clinical presentation, especially in the elderly, in which a specific emotional and/or physical trigger event may be absent. The echocardiographic search for LVOT obstruction is fundamental in order to guide specific therapeutic intervention such as the administration of negative inotropic agents (beta-blockers) and/or hypertonic saline in the case of hypovolemia.

Riassunto

La sindrome di Tako-tsubo (TTS) è una rara presentazione clinica caratterizzata da una discinesia

apicale reversibile del ventricolo sinistro generalmente innescata da stress psico-fisici e spesso confusa con un IMA. Qui descriviamo il caso di una donna di 78 anni con TTS associata ad ipovolemia e a iponatremia. Si ipotizza che lo stato ipovolemico possa avere attivato il sistema simpatico e un sovraccarico di catecolamine con conseguente stordimento miocardico.

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