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CASE REPORT

STRESS CARDIOMYOPATHY: A CLINICAL CASE OF RECURRENT OF THE TAKO-TSUBO SYNDROME AND SHORT REVIEW OF LITERATURE

Sergio Fasullo, Giorgio Maringhini, Graziella Vetrano, Gaspare Parrinello, Giuseppina Novo, Maurizio Abrignani, Stefania Davì, Benedetto Morana, Alessandro Raffa e Nicolò Renda

Abstract

Objective: Stress cardiomyopathy is characterized by symptoms with ECG modification and increased MI-STE typical myocytolysis markers in post-menopausal women who have suffered from an episode or a period of intense emotional stress. A normal coronary artery and a peculiar and reversible morphology of the left ventricle in systole that has taken the Japanese name of Tako-Tsubo.

Method: What truly causes the adverse outcome in tako-tsubo cardiomyopathy? The TS basics of pathophysiology have not come to a definitive conclusion. Numerous mechanisms have been proposed. Active triggers are common, but little is known about psychological background characteristics.

Results: Anxiety and depression contribute to increasing the risk of myocardial infarction or simulating a coronary syndrome.From a medical point of view, therefore, psychiatric disorders must be placed at the same level with type 2 diabetes, smoking, hypercholesterolemia and hypertension.

Although the prognosis is good and spontaneous resolution is common, clinical manifestations may last for weeks.

Conclusions: The reported clinical case has characteristics that are compatible with stress cardiomyopathy and could be an example of how such a clinical syndrome if not properly treated can be reproduced.

Key words: echocardiography, Tako-Tsubo, stress and anxiety

Declaration of interest: the authors have no conflict to declare

Sergio Fasullo*, Giorgio Maringhini*, Graziella Vetrano*, Gaspare Parrinello **, Giuseppina Novo**, Maurizio Abrignani ***, Stefania Davì****, Benedetto Morana ***, Alessandro Raffa*** e Nicolò Renda ***

*Department of Cardiology,Coronary Care Unit, "Paolo Borsellino, G.F. Ingrassia Hospital Palermo,Italy.
**PhD University Palermo, Italy
***Department of Cardiology, Trapani, Italy
***Specialist in Psychiatry, Palermo and Rome Italy
**** PhD in Chemistry and Pharmaceutical Technologies, Palermo, Italy

Corresponding author
Sergio Fasullo (MD)
Chief of Coronary Coronary Unit
Department Cardiology "Paolo Borsellino"
Corso Calatafimi 1002, 90100 Palermo Italy, Tel:3387965572
E-Mail: sergio.fasullo72@gmail.com

It seems like a heart attack, instead it is stress cardiomyopathy.

Unto a broken heart
No other one may go
Without the high prerogative
Itself hath suffered too.
Emily Dickinson, 1704

Introduction

Tako-tsubo cardiomyopathy is an increasingly diagnosed condition. It is important to establish the nature of this state of transient myocardial dysfunction, as this may indicate a potential therapeutic target in those cases with a less favorable clinical course. Tako-tsubo syndrome (TS), described in 1990 by Satoh, can mimic acute myocardial infarction (AMI) and induce pump failure and hemodynamic instability. Misdiagnosis of Tako-tsubo cardiomyopathy for AMI may misdirect therapy (Sato et al. 1990).

Unlike patients with acute myocardial infarction (AMI), TS patients have no obstructive coronary lesions showing at coronary angiography. The most serious complications are cardiogenic shock, stroke, and the formation of an atypical thrombus. Although the exact cause is not known, the syndrome usually worsens the physical and emotional stress secondary to non-cardiac and surgical disorders. Diagnosis is performed with coronary arteriography, left ventriculography and echocardiography. TS patients need to be monitored and hospitalized in intensive care if they have ventricular arrhythmias, heart failure, and mechanical complications.

Treatment up to now consists of symptomatic and supportive therapy, which must be based on the administration of beta-blockers, angiotensin-converting enzyme inhibitors, aspirin and diuretics. Correct treatment in the acute phase allows a rapid improvement

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with a complete recovery of cardiac function in a few weeks. Usually the disease does not cause problems, but it can rarely be complicated by the rupture of the left ventricle resulting in sudden death. TS may also present cases of recurrence, especially in patients with thyroid disorders (Patel et al. 2016).

Case report

We report a clinical case of relapse of the syndrome arrived at the emergency room for chest pain associated with dyspnea, following a new stressful emotional event.

The patient was a 40-year-old woman with a history of anxiety disorders. Hospitalized for stress cardiomyopathy in September 2000, following intense stress.

She was discharged on treatment with Ca ++ antagonists, which was suspended arbitrarily.

We provide all cardiac acute patients with a brief psychiatric counseling questionnaire (Patient Suicide Prevention, protocol PR011DIR006 \ Ingrassia Hospital Palermo), based on historical reconstruction of patient life (previous suicidal attempts, self-inflicted acts, family suicide history, traumatic or conflicting experiences, loss of life, social isolation) and on the examination of clinical conditions (organic brain syndromes, worm-like syndromes, psychiatric pathology, abuse or addiction, terminal disease, or serious body changes). This allows us to identify patients at risk and patients who need psychiatric counseling. In this case the patient had depression risk factors and strong anxiety.

In her life, the patient sacrificed a series of needs and expectations. The conflict with her husband marked a difficult relationship with quarrels and strong misunderstandings. At the time of the visit, the patient reported a strong "heart in the throat" and a feeling of death. She took anxiolytics of her own accord and never consulted a specialist because she was afraid. On January 2016, the patient came to the emergency room about 15 minutes after the symptoms.

An immediate ECG (**figure 1a**) showed sinusal rhythm, ST elevated about 2 mm from V2-V6 and the patient was immediately sent to cardiac intensive therapy where she performed a trans-thoracic echocardiogram (**figure 2**) that showed apical dyskinesia and distal segment of the left ventricular wall front, with depressed systolic function (EF 45%), (Maron et al. 2006).

The necrosis markers showed an increase in blood levels of troponin - Hs (1184.3 ng / mL). The patient immediately received low molecular weight heparin treatment, aspirin 250 mg, clopidogrel load, statin and was submitted to coronarography and ventricolography in the hypothesis of an acute coronary syndrome. The patient was treated with alprazolam drops from the first day of hospitalization. Coronary examination (**figure 3a**, **b**) showed a coronary tree without significant lesions while ventriculography (**figure 3c**) confirmed the apical dyskinesia. The clinical course was regular with rapid improvement in systolic function and normalization of necrosis marker values. Cardiac magnetic risonance (MRC) was programmed but the patient did not do it owing to an episode of claustrophobia (Bybee et al. 2004).

The patient was discharged with acetylsalicylic acid (100 mg), bisoprolol (1.25 mg) and omeprazole (20 mg). Subsequent controls, both ECG and echocardiographic, showed a complete recovery of cardiac function and disappearance of the alteration of the segmentation kinetics. The repeated control of thyroid hormones was in the range of normality. During hospitalization based on the history of anxiety and claustrofobia, she was given the HADS (Hospital Anxiety and Depression Scale) questionnaire and a specialist consultation with

Figure 1 a–b. *Shows electrocardiogram performed on admission and on discharge.*

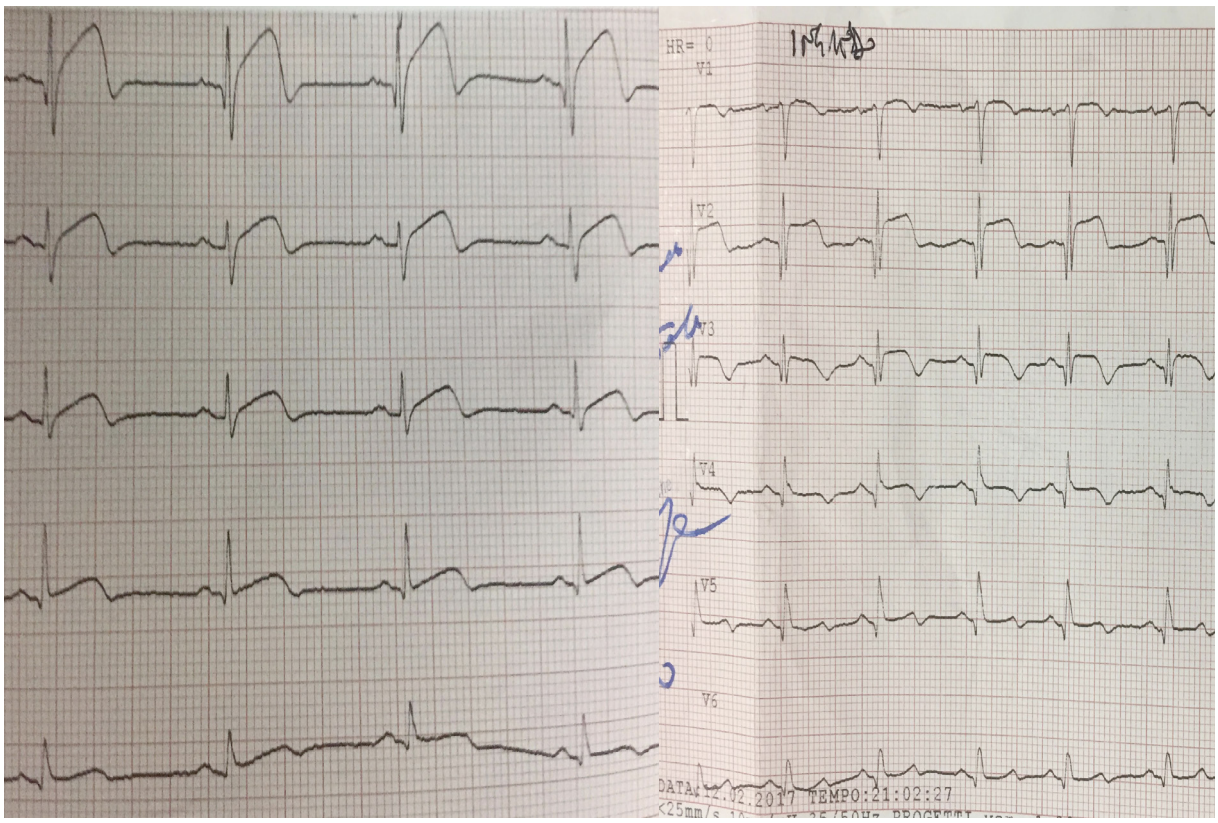


Figure 2. *Shows abnormalities of apical dyskinesia and distal segment of the left ventricular wall front, with depressed systolic function (EF 45%)*

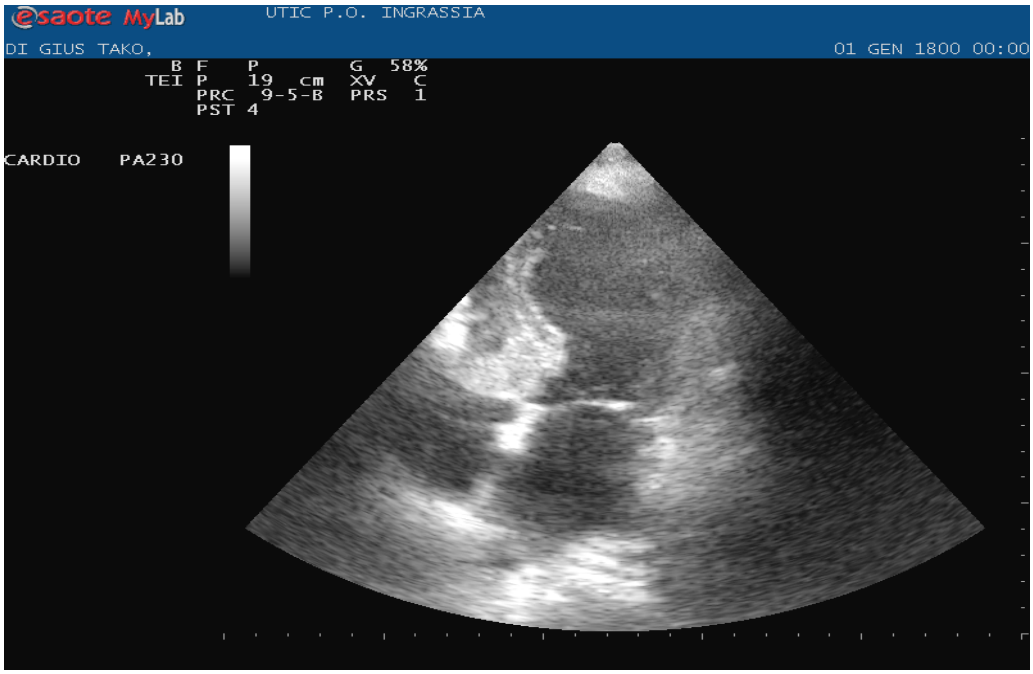
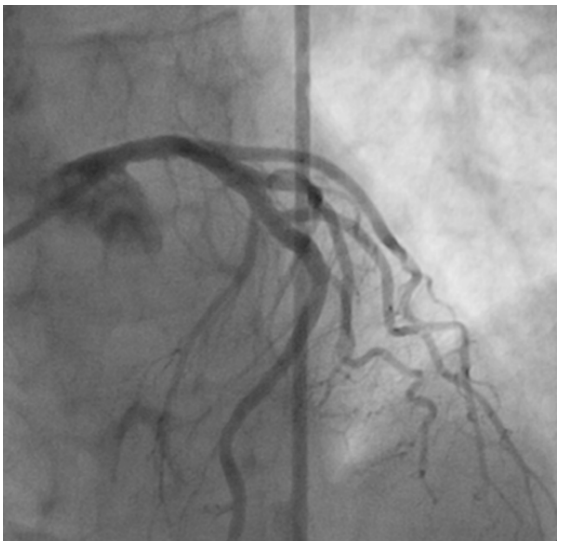
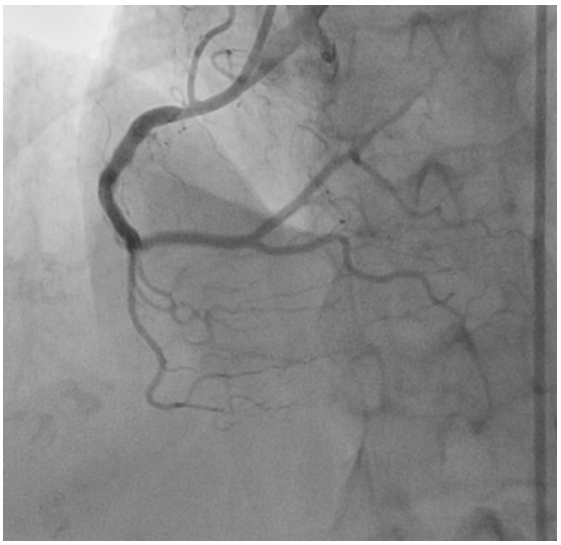


Figure 3a-b. *Coronary examination showed a coronary tree without significant lesions while ventriculography showed apical dyskinesia*





the psychiatrist.

HADS is a questionnaire specifically developed by Zigmond and Snaith in 1983 to detect anxiety and depression in patients with organic illness, excluding the areas of investigation of symptomatic indicators of psychological distress (such as headache, insomnia and Weight loss) potentially due to the presence of the same organic disease or the consequence of therapeutic interventions. The instrument consists of two 7-item scales, one for anxiety evaluation and the other for depression rating, with varying scores from 0 to 3 for each item. For each of the patient's claims, one asks which of four possible options best describes his / her emotional state.

A score equal to 7 or less is considered normal from a psychopathological point of view. From 8 to 10 as borderline cases (potentially in psychopathological evolution) and a score above 11 as cases with clinically relevant signs of anxiety or depression.

The test results were: scale A: 13 \ 21 - scale D: 6 \ 21, demonstrating that the patient suffered strongly from anxiety. The interview was set on two levels: that of somatic disorder (chest pain) with respect to which the patient was very concerned about the clinical situation and secondly the level of emotional relationship: and here the woman was very open to psychological dimensions. This collaboration between specialits will be the key to treatment.

The patient who accepts the psychological matrix of somatic disorder will come out of the disease (Fasullo 2002).

While in many cases Tako-tsubo cardiomyopathy remains without consequences for patients, the

discomfort of anxiety, if not treated, can also lead to the worsening of the clinical situation. Coronary heart disease occurs much more often in depressed people than in control groups with cardiovascular disease but without depressive disorders.

Anxiety and depression contribute to increase the risk of death in cardiac patients (Marano et al. 2016).

The patient was given a therapy with citalopram (20 mg / day) as suggested by the psychiatrist and the result was positive.

Discussion

What causes the adverse outcome in Tako-tsubo cardiomyopathy? The literature on TS pathophysiology has not come to a definitive conclusion. Various mechanisms have been proposed. Histologic studies with myocardial biopsies have shown infiltrates of mononuclear lymphocytes and macrophages with fibrosis and contraction necrosis bands, unlike results from coagulation necrosis in atherosclerotic occlusion in infarction.

Other hypotheses include coronary spasms with subsequent stunning, microvascular dysfunction, myocarditis, but the predominant hypothesis appears to be a catecholamine overload.

The concentration of β-adrenergic receptors is also particularly high in the heart and this could explain the strong and inappropriate response to catecholamines., physicians have found significantly high levels of stress hormones in the blood of these patients, mainly adrenaline and noradrenaline (Smeijers et al. 2016).

However, increased adrenergic activity seems to play an important role in the pathophysiology of TS. The prognosis of TS is good with full recovery within 4-8 weeks. The hospital mortality rate is about 3%, which increases with associated morbidity. Long-term survival is similar to the general population (4-10% at 4 years). Unfortunately, the mechanisms or risk factors underlying the syndrome are not known.

Takotsubo is a transient condition characterized by severe left ventricular dysfunction combined with symptoms and signs mimicking myocardial infarction. Emotional triggers are common, but little is known about the characteristics of the psychological background.

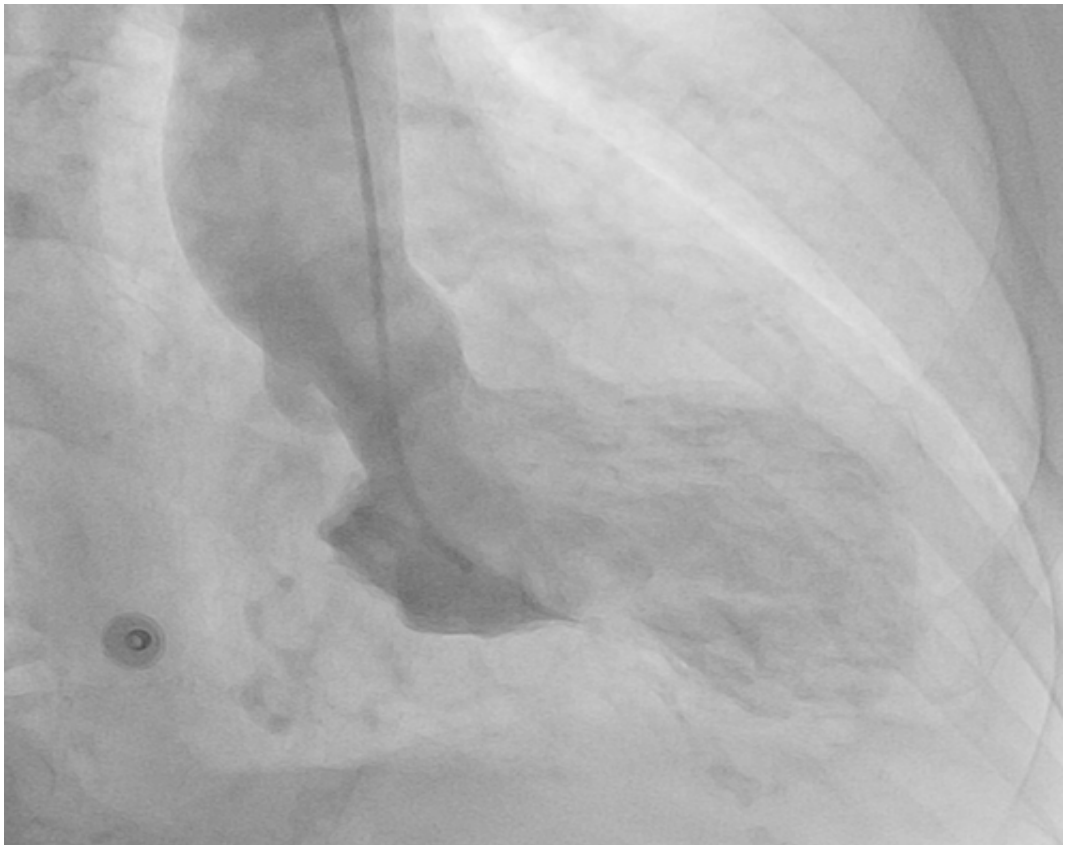
The reported clinical case is particularly interesting for the recurrence of the syndrome that always falls in relation to emotional stress in subjects with major anxiety disorders, not associated with thyroid disorders.

This suggests that the role of psychiatric disorder (in this case hyperactive and unresolved) is a pre-eminent mechanism of the onset of acute pathology. Depressive disorder is associated with greater morbidity and a worse prognosis.

Therefore, from a medical point of view, psychiatric disorders must be on the same level as type 2 diabetes, smoking, hypercholesterolemia and hypertension. Overweight depressed patients (BMI> 30) have three times the risk of coronary heart disease compared to the control group without psychiatric disorders. Therefore, physicians are advised to monitor carefully, in addition to heart disease and risk factors, the presence of psychiatric disorders (and start appropriate therapy). However, also the opposite is true: patients with coronary heart disease often have a tendency to depressive disease.

Depressed mood and other depressive symptoms frequently appear after acute myocardial infarction and it is known that these patients have an increased risk of morbidity and mortality compared to patients without depression. Many risk factors promote the development of clinical depression in patients with recent myocardial infarction (Thornton 2001). Although a large number of studies underline the negative prognostic impact of

Figure 3c



depression on the infarcted patient, only a few patients are appropriately diagnosed and treated (Fasullo 2004).

Furthermore, it should be kept in mind that the use of psychotropics in medically ill patients requires attention. In fact, these drugs can interact with the disease causing numerous complications. Furthermore, because the cardiologic patient is often treated with other drugs, the risk of drug interactions is high.

In light of these data emerges the need to recognize the presence of depressive symptoms in patients with coronary artery disease. As a first indication, it may be sufficient to ask the patient simple questions about a possible depression, sadness or despair and also about the lack of interest in social activities.

Our reported clinical case meets all recent diagnostic criteria proposed by the Mayo Clinic: 1. Transient akinesia or dyskinesia of the left ventricular medial segments, with or without apical involvement; 2. Absence of coronary artery disease or angiographic evidence of acute plaque rupture. 3. Electrocardiographic anomalies (ST segment elevation and / or T wave inversion) or modest elevation of heart troponin; 4. No pheochromocytoma and myocarditis (Prasad 2007, Hansen 2007).

About 10% of cases with acute coronary syndrome have no significant lesions to coronary angiography.

For this reason the contribution of cardiac magnetic resonance imaging (MRI) in the etiological investigation is increasing under these conditions.

Magnetic resonance imaging can be used to differentiate Tako-tsubo syndrome from myocardial infarction and also to obtain better information on myocardial structure (infiltrates, fibrosis, etc.).

The exam can help us in the evaluation of cardiac function; this to improve the patient's management in the initial phase.

Cardiac magnetic resonance could also become the gold standard technique for assessing quality of life and long-term treatment (Camastra et al. 2017).

The new generation antidepressive therapy is strongly indicated because of the best therapeutic index shown in cardiovascular disorders. The cardiologist can then use the latest generation molecules, characterized by a better tolerability profile compared to classical compounds.

To prevent recurrences, therapy must be maintained after symptom remission for at least another 4 weeks (Marano et al. 2011, Delmas et al. 2013).

In the literature we found another case of recurrence, which was not treated with antidepressant drugs (Del Solar-Moreno 2015).

Our clinical case suggests that a careful evaluation of psychiatric pathology in patients with TS can play a decisive role in the therapeutic approach, useful also in the prevention of recurrences.

It would be interesting to have an observational evaluation of patients with TS and the analysis of any possible anxious-depressive components.

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Great is my tribute to Dad, Silvio (*magister optimus*), constant stimulus for reflection and study.

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