

Perioperative Takotsubo Syndrome R Broken Heart Syndrome

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Abstract

Case Report

Takotsubo syndrome, stress-related cardiomyopathy, or broken heart syndrome is a transient cardiomyopathy that was first described in Japan: it generally lasts two weeks, in the absence of mortality or severity at acute phase. Several cases of Takotsubo have been reported worldwide. We report 7 cases of patients treated immediately after surgery for clinical manifestations of chest pain or acute dyspnea with electrical changes to the ECG, elevation of troponins and echocardiographic anomalies thus simulating an acute coronary syndrome. The diagnosis is retained by ultrasound, the coronary angiography does not show any significant lesion and the ventriculography confirms the appearance of the disease. The clinical and ultrasound evolution is favorable with beta-blockers and ACE inhibitors.

Keywords: Takotsubo, cardiomyopathie, cardiomyopathy, ACE inhibitors.

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INTRODUCTION

Stress cardiomyopathy is a cardiac syndrome with transient left ventricular dysfunction that has been reported worldwide for the past three decades. The typical appearance of the left ventricle bloated at the end of systole during the acute phase, similar to the pots used by the ancient Japanese octopus fishermen, gave it its name: Tako-Tsubo syndrome characterized by apical ballooning of the left ventricle. The triggers for Tako-Tsubo syndrome can be physiological or psychological, including shock and emotional stress responsible for acute heart syndrome with reversible heart failure.

In the perioperative period, this syndrome is characterized by a situation leading to intense sympathetic stimulation which can lead, among other things, to an alteration of consciousness, ventricular rhythm disturbances with sometimes acute edema of the lung or cardiocirculatory arrest.

PATIENTS AND METHODS

This retrospective study was conducted at the Cardiology Unit of Sud Francilien Hospital during a period of 6 months (November 2019 to April 2020).

RESULTS

All patients were women with an average age of 75.23 years hospitalized in the orthopedic unit and visceral surgery with a clinical presentation in the form of acute chest pain (2 cases), acute dyspnea (4cases) and atrial fibrillation (1case).

Cardiovascular management consisted of initially eliminating a pulmonary embolism and then an exploration of ischemic heart disease by performing an ECG, assay of cardiac enzymes and an echocardiography (Table-1).

Table-1: Clinical, Biological and echographic presentation

	AGE	Clinical situation	CPK	Troponin	Akinetic site	LVEF
CASE 1	83	Visceral surgery	(-)	36 µg/L	Medioventricular	55%
CASE 2	79	Appendicectomy	(-)	29 µg/L	Apical	58%
CASE 3	85	cholecystectomy	(-)	127 µg/L	Medioventricular	48%
CASE 4	71	cholecystectomy	(-)	309 µg/L	Apical	62%
CASE 5	69	visceral surgery	(-)	65 µg/L	Apical	65%
CASE 6	75	Orthopedic surgery	123UI/L	345µg/L	Apical	45%
CASE 7	65	Orthopedic surgery	210UI/L	201 µg/L	Apical	42%

A coronary angiography was carried out in all the patients showing no significant lesion. A ventriculography comforted the diagnosis of Cardiomyopathy of stress by objectifying evocative kinetic disorders (Figures 1 and 2).

All the patients were put on Beta-blockers, ACE and Aspirin after agreement of the surgeon.

The outcome was favorable for the 7 cases with complete recovery from left ventricular dysfunction after echocardiographic control at 4 weeks.

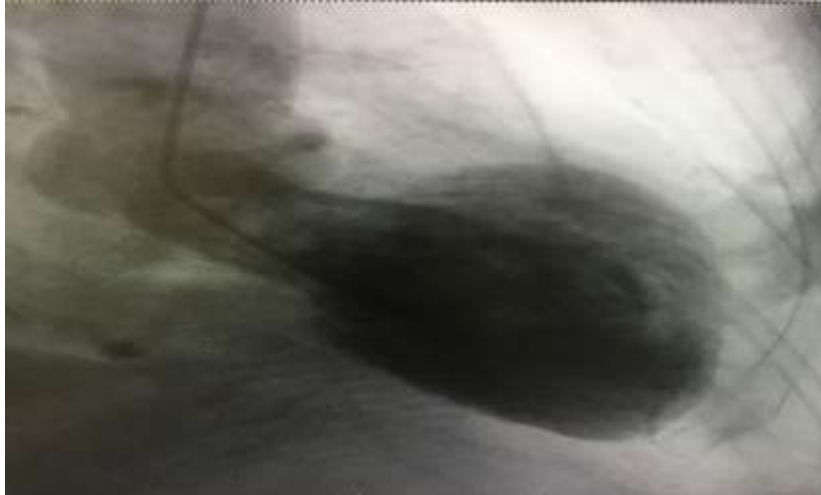


Fig-1: Ventriculographie showing an apical Tako Tsubo



Fig-2: Ventriculographie showing a medioventricular Tako Tsubo

DISCUSSION

Tako-Tsubo syndrome is a relatively rare myocardial pathology. The prevalence is estimated between 0.5 and 2% of acute coronary syndromes [1-3]. It is an entity that mainly affects postmenopausal women, exposed to intense physical stress (acute illness, surgery, pain) or more often emotional (bereavement, major fright). Until today, the pathophysiological mechanisms of this syndrome are poorly understood. Furthermore, it is estimated that a significant release of catecholamines into the bloodstream during emotional stress and myocardial hypersensitivity to these catecholamines could explain myocardial damage [4]. Studies have reported an accumulation of glycogen in cardiomyocytes as well as

reversible structural alterations in contractile proteins and the cytoskeleton [5].

The clinical presentation can simulate in any point an acute coronary syndrome and associates chest pain, dyspnea, and sometimes syncope or sudden death [2]. The electrocardiogram also shows signs suggestive of an acute coronary syndrome with an over or under shift of the ST segment [2]. The echocardiographic aspect highlights a hypo- or a non-systematic akinesia of the apex of the left ventricle [2]. On the other hand, the contractility of the base of the heart is normal or even most often increased, which can then constitute a dynamic obstacle in terms of the ejection of the ejection chamber from the left ventricle. It is in the absence of coronary lesion on the coronary angiography and the

typical ultrasound aspect that we must then evoke the diagnosis of Tako-Tsubo syndrome. Contractile anomalies mainly affecting the medio-ventricular segments and respecting the tip may be seen, producing an atypical aspect of the disease [3].

Blood troponin levels are most often normal or discreetly increased. BNP is sometimes high, especially as patients show signs of acute heart failure.

Initial therapeutic management requires rapid coronary angiography to exclude an acute coronary syndrome linked to coronary involvement.

Sometimes the clinical course can go towards a cardiogenic shock which indicate introducing of catecholamines. However, ultrasound should be monitored in this case for the absence of intraventricular obstruction. A counterpulsation balloon can also be used or even ECMO-type circulatory assistance in the event of worsening of cardiogenic shock despite optimal medical treatment. In the absence of signs of cardiogenic shock, beta-blockers reduce dynamic intraventricular obstruction and prevent possible ventricular rhythm disturbances associated with the pathology.

Perioperative management of TCM involves an intricate interplay of several key factors. Elective procedures in patients with known TCM are often delayed until resolution of the cardiomyopathy. If psychological risk factors, have been identified during the preoperative assessment, then delaying an elective surgery may be prudent. For nonelective cases, extra focus on allaying anxiety and stress may help in preventing a TCM episode. If feasible, regional anesthesia with appropriate sedation should be employed since it affords the ability to avoid general anesthesia-associated stress and provides postoperative pain control [6]. Irrespective of the anesthetic management employed, avoidance of stressors that could trigger a catecholamine surge is vital through appropriate pain management and preoperative anxiolysis as well as smooth induction and emergence. Prophylactic beta-blocker therapy should be given [7].

Outside the acute phase, it is advisable to continue beta-blocking treatment for a few weeks in the absence of contraindications. A converting enzyme inhibitor treatment is sometimes combined for a few weeks.

The evolution of this pathology is most often favorable with a hospital mortality of less than 10% [8, 9].

CONCLUSION

Stress cardiomyopathy is a clinical entity which must be brought up in the presence of acute coronary syndromes without significant coronary

involvement and with transient left ventricular dysfunction. Even retrospective diagnosis can have an impact on the prognosis, thus allowing the discontinuation of drugs which can be harmful in patients most often fragile.

ABBREVIATIONS

ACE: *angiotensin-converting enzyme*

ECG: *Electrocardiogram*

TCM: *TakoTsubo Cardimyopathy*

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