Perioperative Takotsubo Syndrome R Broken Heart Syndrome
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Abstract
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 bêta-blockers and ACE inhibitors.

Keywords: Takotsubo, cardiomyopathy, cardiomyopathy, ACE inhibitors.

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>
<thead>
<tr>
<th>CASE</th>
<th>AGE</th>
<th>Clinical situation</th>
<th>CPK</th>
<th>Troponin</th>
<th>Akinetic site</th>
<th>LVEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>83</td>
<td>Visceral surgery</td>
<td>(-)</td>
<td>36 µg/L</td>
<td>Mediventricular</td>
<td>55%</td>
</tr>
<tr>
<td>2</td>
<td>79</td>
<td>Appendicectomy</td>
<td>(-)</td>
<td>29 µg/L</td>
<td>Apical</td>
<td>58%</td>
</tr>
<tr>
<td>3</td>
<td>85</td>
<td>Cholecystectomy</td>
<td>(-)</td>
<td>127 µg/L</td>
<td>Mediventricular</td>
<td>48%</td>
</tr>
<tr>
<td>4</td>
<td>71</td>
<td>Cholecystectomy</td>
<td>(-)</td>
<td>309 µg/L</td>
<td>Apical</td>
<td>62%</td>
</tr>
<tr>
<td>5</td>
<td>69</td>
<td>Visceral surgery</td>
<td>(-)</td>
<td>65 µg/L</td>
<td>Apical</td>
<td>65%</td>
</tr>
<tr>
<td>6</td>
<td>75</td>
<td>Orthopedic surgery</td>
<td>123UI/L</td>
<td>345µg/L</td>
<td>Apical</td>
<td>45%</td>
</tr>
<tr>
<td>7</td>
<td>65</td>
<td>Orthopedic surgery</td>
<td>210UI/L</td>
<td>201 µg/L</td>
<td>Apical</td>
<td>42%</td>
</tr>
</tbody>
</table>

Table-1: Clinical, Biological and echographic presentation

Juan exponential
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.

**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 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
coronal 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.
Propylactic béta-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

**REFERENCES**

1. Gianni M, Dentali F, Grandi AM, Sumner G,
Hiralal R, Lonn E. Apical ballooning syndrome or
Tako-Tsubo cardiomyopathy: a systematic review.

2. Tsuchihashi K, Ueshima K, Uchida T, Oh-mura N,
Kimura K, Owa M, Yoshiyama M, Miyazaki S,
Haze K, Ogawa H, Honda T. Transient left
ventricular apical ballooning without coronary
artery stenosis: a novel heart syndrome mimicking
acute myocardial infarction. Journal of the
American College of Cardiology. 2001 Jul
1;38(1):11-8.

3. Nef HM, Möllmann H, Elsasser A. Tako-Tsubo
cardiomyopathy (apical ballooning). Heart. 2007;

4. Wittstein IS, Thiemann DR, Lima JA, Baughman
KL, Schulman SP, Gerstenblith G, Wu KC, Rade
JJ, Bivalacqua TJ, Champion HC. Neurohumoral
features of myocardial stunning due to sudden
emotional stress. New England Journal of

5. Nef HM, Möllmann H, Kostin S, Troidi C, Voss S,
Weber M, Dill T, Rolf A, Brandt R, Hamm CW,
Elsässer A. Tako-Tsubo cardiomyopathy:
intraindividual structural analysis in the acute
phase and after functional recovery. European
heart journal. 2007 Oct 1;28(20):2456-64.

Dhamee MS. Anesthetic management of takotsubo
cardiomyopathy: General versus regional

7. Agarwal S, Sanghvi C, Odo N, Castresana MR.
Perioperative takotsubo cardiomyopathy:
Implications for anesthesiologist. Annals of

8. Leyer F, Nallet O, Cattan S. Le syndrome de
takotsubo ou ballonisation apicale transitoire du
ventricule gauche. InAnnales de cardiologie et
d’angiologie 2008 Nov 1 (Vol. 57, No. 5, pp. 284-

ventricular thrombus formation and cardioembolic
complications in patients with Takotsubo-like
syndrome: A systematic review. Int J Cardiol.