A Case of Transient Left Ventricular Apical Ballooning with an Unusual Complication

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INTRODUCTION

Around 6% of acute myocardial infarctions (AMI) in which coronarography is performed occur in the presence of normal coronary arteries. The etiology of these conditions varies widely and includes coronary spasm, coronary embolism, arteritis, cardiac trauma, aortic valve disease, blood dyscrasia, and cocaine use.1

A recent series2 of 88 Japanese patients with transient left ventricular apical ballooning syndrome, or transient apical dyskinesia (TAD), has been published. The epidemiology, trigger factors, clinical, electrocardiographic, and enzymatic evolution, as well as the existence of TAD with normal coronary arteries differentiate it from the conditions described above. Although cases have been described in Japan since 1990,3 it is exceptional in other regions.

Rapid recognition of the syndrome can modify the diagnostic and therapeutic attitude (avoiding thrombolysis and performing catheterization in the acute phase), so we think that it is useful to report a typical case that was recently seen in our center. We also report an embolic complication of the syndrome that has not been described in the literature.
CLINICAL CASE

A 65-year-old woman with mild hypertension, smoker of 20 cigarettes/day until the age of 45, was seen in the emergency room of our hospital for palpitations and nausea after an accidental fall with injury to the head and right elbow. In the emergency room, she presented precordial oppression lasting 3-4 minutes.

The physical examination showed blood pressure 134/74 mm Hg, heart rate 103 beats/min, and post-traumatic hematoma of the right frontal region. The blood tests disclosed a normal differential blood count, kidney function, and electrolyte concentrations. The initial creatine phosphokinase was 222 U/L (normal, 24 U/L-170 U/L). The initial troponin I was 11.8 µg/L (normal, up to 0.4 µg/L). The chest radiograph was normal.

The initial ECG, performed while the patient was...

experiencing chest pain, showed (Figure 1A) elevation of the ST segment of 1-3 mm in V2-V6, I, aVL, and II.

The patient was hospitalized in the coronary unit, where an ECG (Figure 1B) made hours later showed Q waves in the anterolateral region, with elevation of the ST segment in V2-V5 and Q waves on the inferior face. With the diagnosis of an extensive anterolateral necrosis of 6 hours of evolution and an absolute contraindication for thrombolytic treatment, coronaryography was performed in preparation for primary angioplasty. The test revealed a normal coronary tree. Left ventriculography demonstrated a large ballooned apical zone of aneurysmal appearance, with good contractility of the basal segments and an ejection fraction of 39% (Figure 2).

Treatment was begun with platelet antiaggregants, sodium heparin, and captopril. Heparin was discontinued due to an increase in the size of the subcutaneous frontal hematoma. The patient had no new episodes of chest pain or clinical manifestations of heart failure. The maximum creatine phosphokinase and troponin I concentrations were 303 U/L and 31 µg/l, respectively. Unexpectedly, the ECG evolved (Figure 3) toward the disappearance of Q waves and the appearance of strong negativization of T waves in V2-V6, with prolongation of the QT interval (520 ms). At 7 days of admission, isotopic ventriculography showed normal contractility, with no zones of abnormal regional motility.

The patient showed an abrupt reduction of consciousness on day 5 of admission. Cranial CT demonstrated a small acute left frontal ischemic infarction. Doppler study of the supra-aortic trunks was suggestive of embolism to the left anterior cerebral artery. Cerebral arteriography performed one week later was normal.

The patient was released 15 days after admission with platelet antiaggregant treatment and sublingual nitrates. She had no neurological sequelae or clinical incidents in the next 6 months.

DISCUSSION

In July 2001, Tsuchihashi et al published a retrospective analysis of 88 Japanese patients, almost all of them women (86%), with a syndrome characterized by the presence of trigger factors (mental stress, acute disease, or non-cardiac surgery), dyspnea or chest discomfort, electrocardiographic disturbances that were initially identical to those of conventional AMI, minimal or no elevation of creatine phosphokinase and troponin, normal coronary arteries, and apical ballooning of the left ventricle that normalized in a few days.

The electrocardiographic evolution was different from the typical evolution of AMI because the Q waves disappeared and prominent negative T waves appeared in the subacute phase.

As occurred in our patient, in 73% of the cases in the original series the condition was preceded by mental stress, acute disease, or non-cardiac surgery. The pathophysiology of TAD is unknown, and it is postulated that it can be mediated by an increase in sympathetic activity due to the massive discharge of catecholamines, as occurs in episodes of pheochromocytoma and subarachnoid hemorrhage. In the acute phase of subarachnoid hemorrhage, abnormalities in segmental contractility have been described without evidence of coronary lesions or vasospasm, with improvement in the chronic phase, as occurs in stunned myocardium.

For some authors, the mechanism that leads to myocardial ischemia could be a transient, diffuse coronary spasm. Rubio Caballero et al reported a case of variant angina after the subcutaneous administration of epinephrine, in which the epicardial coronary arteries were angiographically normal, which is why the condition was attributed to vasospasm. However, the arti-
icle by Tsuchihashi et al reported vasospasm in only 21% of the 48 patients with TAD in which a pharmaco-
logical challenge was used, which is a strong argu-
ment against vasospasm as the pathophysiological me-
chanism of this disorder.

In the article by Tsuchihashi et al, various complica-
tions associated with TAD are described, including
acute pulmonary edema (22%), cardiogenic shock
(15%), and atrial and ventricular arrhythmias. These
complications occur more frequently in TAD than in
conventional AMI. Paradoxically, the long-term
prognosis of TAD syndrome is more favorable. In the
series of 88 patients mentioned above, only one death
took place during the hospital phase and there was 2%
mortality in a mean follow-up of more than a year.

Cerebral infarction as that which occurred in our pa-
tient has not been described previously in association
with this syndrome. We think that the embolic origin
of the complication has been sufficiently demonstrated
by its clinical characteristics and cerebral arterio-
graphy without lesions, typical Doppler findings in the
supra-aortic trunks, and the exceptional nature of focal
cerebral vasospasm, which could be invoked as an
alternative cause. On the other hand, the thromboem-
bolic phenomena associated with left ventricular dys-
kinesia of ischemic origin are well known, generally
in anterior transmural infarction with apical involve-
ment (which produce emboli mainly in the first 2 we-
eks of evolution of the infarction).

The shortage of descriptions of TAD in our part of
the world may suggest that this disease does not occur
in our population. However, the finding of a typical
case soon after the condition was described as a sepa-
rate entity suggests that it may in fact be underdiagno-
sed in western countries. For that reason, we think that
it is important to suggest that when this syndrome is
suspected (a woman with a typical trigger factor and
elevation of the ST segment), emergency coronario-
graphy should be performed to confirm the diagnosis
and eliminate the risk of unnecessary thrombolysis.

The prognostic and therapeutic implications of TAD
differ from those of conventional AMI and can lead to
a different clinical management.

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