

CASE REPORT

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Tako-Tsubo Cardiomyopathy in a 92-Year Old Woman

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Abstract: Tako-Tsubo cardiomyopathy (TTC) is an acute reversible cause of segmental myocardial dysfunction that is poorly understood and cannot be explained by the occlusion of a single coronary vessel. Its clinical presentation is similar to that of acute coronary syndrome and is often precipitated by a severe psychological or physical stress.

Keywords: midventricular transient left ventricular dysfunction syndrome, Tako-Tsubo cardiomyopathy, menopause, breast cancer

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Tamoxifen, a selective estrogen receptor modulator (SERM) is also a partial estrogen agonist and is associated with an increased incidence of both thromboembolic events and an enhanced level of serum triglyceride, although the relevance of this with respect to cardiovascular risk remains uncertain.

A 92-year-old woman was admitted to the intensive care unit with acute onset of pain in the back with radiation to the left shoulder, as well as mild respiratory distress. She had a medical history of similar episodes of chest pain not however investigated with non-invasive or invasive methods of ischemic diagnostic, along with hypertension for about 35 years, and paroxysmal atrial fibrillation. She had no history of any recent major emotional or physical stress. The patient was taking an angiotensin converting enzyme inhibitor, β -Blocker, Tamoxifen (for three months) and Coumadin. On admission, her blood pressure was 199/119 mmHg and radial pulse rate 90 bpm. Cardiovascular examination revealed soft heart sounds, no gallop rhythm, and an early systolic murmur was heard in the apical region. Echocardiography showed mild mitral regurgitation and wall motion abnormalities including apical dyskinesia, as well as mild hypokinesia in mid-segments of the anterior and lateral walls. Bilateral lung crepitating were heard at auscultation, and chest radiography revealed pulmonary oedema. The initial 12-lead electrocardiogram showed atrial fibrillation with significant ST depression in leads I, aVL and V_{4-6} , and inverted T-waves in leads II, III, V_{3-6} associated with undervolted QRS, with no R wave progress from V_1 to V_3 and lengthening of QT interval. Blood tests performed concomitantly revealed severe elevation of cardiac troponin (39.16 ug/L) and creatinine kinase levels 550 U/L (normal range: 12–140 U/L).

Emergency coronary angiography showed normal coronary arteries with no luminal narrowings (data not shown); however, left ventriculography revealed an apical sparing with preserved basal and midventricular contractile function and ejection fraction of the left ventricle of 45% (movie). Echocardiography (data not shown) repeated 6 weeks after the index event showed a left ventricular ejection fraction of 64% with complete resolution of wall motion abnormalities in apical segments. Therefore, our patient was diagnosed with a variant of Tako-Tsubo cardiomyopathy (TTC), where a small area at the apex is spared (movie).¹

TTC is mainly seen in post-menopausal women aged between 50 and 80 years of age precipitate, without risk factors for coronary artery disease.²

We present a rare clinical case in which transient apical sparing was encountered in a very elderly woman (92-year old) without psychological stress or an acute episode of major depression.³ The patient was started on 30 mg Tamoxifen daily as sole treatment for breast cancer three months ago and she did not undergo any kind of operation for the breast cancer previously. Tamoxifen is a selective estrogen receptor modulator with both estrogen agonistic and antagonistic properties, and it is the most widely prescribed therapy for breast cancer reduction. Tamoxifen binds to estrogen receptors (ER) and prevents the binding of endogenous and exogenous estrogen. During Tamoxifen therapy in elderly postmenopausal women low concentrations of the patient's own estrogen could not directly act on the estrogen receptors in the heart and could not have a protective effect.

Tako-Tsubo left ventricular dysfunction has been described by reduction of estrogen levels in ovariectomized female rats and an incidence of TTC in elderly postmenopausal females suggesting that a reduction of estrogen levels may be involved in this myocardial disease.⁴ The estrogen breast cancer treatment may modulate the estrogen levels in postmenopausal women and thus be involved in the pathophysiology of transient left ventricular dysfunction syndrome. Some authors have recently also suggested that the desensitizing effect of estrogen on cardiac response to catecholamines may create a rebound hypersensitivity after menopause and thus a putative mechanism for the clustering of cases in postmenopausal women.⁵ In addition, the vascular and cardiac response to endogenous and exogenous estrogens appears to change with aging. The estrogen could prevent the development of cardiac vascular disease in newly menopausal women it would have no or even harmful effects in older postmenopausal women with established risk of cardiovascular disease. This has been referred to as the “timing hypothesis”.⁶ The mechanism underlying the association between estrogen level and TTC is unknown and further clinical work is necessary to understand this phenomenon.

Our patient had also a history of malignancy at the time of diagnosis Tako-Tsubo.



A recent study has reported a high prevalence of cancer in patients with Tako-Tsubo cardiomyopathy, but the pathophysiological mechanisms of action remain unclear.⁷ It has to be questioned whether the malignancies and/or chemotherapy pronounce the cardiac toxicity and potential cardiac problems.

The cardiomyopathy observed in this very elderly woman represents an unusual and rare case of apical sparing variant of Tako-Tsubo disease induced without emotional stress, but after receiving selective estrogen receptor modulator. The role of estrogen and/or malignancy in the genesis of Tako-Tsubo syndrome is still unclear and further additional analyses with regard to their effects on the incidence of TTC should be performed.

Disclosures

This manuscript has been read and approved by all authors. This paper is unique and is not under consideration by any other publication and has not been

published elsewhere. The authors and peer reviewers of this paper report no conflicts of interest. The authors confirm that they have permission to reproduce any copyrighted material. Written consent was obtained from the patient or relative for publication of this study.

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