

Stress cardiomyopathy and cardiac arrest complicating fever of unknown origin case

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Abstract

Stress cardiomyopathy mimics acute coronary syndromes usually in postmenopausal women after physical or emotional stress. Here, we report the case of an elderly man complicated by severe and atypical form of stress cardiomyopathy during evaluation of fever of unknown origin. After a six-week hospitalization, the patient was discharged ambulatory, afebrile with normal ejection fraction and a diagnosis of stress cardiomyopathy induced my febrile illness. This case illustrates the potential of life-threatening cardiologic complications in hospitalized medical patients. Early recognition, prompt intervention and multidisciplinary co-operation are of paramount importance in such clinical scenario.

Keywords

Stress cardiomyopathy; cardiac arrest; fever of unknown origin.

Abbreviations

FUO: fever of unknown origin; CXR: chest x-ray; ECG: electrocardiogram; EF: ejection fraction; CT: computed tomography; ICU: intensive care unit.

Introduction

Fever is a common presenting symptom among patients in emergency departments [1]. Occasionally, the cause of fever remains obscure, despite thorough work up. Petersdorf and Beeson made publicly known the challenging entity of fever of unknown origin [2]. Hayakawa et al, reviewing the published case series of FUO (fever of unknown origin) from January 2000 to September 2011 found that 25.3 % of patients in Europe and 21.2 % of elderly patients worldwide remain without diagnosis [3]. Takotsubo syndro-

me or formally Stress Cardiomyopathy can mimic acute coronary syndromes in postmenopausal women after emotional stress (broken heart syndrome) [4]. Three decades of clinical experience and research have illustrated that not only do secondary cases of Stress cardiomyopathy (patients who develop the syndrome while hospitalized for other critical illnesses) exist, but also they do merit prompt recognition and high degree of suspicion due to atypical and sometimes life-threatening presentation [5]. Here, we report the case of an elderly man, who developed severe and atypical form of stress cardiomyopathy during evaluation of fever of unknown origin.

Case Presentation

A 70 years old man with a history of dyslipidemia, idiopathic hypertension, type 2 diabetes mellitus and a recent (2 weeks ago) umbilical hernia repair surgery was admitted to our department due to fever and rigors lasting two days. The patient reported no associated symptoms (cough, dyspnea, urinary frequency, diarrhea, chest or abdominal pain). He was on metformin, simvastatin, amlodipine & perindopril and had been inoculated for seasonal influenza (approximately six weeks ago) and varicella zoster virus (three months ago). Concerning social and exposure history the patient was a retired truck driver, who lived in the Greek countryside breeding livestock, he had no history of traveling abroad for the last ten years, he was a social drinker but he had never smoked. Moreover, he denied recreational drug exposure, unusual dietary habits and sick contacts. Physical examination revealed fever (38°C), fine crackles bilaterally on chest auscultation, a mobile elastic inguinal lymph node in the right groin and a clean midline subumbilical surgical wound. Basic laboratory exams, chest x-ray (CXR) (figure 1) and the electrocardiogram (ECG) were unremarkable apart from a mild elevation of C-reactive protein (32 mg/dl). Due to the recent surgical history and the flu season, an infective cause of fever was our first working diagnosis. Blood, urine & surgical wound cultures were obtained and empirical administration of oseltamivir & levofloxacin was initiated. On fifth day of hospitalization, antibiotics were escalated (piperacillin/tazobactam, doxycycline & vancomycin) and since the patient remained febrile a comprehensive immunologic work-up was sent (ANA, anti-CCP, C3, C4, RF, p- & c-ANCA, all of which were within normal reference range). The patient did not develop any new symptoms or signs, and remained hemodynamically stable. The microbiologic evaluation (influenza-legionella-pneumococcal antigens, HIV, HBV, HCV, EBV, toxoplasma, VDRL, HTLV, parvovirus B19, CMV, VZV, mycoplasma, QuantiFERON, Rose-Bengal, Bartonella, Coxiella, Anaplasma, Borrelia, Leptospira, Leishmania, blood, trauma & urine culture) were unrevealing, while imaging studies (computed tomography) of brain, chest and abdomen demonstrated only a surgical wound seroma (figure 2). Between the 7th to 9th day of hospitalization the fever started to subside but asymptomatic tachycardia and a rising troponin level (table 1) were observed, leading us to order cardiologic consultation and transthoracic echocardiogram, the latter revealing mild regurgitation of atrioventricular valves, no vegetations and an ejection fraction (EF) of 45%. On the next day, the patient acutely developed dyspnea and chest tightness. The ECG showed atrial fibrillation, CXR was indicative of pulmonary edema (figure 3), NT-pro-BNP levels were strikingly high above 3,000 pg/ml and a bedside repeat echocardiogram revealed hypokinesia with an estimated EF < 20%. The patient was immediately transferred to the cardiac intensive care unit with a working diagnosis of acute coronary syndrome. After an episode of cardiac arrest, he was intubated and supported by inotropes in parallel with intra-aortic balloon pump insertion. The urgent coronary artery catheterization did not reveal

any obstructive coronary stenosis and CT pulmonary angiogram excluded pulmonary embolism. After a six week hospitalization (including ICU transfer and management due to severe metabolic acidosis and acute kidney injury requiring continuous renal replacement therapy) the patient was discharged ambulatory, afebrile with normal ejection fraction and a diagnosis of stress cardiomyopathy induced by febrile illness of unknown origin.

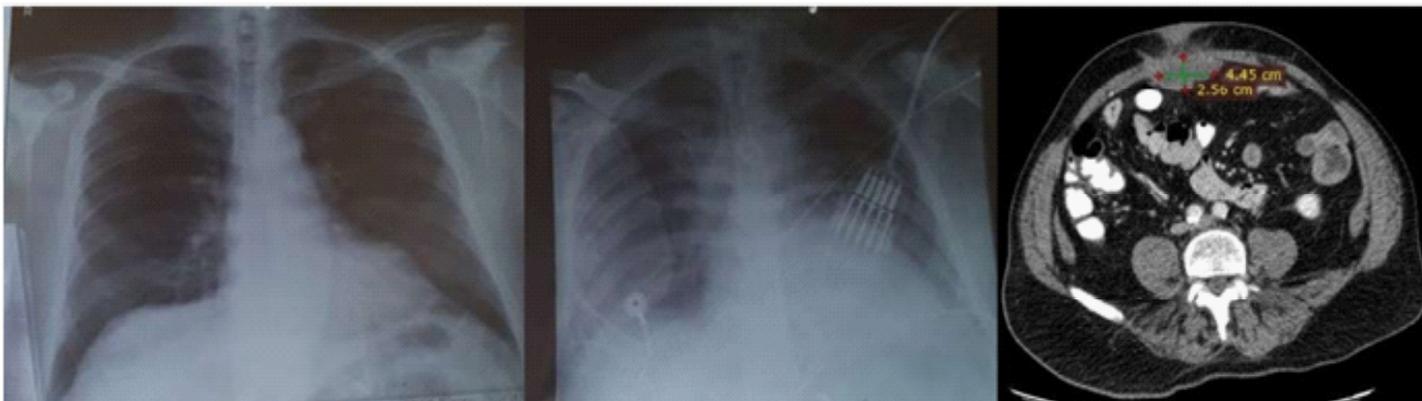


Figure 1: CXR on admission.

Figure 3: CXR on 10th day.

Figure 2: CT abdomen, revealing midline subumbilical seroma.

Table 1: Laboratory values during hospitalization. Measurement units: WBC (white blood cell) cells/mm³ CRP (C-reactive protein) mg/dl, Trop (troponin) ng/ml, pro-BNP pg/ml.

Test	Day 1	Day 4	Day 6	Day 7	Day 10
WBC	5500	5600	6600	5300	7300
CRP	32	105	100	90	28
Trop	16	28	150	145	140
pro-BNP	199	222	-	-	3540

Discussion

In a Greek population study of FUO cases the percentages of undiagnosed patients varied from 16% to 20.5% [6]. Regarding long term outcomes of these patients, only a few studies are available demonstrating a low mortality rate [7,8]. Many different diagnostic criteria have been proposed for the diagnosis of Takotsubo cardiomyopathy, among which Heart Failure Association–European Society of Cardiology Criteria are the most commonly used and include: a) transient regional wall motion abnormalities of left ventricle or right ventricle myocardium, b) which usually extend beyond a single epicardial vascular distribution, c) absence of culprit atherosclerotic coronary artery disease or other pathological conditions to explain the observed pattern of temporary LV dysfunction, d) new and reversible electrocardiographic abnormalities during the acute phase, e) significantly elevated serum natriuretic peptide during the acute phase, f) positive but relatively small elevation in cardiac troponin (disparity between the troponin level and the amount of dysfunctional myocardium) and g) recovery of ventricular systolic function on cardiac imaging at follow-up [9]. The proposed pathophysiologic mechanism of stress cardiomyopathy is a neurogenic mediated myocardial stunning in predisposed individuals [5]. Among commonly implicated risk factors (advanced age, female gender, psychiatric illness, asthma, substance abuse) diabetes and seems to confer worse pro-

gnosis [10]. Additionally, male cases are more often triggered by physical stressors than female cases [11]. As compared to apical ballooning (apical akinesis of left ventricle on imaging studies), midventricular and biventricular variants are usually implicated by acute heart failure and severe hemodynamic compromise [5], which was also the case in our patient. Cardiogenic shock complicates up to 45% of cases, especially elderly patients with midventricular pattern and physical stressors [5]. Arrhythmia is another common complication of these patients and atrial fibrillation (also present in our patient) is associated with cardiogenic shock and worse prognosis [12]. To sum up, advanced age, diabetes and physical stress are interwoven in the apparently complex pathophysiology of this atypical and severe case of stress cardiomyopathy. Further research will certainly shed more light on our better understanding of “stress cardiomyopathy spectrum”. This case illustrates the potential of reversible but life-threatening cardiologic complications in hospitalized medical patients. Early recognition, prompt intervention and multidisciplinary co-operation are of paramount importance in such clinical scenario.

Learning Points

- The long-term outcome of unidentified cases of FUO remains unclear, despite scarce data pointing towards a good prognosis.
- Persistent fever might constitute a physical stressor capable of triggering stress cardiomyopathy in elderly predisposed patients.
- Early recognition of atypical cases of stress cardiomyopathy in hospitalized patients requires a multidisciplinary approach and a high index of suspicion.

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