

Chest Pain: Walking through a Common Symptom

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Abstract A 35-year-old man presented with persistent chest pain. The patient had no known cardiovascular risk factors and an uneventful physical examination. The electrocardiogram showed a biphasic T wave in precordial leads. His echocardiogram revealed an echogenic mass of irregular appearance in the ventricular apex. A more detailed patient interview uncovered a past history of a skin lump. We continued our investigation with thoracic computed tomography and nuclear magnetic resonance, followed by cardiac biopsy that established the diagnosis of cardiac metastasis of a previous skin melanoma. His hospitalization complicated with intense and persistent chest pain refractory to treatment with conventional analgesics, nonsteroidal anti-inflammatory drugs and colchicine. Merely, adjuvant corticosteroid was able to control the incapacitating pain, although for a short period of time. This case illustrates a common symptom associated with a dismal cause, where time to diagnosis his critical and treatment of patient's symptoms is sometimes challenging.

Keywords Chest pain, Pericarditis, Melanoma

1. Introduction

Chest pain is a major reason for hospital admission. There are several clinical entities that can cause this symptom, both cardiac and non-cardiac. Although, coronary heart disease is one of the leading causes of death in developed countries, there are several other conditions that can initially present with chest pain. The clinical history and physical examination are crucial to guide clinical investigation and establish the correct diagnosis. We report a case of a patient complaining of intense and progressively frequent chest pain.

2. Case Report

A 35-year-old black male was admitted to the hospital complaining of progressively frequent chest pain that irradiates to both arms. He had this symptom in the last two months with maximum duration of a few minutes. He denied worsening pain on deep inspiration. Previously treated with nitroglycerin transdermal patch, aspirin and proton pump inhibitor by his family doctor. He had no cardiovascular risk factors, and no family history of heart disease. At presentation, he was afebrile, the physical examination revealed no significant abnormalities, and he didn't have friction rub in cardiac auscultation. The electrocardiogram (ECG) showed a biphasic T wave in precordial leads (fig.1).

The blood tests revealed an increase in inflammatory biomarkers, without any other relevant analytical findings.

Pericarditis was our initial diagnostic hypothesis. The chest x-ray was normal and transthoracic echocardiogram (TTE) revealed an echogenic mass of irregular appearance in the left ventricular apex with 3.5 x 2.7 cm (fig. 2).

A more detailed patient interview, uncovered a past history of a skin lump that was surgically removed in 2010 by excision in his right nipple area, allegedly a melanoma. Treatment was complemented with radiotherapy, and in 2011 he underwent a positron emission tomography control that excluded active neoplastic disease.

The echocardiogram findings were best characterized by thoracic computed tomography (CT) and nuclear magnetic resonance (NMR) of the heart. Thoracic CT described a lesion of soft density measuring 40x38x38 mm, heterogeneous, with intra and extra-cardiac components (fig. 3), and lung infiltration.

Cardiac NMR identified a nodular lesion and located it in the cardiac apex (fig. 4). A biopsy was performed, establishing the diagnosis of cardiac metastasis of melanoma.

He was initially medicated with anti-inflammatory drugs (NSAIDs) – ibuprofen 600 mg every 8h, and colchicine 0.5 mg twice daily. Due to incessant and refractory nature of the chest pain, not responding to conventional medical treatment, morphine was added on demand. He continued to complaint of intense pain, and therapy was escalated to prednisolone 0.5mg/kg/day. The chest pain was ultimately controlled, though the patient showed dependency to corticosteroids, illustrated by several attempts to taper steroid dose, without success. Surgical treatment was not considered since lung metastases were present, and he continued his clinical

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management under oncology care. Treatment duration was 4 weeks of ibuprofen, 6 months of colchicine and prednisolone dose was decreased during the following three months. Concurrently, he began chemotherapy with monoclonal

antibodies, initially *Ipilimumab* with poor response, which was switched later to *Nivolumab*. After nine months of treatment, he is stable and without recurrence of chest pain.

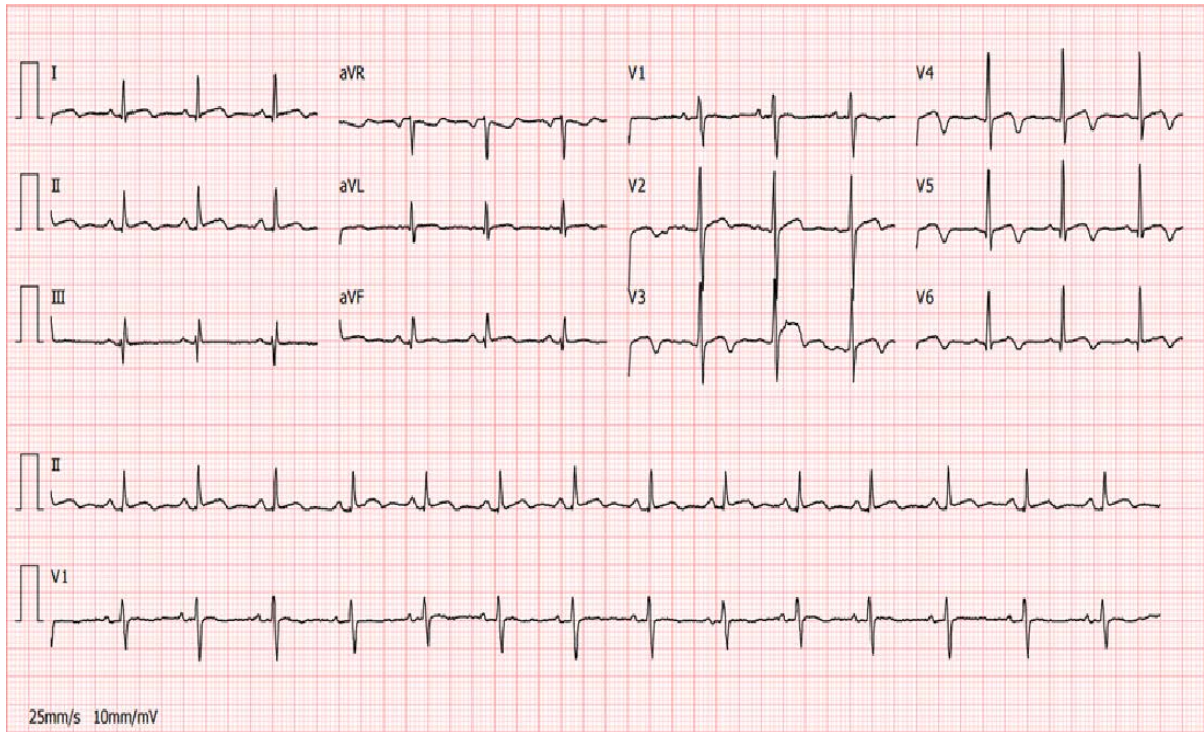


Figure 1. ECG with biphasic T wave in precordial leads

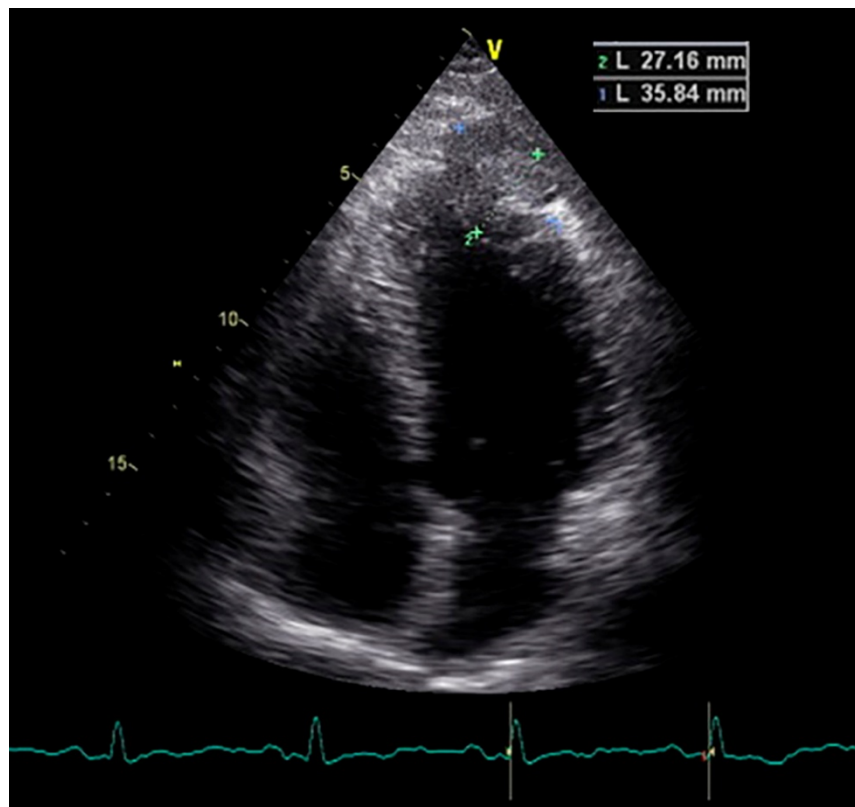


Figure 2. Echocardiogram revealed an echogenic mass of irregular appearance in the left ventricular apex

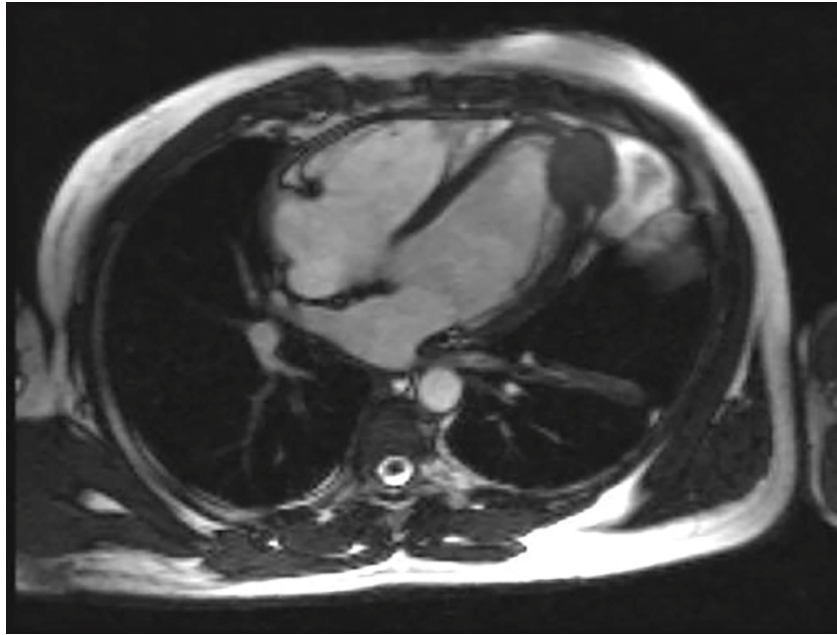


Figure 3. Thoracic CT revealed a lesion of soft density measuring 40x38x38 mm



Figure 4. Cardiac NMR identified a nodular lesion and located it in the cardiac apex

3. Discussion

Chest pain is a common symptom, clinical history and systematic physical examination are fundamental to guide diagnostic strategy and patient management [1]. Pericardial diseases are relatively common in clinical practice and secondary metastatic tumors are a possible etiology of pericarditis [2]. Our patient presented with incessant pericarditis, defined as chest pain lasting for >4 weeks [2]. He had typical ECG changes of pericarditis and elevation of inflammation markers. TTE was the crucial diagnostic test, enabling the documentation of an echogenic mass in the left ventricle, as a form of melanoma metastasis.

Primary cardiac tumors are rare, and secondary tumors

with cardiac involvement are more common and have a poor prognosis [3]. A particularly high incidence is observed in patients with preceding squamous cell lung carcinoma, urinary tract tumors and melanomas [4, 5].

Melanoma is a tumor with poor prognosis, both for the precocity of oligosymptomatic metastatic disease and the frequency in which it affects the heart [6]. Metastatic melanomas to the heart have a high incidence, reaching 50% in post-mortem studies [3, 5], and may appear decades after the initial diagnosis of primary tumor [7]. The pericardium is often involved, followed by myocardium and endocardium [8]. In case of metastases, therapeutic options are limited due to diffuse involvement and poor response to chemotherapy [9].

There are some aspects of this clinical case that makes it noteworthy. First the persistent chest pain due to incessant pericarditis mimicking stable angina pectoris. Although in pericarditis chest pain can irradiate to the arms like in our case, more frequently irradiates to one or both trapezius muscle, because the phrenic nerve that innervates these muscles traverses the pericardium. Moreover, it had none of the other typical characteristics of pericarditis: sudden in onset, pleuritic and exacerbated by inspiration [10]. Second the etiology of cardiac metastasis of melanoma with an atypical pattern; only one tumor located in the left ventricle apex. It is known that melanomas have high propensity to generalized hematogenous spread, and it is assumed that the right side of the heart is more frequently involved than the left, although in most cases diffuse bilateral spread is found [3]. When the left side is affected, the ventricular free wall and the ventricular septum are the most common sites for myocardial lesions [11]. Finally, the refractory chest pain that did not subside with the usual care. Despite the medical treatment has been properly implemented with NSAIDs and colchicine, it was not effective because this treatment works best in idiopathic or viral pericarditis [10]. In order to control pain, we initiate corticosteroids therapy. Although not the first line of treatment, corticosteroids have different anti-inflammatory properties of NSAIDs and should be considered as an alternative option, in selected cases [2, 12]. Even so, it was difficult to control symptoms, because pericarditis in this case had a secondary neoplastic cause. Target treatment at etiology is the key to success. Systemic chemotherapy or local radiotherapy can be effective. Invasive treatment is mostly confined to palliative measures. Pericardiectomy should be considered in patients with severe recurrent pericarditis that do not respond to adequate medical treatment. Surgical resection is only indicated in exception cases of solitary intracavitary heart metastasis [10]. Our patient had a lesion with intra and extra-cardiac components and lung infiltration, so the decision was to start chemotherapy. Nivolumab, an anti-programmed death 1 (PD-1) monoclonal antibody, is a relatively new drug and has shown longer progression free survival in patients with advanced melanoma [13]. In this type of complex patients, it is essential to involve a multidisciplinary team in the evaluation and treatment management.

4. Conclusions

This case illustrates a common symptom, here associated with a dismal cause, where time to diagnosis is critical and treatment of the patient's symptoms is sometimes challenging. In case of past malignancy it is imperative to

consider cardiac metastasis. Cardio oncology liaison is important to achieve rapid prognosis assessment and tailored treatment management.

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