Masquerading Acute Myelogenous Leukemia

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INTRODUCTION

AML can clinically manifest with variable symptoms. The typical presentation involves symptoms related to anemia, thrombocytopenia and/or leukopenia. This includes fatigue, weakness, increased bleeding tendencies or predisposition to infections. Myopericarditis as an initial manifestation of AML is very rare. The awareness of atypical presentations can lead to timely diagnosis and prompt treatment.

CASE PRESENTATION

A 48-year-old Caucasian male presented to our ER with the chief complaint of chest pain for two hours. Until two days prior to presentation, the patient had been in his usual state of health. At that time he noticed malaise, headache and fever. He also noticed severe right sided posterior neck pain which was sharp and non-radiating. A day prior to presenting at our hospital, he had visited a nearby emergency room with complaints as above. His symptoms had been attributed to viral infection. He was given symptomatic treatment and was discharged home.

However, in the next 24 hours, he had worsening symptoms. Two hours prior to presentation to our ER, he had sharp constant substernal chest pain that began at rest. The pain was aggravated with inspiration and being supine and relieved by lying in lateral position. The pain progressively worsened over the course of two hours and was associated with mild shortness of breath. The pain was non-radiating and unrelated to exertion

ROS: positive for fever, headache, neck pain, malaise, fatigue, chest pain, shortness of breath.
Negative for cough, nausea, vomiting, photosensitivity, numbness, tingling, sick contacts or recent travel.

VITALS: Temp 103.4F, Pulse 100 beats/min, RR 20 breaths/min, BP 100/66 mmHg

PHYSICAL EXAM: Unremarkable. No lymphadenopathy, neck rigidity, rash or joint swelling was noted. No murmurs or friction rub was noted.

INVESTIGATIONS

CBC: Hgb 10.8 g/dl, WBC 13,000/µl, blasts 56%,Platelets 83 x10^3/µl.
CMP: Unremarkable
Troponin I: 14.8 ng/ml
ECG: ST segment elevation in leads I, II, aVL and V_5 with PR elevation and ST depression in aVR (Fig. 1).
Bone Marrow Aspiration and Biopsy: mononuclear infiltrates composed of blasts cells with high nucleus/cytoplasmic ratio and conspicuous nucleoli (Fig. 2).
Flow Cytometry: a population of blasts cells with immunophenotypic profile consistent with involvement by AML (non- M3 phenotype) (Fig. 3 and 4).
FISH analysis: Positive for t(6;9) (p23;q34)

CLINICAL COURSE

Based on ECG changes, elevated troponin and family history of early coronary artery disease, he was diagnosed with STEMI. Patient was emergently taken to cardiac catheterization lab. Angiography showed non-obstructive coronaries, mild hypokinesis of mid inferior and anterolateral wall with ejection fraction (EF) of 40-45%. In light of the angiographic findings, his cardiac diagnosis was changed to acute myopericarditis. Patient was started on colchicine and ibuprofen.

Furthermore, an extensive workup was performed to determine the etiology of myopericarditis. The work up, as shown in *Table 1,* was negative. He was started on induction therapy . One week after the completion of induction therapy, bone marrow biopsy was done. It showed 10-20% residual AML He was given salvage therapy with high dose Cytarabine (HiDAC) and Midostaurin. Patient tolerated the chemotherapy well. Repeat bone marrow biopsy confirmed complete remission with normal cytogenetics.

Figure 1. Electrocardiogram

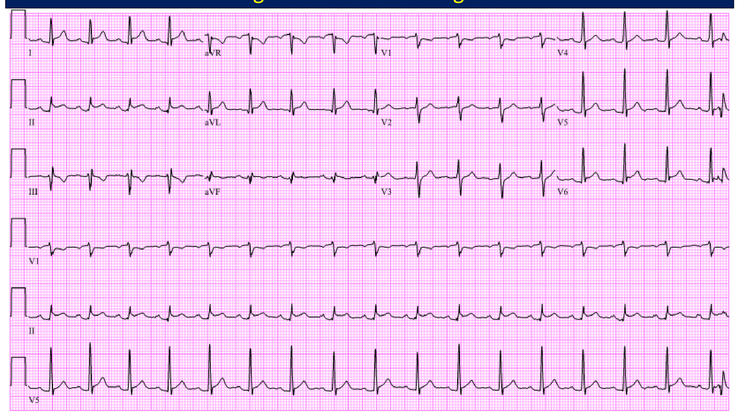

Figure 2. Bone Marrow Aspiration

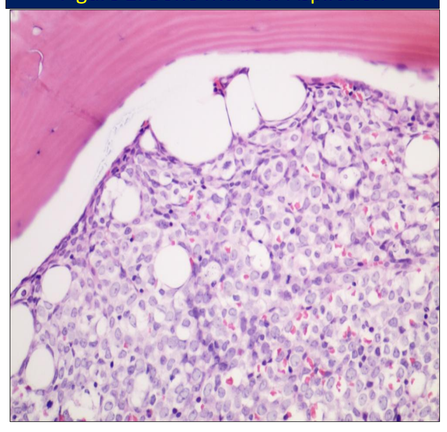

Figure 3. Flow Cytometry

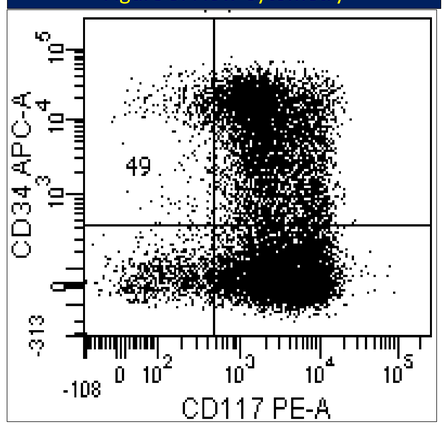

Figure 4. Flow Cytometry

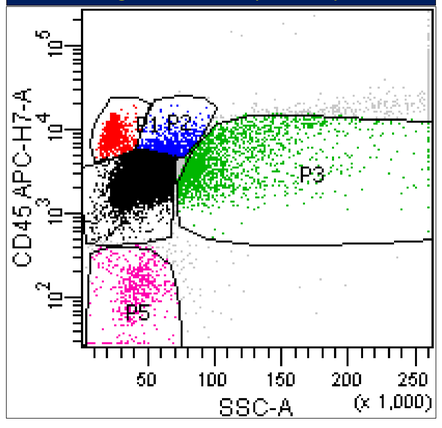

TABLE 1: Work up for Myopericarditis

Human immunodeficiency virus (HIV)	Not detected
Hepatitis A	Not detected
Hepatitis B surface antigen	Not detected
Hepatitis C antibody	Not detected
Cytomegalovirus	Not detected
Coxsackie Type A and B antibody	Not detected
Influenza A and B	Not detected
Parainfluenza 1-4	Not detected
Adenovirus	Not detected
Enterovirus	Not detected
Mycoplasma pneumonia	Not detected
Antinuclear antibody (ANA)	Negative
Antineutrophilic cytoplasmic antibody (ANCA)	Negative

DISCUSSION

• Acute myelogenous leukemia is a condition characterized by clonal proliferation of myeloid precursors with loss of ability to differentiate into mature forms. The typical presentation involves symptoms related to anemia, leukopenia and/or thrombocytopenia. This includes fatigue, weakness, increased bleeding tendencies or predisposition to infections.

• It is also important to be aware of atypical presentation of AML. This can prompt thorough search into this life-threatening condition. Skin can be involved in up to 13 percent of the AML cases [1]. Skin lesions can manifest as mass-like nodules, erythematous or violaceous rash. AML can present with joint manifestations in 4% of the cases [2]. This includes arthralgias and migratory polyarthritis. Central nervous system involvement is very unusual. The symptoms include headaches, cranial nerve palsies, altered mental status or seizures. Less than 1 percent of the cases can manifest as myeloid sarcoma [3].

• The involvement of heart during the course of AML is not infrequent. Robert et al studied a large case series involving 420 autopsies of leukemic patients, either myelogenous and lymphocytic, from the year 1954 to 1964 [4]. The results showed 288 (69 percent) patients suffered from some degree of involvement of the heart such as direct leukemic infiltration or localized hemorrhages or both [4]. The most common site of involvement was the pericardium; affecting 190 (46%) patients followed by left ventricle, right ventricle and left atrium [4]. Much of the heart involvement was not detected until autopsies because, for unknown reasons, it rarely produced detectable signs or symptoms.

•An initial manifestation of AML as pericarditis is very infrequent. This occurs in 1 to 2 percent of the AML cases. In the above case series, only 9 of 420 patients (2.1%) presented with chest pain typical of pericarditis [4]. AG Kulkarni et al studied 80 cases of leukemia in the course of 6 years and only one case had pericarditis as the initial presentation [5].

• In our case, patient presented with myopericarditis as the initial manifestation of AML. Based on our literature review, we could not find any reported cases of AML presenting as myopericarditis.

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