

Acute myeloid leukemia presenting as cardiac tamponade

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ABSTRACT

Acute myeloid leukemia (AML) presenting as massive pericardial effusion is extremely rare and very few cases have been reported. We present the case of a 16-year-old boy who presented with massive pericardial effusion due to leukemic infiltration. He was diagnosed as AML M1. He received chemotherapy, achieved remission, and pericardial effusion resolved. After 15 months, he relapsed with the reappearance of pericardial effusion.

Key words: Acute myeloid leukemia, effusion, pericardium

INTRODUCTION

Leukemia is a systemic disorder that can affect any organ. Effusions caused by acute leukemia are rare and is mostly seen in acute lymphoblastic leukemia (ALL). Pleural and pericardial effusions are very rarely seen in acute myeloid leukemia (AML). There are few reports of pleural effusion associated with AML.^[1,2] Pericardial effusion is rare at initial diagnosis in leukemia.^[3] AML presenting as massive pericardial effusion is extremely rare and very few cases have been reported. We present a case of a 16-year-old boy who presented with massive pericardial effusion and was diagnosed as AML.

CASE REPORT

A 16-year-old boy presented with history of exertional dyspnea and palpitation since 1 month. He was seen at a local hospital where a radiograph of chest showed massive pericardial effusion, which was confirmed by

Echocardiogram (ECHO). He underwent pericardiocentesis and 800 ml of hemorrhagic fluid was drained before he presented to us.

On examination, he was dyspneic, orthopneic, had pallor and cardiomegaly. Chest X-ray showed cardiomegaly suggestive of pericardial effusion [Figure 1]. ECHO cardiogram showed a large pericardial effusion with a left ventricular ejection fraction of 55%. Pericardial fluid examination showed lymphocytes, mesothelial cells and occasional blasts suggestive of leukemic infiltration [Figure 2]. Bone marrow showed 74% blasts and flow cytometry showed the blasts to be positive for CD13, CD117, anti-myeloperoxidase, CD2, CD34, CD45 and negative for CD33, CD64, CD10, CD19, cyCD22, cyCD79a, CD3, CD5, CD7, cyCD3. Cytogenetic study was normal. He was diagnosed as AML M1. He received induction chemotherapy with daunorubicin and cytosine arabinoside, and achieved complete remission. The pericardial effusion subsided. He was consolidated with 4 cycles of high dose cytosine arabinoside. And repeat ECHO cardiogram showed no effusion. He continued to be in complete remission for 15 months. Thereafter, he presented with recurrence of the pericardial effusion and was found to be in relapse.

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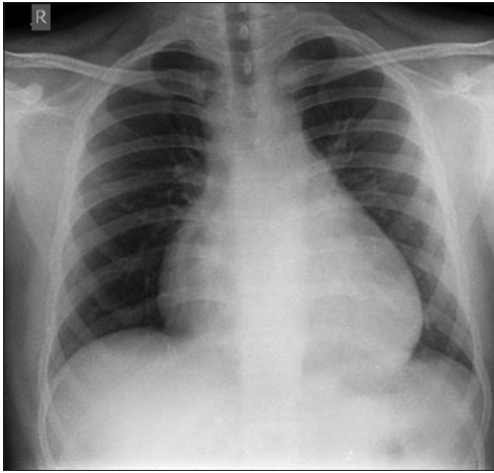


Figure 1: Chest X-ray showing pericardial effusion

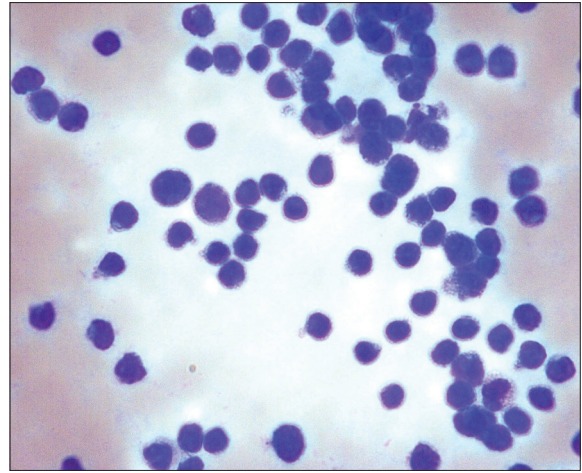


Figure 2: Pericardial fluid cytology showing blasts

DISCUSSION

Pericardial effusion presenting with cardiac tamponade is a potentially life-threatening condition. The hematologic malignancy usually associated with pleural and pericardial effusion is non-Hodgkin's lymphoma.^[4] Cardiopulmonary complications are observed during the treatment of acute leukemias also. However, pericardial effusion caused by leukemic infiltration is an unusual extramedullary manifestation of AML and is very rare at initial diagnosis. These effusions are considered to be a part of the leukemic disease process and can occur secondary to infection, bleed, or infiltration by leukemic cells.^[5] Sometimes, pericardial effusion can occur as a complication of chemotherapy such as bleomycin, cyclophosphamide, all-trans retinoic acid.^[6] ECHO is the safest and most commonly used method for the diagnosis of pericardial effusion.

The frequency and clinical implications of pericardial effusion in leukemia have been studied by Sampat *et al.*^[7] Pericardial effusion was detected in 325 patients (20%) of which only 21% had AML. Only few patients had pericardial effusion at presentation, most occurred after some therapy. The incidence of pericardial effusion at initial presentation was similar among ALL, AML and myelodysplasia (15–27%). Effusion was minimal in the majority, only 5–7% had moderate to large effusions. Concurrent pleural effusion or ascites was found in 23% of patients. Only 3% required pericardiocentesis. These effusions reduced with chemotherapy. The presence of pericardial effusion did not affect the survival.

A case of AML M0 presenting with pericardial and pleural effusion due to granulocytic sarcoma was reported.^[8] A 55-year-old man with a history of polycythemia progressing to AML presenting with pleural and pericardial effusion has also been reported.^[1] A baby girl had pericardial effusion and superior vena cava syndrome caused by a mediastinal

mass due to AML with mixed-lineage leukemia-gene translocation.^[9] Another 52-year-old man with pericardial and bilateral pleural effusion was diagnosed to have AML from pleural fluid.^[10]

Extramedullary leukemia is associated with French-American-British M4-M5 subtypes, CD56 (+) blasts, cytogenetic abnormalities such as t(8:21), inversion 16, 11q abnormalities, and allogeneic stem cell transplantation.^[11] The possible mechanisms of pericardial effusion in AML include the extramedullary proliferation of a leukemic clone which subsequently involved the marrow, or a subclinical marrow disease with consequent seeding to extramedullary sites. Our patient had massive pericardial effusion which proved positive for leukemic blasts, a subsequent bone marrow diagnosed AML.

Many patients with leukemia have organ dysfunction at diagnosis including cardiopulmonary, renal and hepatic dysfunction, which compromise the initiation of chemotherapy. The pericardial effusion usually responds to chemotherapy. In our patient, the pericardial effusion resolved with chemotherapy, however, the effusion recurred with relapse.

CONCLUSION

AML can rarely present as cardiac tamponade causing cardiopulmonary dysfunction which usually resolves with treatment of the underlying malignancy. This case illustrates that leukemia should also be kept as a rare etiology for pericardial effusion.

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Conflicts of interest

There are no conflicts of interest.

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