

Acute Leukemia Presenting as Pericardial Effusion - A Case Report

R Handa, S Bhatia, J P Wali, L Kumar, V Kochupillai, M Mohindra, P S Arora

ABSTRACT

We report a patient with acute lymphoblastic leukemia, who presented with pericardial effusion. There was no haematologic evidence of leukemia at the time of presentation. The pericardial effusion resolved with chemotherapy. Although a common finding at autopsy, clinically evident pericardial effusion is rare in leukemia. It is also extremely rare for pericardial effusion to be the presenting feature or to antedate haematologic evidence of leukemia. Physician awareness is important to make a correct diagnosis.

Keywords: acute lymphoblastic leukemia, pericardial effusion

INTRODUCTION

Clinically evident pericardial effusion is rare in acute leukemia, although leukemic infiltration of the pericardium is not uncommon at autopsy. Pericardial effusion as the presenting feature of acute leukemia is rarer still. Awareness of the condition is important in order to make a correct diagnosis. We present a case which illustrates this point. The management of pericardial effusion in acute leukemia is also outlined.

CASE REPORT

A 30-year-old woman was admitted with dyspnoea and chest pain. Examination revealed a dyspnoeic lady with distant heart sounds. Chest examination was unremarkable. The patient did not have any lymphadenopathy, hepatosplenomegaly or bleeding from any site. Jugular venous pressure was normal and pedal oedema was absent. Blood counts revealed a haemoglobin level of 11.8 g/dL, total leucocyte count of $9.2 \times 10^9/L$, neutrophils 74%, lymphocytes 22% and eosinophils 4%. Blood urea nitrogen, electrolytes, blood sugar and aminotransferases were within normal limits. Electrocardiogram showed a low voltage graph with T wave inversion in the precordial leads. Chest radiography revealed a massive cardiac enlargement. Echocardiography confirmed a large pericardial effusion. Five hundred mLs of straw coloured fluid was removed on pericardiocentesis following which, her symptoms improved. The pericardial fluid had a protein content of 4.7 g/dL with 900 lymphocytes/mm³. A presumptive diagnosis of tuberculous pericardial effusion was made and the patient was put

on anti-tuberculous treatment (isoniazid, rifampicin, ethambutol and pyrazinamide). The response to treatment was not good and 6 weeks later, the patient was readmitted with severe dyspnoea and precordial pain. On examination, she had a raised jugular venous pressure with bilateral ankle oedema. Hepatomegaly of 6 cm and splenomegaly of 2 cm was noted. In addition, she had evidence of left pleural effusion. The heart sounds were very faint. Chest radiography revealed massive cardiac enlargement with left pleural effusion. Echocardiography showed a large pericardial effusion with diastolic collapse of right atrium and right ventricle, suggestive of cardiac tamponade. Blood counts at this time were: a haemoglobin level of 11.9 g/dL; a total count of $46 \times 10^9/L$ with a differential count showing 80% lymphoblasts and the platelet count was $94 \times 10^9/L$. Bone marrow aspiration confirmed acute lymphoblastic leukemia. 300 mLs of serosanguinous fluid was removed on pericardiocentesis, following which, her symptoms ameliorated. An indwelling catheter was left in the pericardial space. The pericardial fluid was exudative and cytology revealed numerous red cells and lymphocytes. No blast cells were seen. Thoracocentesis was also carried out and 500 mLs of fluid removed. Pleural fluid protein was 3.5 g/dL. Pleural fluid cytology showed 350 lymphocytes/mm³ with clumps of atypical cells which could not be characterised further. Pericardial fluid cytology was repeatedly negative for blast cells.

Induction chemotherapy with vincristine, prednisolone and doxorubicin (adriamycin) were given along with prophylactic cranial radiotherapy and intrathecal methotrexate. The haematologic response was partial. However, the pleural and pericardial effusions resolved completely.

DISCUSSION

Leukemia involves all organs and tissues of the body. Leukemic infiltration of the pericardium has been documented frequently at post-mortem examinations^(1,2). In a large autopsy study of 420 patients of all ages, and with all types of acute leukemia, leukemic infiltration of the heart was observed in 156 patients (37%), 99 of whom (23.6%), showed pericardial infiltrates⁽¹⁾. However, it is unusual for the cardiac involvement to be evident clinically, and even rarer for it to be the initial manifestation of leukemia⁽³⁾. The majority of the

Department of Medicine
All India Institute of
Medical Sciences
New Delhi 110 029
India

R Handa, MD
Assistant Professor

S Bhatia, MBBS
Resident

M Mohindra, MBBS
Resident

P S Arora, MBBS
Resident

J P Wali, MD
Professor

Department of Medical
Oncology
All India Institute of
Medical Sciences

L Kumar, MD
Assistant Professor

V Kochupillai, MD
Professor

Correspondence to:
Dr R Handa

patients with pericardial metastases are clinically asymptomatic⁽⁴⁾. Pleural effusions have been reported in 4%-12% of patients with leukemia⁽⁵⁾. In our patient, the blood counts were normal at the time of initial detection of pericardial effusion. So far, there are a few other case reports in the literature, where pericardial effusion antedated haematologic evidence of leukemia^(6,7).

Normal blood counts at the time of initial presentation coupled with the fact that tuberculosis is the leading cause of pleuro-pericardial effusion in India, led to the initial diagnosis of tuberculous pericardial effusion in our patient. Repeated cytological examinations of the pericardial fluid were negative in our patient. The cytological examination of the pericardial fluid is diagnostic in 79% of patients with documented neoplastic pericarditis⁽⁴⁾.

Our patient subsequently developed cardiac tamponade which was successfully treated with pericardiocentesis. Cardiac tamponade complicating leukemia is very uncommon. Kawasaki et al in 1990, reviewed the literature and found only 27 reported patients with leukemia complicated by cardiac tamponade⁽⁸⁾.

The pleuropericardial effusion in our patient responded to chemotherapy although the haematologic patient response was partial. Pericardiocentesis or pericardiotomy in leukemic pericardial effusions is recommended when the pericardial effusion is resistant to chemotherapy, when patient symptoms are severe, and when infection has to be excluded⁽³⁾. Radiotherapy and intrapericardial

chemotherapy may have to be considered in resistant cases of leukemic pericardial effusion^(5,9).

In conclusion, leukemia should be considered in the differential diagnosis of pericardial effusion. Awareness of the condition facilitates early diagnosis. The low rate of clinical recognition coupled with effectiveness of current therapy in most leukemias, underscores the importance of a high index of clinical suspicion.

REFERENCES

1. Roberts WC, Bodey GP, Westlake PT. The heart in acute leukemia: a study of 420 autopsy cases. *Am J Cardiol* 1968; 21:388-412.
2. Bierman HR, Perkins EK, Orega P. Pericarditis in patients with leukemia. *Am Heart J* 1952; 43:413-22.
3. Leung WH, Tai YT, Lau CP, Wong CK, Cheng CH, Chan TK. Cardiac tamponade complicating leukemia: immediate chemotherapy or pericardiocentesis. *Postgrad Med J* 1989; 65:773-5.
4. Press OW, Livingston R. Management of malignant pericardial effusion and tamponade. *JAMA* 1987; 257:1088-92.
5. Vieta JO, Craver LF. Intrathoracic manifestations of the lymphomatoid diseases. *Radiology* 1941; 37:138-58.
6. Chia BL, Da Costa JL, Ransome GA. Cardiac tamponade due to leukemic pericardial effusion. *Thorax* 1973; 28:657-9.
7. Wendkos MH. Leukemic pericarditis. Report of a case of lymphatic leukemia in which massive pericardial effusion was the earliest and most outstanding manifestation. *Am Heart J* 1941; 22:417-22.
8. Kawasaki M, Yamano Y, Kikuchi Y, Sata T, Harada M, Niho Y. Cardiac tamponade as an initial manifestation of acute myeloblastic leukaemia. *Rinsho-Ketsueki* 1990; 31:224-8.
9. Terry LN Jr, Klingerman MN. Pericardial and myocardial involvement by lymphoma and leukemias - the role of radiotherapy. *Cancer* 1970; 25:1003-8.