Case Report

Myelomatous Pleural Effusion

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Abstract
Pleural effusions in multiple myeloma are relatively infrequent and more so myelomatous ones. We report a 66-year-old man who presented with multiple myeloma and a myelomatous right-sided pleural effusion. The diagnosis was made by repeated cytopathological pleural fluid examinations. The patient received one cycle of cyclophosphamide and methylprednisolone but despite therapy patient showed a downhill course. We reviewed the clinical features of this case and literature concerning multiple myeloma presenting as pleural effusion. ©

INTRODUCTION
Multiple myeloma is a malignant proliferation of plasma cells that primarily affects the bone marrow and skeletal system. Malignant pleural effusions due to multiple myeloma are rare. The incidence is 1-2% of all cases of multiple myeloma. We here present a rare case of multiple myeloma presenting as pleural effusion.

CASE REPORT
A sixty-six year old male pharmacist presented with one-month history of pleuritic chest pain and breathlessness. No history of hemoptysis, fever or cough was present. He had history of significant weight loss over the last couple of months. Patient was evaluated in a hospital outside and was found to have right-sided pleural effusion on Chest X-ray. Pleural fluid aspiration was done and it was reported as hemorrhagic exudative fluid, details of which were not available. PCR for mycobacterium was negative. An echocardiogram done was normal. Patient was advised anti-tubercular treatment, which he did not take. On admission in our hospital, on physical examination he looked ill and was using accessory muscles of respiration. The temperature was 37.8°C, pulse 100/min, respiration 26/min and blood pressure of 130/80 mm Hg. Examination revealed dullness and decreased breath sounds in the right inter-and infrascapular areas. On admission, hemoglobin was 8.0 gm/dl; white blood count 8100/cumm with normal differential count and platelets were 255,000/cumm, ESR 125 mm in first hr., blood urea nitrogen 37.1 mg/dl, creatinine 2.1 mg/dl, sodium 127 meq/l and potassium of 5.9 meq/l. His total protein was 9.8 gm/dl and albumin of 3.3 gm/dl. Blood and urine cultures were sterile.

Chest X-ray showed massive right-sided pleural effusion (Fig. 1). CT thorax revealed moderate right pleural effusion with collapse consolidation of right middle and lower lobe likely passive atelectasis. Bones showed diffuse osteopenia with a well-defined lytic lesion involving body of D10 vertebra, costovertebral junction of left 7th rib and midsternal region (Fig. 2). Rapidly filling pleural fluid and severe dyspnea led to intercostal drainage of the right pleural cavity. X-ray skull showed multiple punched out lesions suggestive of multiple myeloma. Bone marrow examination revealed 18-20% plasma cells consistent with multiple myeloma. Serum protein electrophoresis showed monoclonal spike in gamma region. Serum immunofixation electrophoresis showed monoclonal band in the gamma region corresponding to IgG-lambda immunoglobulin. Pleural fluid examination showed hemorrhagic fluid with glucose 91 mg/dl, protein 7.2 gm/dl, albumin 2.9 gm/dl and LDH of 183 IU. There were 3000 cells with predominantly polymorphs (95%). Pleural fluid Gram

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Fig. 1: Chest X-ray showing massive right-sided pleural effusion
stain, fungal and AFB smears were negative. The pleural fluid cultures were sterile. Bronchoscopy and bronchoalveolar lavage were done. BAL fluid did not grow any organism on culture. Cytopathological examination of the pleural fluid as well as the BAL fluid was done on two occasions and careful examination about 40% plasma cells were seen with pleomorphism, typical of malignancy (Fig. 3). Patient condition deteriorated and he had to be shifted to intensive care unit. His renal parameters became worse. He was given modified chemotherapy in the form of methylprednisolone and cyclophosphamide due to his deranged renal profile and general condition. His condition did not improve and patient left the hospital against medical advice.

**DISCUSSION**

Pleural effusion in multiple myeloma occurs in about 6% of patients and is due to several etiologies requiring different types of therapy. These etiologies are most commonly, heart failure secondary to amyloidosis, followed by: pulmonary embolism, chronic renal failure, second neoplasm and pleural myelomatous involvement. Pleural effusion secondary to pleural involvement has been rarely reported in the literature but this condition as the first manifestation of multiple myeloma is exceptional.

A Mayo Clinic review of 958 cases with multiple myeloma included 58 with pleural effusion. However, only 8 (0.8%) were found to have effusions due to myeloma. In this series the most common cause of effusion was congestive cardiac failure due to amyloidosis.

The pathogenesis of myelomatous effusion is unknown. Proposed mechanisms include invasion from adjacent skeletal lesions, extension from chest wall plasmacytomas and direct pleural involvement by myeloma. Our patient had rib, vertebral and sternal lesions on CT scan supporting the first mechanism of pleural effusion described above.

As far as the diagnosis of myelomatous pleural effusion is concerned, several methods have been described. The best means of diagnosis is the cytological identification of malignant plasma cells within the pleural fluid as seen in our case. Plasma cells from the pleural fluid in our case showed typical basophilic cytoplasm with large, eccentric nuclei and prominent nucleoli. Reactive plasmacytosis, as seen in tuberculosis and Hodgkin’s lymphoma, is usually accompanied by neutrophilic leukocytes, lymphocytes, reactive mesothelial cells, which seldom exceeds 15-20% of the cells and have few or no abnormal features.

Multiple myeloma associated with myelomatous pleural effusion have poor prognosis. Myelomatous pleural effusion has been thought as a late manifestation in the natural history of multiple myeloma or an expression of the aggressive behavior of the disease. Reported length of survival generally has been less than four months. The mainstay of therapy is systemic chemotherapy as myelomatous effusion is dependent on excess production of monoclonal protein.

In the end, we would like to conclude with the view that myelogenous effusions are a rare finding and have a poorer prognosis and due to multiple causes of pleural
effusion in patients with myeloma, diagnostic thoracocentesis with protein studies and cytologic examination of the fluid should be performed wherever possible and treat the condition in accordance with the etiology.

REFERENCES


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20th Annual Conference Cardiological Society of India, Delhi Branch, October 8-9th 2005. At the Auditorium, India Habitat Centre, Lodhi Road, New Delhi-110003

Dr. S. Padmavati Dr. Naresh Trehan Dr. (Col.) S.K. Parashar Dr. H.K. Chopra
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