CASE REPORT

MULTIPLE MYELOMA PRESENTING AS A PLEURAL EFFUSION

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Abstract

Malignant pleural effusions due to multiple myeloma are rare and it is very unusual for patients with myeloma to present with a pleural effusion. We report a sixty seven year old female who presented with a right-sided pleural effusion, which on cytological examination was found to have plasma cells. Serum protein electrophoresis demonstrated a monoclonal band and bone marrow biopsy revealed 30% plasma cells. Clinical examination and extensive investigations did not show any other causes for the pleural effusion. The patient was treated with melphalan, prednisolone and repeated thoracocentasis. She was discharged with minimal pleural effusion and was followed up in haematology and oncology clinics.

Key words: Pleural effusion, multiple myeloma, cytology, plasma cells

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[1] .The incidence of pleural involvement is 1-2% of all cases of multiple myeloma[2]. We present an unusual case of multiple myeloma manifesting as a pleural effusion.

Case Presentation

A sixty-seven-year-old female presented with a one-month history of cough and breathlessness. She also had a history of loss of appetite and significant weight loss over the preceding four months. She had no fever or haemoptysis and there was no contact history or past history of tuberculosis. At the peripheral hospital, she was found to have a right sided moderate pleural effusion on chest X- ray, and was transferred for further evaluation.

On admission to our hospital, she looked ill and was using accessory muscles of respiration. Her temperature was 37.8°C, pulse rate 90/min, respiratory rate 28/min and blood pressure 120/80 mmHg. Examination revealed a stony dullness and absent breath sounds in the right mid and lower zones of the chest.

On admission, her hemoglobin was 6.0 gm/dl; white cell count 5200/mm^3 with normal differential count and platelets were 300,000/mm.^{3} The erythrocyte sedimentation rate (ESR) was 162 mm in the first hour. Serum creatinine was 2 mg/dl, while serum sodium was 137 meq/l and potassium was 4.9 meq/l. Her total protein was 8.8 gm/dl and albumin 3.3 gm/dl.

The chest X-ray showed a moderate right-sided pleural effusion (**Figure 1**). An ultrasound scan of the chest confirmed the pleural effusion, which was not locculated,

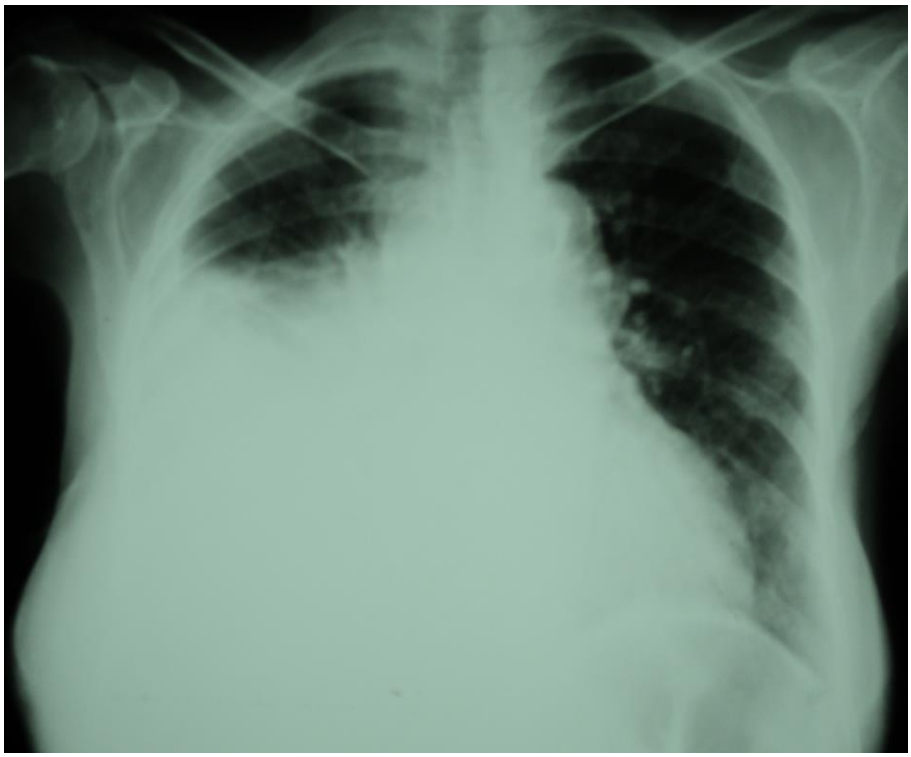

Figure 1 - Chest X- ray showing a moderate right sided pleural effusion

and there were no masses or consolidations. Pleural fluid analysis revealed a blood stained exudate which was sterile on culture and did not reveal any acid fast organisms on smears. Pleural biopsy did not reveal any features of tuberculosis or malignancy. Pleural fluid adenosine deaminase level was within normal limits. Pleural fluid cytology revealed plasma cells with eccentric nuclei and prominent nucleoli **(Figure 2**), which directed us to investigate for myeloma.

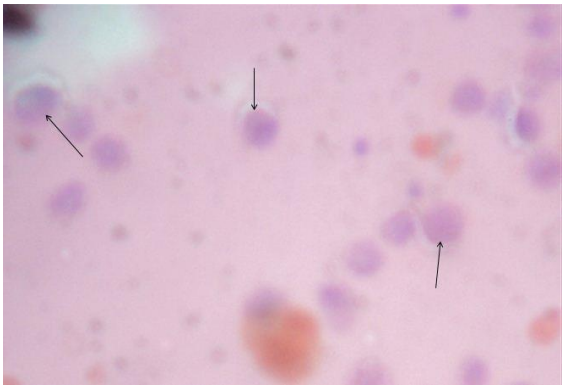

Figure 2 - Pleural fluid cytology showing plasma cells (shown by arrows) with eccentric nuclei and prominent nucleoli

The Mantoux test was non-reactive. Her blood picture revealed a normochromic-normocytic anaemia with rouleaux formation. Serum protein electrophoresis showed a monoclonal band and bone marrow biopsy revealed 30% plasma cells, confirming multiple myeloma. However, the skeletal survey showed only osteopenia and there were no lytic lesions.

Repeated therapeutic pleural fluid aspirations were done but the fluid re-accumulated. The patient was started on melphalan and prednisolone as chemotherapeutic agents for myeloma. Her urine output was normal

despite the elevated creatinine and there were no indications for dialysis. Her general condition and appetite improved with treatment, and the ESR dropped to 60mm/1st hour. The shortness of breath and cough settled after repeated therapeutic pleural aspirations. She was discharged from hospital despite having a small residual pleural effusion which was not symptomatic. She was followed up in the haematology clinic and later at the oncology clinic for chemotherapy.

Discussion

Although there are many aetiologies for pleural effusion in multiple myeloma such as infections, heart failure secondary to amyloidosis, pulmonary embolism, and chronic renal failure, pleural involvement occurs only in about 1-2% of patients[2,3]. Pleural effusion as the first manifestation of multiple myeloma is exceptional[3]. The incidence of myelomatous pleural effusion was estimated to be 0.8% in a review of 958 cases at the Mayo Clinic from 1960 to 1974. 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 the myeloma[1]. Our patient did not have any lytic lesions or plasmacytomas in the adjacent rib cage making this mechanism unlikely in this case. In most reported cases, the effusion was left sided, but it was right sided in our patient[5].

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. Tuberculosis, which is one of the commonest causes for pleural effusions in our country, was excluded by the absence of acid fast bacilli in the pleural fluid, negative mantaoux and normal adenosine deaminase which is highly sensitive for tuberculosis. Furthermore, pleural biopsy failed to show any granulomas. The possibility of plasma cell leukemia was excluded by the blood picture.

Multiple myeloma associated with myelomatous pleural effusion has a poor prognosis and is probably a late manifestation in the natural history of myeloma[6,7]. The reported length of survival generally has been less than four months[7, 8, 9]. A malignant effusion in myeloma patients places the patient in advanced Salmon Durie stage. These patients are usually resistant to treatment and often relapse in spite of aggressive chemo-radiotherapy necessitating pleurodesis. Therefore, recognition of the atypical plasma cells in the fluid is critical for therapeutic and prognostic considerations[10].

In conclusion, myelomatous pleural effusion is a rare finding and has a relatively poor prognosis. Due to the 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 the condition should be treated in accordance with the aetiology.

References

1 Meoli A, Willsie S, Fiorella R. Myelomatous pleural effusion. *South Medical Journal* 1997;90:65-8

2 Despande AH, Munshi MM. Pleural effusion as an initial manifestation of multiple myeloma. *Acta Cytologica* 2000;44:103-4.

3. Rodriquez JN, Pereira A, Martinez JC, Conde J, Pujol E. Pleural effusion in multiple myeloma. *Chest* 1994;105:622-4.

4. Kintzer JS, Rosenow EC III, Kyle RA. Thoracic and pulmonary abnormalities in

multiple myeloma: a review of 958 cases. *Archives of Internal Medicine* 1978;138:727-30.

5. Fekih L, Fenniche S, Hassene H,Abdelghaffar H, Yaalaoui S, Mezni F, Belhabib D, Zidi A ,Megdiche M L. Multiple Myeloma Presenting with Multiple Thoracic Manifestations. *The Indian Journal of Chest Diseases & Allied Sciences* 2010;52:47-9

6. Waddell CC. Response of myelomatous pleural effusion to chemotherapy. *Chest* 1981;80:6-7.

7. Kim YM, Lee KK, Oh HS. Myelomatous effusion with poor response to chemotherapy. *Journal of Korean Medical Sciences* 2000;15:243-6.

8. Dhingra KK, Singhal N, Nigam S, Jain S. Unsuspected multiples myeloma presenting as bilateral pleural effusion: a cytological diagnosis. *Cytojournal* 2007; 4:17.

9. Ghosh S, Gopal R, Advani SH. Myelomatous pleural effusion. *Journal of Association of Physicians India* 2006;54:738-9.

10. Palmer HE, Wilson CS, Bardales RH: Cytology and flow cytometry of malignant effusions of multiple myeloma. *Diagnostic Cytopathology* 2001, 22:147-151.