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CASE REPORT **OPEN ACCESS**

Myelomatous Pleural Effusion- A Rare Case

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A B S T R A C T

Plasma cell disorders, including multiple myeloma, are a group of diseases characterized by the abnormal proliferation of plasma cells. While pleural effusion is uncommon in multiple myeloma, it may result from myelomatous infiltration of the pleura or heart failure due to amyloidosis. In this report, we present a case of a 62-year-old male who was diagnosed with multiple myeloma after presenting with progressive dyspnea, cough, and generalized weakness over two months. Physical examination revealed diminished breath sounds over the left hemithorax. Chest X-ray and ultrasonography confirmed moderate pleural effusion, with 1000 mL of sero-sanguinous fluid aspirated. Pleural fluid analysis showed lymphocytic exudative effusion, elevated adenosine deaminase (76 IU/L), and plasma cell dyscrasias, indicative of multiple myeloma. Blood tests revealed anemia (Hb 7.5 g/dL) and renal impairment (serum creatinine 2.4 mg/dL). Imaging studies identified multiple lytic lesions in the skull and compression fractures in the thoraco-lumbar spine. Bone marrow aspirate showed 46% plasma cells. The patient was diagnosed with multiple myeloma and initiated on chemotherapy, showing clinical improvement with no recurrence of pleural effusion on follow-up. This case emphasizes the rarity of myelomatous pleural effusion and highlights the importance of early diagnosis and appropriate management. Treatment typically involves chemotherapy, with supportive care to manage symptoms, though the prognosis remains poor in cases of myelomatous pleural effusion.

Keywords: Multiple myeloma, Pleural effusion, Myelomatous effusion, Monoclonal gammopathy of undetermined significance (MGUS), Poor prognosis.

BACKGROUND

Plasma cell disorders encompass a range of conditions, with multiple myeloma and amyloidosis being prominent examples. Multiple myeloma (MM) is one of the most common and represents 10% of all the malignant hematological diseases which mainly affects bone marrow although extramedullary tissues may be infiltrated as well [1]. The key features of this disease are captured by the CRAB mnemonic: elevated calcium levels, kidney dysfunction, anemia, and lytic bone lesions, primarily affecting the skull [2]. Multiple myeloma is believed to develop from an asymptomatic premalignant condition called monoclonal gammopathy of undetermined significance (MGUS), which carries an annual progression risk of approximately 1% [3]. Pleural effusion in multiple myeloma is a rare complication (6 percent of patients of MM), It is particularly rare (<1%) for MM patients to present myelomatous pleural effusion, especially for those with pleural effusion as an initial sign [4]. Till now only 16 cases reported in English literature since 2000. which can arise either from direct myelomatous infiltration of the pleura or as a consequence of heart failure seen in cardiac amyloidosis. Diagnosing myelomatous pleural effusion typically involves a combination of pleural fluid analysis, including cytomorphology to identify malignant plasma cells, flow cytometry to confirm their clonality, and serum protein electrophoresis to detect abnormal monoclonal proteins. In some cases, a pleural biopsy may be necessary for definitive diagnosis. In this report, we present a case of a left-sided pleural effusion, which was ultimately diagnosed as a manifestation of multiple myeloma.

Case Report

A 62-year-old male with no significant past medical history presented with a two-month history of progressively worsening dyspnea, persistent cough, and generalized weakness. The symptoms had gradually intensified, significantly impairing his daily activities. He has a history of alcohol use but is a nonsmoker. Physical examination revealed no abnormalities, except for diminished breath sounds over the lower left hemithorax, suggesting a possible pleural or pulmonary pathology.

INVESTIGATIONS

Chest x-ray & ultrasonography of thorax, abdomen & pelvis revealed moderate pleural effusion. 1000ml sero-sanguinous pleural fluid was aspirated and analysis revealed lymphocytic exudative effusion with Adenosine deaminase 76IU/L. Pleural fluid cell block revealed plasma cell dyscrasias suggestive of Multiple Myeloma.

Blood parameters were unremarkable except Hb of 7.5gm%, Serum Creatine 2.4mg%. X ray of skull revealed multiple lytic lesions. MRI dorso-lumbar spine suggested compression fractures D9-D12 vertebral bodies.

Degenerative disc bulges in D-L spine fracture of left lower ribs. Bone marrow aspirate showed increased plasma cells (46%) both mature and immature forms suggestive of multi-Myeloma.

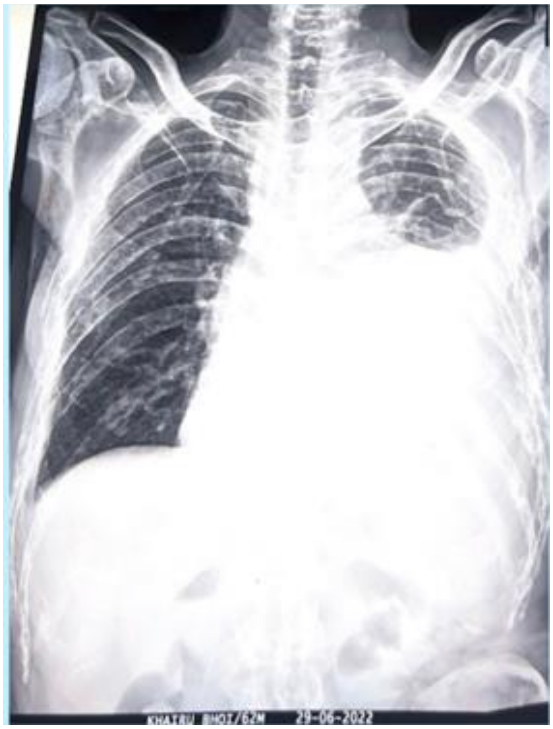

Figure 1: Chest X-ray PA view showing features like left side moderate pleural effusion in a patient with multiple myeloma

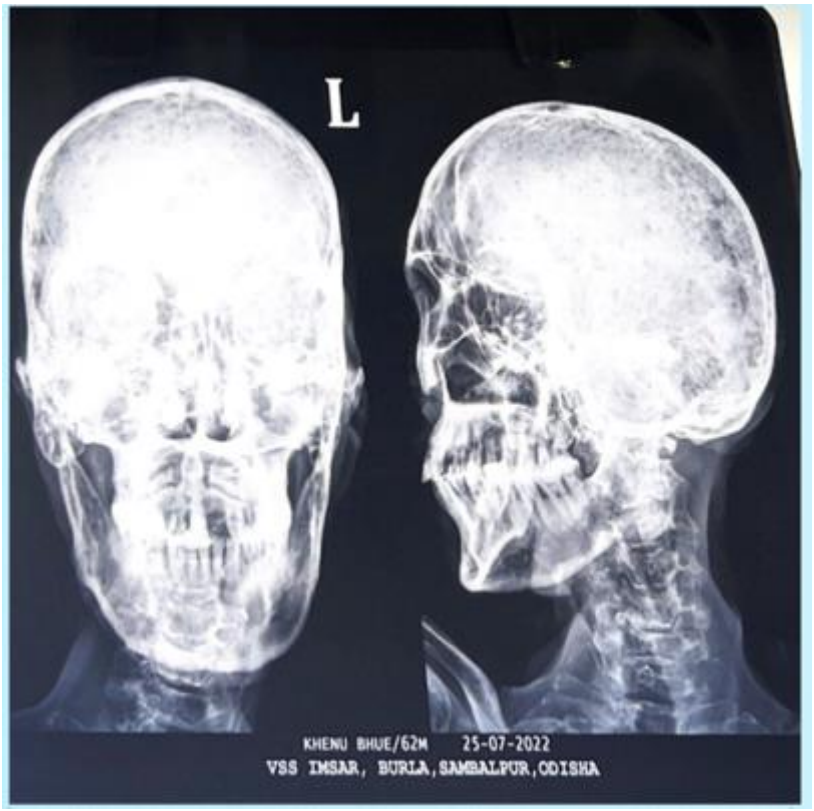

Figure 2: Skull X-ray shows multiple lytic lesions, characteristic of bone involvement in multiple myeloma, often described as a "punched-out" appearance

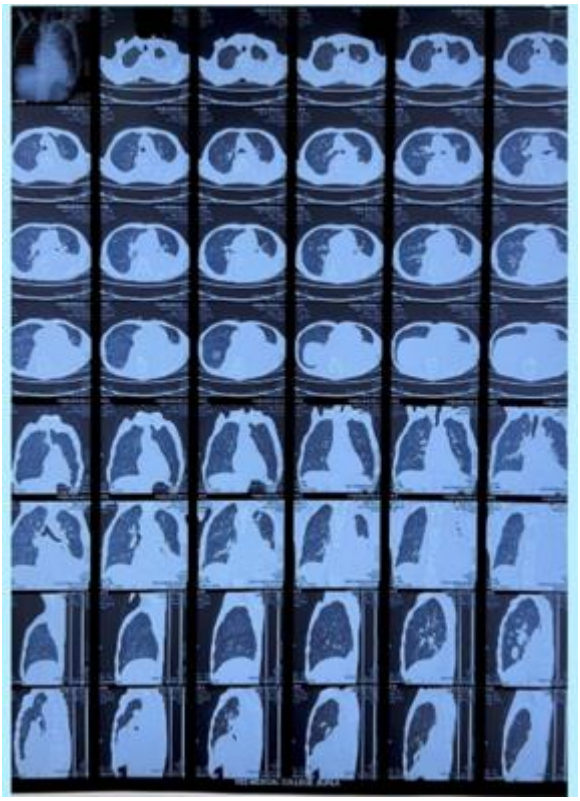

Figure 3: This CT scan of the chest reveals a large pleural effusion, predominantly on the left side with collapse of the underlying lung

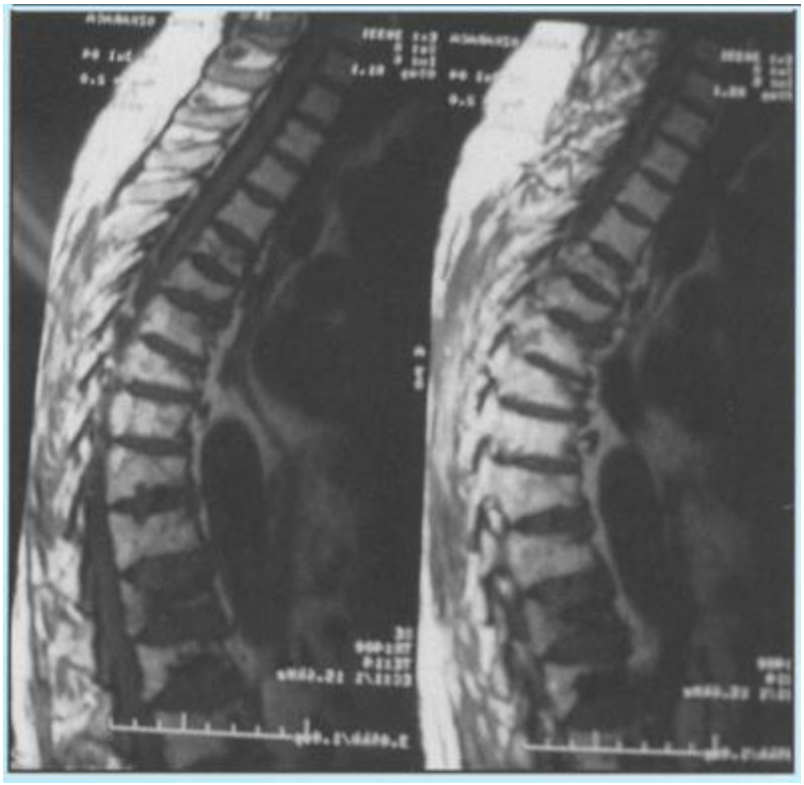

Figure 4: In this spine MRI, there are noticeable compression fractures primarily in the thoracic region, with the most prominent fractures visible in the mid-thoracic vertebrae (approximately T7-T9 region). The vertebrae show the characteristic "wedge-shaped" compression deformity consistent with multiple myeloma-related bone involvement

Laboratory results showed a hemoglobin level of 13.1 g/dL, WBC count of 7,200, and platelets at 22,500. Kidney function tests revealed urea at 15 mg/dL and creatinine at 1.4 mg/dL. Electrolyte abnormalities included low sodium (133 mmol/L) and potassium (9 mmol/L), as well as low calcium (1 mmol/L). Liver function tests showed normal AST (38 IU/L), ALT (29 IU/L), and ALP (57 U/L). Total bilirubin was 0.7 mg/dL, and direct bilirubin was 1.0 mg/dL. HIV, HBV, and ANA profiles were negative, and serum Aquaporin-4 antibody was absent. Cerebrospinal fluid (CSF) analysis revealed mild pleocytosis with increased protein, normal glucose, and no acid-fast bacilli or bacteria growth on Gram stain.

DISCUSSION

The patient was diagnosed with multiple myeloma and started on chemotherapy. Over subsequent follow-ups, the patient showed significant clinical improvement, with no recurrence of pleural effusion.

CONCLUSION

Extramedullary disease typically manifests in the advanced stages of myeloma and is associated with poor prognosis [5]. Common sites of extramedullary involvement in multiple myeloma (MM) include the nasal cavity, lymph nodes, lungs, central nervous system, liver, spleen, skin, and orbit [6]. However, serous cavity involvement is rare in MM. Pleural effusions occur in approximately 6% of cases, often secondary to conditions such as cardiac failure, amyloidosis, pulmonary embolism, pneumonia, or a secondary malignancy [7]. Myelomatous pleural effusion (PE), diagnosed by identifying malignant plasma cells in the pleural fluid, is an extremely rare occurrence, reported in less than 1% of MM cases [8]. In summary, pleural effusions in patients with multiple myeloma should be carefully assessed to rule out myelomatous pleural effusion. This condition is uncommon but is associated with a poor prognosis and a rapidly progressing clinical course.

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