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Case report

Multiple myeloma causing interstitial pulmonary infiltrates and soft-tissue plasmacytoma

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ABSTRACT

Multiple Myeloma (MM) is a relatively rare disease and MM presenting outside the bone marrow, known as extramedullary myeloma (EMM), is rarer still. While the liver and CNS are most commonly affected in EMM, the lung parenchyma is an especially unusual site of involvement.

We present the case of a 64-year-old male with known history of MM admitted with acute respiratory failure and a chest wall mass. Chest CT revealed patchy interstitial and alveolar opacities with no pulmonary masses or nodules. Bronchoalveolar lavage (BAL) was performed, with flow cytometry demonstrating monoclonal plasma cells expressing CD38, CD138 and CD56 with lambda light chain restriction. Fine Needle Aspiration of chest wall mass revealed CD138-positive cells as well.

Review of the literature revealed only one other documented case of a patient presenting with both interstitial lung parenchymal involvement with MM as well as soft tissue plasmacytoma, with this occurring in a patient who had previously underwent stem cell transplant. To our knowledge, we report the first recorded case of this presentation in a patient without a history of stem cell transplantation. Furthermore, it demonstrates the utility of using BAL, rather than lung biopsy, to establish the diagnosis through less invasive means.

1. Introduction

Multiple Myeloma (MM) is a relatively rare disease, with an estimated incidence in the Western World of 5 cases per 100,000 [1]. Rarer still is myeloma that arises from sights distinct from the bone marrow, such as soft tissue plasmacytomas or plasma cell infiltration of other anatomical structures. This manifestation, known as extramedullary myeloma (EMM), is present in 6%–8% of patients at the time of myeloma diagnosis, and the incidence increases over the duration of the disease with 10%–30% of myeloma patients eventually presenting with EMM [2]. Common sites of EMM involvement include hepatic, renal, pancreatic, pleural and the CNS. However, the pulmonary parenchyma is rarely involved [2,3]. One large study of 958 patients with MM found only 4 patients with presentations suggesting pulmonary infiltration by myeloma cells. Only one of these cases was proven histologically [3]. We present a case of a patient presenting with diffuse interstitial lung disease (ILD) found to be consistent with myelomatous involvement as well as a soft tissue plasmacytoma.

2. Case

A 64-year-old male with a history of hypertension and multiple myeloma status post chemotherapy five months prior presented to the ER in acute hypoxic respiratory failure. On exam, he was afebrile, his heart rate was 128 bpm, and he was hypoxic with SpO2 of 70% on a non-rebreather. Chest auscultation revealed diffuse, bilateral crackles. The patient was promptly admitted to ICU and intubated.

One day prior to the current admission, the patient had been discharged from the hospital after treatment for relapsed MM. His course during this time was complicated by acute hypoxic respiratory failure necessitating intubation and ICU admission which was presumed secondary to pneumonia. During this previous admission the patient was also found to have a right chest wall mass and Fine Needle Aspiration revealed monoclonal plasma cells that were CD138-positive.

During his current admission a high-resolution Chest CT was obtained and demonstrated patchy interstitial and alveolar opacities with no pulmonary masses or nodules (see Figs. 1 and 2). Bronchoscopy revealed 27% lymphocytes and was negative for evidence of infection. Bronchoalveolar lavage (BAL) flow cytometry demonstrated monoclonal plasma cells expressing CD38, CD138 and CD56 with lambda light chain restriction (see Fig. 3). The patient's condition worsened, and he expired due to complications of MM. Autopsy was declined.

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Abbreviations

ARDS	Acute Respiratory Distress Syndrome
BAL	Bronchoalveolar lavage
EMM	Extra Medullary Myeloma
ILD	Interstitial Lung Disease
MM	Multiple Myeloma

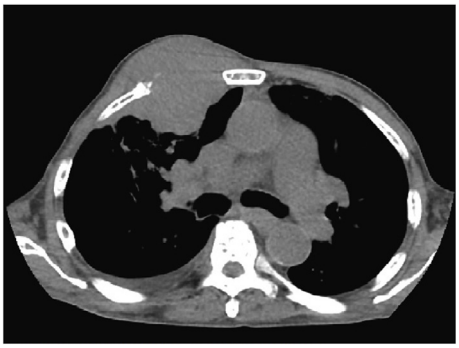

Fig. 1. Chest CT revealing showing large right sided chest wall mass.

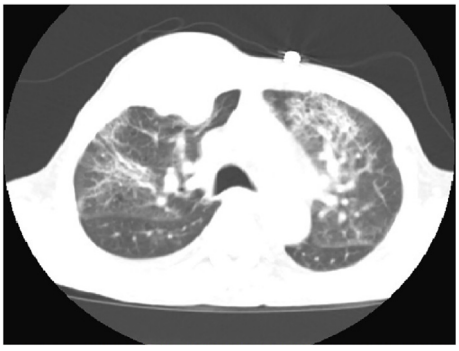

Fig. 2. Chest CT showing bilateral patchy alveolar and interstitial opacities, affecting primarily the upper lobes.

3. Discussion

While pulmonary findings in MM are relatively common, the overwhelming majority of these are related to an infectious etiology [3]. Review of the literature revealed seven case reports of patients with MM found to have interstitial pulmonary infiltration with neoplastic plasma cells, of which two were the initial presentation of myeloma and five were in patients previously diagnosed and treated [4–10]. The clinical picture can also differ significantly, from a more insidious onset of cough and shortness of breath to a rapidly progressive presentation resembling the Acute Respiratory Distress Syndrome (ARDS) [6,8–10].

Our patient presented both with pulmonary parenchymal involvement by MM and a subcutaneous plasmacytoma. Search of the literature revealed one similar case of a patient presenting with both pulmonary and skin involvement [4]. However, this previously reported case occurred after autologous stem cell transplant for previously diagnosed MM.

Our patient's BAL results revealed monoclonal plasma cells on flow cytometry. This approach to diagnosis is significant given that a diagnosis of MM causing ILD can be challenging to confirm. In the majority of cases reviewed, the diagnosis was either made via biopsy (transbronchial or surgical) or at autopsy [6–10]. However, two cases were reported in the literature of BAL flow cytometry revealing monoclonal plasma cells in patients who had histologically proven myelomatous involvement of the pulmonary parenchyma [4,5]. These two cases, along with the case we have presented, suggest that evaluation of BAL samples by flow cytometry could help establish the diagnosis and avoid the need for more invasive biopsy techniques.

4. Conclusion

In conclusion, we present a case of a patient with pulmonary parenchymal infiltration by MM as well as subcutaneous plasmacytoma. To our knowledge this is the first such presentation in a patient without a history of stem cell transplant. MM should be considered on the differential diagnosis of patients with the appropriate clinical history and interstitial infiltrates. Furthermore, flow cytometry of BAL samples should be considered in patients with known or suspected MM and a pattern on imaging consistent with ILD.

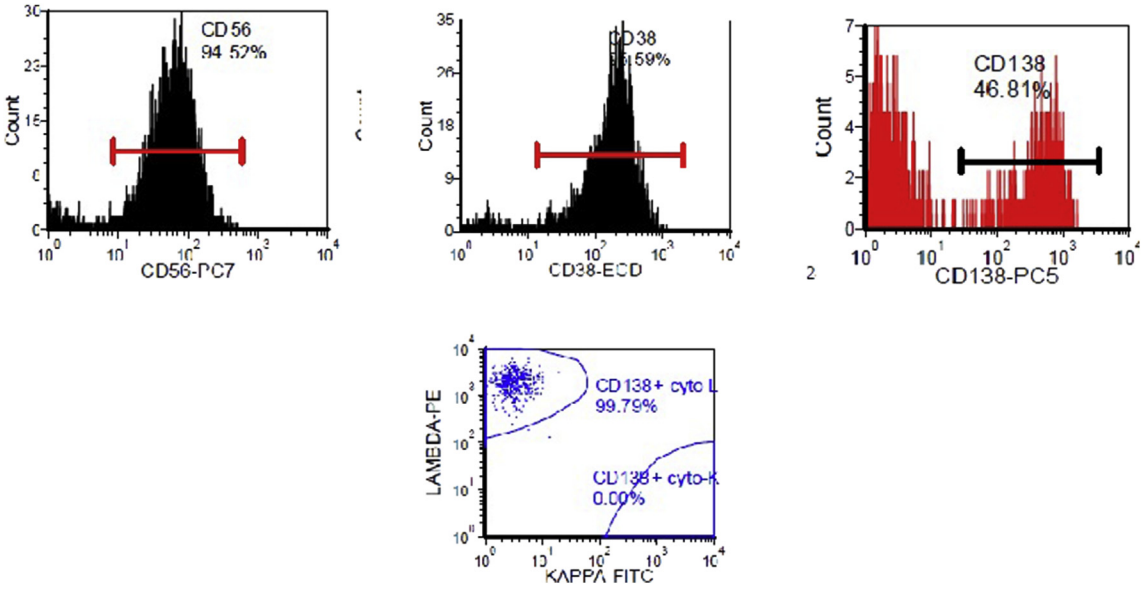

Fig. 3. Flow cytometry figure demonstrating CD138+, CD38 $^{+}$ and CD56 $^{+}$ plasma cells with lambda light chain restriction.

Conflicts of interest

The authors have no conflicts of interest to report.

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Prior presentation/publication

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