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A Case of Multiple Myeloma Presenting as Acute Respiratory Distress Syndrome

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Abstract: ***Pulmonary involvement in multiple myeloma is uncommon, and presentation as progressive acute respiratory distress syndrome (ARDS) is particularly rare. Because the radiological pattern resembles more common infectious or inflammatory lung diseases, diagnosing myeloma-related ARDS without histopathological confirmation is challenging. Direct infiltration of the lung by malignant plasma cells is considered one of the mechanisms behind this unusual presentation. When evaluating patients with non-infectious, rapidly worsening ARDS, multiple myeloma should be included in the differential diagnosis.***

Keywords: multiple myeloma, acute respiratory distress syndrome, pulmonary involvement, plasma cell infiltration, differential diagnosis

1. Introduction

Multiple myeloma (MM) is a malignancy of clonal plasma cells characterized by uncontrolled production of monoclonal immunoglobulins. This excess proliferative activity can lead to end-organ injury, classically manifested as hypercalcemia, renal dysfunction, anemia, or bone lesions. Although these features have a broad differential diagnosis, timely identification of MM is essential because prompt treatment improves outcomes.[1][2]

Pulmonary manifestations of MM are rare and often mimic common parenchymal or pleural diseases, metastatic lesions, or primary lung malignancies. This can delay diagnosis unless tissue sampling is performed.

2. Case Summary

A 65-year-old woman presented with dull, pleuritic retrosternal chest pain lasting five days, partially responsive to NSAIDs. She also reported cough, progressive exertional dyspnea, early satiety, and an unintentional weight loss of 11 pounds over two months. Her medical history included type 2 diabetes, hypertension, asthma, and obesity.

On examination, she was initially comfortable at rest but quickly became breathless with minimal movement. Temperature was 101.7°F, heart rate 96/min, respiratory rate 20/min, and blood pressure 117/72 mm Hg. Bilateral basal crackles were the only abnormal finding. Laboratory data showed WBC 10,400/mm³, hemoglobin 9.7 g/dl, sodium 131 mEq/L, calcium 8.5 mg/dl, and creatinine 1.0 mg/dl. Chest radiography revealed bilateral multifocal nodular opacities. Troponin levels were normal. Oxygen saturation was 88% on room air, improving to 94% with 5 L/min oxygen.

Despite broad-spectrum antibiotics for presumed pneumonia, her respiratory function deteriorated. By day four, she developed severe respiratory distress requiring intubation and mechanical ventilation using low tidal volume and high PEEP strategies. Arterial blood gas on 50% FiO_2 demonstrated pH 7.46, $PaCO_2$ 5.2 kPa, and PaO_2 4.5 kPa. Bronchoalveolar lavage revealed macrophages (40%), neutrophils (25%), and lymphocytes (35%), with no malignant cells or infectious pathogens. All cultures remained negative.

CT imaging showed diffuse bilateral airspace consolidation with nodularity, small pleural effusions, mediastinal lymphadenopathy, and a possible lytic lesion in the T9 vertebra. Thoracentesis produced a bloody exudate, negative for malignant cells. Thoracoscopic lung biopsy, however, demonstrated diffuse and nodular infiltration by neoplastic plasma cells. Urine protein was 918 mg/24 hours, and immunoelectrophoresis identified a monoclonal IgG-kappa band with excess kappa light chains; serum studies showed a similar pattern.

The patient received antibiotics and methylprednisolone for myeloma-associated lung involvement. Due to progressive multiorgan failure, she was deemed unsuitable for aggressive chemotherapy. As per her advance directives and family decision, life-supportive measures were withdrawn. Post-mortem tissue sampling was not permitted.

3. Discussion

Although confirmed pulmonary involvement in MM requires tissue diagnosis, several clinical clues—pleural effusion, failure to respond to antibiotics, absence of leukocytosis, and radiological evidence of lytic bone lesions—may suggest myeloma-related lung disease.

Thoracic manifestations of MM are diverse. In a large review of 958 patients, Kintzer et al. found thoracic skeletal disease in 28%, pulmonary infiltrates in 10% (mostly infectious), pleural effusions in 6%, and extramedullary plasmacytomas in 1%.[3]

Direct lung involvement may occur from plasma-cell infiltration, deposition of paraproteins within alveoli, alveolar septal amyloidosis, or metastatic calcification of alveolar structures.[4–7] The term “myeloma lung” has been applied to cases where malignant plasma cells and crystalline material

infiltrate lung tissue, producing diffuse pulmonary densities. [8] [9]

Radiological findings may resemble metastatic nodules, interstitial disease from amyloidosis, or dense consolidations.[10][11] Our patient's imaging and hypoxemia fulfilled the American-European Consensus criteria for ARDS.[12]

4. Conclusion

Although rare, multiple myeloma can present with pulmonary parenchymal infiltration severe enough to cause ARDS. Maintaining clinical suspicion, obtaining comprehensive laboratory evaluation, and pursuing early tissue diagnosis or bone marrow examination are essential for timely recognition and management.

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