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Lung uptake on a bone scan: A case of pulmonary Waldenstrom's macroglobulinemia

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Pulmonary involvement secondary to Waldenstrom's macroglobulinemia (WMG) is described in a 40-year-old male by incidental findings on a bone scan. He was examined for right leg pain, and bone scan revealed unexpected pulmonary uptake of Tc-99m MDP. CT scan of the thorax revealed pleural effusion and slightly disseminated micronoduler density increase in the right lung and parenchymal infiltration in the left lung. Transdermal lung biopsy demonstrated diffuse infiltration of lymphoplasmocytoids. Reporting the presence of pulmonary involvement is important because it may prevent morbidity from pulmonary dysfunction.

Key words: Waldenstrom's macroglobulinemia, pulmonary involvement, Tc-99m MDP

INTRODUCTION

Waldenstrom's macroglobulinemia (WMG), first described in 1944, is the proliferation of malignant monoclonal IgM secreting plasmacytoid lymphocytes in lymph nodes, spleen, and marrow.[1] The disease is of unknown etiology but appears to have increased familial incidence. It has an overall incidence of 2.5/million/year. This disease, most common in the elderly, usually follows an insidious onset and pursues a chronic clinical course.[2,3] The clinical onset of macroglobulinemia is associated with weakness, fatigue, epistaxis or other bleeding manifestations. The disease is characterized by hepatomegaly (20%), splenomegaly (15%), and lymphadenopathy (15%). The most common laboratory finding is anemia with a median hemoglobin value of approximately 10 g/d*l*. IgM monoclonal protein is detected as a circulating tumor marker. IgM M-components lead to hyperviscosity, cryoprecipitation or bleeding phenomena.

Extraskeletal uptake of bone seeking radiopharmaceuticals occurs in a multitude of disorders, mostly as incidental findings in the evaluation of the skeletal system by bone scintigraphy. These observations sometimes can lead to additional attention being paid to patient management.[4,5]

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CASE REPORT

A 38-year-old man with known WMG for five years was admitted to our hospital with complaining of right leg pain. On physical examination, the liver, spleen and lymph nodes were not enlarged, and the range of motion of his left leg was normal. Hematologic examination revealed Hb 11.9 g/d*l*, platelet 28.1×10^4/microliter and WBC 6,800/microliters, ESR was within normal limits. Plain film of the right lower extremity was also normal. He was referred to our department for bone scanning. Bone imaging was performed 2 hours after the injection of 925 MBq (25 mCi) of Tc-99m MDP with an Elscint SPX gamma camera equipped with low energy, all purpose collimator. Bone scan showed greatly increased accumulation of radioactivity diffusely throughout the lungs as an incidental finding. Serum calcium and phosphorus levels were within the normal ranges. CT scan of the chest showed pleural effusion on the right side and slightly disseminated micronodular density increase in the right lung and disseminated micronodular interstitial infiltrations in the left lung. Percutaneous lung biopsies showed dense lymphoplasmacytoid infiltration. These data established the diagnosis of pulmonary WMG.

DISCUSSION

Pulmonary involvement is a rare manifestation of the disease. Direct infiltration of pulmonary parenchyma by

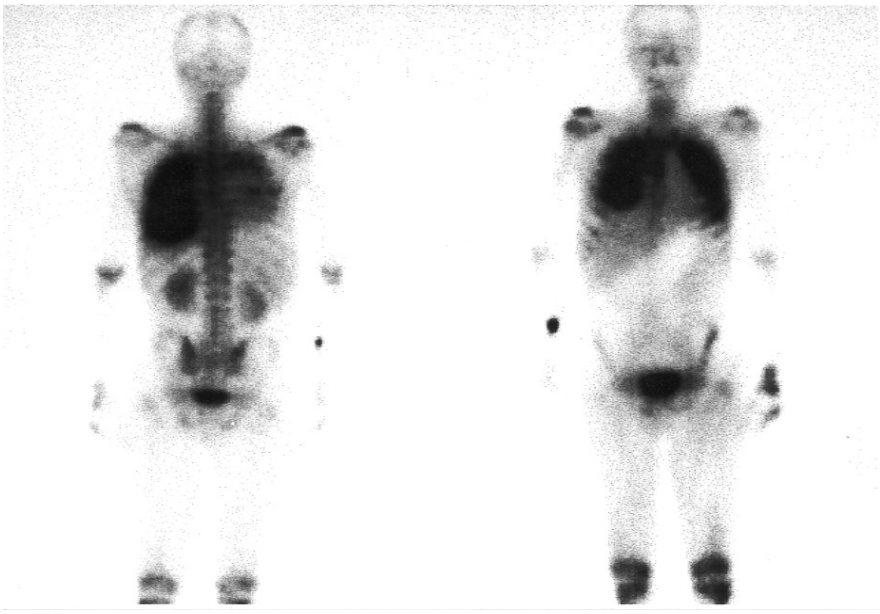

Fig. 1 Bone scan with Tc-99m MDP shows markedly increased accumulation of radioactivity diffusely throughout the lungs.

lymphocytes and plasma cells is an important factor in the etiology and pathogenesis of pulmonary manifestations of the disease.[6,7] Pulmonary complications of WMG have been reported, first in 1956 by Noach.[8] The true incidence has not been determined. It has been reported to be occurred in fewer than 5% of cases.

Symptoms at the onset of pulmonary involvement of the disease are included dyspnea, nonproductive cough and chest pain. Sometimes patients are asymptomatic.[6] Biopsy reveals diffuse infiltration of pulmonary parenchyma with lymphoplasmocytoid cells and the cytoplasm of cells stain for monoclonal IgM by the peroxidase-antiperoxidase method.[9]

The radiologic findings of pulmonary involvement, evident in most patients when first seen, include masses, infiltrates and pleural effusions. Isolated lung masses without mediastinal lymphadenopathy, parenchymal infiltrates or pleural effusion are least common.[10–12]

Such pulmonary manifestations can cause morbidity, and should be considered in any patient with WMG who has no respiratory symptoms.

Lung uptake of radiolabeled skeletal agents has been reported in a wide variety of disorders. Common underlying metabolic or pathologic causes have been described. But there has not been any report of pulmonary uptake of MDP in patients with WMG, This observation is important, because prompt recognition and appropriate treatment may prevent increasing morbidity from pulmonary dysfunction.

In this case, the uptake of MDP in the lungs is not clear but the authors think that it may be related to direct infiltration of pulmonary parenchyme by lymphocytes and plasma cells. This agent might make a complex with IgM.

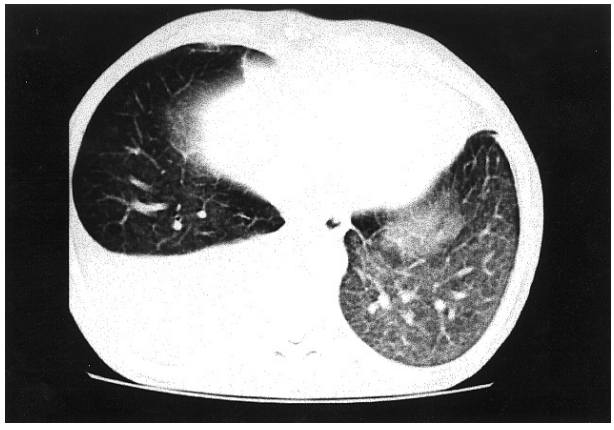

Fig. 2 CT of the thorax showing pleural effusion and slightly disseminated micronoduler density increase in the right lung and disseminated micronoduler interstitial infiltrations in the left lung.

In our case, bone scan indicated previously unknown pulmonary involvement of WMG. We think that this case should be added to the reasons of pulmonary uptake on bone imaging.

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