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Medical Imaging Quiz – Case 46

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A 78-year-old man presented to the emergency department due to persistent cough and dyspnea for 15 days. He was diagnosed with multiple myeloma one year ago (fig. 1), and refused any treatment. Physical examination revealed temperature of 37.3 °C, pulse rate: 85/min, respiratory rate: 16/min, blood pressure: 130/85 mmHg and pathologic auscultatory sounds. He underwent a chest computed tomography (CT) which showed diffuse inhomogeneous opacities and interlobular septal thickening (fig. 2). Laboratory investigation excluded infectious diseases. Fine needle biopsy was performed and confirmed the diagnosis. Biopsy specimen staining was positive with Congo red and demonstrated apple-green birefringence under polarized light.

Comment

Multiple myeloma is a clonal malignancy of terminally differentiated B lymphocytes characterized by the expansion of clonal plasma cells in the bone marrow resulting in suppression of normal hematopoiesis, production of monoclonal immunoglobulins or fragments, immunosuppression, nephropathy and neuropathy. These findings often result from direct injury or accumulation of immunoglobulins (heavy or light chain) in various organs. The toxic

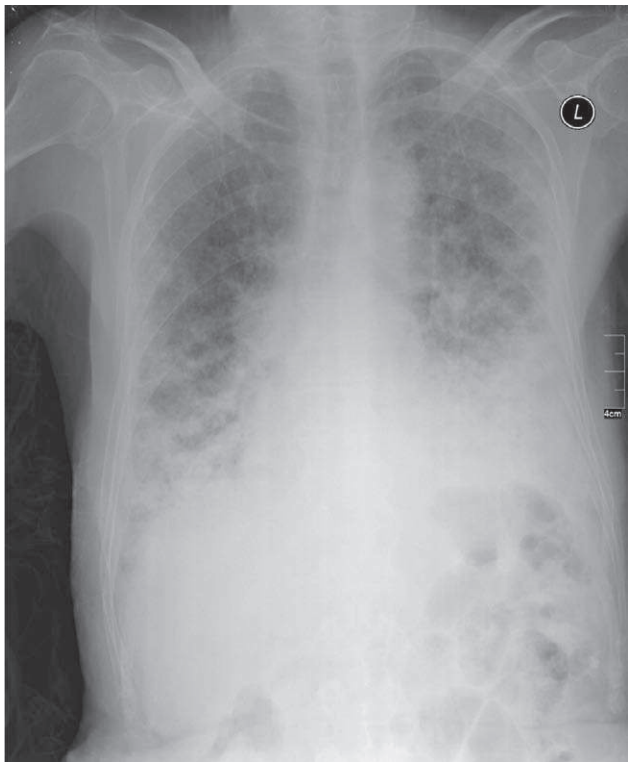

Figure 1. Chest X-ray at the time of multiple myeloma diagnosis.

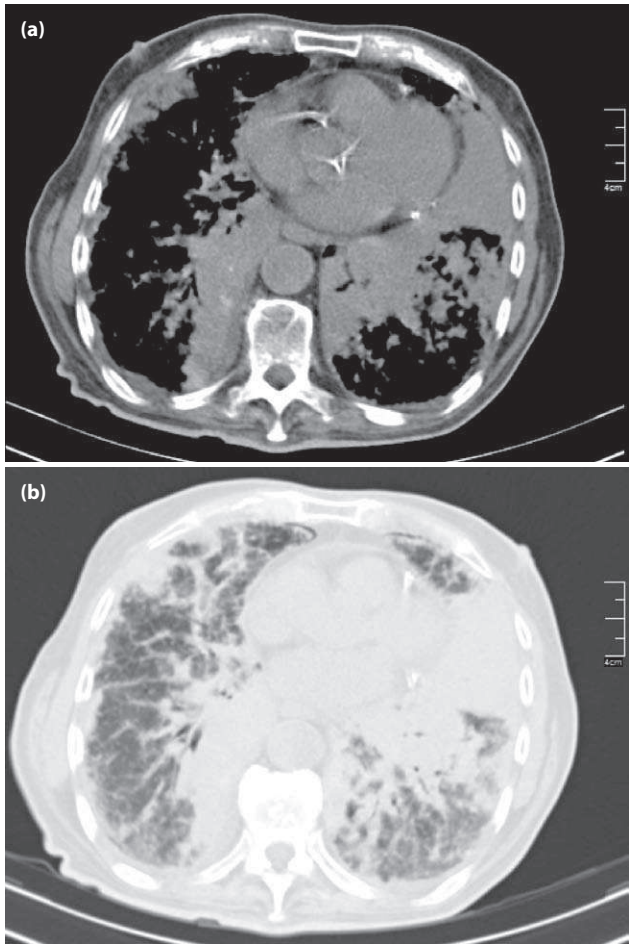

Figure 2. (a) Chest CT image revealing diffuse inhomogeneous opacities and (b) interlobular septal thickening.

effects and organ dysfunction caused by immunoglobulin deposition, however, differ in severity, clinical presentation and prognosis from that caused by "amyloidogenic" light chain deposition as seen in amyloidosis. Approximately 10–15% of myeloma patients develop clinical amyloidosis through the course of their disease and up to 30% of patients are found to have subclinical amyloid deposits in subcutaneous fat pad aspirates, bone marrow biopsies and biopsies of other vital organs such as heart, liver and kidneys.

Symptoms and signs of amyloid organ involvement such as dyspnea that is disproportionate to the degree of anemia, proteinuria with predominant albuminuria, neuropathy with autonomic dysfunction, often are mistakenly considered to be related to multiple myeloma. Therefore, it is crucial to recognize the presence of light-chain (AL) amyloidosis in the setting of multiple myeloma, in particular, when making therapeutic decisions regarding the choice of induction therapy or the intensity of the conditioning regimen.

AL amyloidosis and multiple myeloma share several clinical features such as clonal plasma cells and the production of monoclonal immunoglobulins; however, the hallmark of the amyloid monoclonal light chain is its propensity to form insoluble fibrils with specific tropism for variable organs. Hence, the diagnosis of AL amyloidosis requires histological confirmation with a biopsy specimen staining positive with Congo red and demonstrating apple-green birefringence under polarized light.

Although physical findings of amyloidosis are specific (enlargement of the tongue, periorbital purpura, shoulder pad sign), relying on symptoms and signs alone without entertaining the possibility of the co-existence of amyloid in myeloma patients inevitably may result in overlooking this additional condition and potentially significant therapeutic consequences. Therefore, amyloidosis should always be suspected in any myeloma patient with dyspnea disproportionate to the degree of anemia, diffuse interstitial lung infiltrates, nephrotic range proteinuria, infiltrative cardiomyopathy, autonomic neuropathy, hepatomegaly and symptoms of partial bowel-obstruction.

References

1. DESIKAN KR, DHODAPKAR MV, HOUGH A, WALDRON T, JAGANNATH S, SIEGEL D ET AL. Incidence and impact of light chain associated (AL) amyloidosis on the prognosis of patients with multiple myeloma treated with autologous transplantation. *Leuk Lymphoma* 1997, 27:315–319
2. MERLINI G, BELLOTTI V. Molecular mechanisms of amyloidosis. *N Engl J Med* 2003, 349:583–596
3. PACCALIN M, HACHULLA E, CAZALET C, TRICOT L, CARREIRO M, RUBI M ET AL. Localized amyloidosis: A survey of 35 French cases. *Amyloid* 2005, 12:239–245
4. BAHLIS NJ, LAZARUS HM. Multiple myeloma-associated AL amyloidosis: Is a distinctive therapeutic approach warranted? *Bone Marrow Transplant* 2006, 38:7–15
5. FIELDER K, DURIE BG. Primary amyloidosis associated with multiple myeloma. Predictors of successful therapy. *Am J Med* 1986, 80:413–418

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