IMAGES IN PULMONARY, CRITICAL CARE, SLEEP MEDICINE AND THE SCIENCES

Systemic Amyloidosis Mimicking Lung Cancer

Adam S. Fisch¹, Florian J. Fintelmann², Maria L. Garcia-Moliner³, Henning A. Gaissert⁴, Inga Lennes⁵, James N. Butera⁶, James R. Stone¹, and Lida P. Hariri¹

¹Department of Pathology, ²Department of Radiology, ⁴Division of Thoracic Surgery, and ⁵Cancer Center, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts; and ³Department of Pathology and ⁶Department of Medicine, Rhode Island Hospital, Warren Alpert Medical School of Brown University, Providence, Rhode Island

Figure 1. (A and B) Serial axial computed tomography images of the thorax in lung windows demonstrate the left upper lobe pulmonary nodule at baseline (arrow, A) and after 12 months (arrow, B). (C and D) Serial axial computed tomography images without (arrow, C) and with (arrow, D) fluorodeoxyglucose–positron emission tomography obtained 24 months after baseline demonstrate interval growth and mild focal uptake, respectively.

An 80-year-old woman presented to our multidisciplinary Lung Nodule Clinic with a remote 20-pack-year smoking history and an irregular, solid left upper lobe pulmonary nodule found on workup for a persistent cough of 2 years' duration. The lesion was followed with serial computed tomography and showed growth from 8.7-mm maximal and 6-mm mean diameter to 12.4-mm maximal diameter and 11-mm mean diameter over 2 years, and demonstrated mild focal uptake on fluorodeoxyglucose–positron emission tomography (Figure 1). At an outside hospital, she received recommendations to undergo either resection or stereotactic body radiation therapy for presumed lung cancer. We recommended excision over stereotactic body radiotherapy because of the lesion's proximity to the mediastinum.

A thoracoscopic wedge resection was performed. Pathological examination revealed eosinophilic, anucleate material with both nodular and subtle diffuse

interstitial involvement. No neoplastic cells were present. Congo Red staining confirmed amyloid deposition (Figure 2). Mass spectrometry revealed wild-type transthyretin amyloid, consistent with the diffuse interstitial amyloid pattern (1). Subsequently, the patient received a clinical diagnosis of systemic amyloidosis.

Solitary pulmonary amyloidomas are known mimickers of malignancy on computed tomography and positron emission tomography imaging (2). In contrast, systemic amyloidosis infrequently involves the lung in a clinically significant fashion, especially as the first site, and rarely presents as a solitary lung nodule (3–5). Through histological examination and mass spectrometry, this patient's presumed lung malignancy was discovered to be undiagnosed systemic transthyretin amyloidosis with primary lung involvement. ■

Author disclosures are available with the text of this article at www.atsjournals.org.

Figure 2. (A and B) Histologic images of lung wedge resection, including hematoxylin and eosin–stained sections of the interface between the pulmonary nodule and normal lung (A, 5× magnification on whole slide imaging [WSI]; scale bar, 250 μ m) and the anucleate eosinophilic amyloid material (B, 40× magnification on WSI; scale bar, 50 μ m). (C and D) Congo Red–stained sections of interstitial amyloid under unpolarized (C, 200× magnification; scale bar, 100 μ m) and polarized (D, 200× magnification; scale bar, 100 μ m) light demonstrate the classical apple-green birefringence of the interstitial amyloid under polarized light. The images in A and B were acquired as a secondary capture from a 5× (2 μ m/pixel) and 40× (0.25 μ m/pixel) WSI system (Philips), respectively.

References

1. Khor A, Colby TV. Amyloidosis of the lung. *Arch Pathol Lab Med* 2017; 141:247–254.
2. Barešić M, Sreter KB, Brčić L, Hećimović A, Janevski Z, Anić B. Solitary pulmonary amyloidoma mimicking lung cancer on 18F-FDG PET-CT scan in systemic lupus erythematosus patient. *Lupus* 2015;24: 1546–1551.
3. Hawkins PN, Ando Y, Dispenzeri A, Gonzalez-Duarte A, Adams D, Suhr OB. Evolving landscape in the management of transthyretin amyloidosis. *Ann Med* 2015;47:625–638.
4. Revelo AE, Magaspi C, Maguire G, Aronow WS. Hereditary amyloidosis with recurrent lung infiltrates. *Am J Case Rep* 2016;17:874–879.
5. Oezkan F, Khan AM, Freitag L, Montag M, Hahn S, Berliner PJ, *et al*. Hemoptysis in primary pulmonary amyloidoma treated with intrabronchial arterial coiling. *Am J Respir Crit Care Med* 2014;190:1311–1314.