Clinical Case Reports

Open Access

CASE REPORT

Pulmonary amyloidosis mimicking prostate cancer metastasis

Soichiro Natsume[1], Yoshiro Nakahara[1], Tatsuru Okamura[1] & Tsunekazu Hishima[2]

[1]Department of Thoracic Oncology and Respiratory Medicine, Tokyo Metropolitan Cancer and Infectious Diseases Center, Komagome Hospital, Tokyo, Japan
[2]Department of Pathology, Tokyo Metropolitan Cancer and Infectious Diseases Center, Komagome Hospital, Tokyo, Japan

Correspondence
Yoshiro Nakahara, Department of Thoracic Oncology and Respiratory Medicine, Tokyo Metropolitan Cancer and Infectious Diseases Center, Komagome Hospital, 3-18-22, Honkomagome, Bunkyo-ku, Tokyo 113-8677, Japan. Tel: +81 3 3823 2101; Fax: +81 3 3823 5433; E-mail: yoshironakaharakomagome@yahoo.co.jp

Funding Information
No sources of funding were declared for this study.

Received: 13 October 2014; Revised: 18 March 2015; Accepted: 19 March 2015

Clinical Case Reports **2015; 3(7): 626–628**

doi: 10.1002/ccr3.282

Key Clinical Message

Localized nodular pulmonary amyloidosis is rare. However, the disease should be considered in the differential diagnosis of multiple lung nodules.

Keywords

Localized nodular pulmonary amyloidosis, lung metastasis, prostate cancer, solitary lung nodule

Clinical Course

An asymptomatic 65-year-old man was referred to our clinic after a small nodular shadow in the right middle lung field was observed on X-ray. Chest computed tomography showed multiple nodular shadows in bilateral lung fields (Fig. 1). Laboratory tests revealed a white blood cell count of 4600/mm^3, hemoglobin 16.0 g/dL, platelets 27.5 × 104/mm^3, serum total protein 7.0 g/dL, albumin 4.6 g/dL, serum creatinine 0.9 mg/dL, and lactate dehydrogenase 170 IU/L. Prostate-specific antigen (PSA) levels were also elevated (18.4 ng/mL). Therefore, prostate biopsy was performed, and he was subsequently diagnosed with prostate cancer. Moreover, the lung nodules were suspected to represent prostate cancer metastases. The patient subsequently underwent hormone therapy, which resulted in prostate cancer improvement after 4 months; however, the lung nodules did not improve. An F-18 fluorodeoxyglucose positron emission tomography (FDG-PET) scan was then performed, but no FDG uptake was observed in these nodules, nor any other organs, including bones (Fig. 2). The patient underwent video-assisted thoracoscopic surgery of the right middle

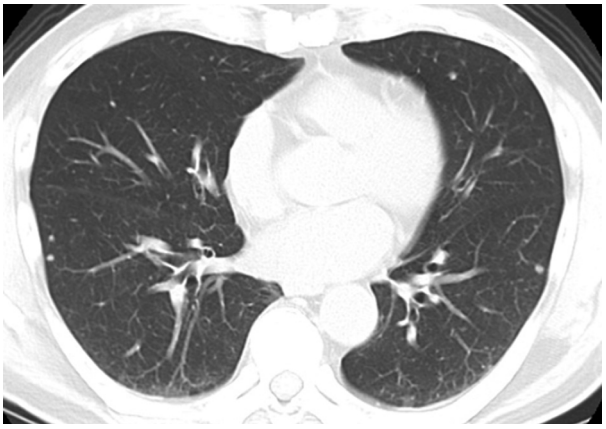

Figure 1. Chest computed tomography showed multiple nodular shadows in bilateral lung fields.

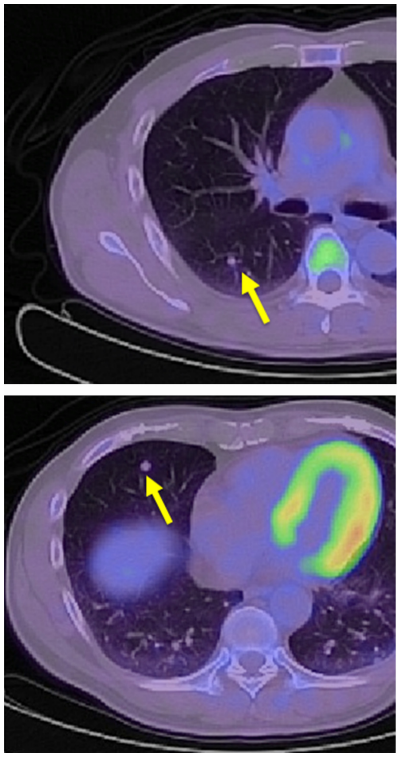

Figure 2. An F-18 fluorodeoxyglucose positron emission tomography (FDG-PET) scan was then performed, but no FDG uptake was observed in these nodules.

lung lobe. Homogeneous deposition of eosinophilic amorphous material was seen in a resected nodule and direct fast scarlet (DFS) stained the deposited material red. Polarizing microscopy showed green birefringence of the deposited material stained by DFS and the deposited material showed positive immunostaining results for λ chain, but negative for κ chain. Based on these findings, the lung lesions were diagnosed as nodular immunoglobulin light chain (AL) amyloidosis (Fig. 3). Next, the patient was investigated for evidence of myeloma or plasma cell dyscrasias. Bone marrow biopsy was performed, but there were no findings of multiple myeloma. Urine protein electrophoresis did not reveal Bence-Jones protein, and serum protein electrophoresis showed λ-type monoclonal protein, so we could not completely exclude monoclonal gammopathy of undetermined significance (MGUS). No lesions were seen in other organs; therefore, the final diagnosis was localized nodular pulmonary amyloidosis. The patient remained under observation for 3 years without treatment or disease progression.

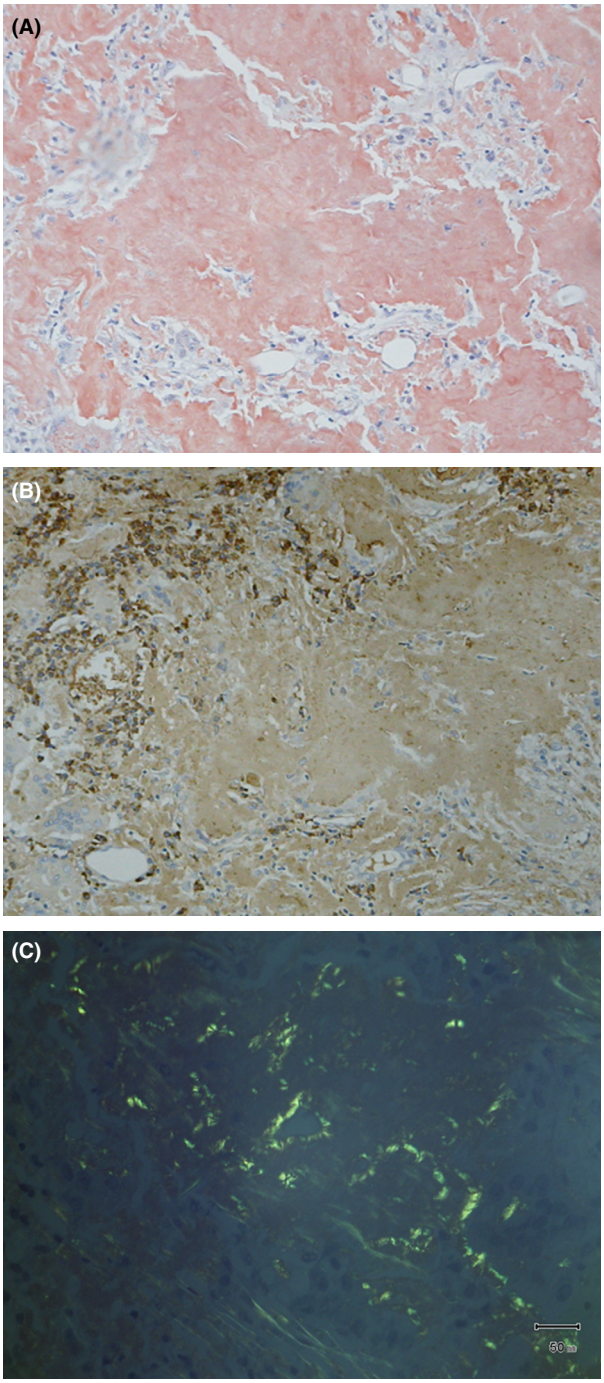

Figure 3. (A) Homogeneous deposition of eosinophilic amorphous material was seen in a resected nodule and direct fast scarlet (DFS) stained the deposited material red. (B) The deposited material showed positive immunostaining results for k chain. (C) Polarizing microscopy showed green birefringence of the deposited material stained by DFS.

Discussion

Herein, we report a case of amyloidosis concomitant with prostate cancer. Pulmonary amyloidosis typically displays four main patterns: nodular, tracheobronchial, alveolar septal, and as a component of low-grade B-cell lymphomas [1–5]. Whereas alveolar septal amyloidosis is

associated with systemic forms of amyloidosis, nodular and tracheobronchial amyloidosis are generally derived from immunoglobulin light chains, without systemic amyloid deposits and are typically localized in the lung. Occurring as single or multiple nodules, nodular pulmonary amyloidosis lesions are found incidentally on imaging studies.

The link between amyloidosis and cancer is frequently reported. For instance, Hemminki et al. reported that amyloidosis patients are at an increased risk of myeloma, non-Hodgkin lymphoma, and squamous cell skin cancer risk. Moreover, AL amyloidosis is associated with multiple myeloma, MGUS, and Waldenstrom macroglobulinemia [6], and endocrine tumors, including insulinoma, prolactinoma, and medullary thyroid tumors, and pituitary adenomas have been reported to be associated with amyloidosis in previous case reports [6].

The mechanism underlying amyloidosis-associated cancers has been hypothesized to be the overproduction of amyloid precursor proteins or peptides by tumors in AL amyloidosis and endocrine peptide-related amyloidosis, while malignant transformation is caused by chronic stimulation or inflammation in FAP- and SSA-related amyloidosis [6,7].

The patient in the present case did not show evidence of amyloidosis elsewhere, and thus we made the diagnosis of localized nodular pulmonary amyloidosis. Localized nodular pulmonary amyloidosis is rare, and the details regarding its presentation varies. For instance, Pickford et al. [8] reported that 60% of patients show a solitary nodule, 20% show two nodules, and 20% showed ten nodules. In contrast, Hui et al. [9] reported 67% of patients presenting with multiple nodules. Based on the present report, localized nodular pulmonary amyloidosis should be considered in the differential diagnosis of multiple lung nodules.

Conflict of Interest

None declared.

References

1. Lim, J. K., M. Q. Lacy, P. J. Kurtin, et al. 2001. Pulmonary marginal zone lymphoma of malt type as a cause of localised pulmonary amyloidosis. J. Clin. Pathol. 54:642–646.
2. Ryan, R. J., J. M. Sloan, A. B. Collins, et al. 2012. Extranodal marginal zone lymphoma of mucosa-associated lymphoid tissue with amyloid deposition: a clinicopathologic case series. Am. J. Clin. Pathol. 137:51–64.
3. Utz, J. P., S. J. Swensen, and M. A. Gertz. 1996. Pulmonary amyloidosis. The mayo clinic experience from 1980 to 1993. Ann. Intern. Med. 124:407–413.
4. Dacic, S., T. V. Colby, and S. A. Yousem. 2000. Nodular amyloidoma and primary pulmonary lymphoma with amyloid production: a differential diagnostic problem. Mod. Pathol. 13:934–940.
5. Xu, L., A. Frazier, and A. Burke. 2013. Isolated pulmonary amyloidomas: report of 3 cases with histologic and imaging findings. Pathol. Res. Pract. 209:62–66.
6. Hemminki, K., X. Li, A. Försti, et al. 2014. Cancer risk in amyloidosis patients in Sweden with novel findings on non-Hodgkin lymphoma and skin cancer. Ann. Oncol. 25:511–518.
7. Sipe, J. D., M. D. Benson, J. N. Buxbaum, et al. 2014. Nomenclature 2014: Amyloid fibril proteins and clinical classification of the amyloidosis. Amyloid. 21:221–224.
8. Pickford, H. A., S. J. Swensen, J. P. Utz, et al. 1997. Thoracic cross-sectional imaging of amyloidosis. AJR 168:351–355.
9. Hui, A. N., M. N. Koss, L. Hochholzer, et al. 1986. Amyloidosis presenting in the lower respiratory tract. Clinicopathologic, radiologic, immunohistochemical, and histochemical studies on 48 cases. Arch. Pathol. Lab. Med. 110:212–218.