

CASE REPORT

Nodular amyloidosis of the lung and the breast mimicking breast carcinoma with pulmonary metastasis

Y-S. Liaw*, S-H Kuo**, P-C Yang*, C-L Chen†, K-T Luh**

Nodular amyloidosis of the lung and the breast mimicking breast carcinoma with pulmonary metastasis. Y-S Liaw, S-H Kuo, P-C Yang, C-L Chen, K-T Luh. ©ERS Journals Ltd 1995.

ABSTRACT: Nodular amyloidosis of the breast and lung is a rare condition of unknown aetiology. The disease runs a benign course, but offers a diagnostic problem due to nonspecific histological features. We describe the case of a 56 year old woman with a 5 year history of multiple nodules of both lungs and left breast, clinically mimicking breast carcinoma with pulmonary metastasis.

To our knowledge, this is the first case of cytologically proven amyloidosis diagnosed by ultrasound-guided percutaneous transthoracic fine-needle aspiration of pulmonary nodules.

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*Depts of Internal Medicine, **Laboratory Medicine and †Pathology, National Taiwan University Hospital, Taipei, Taiwan, Republic of China.

Correspondence: S-H Kuo, National Taiwan University Hospital, No. 7 Chung Shan South Rd., Taipei, Taiwan, Republic of China

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Amyloidosis, either generalized or localized, affects the upper and lower respiratory tract. Localized parenchymal amyloidosis of the lung and the breast is rarely reported [1–3]. Nodular pulmonary amyloidosis should be differentiated from benign or malignant lung tumours, pulmonary tuberculosis or other granulomas. Chest ultrasound (US) and US-guided transthoracic fine-needle aspiration offer a relatively simple, reliable and safe method for diagnosis of pulmonary nodules [4]. The diagnosis of nodular amyloidosis of the lungs by chest US and US-guided percutaneous transthoracic fine-needle aspiration has not previously been discussed in the literature. We describe a case in which cytological proof of pulmonary nodular amyloidosis was made by US-guided aspiration.

Case report

A 56 year old housewife was referred to the National Taiwan University Hospital in March 1994 with a 5 year history of multiple nodules of both lungs and the breast. Sixteen years prior to presentation, she had pulmonary tuberculosis with 1 year of treatment. Follow-up chest radiographs showed residual fibrosis and calcification in the posterior segment of the left upper lobe of the lung.

Her history had then been uneventful until 5 yrs previously, when a productive cough with mucopurulent sputum developed. The chest radiograph showed multiple nodules in both lungs. Under suspicion of metastatic pulmonary malignancy, she had been admitted for a further work-up. On physical examination, a nodule was incidentally found in her left breast at the 8 o'clock position. It was moveable, nontender, elastic but firm, and measured as 2 × 1.5 cm. There was no dimpling of

the skin or nipple retraction, and no axillary nodes were palpated. Laboratory data were within normal limits, with the exception of serum globulin which was increased to 3.6 g·dl⁻¹ (normal range 2.3–3.5 g·dl⁻¹). Invasive examinations, including bronchoscopy, and upper and lower gastrointestinal series were negative. The result of aspiration cytology of the breast nodule was negative for malignancy. Sputum culture for *Mycobacterium tuberculosis* was negative. The patient refused breast nodule biopsy and was discharged.

The patient developed another nodule in the left breast in March 1994. The follow-up chest radiograph showed increased number and size of pulmonary nodules in both lung fields (fig. 1). She was again admitted for excision biopsy of the breast nodule. Her physical condition was still unremarkable, except for two nodules in the left breast. The new nodule measured 1.5 × 1 cm and was located at the 3 o'clock position; it was firm, moveable, and nontender. The laboratory tests were essentially negative, with the exception of serum globulin which was increased to 5.5 g·dl⁻¹. Serum protein electrophoresis revealed increased beta-globulin and polyclonal hypergammaglobulinopathy. The result of urine electrophoresis was negative. Cardiac US demonstrated good left ventricular contractility, with 0.76 ejection fraction and without evidence of cardiac amyloid deposition. US of the chest revealed several subpleural nodules with irregular margins in both lungs. Their echotexture was homogeneous, hypoechoic with eccentric cavitation (fig. 2). US-guided percutaneous transthoracic fine-needle aspiration was carried out, demonstrating an amorphous eosinophilic substance with some degenerated inflammatory cells. No malignant cells were seen. Amyloid material was detected by microscopy using polarizing light following



Fig. 1. – Chest radiograph in 1994, showing multiple nodules in both lung fields. Arrowhead indicates subpleural nodule shown in figure 2.



Fig. 2. – Chest ultrasound revealing a hypochoic subpleural nodule measuring 2x2 cm with irregular margin.

Congo red staining (fig. 3). Subsequent excision biopsy of the breast nodules showed a fibrocystic disease, with areas of fat necrosis. The homogeneous eosinophilic material was found to be amyloid by Congo red staining. Calcification, and even ossification were also seen. Histochemical study did not show monoclonal light chain restriction in the amyloid nodule.

Clinically, secondary nodular amyloidosis of the breast and the lung was diagnosed, although no clinical or laboratory evidence of rheumatoid arthritis or tuberculosis was found. No biopsies for other amyloid target sites, such as rectal mucosa were carried out. The patient has been well until now.

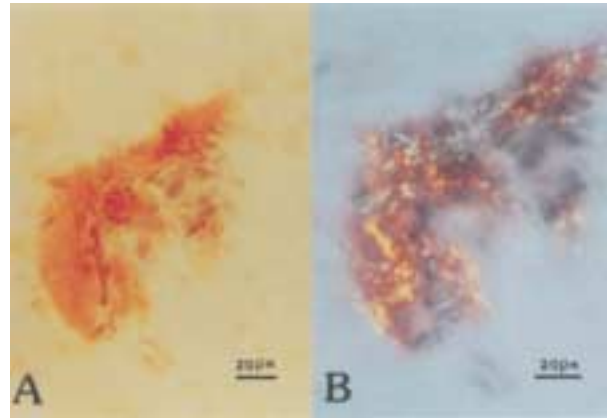


Fig. 3. – Aspirated material from a pulmonary nodule showing mononuclear cells and an eosinophilic amorphous substance with positive Congo red staining. Using polarized light, the eosinophilic substance appears yellowish green. (Internal scale bars=20 µm).

Discussion

Since the first report of nodular amyloidosis of the lung parenchyma by Lesser in 1877, it has remained a rare disease. Clinically, significant amyloid deposits in the larynx and lower respiratory tract frequently occur in generalized amyloidosis. Most of the patients suffer from "primary" or "myeloma-associated" varieties, in which the amyloid fibrils are derived from immunoglobulin light chains, especially kappa chains. Rectal or tongue submucosal biopsy is a useful procedure to establish the diagnosis. Pulmonary deposits are common and manifest themselves as diffuse alveolar septal involvement [5, 6]. Respiratory insufficiency is frequently seen and the prognosis is grave. Localized amyloidosis of the lower respiratory tract is rare. Secondary generalized amyloidosis affecting the lower respiratory tract is less common, and involves the lung to a lesser extent. Patients with secondary generalized amyloidosis have few respiratory symptoms and normal chest radiographs. Most patients with nodular amyloidosis are asymptomatic. Radiographic manifestations may present as a peripheral circumscribed mass or multiple nodules [7]. They may be unilateral or bilateral, and grow slowly. The sizes range from a few millimetres up to 15 cm, and in half of the cases contain calcification and cavitation.

Amyloidosis is rarely considered in the differential diagnosis of breast masses. A few cases of breast amyloidosis have been reported, including both systemic and localized forms [3]. Amyloid deposits focally or diffusely in the unilateral or bilateral breasts. CARSTEN *et al.* [8] reported mammary amyloidosis in 21 of 35 patients with tubular carcinoma. However, mammary amyloidosis without carcinoma is unusual. The combination of nodular amyloidosis in the lungs and breast has rarely been reported. The only two cases reported in the past, however, were secondary amyloidosis in association with a plasma cell dyscrasia [9] and breast carcinoma [3]. They were diagnosed at autopsy and thoracotomy, respectively.

The first cases of tracheobronchial amyloidosis were also diagnosed at autopsy or thoracotomy [10]. Although

diagnosis can be established by bronchoscopy [11], transbronchial biopsy may lead to prolonged or intractable haemorrhage. In fact, fatal outcomes due to pulmonary hemorrhage and air-embolism after transbronchial biopsy have been reported in patients with nodular pulmonary amyloidosis [12, 13]. Direct percutaneous needle aspiration of peripheral pulmonary lesions has a higher diagnostic rate and involves less risk than transbronchial biopsy [4, 14]. Diagnosis of multiple nodular amyloidosis of the lung by percutaneous transthoracic fine-needle aspiration has been successfully demonstrated using fluoroscopy or computed-tomography guidance [15, 16].

In this patient, pulmonary nodules and left breast tumours were initially suspected to represent pulmonary metastases from breast carcinoma. Chest US showed multiple well-defined, hypoechoic, homogeneous subpleural nodules. Pulmonary amyloidosis was diagnosed by US-guided percutaneous transthoracic fine-needle aspiration and after Congo red staining of the aspirated material, thus unnecessary thoracotomy was avoided. To our knowledge, this is the first case report of US-guided percutaneous transthoracic fine-needle aspiration confirming the diagnosis of nodular pulmonary amyloidosis.

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