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Case Report

Benign tumor behaves malignantly: a case report of bilateral multiple pulmonary sclerosing pneumocytoma

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Abstract: A 66 year old was woman admitted to our respiratory department after being diagnosed with intrapulmonary metastasis of lung cancer. For further evaluation, we performed a CT guided percutaneous pulmonary puncture biopsy following the thorax-computed tomography, which revealed multiple nodules in the lung field. Histological analysis suggested that it was pulmonary sclerosing pneumocytoma. It's really hard to distinguish whether a lung lesion is malignant or benign using only a thorax-computed tomography, and an accurate diagnosis leads to the right medical decision-making. Pulmonary sclerosing pneumocytoma (PSP) is a unique, uncommon carcinoid tumor, which dominantly appears among the middle-aged women, especially the Asian women. Only a handful literature has reported PSP with lymph nodes metastasis and multicentric PSP. It has proven that it has the potential to metastasize. That is why this rare case merits our attention when we handle similar situations.

Keywords: Pulmonary sclerosing pneumocytoma, lung metastasis

Introduction

The name pulmonary sclerosing pneumocytoma (PSP) also known as sclerosing haemangioma (SH), was used by Liebow and Hubbell in 1956 to describe a unique, benign pulmonary tumor [1]. PSP is an unusual, benign tumor that predominantly appears among middle aged females [2]. Till now, its pathogenesis remains a controversial issue, whereas existing evidence suggests that PSP probably were originated from alveolar epithelial cells [3]. Pathological evidence reveals that two types of neoplasm cells are concerned---'lining cells' and 'round cells'. PSP polymorphic pathology manifests four major histological patterns; four major histological patterns are described in PSP, papillary, hemorrhagic, solid and sclerotic with significant vascular hyperplasia, inclination to fibrosis, angiomatoid, massive histiocytic infiltration and various stage of hemorrhage to be observed. Patients most frequently consult practitioners for sudden occurrence of hemoptysis or as asymptomatics who detected a mess in the lung field incidentally by routine radiograph [4]. Even though it is thought to be benign, cases with lymph node metastasis or multiple pulmonary involvement have been reported in the literature [5-10]. In this case, we reported an old woman with bilateral multiple metastasis of pulmonary sclerosing pneumocytoma. Due to the morphology of solitary tuber, it is more like the carcinoid neoplasm.

Case report

Clinical summary

A 66-year-old woman arrived at the respiratory department after experiencing coughing and expectoration for one month. CT results from a local hospital suggested that a possible metastasis site of neoplasm of the right lung. The patient went through finer bronchoscope for further evaluation in our hospital (West China Hospital, Chengdu), but bronchial results were found to be negative at all levels. Two different volumes of tubers of the right lung were detected by the thorax contrast-enhanced computed tomography. One located in the middle lobe, measuring 21 mm × 20 mm in size (**Figure 1**), one situated in the inferior lobe, measuring 15 mm × 14 mm in size (**Figure 2**). Similarities between these two tubers included quasi-circu-

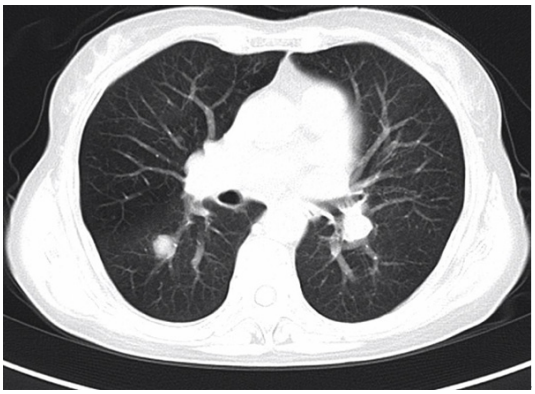

Figure 1. Pulmonary sclerosing pneumocytoma in the middle lobe and inferior lobe of right lung.

lar foci and sharp boundary on transverse sections. The density of these two tubers was shown to vary from that of the adjacent normal tissues by using an iodine contrast medium multiple sized weak nodules of about 4 mm × 5 mm were distributed in right upper lobe, middle lobe and left inferior lobe (**Figure 3A-D**). There was no sign of metastasis of mediastinal or hilar lymph nodes.

This patient had no history of smoking, no relevant family disease history. Blood tests showed almost entirely negative results except for a slight rise of the CYFRA21-1 (3.27 ng/ml, < 3 ng/ml).

Using a combination of clinical manifestations, laboratory parameters, and imaging findings, tuberculosis was eliminated first. In a case like this, it's hard to differentiate whether the foci are benign, or malignant without pathologic evidence. We had to go on exploring.

Pathological findings

Histological analysis of CT guided percutaneous pulmonary puncture (**Figure 4**) biopsy revealed it was neoplasm. Immunohistochemical staining suggested that the neoplasm was positive for thyroid transcription factor-1 (TTF-1), epithelial membrane antigen (EMA), vimentin and the Ki-67 about 2%. And negative for pan-cytokeratin (PCK), cytokeratin7 (CK7), napsin A, CD31, CD34, F-8, CD56, CgA, Syna. According to the study of morphology and immunohistochemical staining results, we made the diagnosis of pulmonary sclerosing pneumocytoma. Surgery was dismissed due to the bilateral metastasis. At last the patient strongly demanded discharge for economical reasons while we made a therapeutic regimen with the Oncology department.

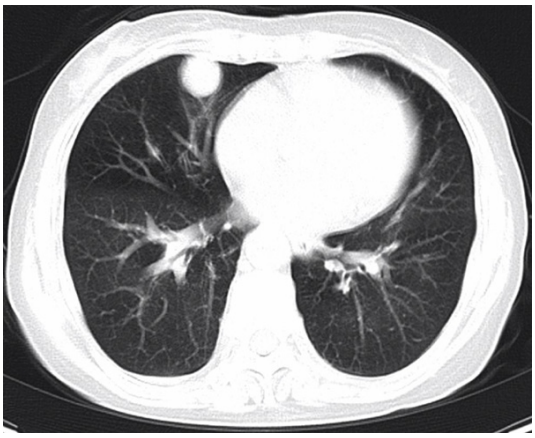

Figure 2. Pulmonary sclerosing pneumocytoma in the inferior lobe of right lung.

Discussion

Due to its controversial histogenesis [11], pulmonary sclerosing pneumocytoma was previously known as pulmonary sclerosing haemangioma (PSH) or sclerosing hemangioma (SH) of the lung. Owing to the technology of immunohistochemistry and the study of ultrastructure, PSP has been revealed to be an epithelial tumor with differentiation to type II pneumonocytes. The word pneumocytoma was originally defined and described by Tanaka et al. in 1986 [12]. According to the 2004 World Health Organization classification of lung tumors, PSP is under the column of a miscellaneous tumor. They are mainly composed of "lining cells" and "round cells". Lining cells were epithelial cells, morphologic appearance of lining cells were cubic, flat, cylindrical or oval, for which coating around the surface of the tumor, or inner wall of cavities. Round cells located in the interstitium, typically made of uniform, medium size, ovate or polygonal mononuclear cells [13]. TTF-1 expression was detected in both lining cells and round cells, while few of the cells were positive for vimentin, EMA (epithelial membrane antigen), CD68 and cytokeratins. These differences in morphology and phenotype probably caused the differences in the status of the lining cells and round cells, suggested by Wang and colleagues [14]. Typically, it shows evident-

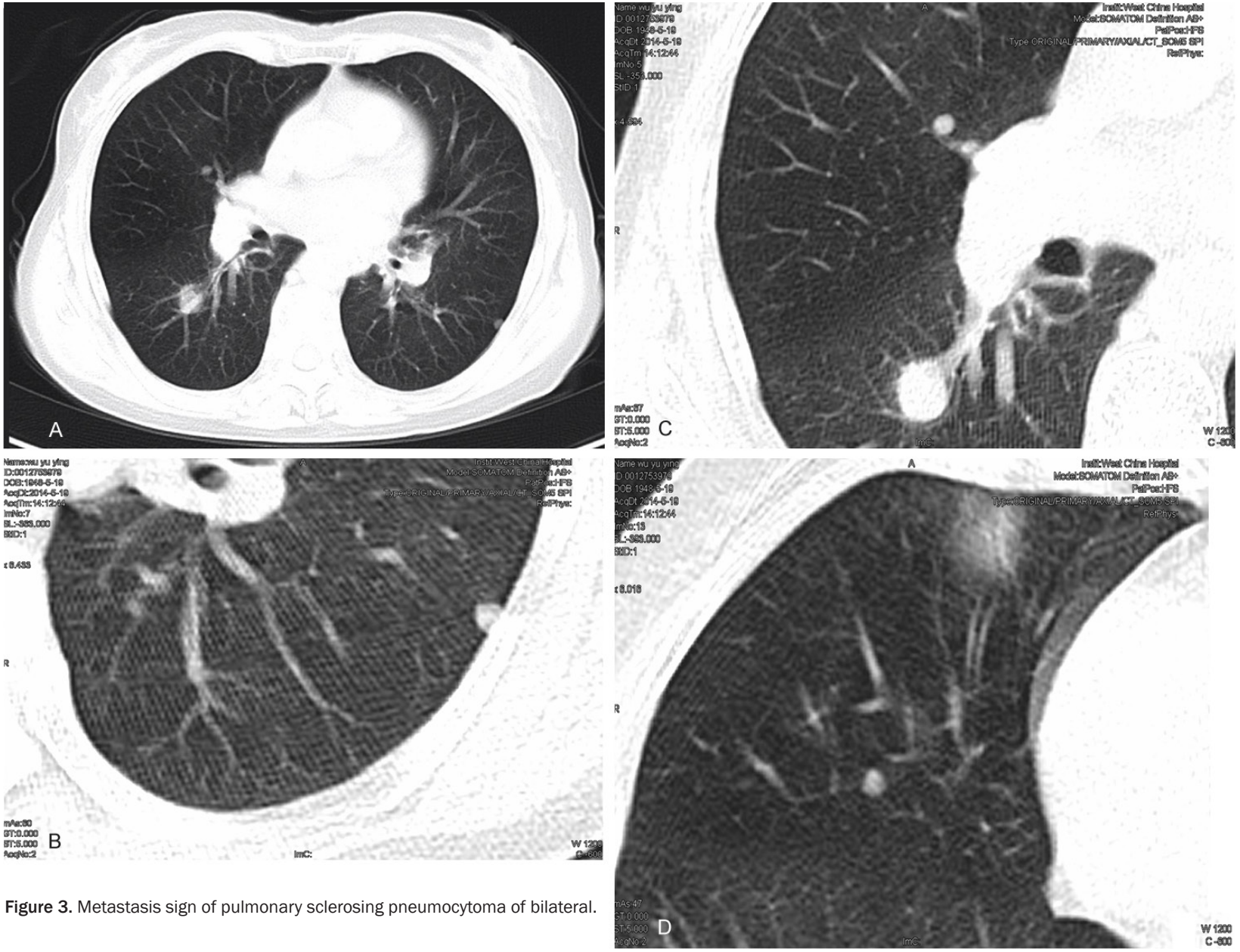

Figure 3. Metastasis sign of pulmonary sclerosing pneumocytoma of bilateral.

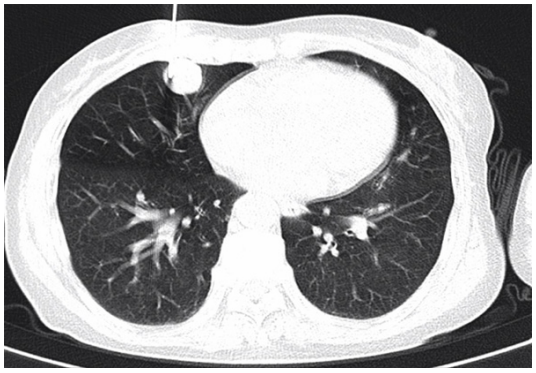

Figure 4. CT guided percutaneous lung biopsy of inferior lobe.

ly predominantly among Chinese women from forty to fifty years old, surgical excision is curative with a fantastic prognosis. Because of its slow growth and solitary characteristics, it usually considered a benign tumor [15]. In spite of that, it usually imitates malignancy, making it a diagnostic and management challenge [16].

Some scholars have been reported a few cases of PSP with lymph node metastasis [17] and intrapulmonary metastasis [18]. Multifocal pulmonary sclerosing pneumocytoma have been extremely rare [19].

We present a case of an old woman who was diagnosed with pulmonary sclerosing pneumocytoma whose computer tomography image manifests the malignant tumor behavior at the first impression. But she quite fit the diagnostic criteria of PSP, despite the distinctive pulmonary focus.

Electronic microscope appearance revealed histological patterns, which were papillary, solid and hemorrhagic and were encountered in different ratios within the tumor. The papillary pattern was constituted of tanglesome anastomosing interstices with diverging papillary structures lined by cuboidal cells, type II cells and bronchiolar epithelium stretched into the tumor. The solid pattern consisted of uniform round to polygonal cells with centrally located ovoid nuclei, with rarely visible mitotic figures. Cuboidal cells contained smaller and darker nuclei which surrounded the round cells. Focally accumulated form cells, singly or clusteringly distributed erythrocytes, were also commonly interspersed around the round cells to form small blood lakes.

Hemorrhagic foci were full of vascular or vascular shape channels. They were large, irregular, and dilated, and packed with varying amounts of erythrocytes. A single layer of cuboidal cells or flat cells such as endothelium lined the walls of channels, some of which had hyalinosis. Typical round cells were always in the interstitium.

Immunohistochemistry with several antibodies was conducted to confirm the phenotype, including thyroid transcription factor-1 (TTF-1), epithelial membrane antigen (EMA), vimentin, pan-cytokeratin (PCK), cytokeratin7 (CK7), napsin A, CD31, CD34, F-8, CD56, CgA, Syna, Ki-67. These antibodies represented different tumor markers indicating the origin of the neoplasm, such as epithelial markers, neuroendocrine markers, vascular-endothelial markers, proliferation markers. The neoplasm was positive for thyroid transcription factor-1 (TTF-1), epithelial membrane antigen (EMA), vimentin and the Ki-67 about 2%, and negative for pan-cytokeratin (PCK), cytokeratin7 (CK7), napsin A, CD31, CD34, F-8, CD56, CgA, Syna (**Figure 5**).

In this case we have several knotty problems, which are worthy of elucidation. The first is that we didn't further investigate whether another tuber that was situated in the inferior lobe of the right lung was either a metastasis lesion or another bigger solitary primary site. Second we didn't gather pathological evidences to testify that the rest of the lesions were PSP as well, except the CT guided percutaneous pulmonary puncture lesion that was located in the inferior lobe of the right lung. Last, but most importantly, we can't declare whether these lesions are multicentric in origin or intrapulmonary metastasis from one primary lesion. Multiple factors like the patient willingness, financial situation, post-puncture complication and professional evaluation, for instance, prevented us from going further. But in our professional view, we assumed that the patient more likely had pulmonary sclerosing pneumocytoma with bilateral metastasis. We should pay attention to this kind of situation during the procedure.

Acknowledgements

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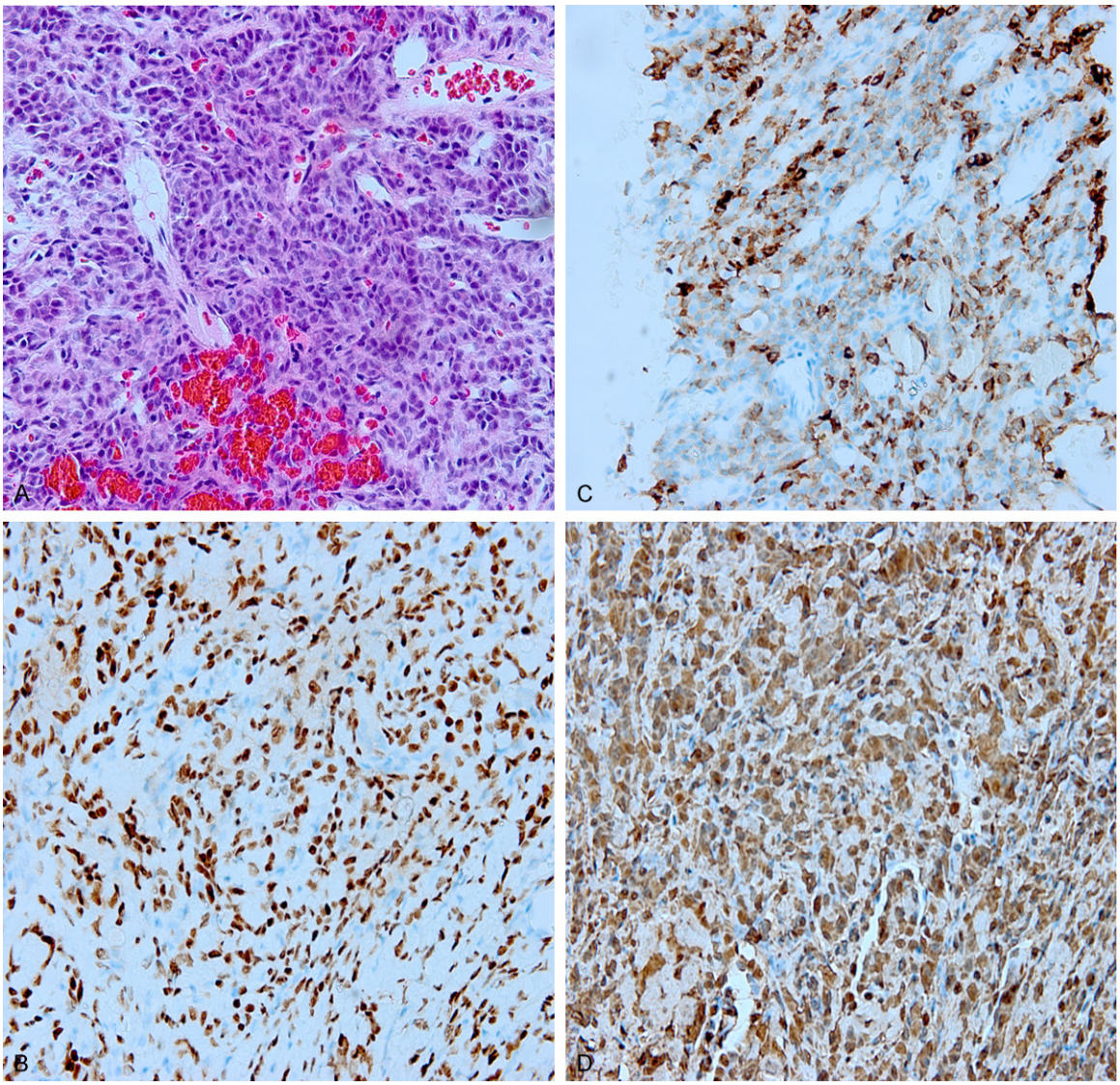

Figure 5. A. ×400, PSP by hematoxylin-eosin stain which shows hemorrhagic type. B. ×200, immunohistochemical staining suggested that the neoplasm was positive for thyroid transcription factor-1, TTF-1. C. ×200, immunohistochemical staining suggested that the neoplasm was positive for epithelial membrane antigen, EMA. D. ×200, immunohistochemical staining suggested that the neoplasm was positive for vimentin.

Disclosure of conflict of interest

None.

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