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Case report

Schwannoma arising in a lymph node mimicking metastatic pulmonary carcinoma

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ABSTRACT

Schwannomas commonly arise in the torso, extremities, and mediastinum. However, no interlobar lymph node (#11i) lesions have ever been reported. This is a thought-provoking case, because it involved a schwannoma arising in a lymph node mimicking metastatic pulmonary carcinoma. A 72-year-old man was diagnosed with primary pulmonary carcinoma, and 18F-fluorodeoxyglucose (FDG) positron emission tomography demonstrated high FDG uptake in the primary lesion and in #11i, which suggested metastasis (clinical stage IIA). A right lower lobectomy with lymph node dissection was performed. Fortunately, the enlarged #11i was a schwannoma and not metastasis. The take-home message is "a patient with multiple neuromatosis tends to have schwannomas throughout the body".

1. Introduction

Schwannomas are relatively rare neoplasms that arise from peripheral nerve sheath Schwann cells. The most common locations are the neck, head, extensor surfaces of the extremities, and posterior mediastinum [1,2]. Interlobar lymph node lesions are rare, and none have been reported in the English literature. This is the first report of a schwannoma arising in a lymph node mimicking metastatic pulmonary carcinoma. We present this thought-provoking case.

2. Case report

A 72-year-old man was referred to our hospital because of an abnormal shadow in the right lower lung on a chest X-ray. Computed tomography (CT) showed an irregularly shaped, 27-mm-diameter, solid nodule with pleural indentation in the superior segment (segment 6) of the right lower lobe and a slightly enlarged interlobar lymph node (#11i) (Fig. 1). The patient had been treated with methotrexate 8 mg/week for chronic rheumatoid arthritis for 10 years. The patient also had multiple neuromatosis and a resected skin schwannoma on his left leg. Levels of serum tumor markers, including carcinoembryonic antigen, neuron-specific enolase, cytokeratin 19 fragment, and pro-gastrin-releasing peptide, were within the normal range. 18F-fluorodeoxyglucose (FDG) positron emission tomography (PET) showed high FDG uptake in the primary lesion in the right lower lobe [maximum standardized uptake value (SUVmax) = 6.5] and in the #11i lymph node (SUVmax = 2.7), suggesting metastasis (Fig. 2). A transbronchial lung biopsy from segment 6 led to a diagnosis of adenocarcinoma with sarcomatoid components. These findings suggested a primary pulmonary pleomorphic carcinoma, clinical stage IIA (T1bN1[#11i]M0). Pulmonary function tests revealed a vital capacity of 3.2 L (100%) and a forced expiratory volume in 1 s of 1.2 L (100%). Therefore, we performed a right lower lobectomy with hilar and mediastinal lymph node dissection using video-assisted thoracoscopic surgery. The operating time was 165 min, and blood loss was less than 50 g.

Histologically, the tumor consisted of epithelioid and sarcomatous cells. The central tumor consisted of atypical cells in a solid growth pattern with necrosis. Atypical columnar epithelial cells in papillary or irregular glandular patterns were seen around the central tumor. Immunohistochemistry showed diffuse positivity for pan-keratin in the epithelioid and sarcomatous components. Consequently, a diagnosis of pulmonary pleomorphic carcinoma was made (Fig. 3). Histologically, the #11i lymph node contained spindle-shaped cells with pointed basophilic nuclei and nuclear palisading arranged in interlacing bundles. Neither malignancy of the proliferative cells nor invasion was observed. Immunohistochemically, the cells were positive for S-100 and negative for CD34 and SMA. These findings were compatible with schwannoma (Fig. 4).

The postoperative pathology indicated primary pulmonary pleomorphic carcinoma (pT2a[pl2]N0M0, stage IB, complete resection).

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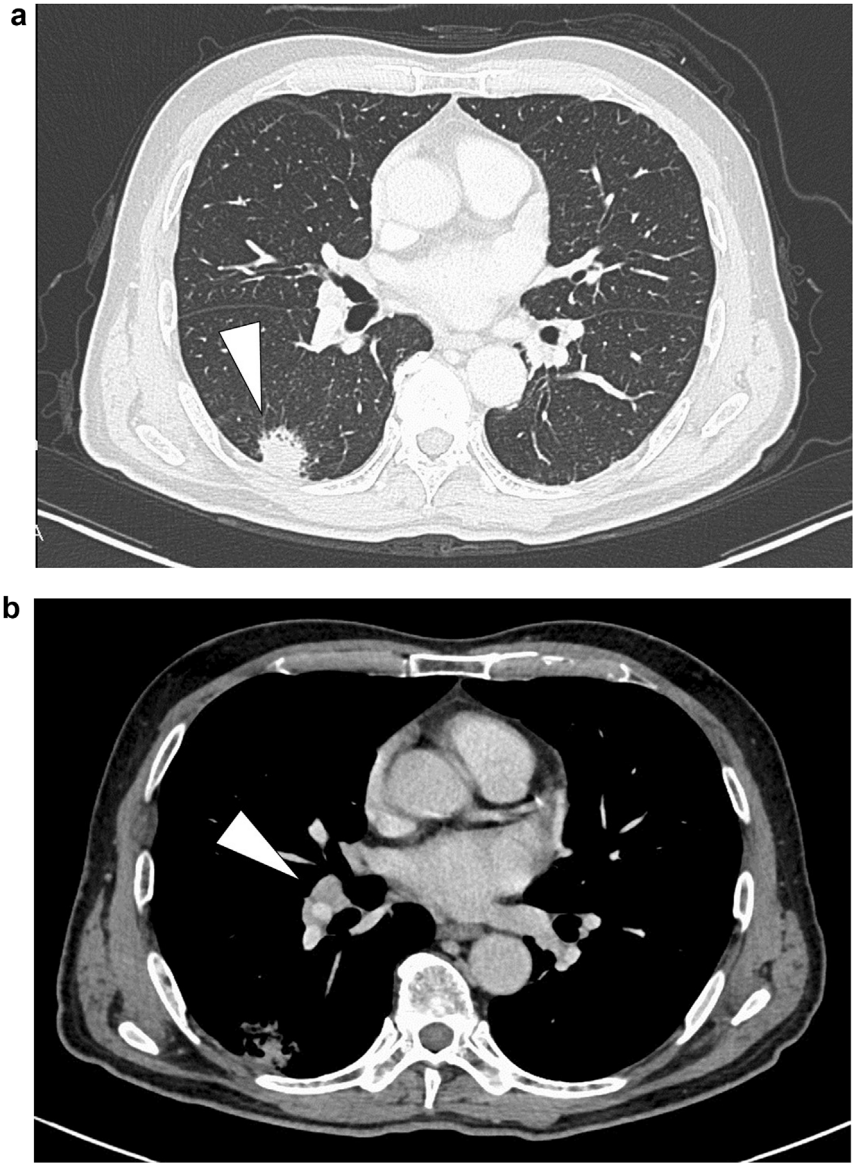

Fig. 1. CT shows (A) a solid nodule in the right lung (white arrowhead) and (B) slight enlargement of the interlobar lymph node (white arrowhead).

The postoperative course was uneventful, and the patient was discharged on postoperative day 4. He underwent postoperative adjuvant chemotherapy (two cycles of cisplatin plus vinorelbine), and as of 4 months post-surgery, the patient is alive without recurrence.

3. Discussion

In this case, the use of FDG-PET failed to distinguish a schwannoma from lymph node metastasis. A schwannoma arising in an interlobar lymph node should be included in the staging evaluation of primary lung cancer. However, we believe that it is difficult to distinguish a schwannoma in an interlobar lymph node from metastasis. There are several reports [3–5] of schwannomas misdiagnosed as lymph nodes metastasis or malignant tumors detected by FDG-PET (Table 1). Table 1 shows that the SUVmax values of schwannomas range from 2.7 to 5.6, depending on the degree of cellularity. They have a characteristic dual pattern with areas that are highly (Antony A) and less (Antony B) cellular, and the degree of cellularity varies widely among lesions; therefore, these tumors can display a wide range of SUVs (0.33–3.7 and 1.9–7.21, respectively) [6,7]. Consequently, FDG-PET is not always useful for differentiating benign from malignant tumors. Retrospectively, the SUVmax of the #11i lymph node was too low compared with that of the primary lesion to diagnose it as malignant. However, our criterion for a positive SUVmax is greater than 2.5; therefore, we diagnosed the #11i lymph node as malignant.

Magnetic resonance imaging (MRI) is potentially a more useful method for detecting a schwannoma in a lymph node. On T1-weighted images, the masses were homogenous and isointense relative to skeletal muscle, while T2-weighted images reveal increased, slightly heterogeneous signal intensity [8]. However, MRI of the chest is not always performed routinely in the evaluation of primary lung cancer.

In our patient, surgery was indicated because of the interlobar lymph node involvement. However, if a mediastinal lymph node is involved in a schwannoma, the patient should undergo preoperative mediastinoscopy or endobronchial ultrasound-guided transbronchial needle aspiration. This could alter the diagnostic process and

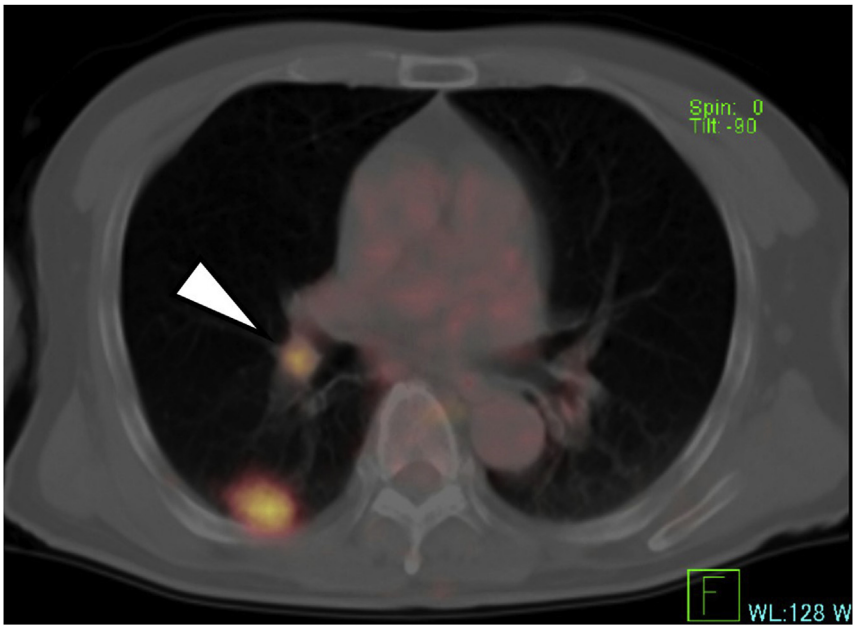

Fig. 2. FDG-PET shows high FDG uptake in the right lower lobe (SUVmax = 6.5) and interlobar lymph node #11i, between the right middle and lower lobe bronchi (SUVmax = 2.7) (white arrowhead).

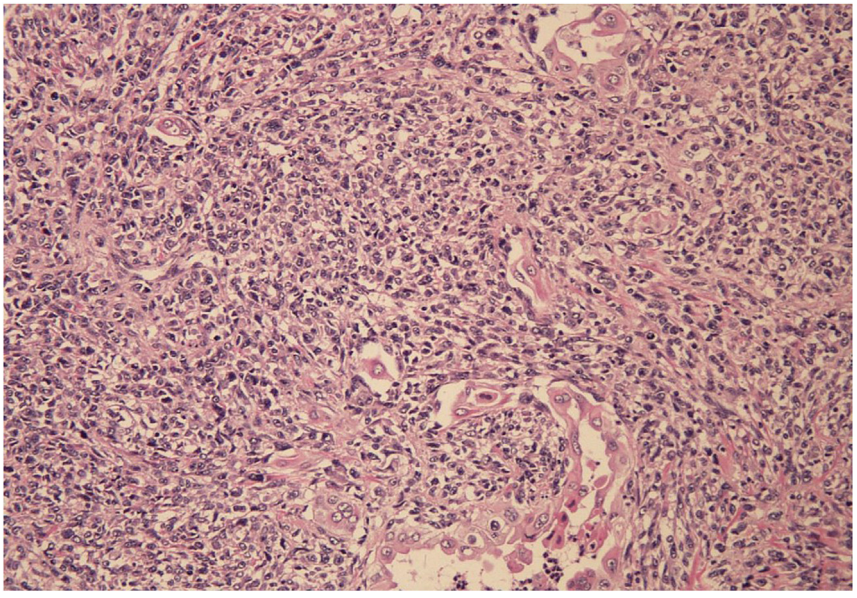

Fig. 3. Histologically, the tumor cells have a biphasic appearance with epithelioid and spindle cell sarcomatous components (hematoxylin and eosin staining; magnification, × 400). Pulmonary pleomorphic carcinoma with adenocarcinoma components was diagnosed.

therapeutic modality completely, depending on the location of the lymph node involvement.

Pulmonary pleomorphic carcinoma is a rare primary malignancy that possesses carcinomatous and sarcomatous elements. Pleomorphic carcinoma generally follows an aggressive clinical course and tends to grow rapidly and invade adjacent structures during the early stage [9]. This knowledge led us to diagnose the # 11i lymph node as a metastasis from the primary lesion.

We considered the scenarios in which an endobronchial ultrasound-guided transbronchial needle aspiration (EBUS) had been performed and the schwannoma was diagnosed before proceeding with the lobectomy. Some clinicians might have suggested a biopsy of the pulmonary nodule using a CT-guided needle lung biopsy or VATS biopsy. If we had recognized only primary pleomorphic carcinoma as stage IB and lymph node schwannoma, we would have performed surgical resections, which is what we did.

In summary, we report the first case of a schwannoma in an interlobar lymph node. We believe that the main lesson from this case is that a primary lesion does not always correspond to a lymph node lesion. In resectable cases, like our patient, we can perform radical surgery, which provides a definitive diagnosis. However, in non-resectable cases, we must consider that the patient with multiple neuromatosis tends to have schwannomas throughout the body, and if several lesions are seen, each lesion should be biopsied.

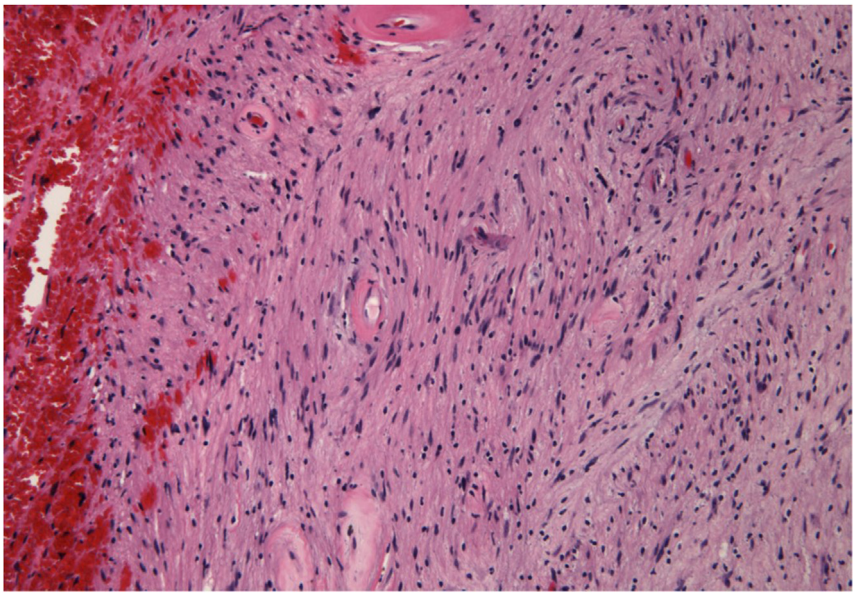

Fig. 4. Histologically, the #11i lymph node reveals a schwannoma composed of spindle-shaped cells with nuclear palisading arranged in interlacing bundles (hematoxylin and eosin staining; original magnification, × 100).

Table 1
English-language studies on schwannomas detected by 18F-fluorodeoxyglucose positron emission tomography misdiagnosed as malignancies.

Year	Author	Schwannoma, SUVmax	Location of schwannoma	Primary cancer SUVmax	Suspected original cancer	Neurogenic problem
2013	Ortega-Candil	5.6	Sacroiliac joint	10.4	colorectal cancer	None
2014	Fujii	3.4	Axillar-subclavicular	LN only	renal cell carcinoma	None
2014	Fujii	2.6	Axillar or subclavicular	2.7	lung cancer	None
2014	Igai	5.51	Parasternum	LN only	breast cancer	None
	Present case	2.7	Interlobar	6.5	lung cancer	Multiple neuromatosis

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.rmcr.2018.06.002.

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