

Primary Small Cell Carcinoma of the Lung Presenting with Breast and Skin Metastases

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Cutaneous metastases originating from an internal cancer are relatively uncommon in clinical practice, and metastatic lesions to the breast are rarer than those to the skin. Skin metastases of lung cancer, which may be the first sign of the disease, usually indicate progressive disease and a poor prognosis. We describe a 47-year-old male who presented with recurring masses in the lumbar region bilaterally and the right breast. Immunohistochemical findings and radiological imaging suggested lung cancer. This is the first reported case of small cell lung cancer metastasizing to two separate, uncommon sites, the skin and breast. (*Korean J Intern Med* 2011;26:207-209)

Keywords: Carcinoma, small cell; Neoplasm metastasis

INTRODUCTION

Small cell carcinoma usually occurs in the lung, but can occur in a variety of other sites. It is aggressive and has a similar histological appearance wherever it occurs. In the advanced stage of the disease, metastases usually occur in the liver, but they can also occur in the other organs [1]. Lung cancer metastases to the skin or breast are rare; 1-12% of patients with lung cancer will develop cutaneous metastases [2], although some researchers estimate that the incidence reaches 24% [3]. Clinically, lung cancer may be signaled only by cutaneous or breast metastases, because the primary lung lesion is often quiescent. Metastases to soft tissues can easily be misdiagnosed as primary soft-tissue neoplasms. The clinical distinction between a metastatic neoplasm to soft tissue and a primary soft-tissue neoplasm is critical because the treatment and prognosis are markedly different.

CASE REPORT

A 47-year-old male underwent surgery for palpable masses in the right breast and bilateral lumbar region at another institution 3 months earlier. Histopathological evaluation of the excised lesions revealed undifferentiated carcinoma. Then, the patient was referred to our department. He had smoked for 30 pack-years, though the rest of his medical history was unremarkable. Firm, lobulated, immobile, tender masses were palpated at the sites of the previous operations (Fig. 1). No other mass or lymph node was palpated in the axillary region. The pathology of the previously excised lesions was examined and a diagnosis of small cell cancer was made (Fig. 2). On immunohistochemical staining, the tissue was negative for estrogen receptors (ER), progesterone receptors (PR), Cerb-B2, cytokeratin 7 (CK7), and cytokeratin 20 (CK20), and positive for chromogranin, pancytokeratin (focal specific), synaptophysin (diffuse specific), and thyroid transcription factor 1 (TTF-1). A nodular opacity was detected in the left hilar region on lung radiography and a

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Figure 1. Firm, lobulated, fixed and tender nodules were palpated in the right breast and the site of the previous lumbar surgery.

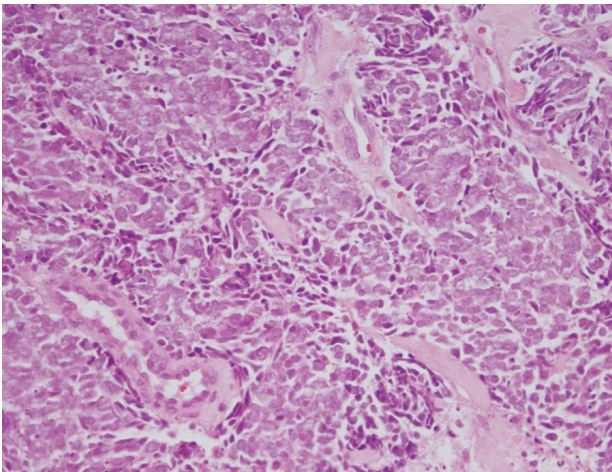


Figure 2. The skin lesion shows malignant cells with large nuclei and faint cytoplasm (H&E, x 400).

mass surrounding the left upper bronchus was identified on computed tomography (CT) of the thorax (Fig. 3). At bronchoscopy, there was contraction, mucosal erythema, and irregularity along the bronchus of the left upper lobe apical segment. A punch biopsy and bronchial lavage sampling were performed during the procedure. Malignant cells with large, hyperchromatic nuclei, and faint cytoplasm were detected in the punch biopsy sample covered by respiratory epithelium. The diagnosis of small cell lung cancer was confirmed because the immunohistochemical results were the same as for the previous excisional biopsy

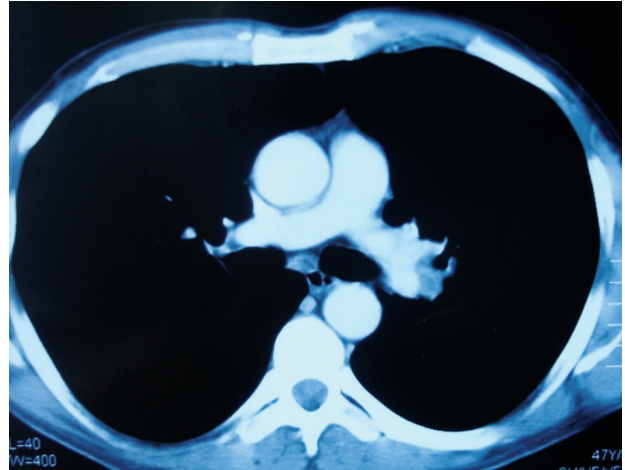


Figure 3. Chest CT shows a mass surrounding the left upper lobe bronchus.

samples. There was no pathological finding on cranial CT or bone scintigraphy. The patient was diagnosed with metastatic primary small cell lung cancer and started on chemotherapy. He died of multiple systemic metastases 8 months after starting the therapy, and 11 months after the diagnosis of the first metastases.

DISCUSSION

Skin metastasis of lung cancer is a rare clinical entity. The reported incidence of skin metastases of lung cancer is between 1 and 24% [2,3]. Although the skin and soft tissues comprises more than half of the human body mass, metastases to this area are rare. Several factors have been implicated in the rarity of this phenomenon [4]. The most common sites of skin lesions are the chest, back, abdomen, scalp, and neck [2,5]. In our case, the recurrent metastatic lesions were detected in the lateral abdominal walls and breast.

Various histological types of lung cancer can give rise to cutaneous metastases. Adenocarcinoma is the most common lung carcinoma and its skin metastases are consequently the most frequent. Terashima and Kanazawa [2] reported that large cell carcinoma tended to metastasize to the skin. Hidaka et al. [5] reported no significant difference in the incidence of skin metastasis among histological types. Thus, it has not yet been established which histological type has the highest incidence of skin metastasis.

Patients with lung cancer present with different respiratory

symptoms, including cough, sputum, hemoptysis, and dyspnea. Some patients present with symptoms related to disease progression, like fatigue, weakness, or pain. Our patient had no respiratory complaint on admission. The lung mass was diagnosed from radiological images that were obtained after the immunohistochemical analysis. Clinical findings of metastatic lesions are variable. Brownstein and Helwig [6] classified the lesions as nodular, inflammatory and sclerodermoid, with the nodular type being the most common [5]. Generally, the metastatic lesions are painless [3,7]. In our patient, the initial lesions that were excised were nodular, mobile, and painless, while the lesions that recurred after 3 months were irregularly lobulated, immobile, and painful.

Metastases to the breast from extramammary sites are uncommon and account for only 0.4-2.0% of breast malignancies [8]. Breast primary small cell carcinoma is extremely rare, with fewer than 30 cases reported in the English language literature [9]. The histological findings of primary small cell carcinoma of the breast and of other organs are similar, although their immunohistochemistry differs. The histological detection of *in situ* intraductal components is very important, because they are present if the primary lesion is in the breast [10]. A single marker is insufficient for an immunohistochemical diagnosis, and immunochemical staining for ER, PR, Her2/Neu, TTF-1, CK7, CK20, chromogranin, and synaptophysin should be examined. Primary small cell lung cancer is usually TTF-1-positive, but this finding is non-specific, and it can rarely be detected in primary breast small cell cancer [4].

There are reports of primary small cell lung cancer presenting with either skin or breast metastasis, but no other case with simultaneous metastases to both these sites has been reported. Similarly, there is no information in the literature on recurrence time. In our patient, we first considered that the skin metastasis originated from the primary breast small cell cancer. However, the fact that the tissue was negative for ER, PR, and CK7, positive for TTF-1, and lacked an *in situ* intraductal component indicated that the breast lesion was a metastasis. Imaging studies detected a mass in the left lung and a bronchoscopic biopsy confirmed the diagnosis of primary small cell lung cancer. Lung cancer may rarely appear as skin or breast metastasis

with no other clinical finding. It is important to distinguish these two entities, because the therapeutic approach and prognosis are different. We suggest that clinicians consider this when examining benign-appearing cutaneous or subcutaneous masses.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

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