A Resected Melanoma of the Lung Metastasized from an Occult Skin Lesion: A Case Report

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An 86-year-old woman with a history of right breast cancer resected seven years ago had a small pulmonary nodule located in left S5. Diagnosis was made by bronchoscopy using the endobronchial ultrasonography-guided sheath (EBUS-GS) method, but a histological diagnosis was not obtained. Wedge resection was performed due to suspicion of a metastatic lesion from breast cancer based on radiological findings. The tumor was subsequently found to be malignant melanoma of the lung. An initial diagnosis of primary melanoma of the lung was made because a melanoma lesion at another site was not seen despite a detailed work up. However, 8 months after surgery, a malignant melanoma appeared at the tip of the right index finger. We rediagnosed the lung lesion as a metastatic malignant melanoma based on the low incidence of primary melanoma of the lung and on the pathological features.

Keywords: malignant melanoma, lung, endobronchial ultrasonography

Introduction

Primary malignant melanoma of the lung is extremely rare. Most cases of malignant melanoma in the lung are metastatic melanoma from a skin lesion. Here, we report a case of melanoma of the lung that metastasized from an occult skin lesion.

Case Report

An 86-year-old woman presented with an abnormal shadow in the left lower lung field in chest radiography and was admitted to hospital for surgical resection. Her history included right breast cancer treated with right mastectomy seven years ago. A chest radiograph (P-A view) on admission showed a small nodular shadow in the left lower lung field. Chest CT showed that the lesion was located in left S5. The dimensions of the homogeneous and well-defined nodule were about 11 × 10 mm without swollen mediastinal and hilar lymph nodes (Fig. 1). A PET/CT scan showed that the SUV$_{\text{max}}$ of the nodule was 0.93. No abnormal FDG uptake was found at any other site of the body.

In endobronchial ultrasonography-guide sheath (EBUS-GS) bronchoscopy, a thin ultrasonic probe covered by a guide sheath was inserted into the left B5b bronchus under fluoroscopic guidance and reached the tumor. The tumor was depicted as a well defined and homogeneous echogenic nodule. Biopsy and brushing were performed via the guide sheath. No malignant findings were obtained in the tissue fragments, but a small number of atypical cells with eccentric nuclei and a high N/C ratio, such as that in adenocarcinoma, were observed in cytologic specimens.

The CT and cytologic findings led to a strong suspicion of metastasis from breast cancer. Wide wedge resection of S5 was performed thoracoscopically. The resected
tumors were well circumscribed with a dark brown color (Fig. 2A). In HE staining of the resected specimen, polygonal or spindle cells with clear nucleoli in large nuclei were multiplying, and many brown pigments were observed in the cytoplasm and in macrophages (Fig. 2B). In addition, since Melan-A and HMB45 were positive in immunostaining, we diagnosed the tumor as a malignant melanoma (Fig. 2C and 2D).

Since whole body screening examinations to detect the primary melanoma lesion found no additional tumor, we initially considered the case to be a rare primary malignant melanoma of the lung. However, 8 months after surgery, a melanotic macule with callositas was discovered at the tip of the right index finger (Fig. 3). Excisional biopsy and stump plasty were performed at a line 1 cm from the distal interphalangeal joint in the Department of Dermatology. The finger tumor was subsequently diagnosed as malignant melanoma. We recommended postoperative chemotherapy, but the patient declined treatment. However, she continued to undergo treatment for alleviation of symptoms of multiple intrapulmonary metastases on an outpatient basis. At 1 year 4 months after lung resection, the patient died of respiratory failure at a palliative care unit.

Discussion

Melanoma is a malignant tumor and up to 90% of cases develop as a skin lesion with an anecdotal prognosis. It is extremely rare for melanoma to arise from the lung field. Most lung melanoma lesions are metastatic tumors and only 4% of patients survive for 4 years after diagnosis. Wilson and Moran reported only 8 proven cases of primary malignant melanoma of the lung in the Pulmonary Tumor Registry of the Armed Forces Institute of Pathology, accounting for 0.01% of all lung tumors, and the incidence of primary lung malignant melanoma is approximately 0.4% of all malignant melanomas.

It is difficult to distinguish primary malignant melanoma of the lung from metastatic melanoma. The diagnostic criteria for primary malignant melanoma of the lung based on pathological findings include (1) a junctional change with a “dropping off” or “nesting” of malignant cells containing melanin just beneath the bronchial epithelium, (2) invasion of the bronchial epithelium by melanoma cells in an area where the bronchial epithelium is damaged, and (3) an obvious melanoma beneath an epithelium with these changes. In our case, these characteristic findings were not microscopically recognized retrospectively. However, these pathological features are not necessarily specific to primary malignant melanoma of the lung and other reports suggest that “junctional changes” also occur in metastatic malignant melanoma. Wilson and Moran proposed the following clinical diagnostic criteria for primary pulmonary malignant melanoma: (1) a solitary pulmonary lesion, (2) proof of malignant melanoma by immunohistochemical staining or electron microscopy, (3) no history of treatment for malignant melanoma at other sites, and (4) no lesions found at other sites when the pulmonary melanoma is found. However, the differential diagnosis should be made carefully based on a case in which a lung metastatic nodule was confirmed 25 years after resection of an ocular melanoma lesion and a second case in which multiple ground-glass opacity was found despite metastasis of malignant melanoma from a nasal cavity lesion.

The preoperative histological diagnosis should be made carefully since the process of obtaining the biopsy itself could cause metastasis, but the biopsy may be needed because of suspicion of malignant melanoma in the lung prior to treatment. Harpole, et al. reported an incidence of preoperative diagnosis of metastatic melanoma of the lung of 1.5% using bronchoscopy. In our case, pulmonary metastasis of breast cancer was suspected based on the patient’s history, and thus EBUS-GS was performed preoperatively. Insertion of an ultrasonic probe into the left B5b bronchus detected the tumor as a homogeneous echogenic nodular mass with a clear border in the peripheral lung. This finding has not been reported previously. However, it was difficult to differentiate melanoma from other tumorous lesions based on the ultrasonic bronchoscopy images.

There are few reports of cytological findings of melanoma of the lung. A preoperative ‘histological’
investigation may produce a confusing diagnosis, such as poorly differentiated adenocarcinoma, large cell carcinoma, carcinoid tumor and mesenchymal sarcoma. Thus, preoperative diagnosis by bronchial brushing cytology is still difficult. In contrast, the gross section of the pulmonary nodule showed a well circumscribed tumor with a clear dark brown color. At first, a systematic exploration showed no melanoma lesions at other sites, suggesting a primary pulmonary melanoma of the lung. However, a skin lesion appeared postoperatively. Interestingly, the skin lesion in our case appeared in a similar fashion to that in an anorectal case with a change from an amelanotic melanoma to a melanotic appearance, as reported by Akamaru, et al. The details of these changes require evaluation through further accumulation of cases.

**Conclusion**

We have described a case of metastatic melanoma in the lung that was initially diagnosed as a primary lung melanoma. The features of this case emphasize the difficulty of distinguishing between these two types of lesion.

**Disclosure Statement**

The all authors declare that they have no conflict of interest.
References


