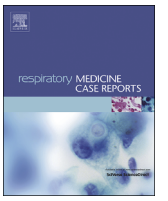
Respiratory Medicine Case Reports 40 (2022) 101747

Contents lists available at ScienceDirect

Respiratory Medicine Case Reports

journal homepage: www.elsevier.com/locate/rmcr



Case Report

A case of metastatic endobronchial tumor from uterine leiomyosarcoma

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ARTICLE INFO

Keywords:
Uterine leiomyosarcoma
Endobronchial metastasis

ABSTRACT

A 54-year-old woman presented with persistent productive cough, found to have an endobronchial tumor which obstructed the left upper lobe bronchus. Histopathological examination of a transbronchial biopsy of the endobronchial tumor suggested leiomyosarcoma. A positron emission tomography (PET)-CT revealed uterus tumor with moderate uptake of ^{18}F-fluorodeoxyglucose, suggesting uterine malignancies. From the results of histological findings of the resected uterus and the biopsied bronchial specimen, she was diagnosed with uterine leiomyosarcoma and endobronchial metastasis. The systematic use of PET-CT could be useful for patients presenting with tumors that cause endobronchial metastasis of leiomyosarcomas.

1. Introduction

Uterine leiomyosarcomas account for 1.3% of all uterine malignancies and 30–40% of all uterine sarcomas [1]. Breast, renal and colon neoplasms are most commonly responsible for endobronchial metastasis, however, reports of endobronchial metastasis from uterine leiomyosarcoma are extremely rare [2]. Here we report a case of endobronchial metastasis from uterine leiomyosarcoma which was diagnosed by a transbronchial biopsy of the endobronchial mass and histological findings of the resected uterus.

2. Case report

A 54-year-old woman without major past history of lung diseases presented with persistent productive cough for 3 weeks. She had no history of tobacco smoking. Her father was diagnosed with lung cancer in his 60's, and her older sister was diagnosed with lung cancer in her 50's. A physical examination revealed an oxygen saturation of 96% on room air, a respiratory rate of 24/min, temperature 37.4 °C, and the respiratory sounds were attenuated in the left upper chest. The remainder of the examination findings were unremarkable. A computed tomography (CT) scan of her chest revealed a presence of endobronchial mass in the left main bronchus which caused atelectasis of her upper lobe of left lung (Fig. 1A). The patient was suspected to have a malignant lung tumor. Bronchoscopy revealed an endobronchial tumor which obstructed the left upper lobe bronchus (Fig. 1B). She underwent a transbronchial biopsy of the endobronchial tumor (Fig. 2). Histopathological examination showed spindle-shaped cells with nuclear atypicality, numerous mitoses and area of tumor cell necrosis, characterized by positive staining for smooth muscle actin (SMA), desmin and

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https://doi.org/10.1016/j.rmcr.2022.101747
Received 7 July 2022; Received in revised form 6 September 2022; Accepted 23 September 2022
Available online 24 September 2022
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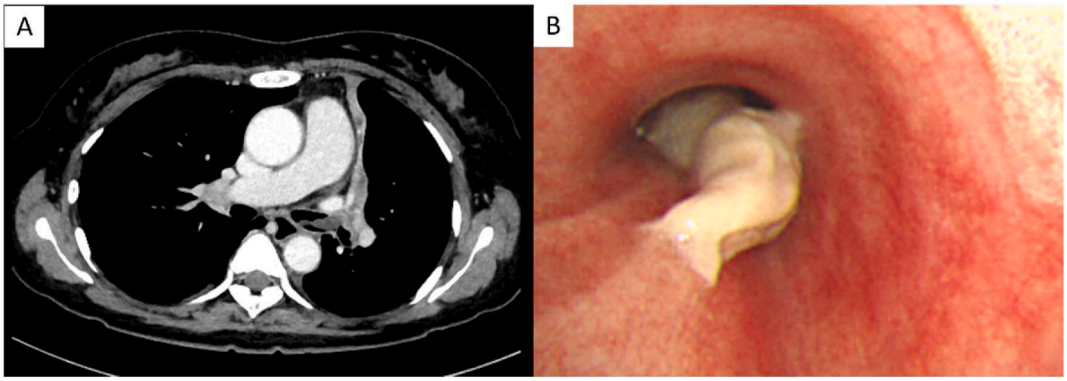

Fig. 1. (A) Computed tomography revealing presence of endobronchial mass in the left main bronchus causing atelectasis in her left upper lung. (B) Bronchoscopical finding revealing the endobronchial mass.

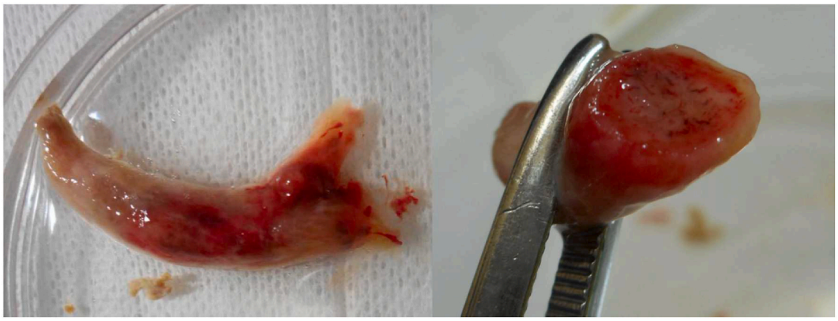

Fig. 2. Gross specimen of the endobronchial mass after removal showing a smooth polypoid tumor and cut surface.

caldesmon, as well as negative staining for CD34, CD31 and S-100; suggesting histological diagnosis of leiomyosarcoma (Fig. 3). A positron emission tomography (PET)-CT revealed uterus tumor with moderate uptake of ^{18}F-fluorodeoxyglucose (FDG) (Fig. 4), suggesting uterine malignancies. An abdominal total hysterectomy and bilateral salpingo-oophorectomy were performed. Histological findings of the resected uterus were similar to the preoperative biopsied bronchial specimen (Fig. 5). From these results, she was diagnosed with uterine leiomyosarcoma and endobronchial metastasis. She received a first-line chemotherapy with doxorubicin and ifosfamide; however, a CT scan showed progression of the endobronchial metastasis after 2 months. Then, she received a second-line chemotherapy with pazopanib, and was found new pelvic lesions after 3 months. She ended further chemotherapy, and succumbed to metastatic diseases 6 months later.

3. Discussion

Uterine leiomyosarcomas account for 1.3% of all uterine malignancies and 30–40% of all uterine sarcomas [1]. Studies of several clinical trials for efficacy of current conventional chemotherapy to advanced leiomyosarcoma are limited and largely restricted to uterine leiomyosarcoma. Patients with advanced uterine leiomyosarcomas have a poor prognosis regardless of the stage [3]. The most

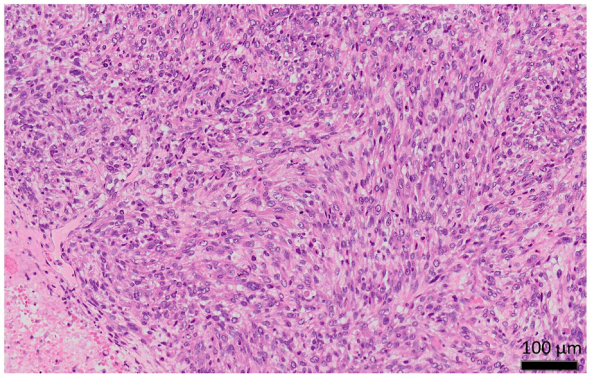

Fig. 3. Pathological findings of the endobronchial mass showing spindle-shaped cells with nuclear atypicality, suggesting leiomyosarcoma.

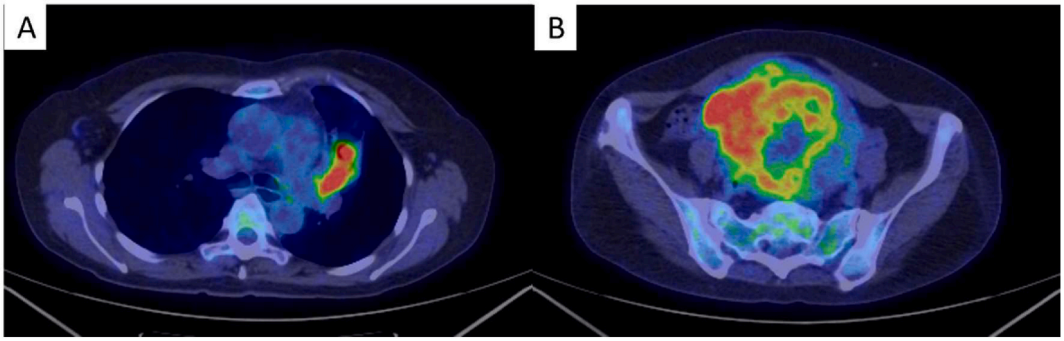

Fig. 4. A positron emission tomography (PET)-CT with ^{18}F-fluorodeoxyglucose (FDG) shows the accumulation of the tracer in a tumor in the endobronchial mass (A) and the uterus (B).

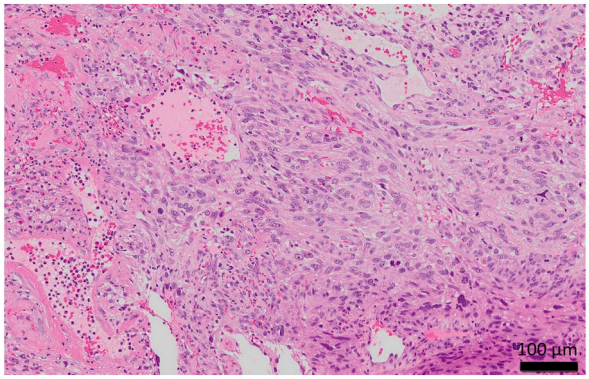

Fig. 5. Histological findings of resected specimens of uterus, which present the similar findings to the biopsied specimen of the endobronchial mass.

common site of metastases from uterine myosarcoma was lung (74%), followed by peritoneum (41%), bones (33%), and liver (27%) [4].

Endobronchial metastasis by definition is a bronchoscopically visible non-pulmonary tumor, involving the proximal central bronchus or subsegmental bronchi, with lesions histologically identical to the primary tumor [5]. Lung is one of the most common organs where malignant tumors develop metastases, however, metastases presenting as endobronchial growth are quite unusual. The frequency of endobronchial metastasis from non-pulmonary malignancies is known to range from about 2 to 50%, varying by the definition of metastasis and the types of primary extrapulmonary solid malignancies [5,6]. In the previous study that collected 174 cases of endobronchial metastasis, their ages ranged from 27 to 89, with a mean age 67 years [6]. Diagnosis of endobronchial metastasis was obtained after a diagnosis of extrapulmonary tumor in 154 cases (89%). In 11 cases (6%) an endobronchial tumor was detected and the extrapulmonary tumor was diagnosed simultaneously. Primary lesions of endobronchial metastasis are breast carcinoma (30%), colorectal carcinoma (24%), renal carcinoma (14%), stomach carcinoma (6%), prostate carcinoma (5%), and melanoma (4.5%); a small number of cases from spermatic cord liposarcoma, solitary fibrous tumor and leiomyosarcoma were reported. Cases of endobronchial metastasis from uterine leiomyosarcoma are rarely reported. Considering that bronchoscopy is not routinely performed in all patients with pulmonary tumors, both incidence and frequency of endobronchial metastases might be underestimated. In 9 cases (5%) a primary tumor remained occult at the time of endobronchial metastases. The overall median latency period between the detection of extrapulmonary tumor and the occurrence of endobronchial metastasis was 136 months (range, 1–300 months) [7,8]. The most frequent occult extrapulmonary malignancies leading to endobronchial metastasis were breast carcinoma and renal carcinoma. This period was long compared to the average intervals for metastasis to other organs in these cancers. This might mean endobronchial metastasis frequently occur in primary cancer with a good prognosis, which was not the case with sarcoma. Schoenbaum S. et al. reported that metastatic spread of malignant tumors to bronchi occurred by pulmonary arterial metastasis invading the lymphatic vessels around the bronchi, lymphatic metastasis in the lymphatic vessels around the bronchi from the metastasized lymph node, bronchial arterial metastasis onto the bronchial wall, and direct metastasis to the wall of the bronchi [9]. In our cases, endobronchial metastasis occurred despite the absence of lymph node metastasis, and the metastatic pathway was suspected of bronchial arterial metastasis onto the bronchial wall.

For fusiform cell tumors of endobronchial mass, leiomyosarcoma, synovial sarcoma, solitary fibrous tumor, malignant meningioma, malignant melanoma, spindle cell carcinoma, and neurogenic tumor are subject to the differential diagnoses. Immunohistochemistry may be beneficial for distinguishing endobronchial metastasis from a primary bronchial tumor and contribute to diagnose leiomyosarcoma. Unfortunately, the perfect panel of immunohistochemistry to detect primary lesion of leiomyosarcoma does not exist. Leiomyosarcoma is characterized by prominent cellular atypia, greater than 10 mitoses per 10 high power fields, and areas of tu-

mor cell necrosis [10]. Therefore, the correct diagnosis requires a multidisciplinary approach with clinical data, imaging studies, pathomorphological studies for endobronchial metastasis and the primary lesion. Most of the cases of uterine leiomyosarcomas are diagnosed postoperatively except for rare cases which are diagnosed by preoperative endometrial sampling or by intraoperative frozen section. No single preoperative test can reliably differentiate benign from malignant uterine disease. Although magnetic resonance imaging (MRI) is a potentially useful tool, a diagnosis of endobronchial metastasis follows the diagnosis of the primary lesion with a largely variable time interval between them. Identifying primary lesion of endobronchial metastasis with CT scan or MRI is difficult in some cases. ^{18}F-FDG uptake on PET-CT image is generally high in sarcomas. Previous studies showed uterine leiomyosarcoma usually showed moderate to intense ^{18}F-FDG uptake [11,12] and PET-CT could reliably differentiate between leiomyomas and uterine sarcomas [13]. Therefore, the systematic use of PET-CT could be useful for patients presenting with tumors that cause endobronchial metastasis of leiomyosarcomas [14].

Therapeutic strategies to relieve the symptoms caused by endobronchial metastasis are chemotherapy, surgical resection, radiation, laser evaporation, endobronchial brachytherapy, and photodynamic therapy [7]. The treatment is also dependent on the biological status of the disease. For patients with advanced uterine leiomyosarcomas, postresection chemotherapy may be offered rather than observation, however, whether treatment improves survival has not been established [15]. Considering overall survival rate of advanced uterine leiomyosarcomas is very poor, treatment options for endobronchial metastasis including surgical resection, radiation, laser evaporation are indicated to limited cases.

4. Conclusion

In conclusion, we reported a rare case of endobronchial metastasis from uterine leiomyosarcoma. Considering the long latency period of endobronchial metastasis, patients with respiratory symptoms of cough or dyspnea who are diagnosed of an extrapulmonary malignancy associated with a higher risk of endobronchial metastases should be considered for a bronchoscopy. In order to reach a correct diagnosis, identification of endobronchial histologic specimens together with histologic specimens from extrathoracic primary tumor is necessary. PET-CT was useful for identifying primary lesion of endobronchial metastasis and could differentiate between leiomyomas and uterine sarcomas. Treatment options for endobronchial metastasis have to be personalised based on the biological status of the disease and performance status.

Informed consent

Informed consent was obtained from the next of kin of the deceased patient.

Declaration of competing interest

The authors declare that they have no competing interests.

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