

CT, MRI, and ^{18}F -FDG PET-CT Findings of Pulmonary Benign Metastasizing Leiomyoma: A Case Report*

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ABSTRACT

Here we report imaging studies of a patient with pulmonary benign metastasizing leiomyoma (BML). A 44-year-old woman who underwent a hysterectomy for uterine cellular leiomyoma presented with abnormal shadows on a chest X-ray. Chest computed tomography (CT) revealed multiple well-defined nodules in both lungs. Chest magnetic resonance imaging (MRI) indicated these nodules as T1-low/T2-high intensity lesions. Contrast-enhanced MRI indicated these nodules as well-enhanced lesions, while ^{18}F -fluorodeoxyglucose positron emission tomography-CT revealed no abnormal accumulation in these nodules. Bilateral lung wedge resections were performed for the largest 2 lesions to confirm the diagnosis, and both nodules were histologically diagnosed as BML.

Keywords: Benign Metastasizing Leiomyoma; CT; PET-CT; MRI

1. Introduction

Benign metastasizing leiomyoma (BML) is a rare disease that occurs in patients with benign leiomyomatous lesions, predominantly in women with a previous history of uterine leiomyoma [1]. Surgical resection is usually performed for histological diagnostic and/or curative purposes, while endocrine therapy [2] and a wait-and-see strategy [3] are also common approaches to this disease since the clinical course is typically indolent [4]. Clinically, it is important to distinguish between BML and metastatic leiomyosarcoma (LMS) because the therapeutic strategies and prognoses for BML and LMS are quite different; however, the understanding of typical imaging findings of BML is incomplete.

2. Case Report

A 44-year-old woman who had undergone a simple hysterectomy for uterine cellular leiomyoma 30 months earlier was found to have asymptomatic multiple pulmonary

nodules, according to a chest X-ray. Chest computed tomography (CT) scans showed bilateral multiple pulmonary nodules (**Figures 1(a)-(d)**). Chest magnetic resonance imaging (MRI) revealed T1-low intensity/T2-high intensity nodules (**Figures 2(a) and (b)**), and contrast-enhanced MRI demonstrated that the nodules were well enhanced (**Figures 2(c) and (d)**), which suggested that the nodules were blood flow-rich lesions. Interestingly, the nodules did not take up ^{18}F -fluorodeoxyglucose (FDG) during an ^{18}F -FDG positron emission tomography (PET)-CT scan (**Figures 3(a),(b)**). The largest 2 nodules were removed for histological diagnosis during video-assisted thoracic surgery, and both nodules were confirmed as pulmonary BML because non-atypical proliferating α -SMA-positive leiomyoma cells were observed without hemorrhage or necrosis (**Figures 4(a)-(c)**).

3. Discussion

Because of its rarity, typical imaging findings for pulmonary BML have not been established, with the exception of CT findings, which include multiple well-defined rounded nodules. Thus, we newly report that the lesions

*Conflict of interest: All authors have no conflict of interest.

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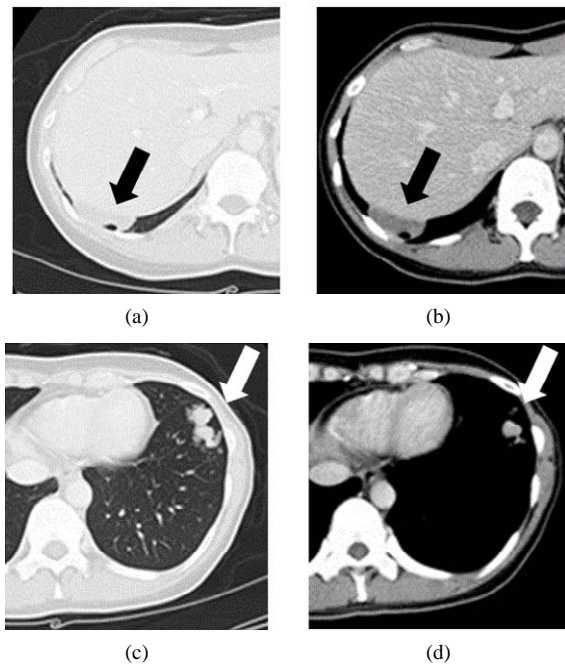


Figure 1. Chest CT scan showing multiple well-defined rounded bilateral lung nodules. (a) representative lesions; (b) a mass lesion that measured 46 mm in right S9; (c) and (d) grouped small nodules in the left S8.

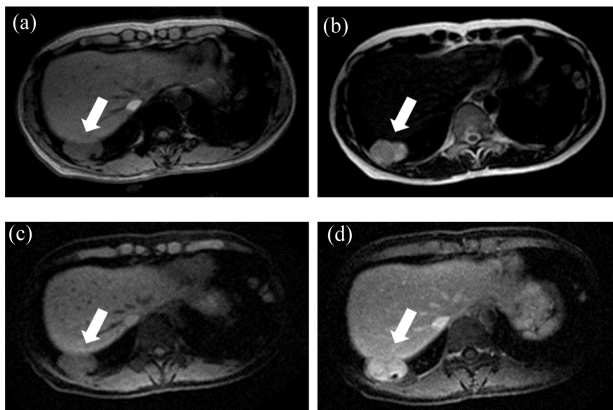


Figure 2. MRI findings. The mass lesion in right S9 was shown as a T1-low/T2-high intensity lesion (a), (b), and contrast-enhanced MRI showed it as a well-enhanced mass (c), pre-enhanced phase and (d), enhanced phase.

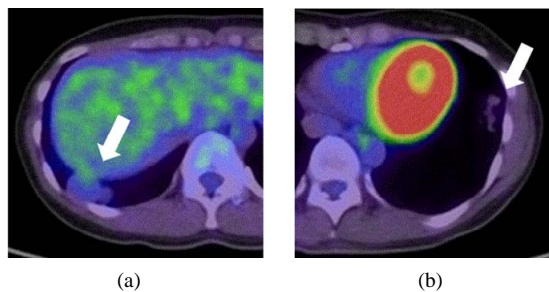


Figure 3. (a) and (b) Bilateral pulmonary nodules with no ^{18}F -FDG uptake.

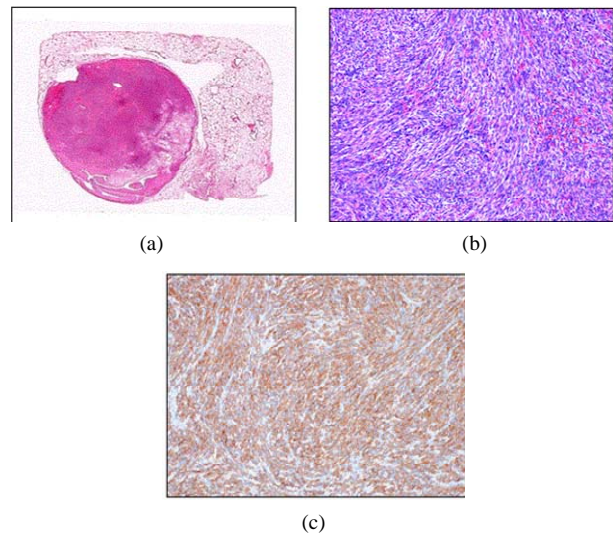


Figure 4. (a) Macroscopically, the tumor in the right S9 presented as an isolated rounded mass and (b) microscopically, hematoxylin-eosin staining showing non-atypical spindle-shaped cells that proliferated in a complex arrangement without hemorrhage or necrosis. The mitotic index is 7/50 HPF. (c) Immunohistochemical staining showing αSMA -positive spindle-shaped cells.

in the present case appeared as T1-low/T2-high intensity nodules on MRI and as blood flow-rich tumors on contrast-enhanced MRI. A few studies reported ^{18}F -FDG PET-CT findings in pulmonary BML, and all appeared as avid-mild accumulating nodules [5-8]. In accordance with previous reports, the lesions in the present case did not take up ^{18}F -FDG, suggesting that BML is a blood flow-rich tumor with low metabolic activity.

The main clinical interest is to distinguish BML from metastatic LMS. Ogawa and his collaborator reported that pulmonary BML with malignant transformation showed high ^{18}F -FDG uptake with a maximum SUV of 18.8 [9], suggesting that ^{18}F -FDG PET-CT might be a useful tool to distinguish BML from LMS. On the other hand, it was reported that uterine leiomyoma showed $^{99\text{m}}\text{Tc}$ uptake [10] and that pulmonary BML showed high $^{99\text{m}}\text{Tc}$ uptake but low ^{18}F -FDG uptake [8], suggesting that ^{18}F -FDG PET-CT combined with $^{99\text{m}}\text{Tc}$ scintigraphy might be a useful diagnostic option to distinguish BML from other diseases.

In conclusion, we experienced a case of BML. The lesions were well enhanced on contrast-enhanced MRI, while no metabolic activity was indicated on ^{18}F -FDG PET-CT, suggesting that BML is a blood flow-rich tumor with low metabolic activity.

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