



A rare case of human pulmonary dirofilariasis with a growing pulmonary nodule after migrating infiltration shadows, mimicking primary lung carcinoma

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ABSTRACT

INTRODUCTION: Pulmonary dirofilariasis is a rare pulmonary parasitic infection by the nematode *Dirofilaria immitis*. It is characterized by an asymptomatic pulmonary nodule usually seen on chest X-ray. The differential diagnosis of pulmonary dirofilariasis includes other pulmonary diseases, primary lung carcinoma and metastatic lung tumor.

CASE PRESENTATION: Pulmonary dirofilariasis was diagnosed in a woman who presented with interstitial pneumonia. Growth of the pulmonary nodule was detected subsequent to hemoptysis. The histological diagnosis was made based on a wedge resection performed under video-associated thoracic surgery (VATS).

CONCLUSION: Pulmonary dirofilariasis often varies in its clinical course. The diagnosis is best made using wedge resection under VATS.

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1. Introduction

Human pulmonary dirofilariasis is a sporadic zoonotic infection caused by *Dirofilaria immitis* [1]. This parasitic nematode primarily infects dogs, whereas humans are accidental hosts [2]. Pulmonary dirofilariasis is initially asymptomatic in humans, with the most common clinical finding being a pulmonary granuloma [3]. Here we present a rare case of pulmonary dirofilariasis in a woman with unusual radiological findings, mimicking primary lung carcinoma.

2. Case presentation

A 66-year-old woman who was a non-smoker presented with hemoptysis. She was examined by chest computed tomography (CT), which showed a pyramid-shaped infiltration by pulmonary hemorrhage in S1 of the right upper lobe (Fig. 1). Seven years later, she had a second episode of hemoptysis. Chest CT revealed a 9-mm, well-demarcated, round nodule in S4 of the right middle lobe against a background of interstitial pneumonia (Fig. 2). She was admitted to our hospital for further examination and treat-

ment. Diagnostic sputum cultures showed no findings indicative of a bacterial infection, including TB. Tumor markers, including carcinoembryonic antigen and cytokeratin 19 fragments, were normal. A blood examination showed no evidence of eosinophilia. During 3 months of observation, the mass continued to grow, reaching a size of 11 × 10 × 8 mm. An 18-fluorodeoxyglucose positron emission tomography/computed tomography (18F-FDG PET/CT) scan showed low 18F-FDG uptake by the nodule. The maximum standardized uptake value was 0.94 (Fig. 3). As neither primary lung carcinoma of a particular histological subtype, including mucinous adenocarcinoma, nor a low-grade malignant tumor could be ruled out, a diagnostic wedge resection of the right middle lobe (S4) was performed (Fig. 4). The intraoperative histopathological diagnosis was a benign granuloma without malignant cells. The postoperative histopathological diagnosis was granuloma with pulmonary dirofilariasis (Fig. 5). The patient's postoperative clinical course was good, and she was discharged on postoperative day 6.

3. Discussion

Dirofilaria immitis is a parasitic nematode that infects dogs, with mosquitoes serving as the vectors [1]. Humans are accidental hosts, and human dirofilariasis is a sporadic infection [2]. A filarial infection in a pulmonary blood vessel of a patient was reported by Faust

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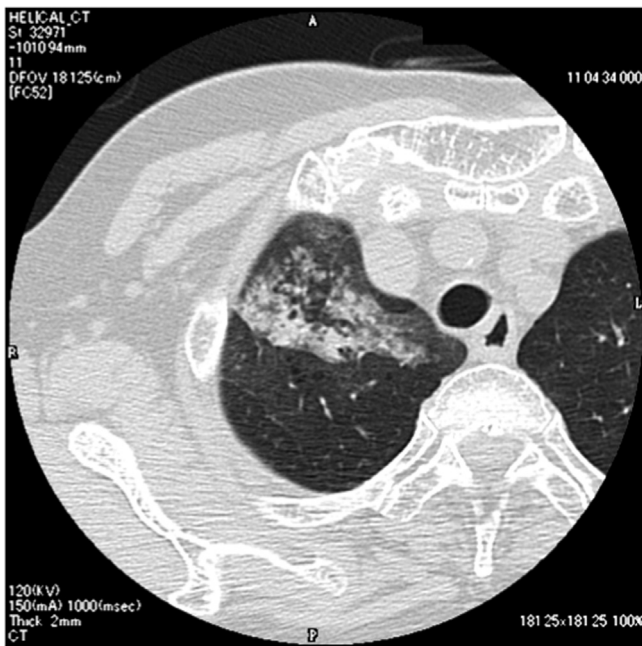


Fig. 1. Chest computed tomography (CT) images show a pulmonary hemorrhage spreading radially in the right upper lobe.

in 1952 [4]; Dashiell described the first case of human pulmonary dirofilariasis in 1962 [1].

The most common clinical finding in human pulmonary dirofilariasis is a pulmonary granuloma, which develops when the immature worms reach a branch of the pulmonary artery and then settle in the lung. A small nodule often forms, caused by an inflammatory reaction that remains asymptomatic [3]. The pulmonary nodule is usually subpleural, often speculated or cavitated, has a predilection for the right lower lobe of the lung [5], and a size <3 cm [6]. The differential diagnosis includes pulmonary dirofilariasis but also other pulmonary diseases, such as primary lung carcinoma, metastatic lung tumors, tuberculosis, and hamartomas [1,4,7].

Most patients with pulmonary dirofilariasis are asymptomatic, but ~38% will have symptoms [8] of cough, chest pain, fever, eosinophilia, and/or hemoptysis [9]. In one report, eosinophilia was described in 11% of dirofilariasis patients [8]. The main symptom in our patients was hemoptysis. Chest CT showed a pulmonary hemorrhage in S1 of the right upper lobe on the same side. These

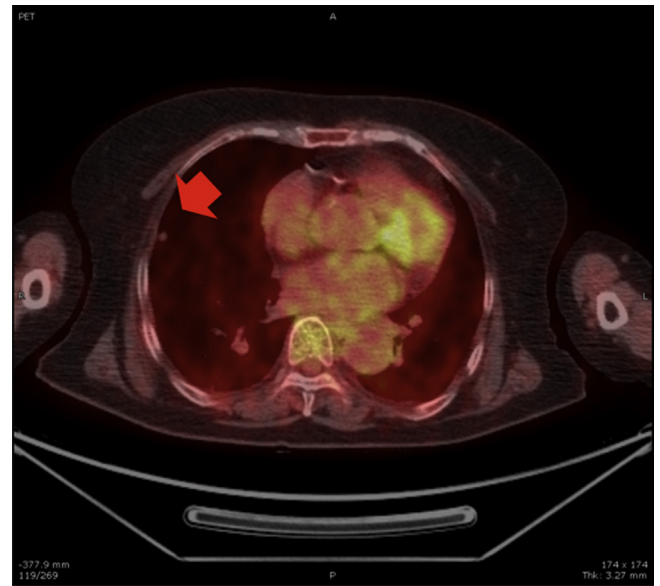


Fig. 3. Positron emission tomography/CT images show the low signal accumulation of signal in a pulmonary nodule (arrow).

findings suggested that the worm had migrated from the right upper lobe to the right middle lobe, where it triggered granuloma formation. Previous reports described new coin lesions together with migrating infiltration shadows in patients with *D. immitis* [4] and *Paragonimus Miyazakii* [10] infections. The former report did not find an association between the nematode and a migrating infiltration shadow, whereas the latter concluded that if the worms fail to migrate, secondary effects will not be seen.

Primary lung carcinoma often occurs against a background of interstitial pneumonia [11]. For this reason, a tumor could not be ruled out in our patient, who presented with a slowly growing pulmonary nodule and interstitial pneumonia. A rare case of pulmonary dirofilariasis with coexisting primary lung carcinoma has been also reported [12]. Wedge resection allowed an operative histopathological diagnosis. Following successful surgical resection, postoperative chemotherapy was unnecessary [13].

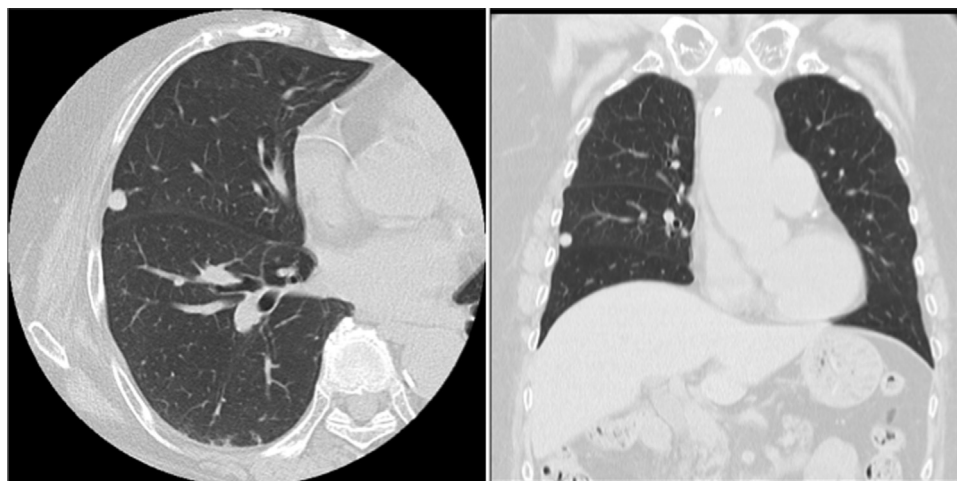


Fig. 2. Transverse and coronal chest CT images show a growing pulmonary nodule in the right middle lobe.

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