

# Clinical and radiographic characteristics in pulmonary endometriosis: based on five cases

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## Summary

**Objective:** This study aims to improve the diagnostic and therapeutic efficacy through analysis of clinical and radiographic characteristics in pulmonary endometriosis. **Materials and Methods:** This retrospective study was conducted from January 1998 to December 2008. The clinical and radiographic characteristics of five patients diagnosed as pulmonary endometriosis were evaluated. **Results:** Among the five female patients of reproductive age, one case presented with recurrent pneumothorax, four cases presented with recurrent hemoptysis. Episode of pneumothorax and hemoptysis had the close association with the menstrual cycle. Except for pneumothorax case, the computed tomography (CT) scans during menstruation showed patchy opacification or infiltration (n=4). Histopathologic examination of the resected specimen conformed typical endometrial tissue in the lungs. Misdiagnosis occurred involving spontaneous pneumothorax (n=1), pulmonary tuberculosis (TB) (n=3), and bronchiectasis (n=1). **Conclusion:** Pulmonary endometriosis is prone to misdiagnosis. The combination of medical history and CT scans in association with menstrual cycle was useful to make the differential diagnosis after effective diagnostic treatment of hormone therapy.

**Key words:** Computed tomography; Lung; Endometriosis; Hormone therapy.

## Introduction

Endometriosis is classically defined as an extrauterine growth of endometrial tissue (glands and stroma) and it affects about 10% to 15% of women in reproductive age [1]. Even though endometriosis is usually located in the pelvis, it can occur in non-gynecologic sites involving thoracic, peritoneum, brain, etc. The different manifestations of non-gynecologic endometriosis vary completely depending on the location of the lesion [2]. Pulmonary endometriosis is diagnosed when endometrial tissue can be found within the respiratory system. It is rare but well-documented [3]. The clinical presentation of pulmonary endometriosis is hemoptysis or pneumothorax/hemothorax and the most common visiting branch of the hospital is emergency room or General Physician without specificity in radiographic findings. This retrospective study was conducted to evaluate the clinical and radiographic characteristics in pulmonary endometriosis.

## Materials and Methods

### Ethics

This retrospective study was conducted in Department of Respiratory Medicine, the 2<sup>nd</sup> Affiliated Hospital, Zhejiang Chinese Medical University, Hangzhou, China from January 1998 to December 2008. This study was implemented in accordance with the declaration of Helsinki and received approval from the Ethics Committee of Zhejiang Chinese Medical University. Written informed consent was obtained from all participants.

### Materials

The mean age of five patients diagnosed as pulmonary endometriosis was 33 years (age range: 25-43) and the duration of the medical history was three months to six years. The final diagnosis was based on medical history alone or diagnostic hormone therapy or thoracoscopy.

### Clinical evaluation

The clinical and radiographic characteristics of five patients were evaluated in details containing inpatient assessment and chest computed tomography (CT) scans, Laboratory tests including erythrocyte sedimentation rate (ESR), tumor markers, tuberculosis-SPOT (TB-SPOT), fiberoptic bronchoscopy, bronchoalveolar lavage, and sputum cytology were also investigated. The CT scans was performed during and two weeks after menstruation.

The reason of performed surgery using thoracoscopy was recurrently severe hemoptysis in one patient (the amount of hemoptysis was 100 ml per day).

## Results

### Clinical characteristics

Among the five female patients of reproductive age, one case presented with recurrent pneumothorax. Other four cases presented with recurrent hemoptysis, occurring usually during menstruation, sometimes before and after the menstruation. The amount of hemoptysis ranged from ten to 100 ml per day. One of the four cases had the pulmonary endometriosis combined with pelvic endometriosis, the other three cases presented with single lesion in lungs.

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Table 1. — *Clinical characteristics and CT findings of pulmonary endometriosis during menstruation.*

Patient	1	2	3	4	5
Clinical presentation					
Chest pain	+				
Hemoptysis		+	+	+	+
Past medical history					
Abortion	+		+	+	+
Menstrual colic		+		+	
CT findings					
Pneumothorax	+				
Patchy opacification		+	+	+	+
Infiltration		+	+	+	+

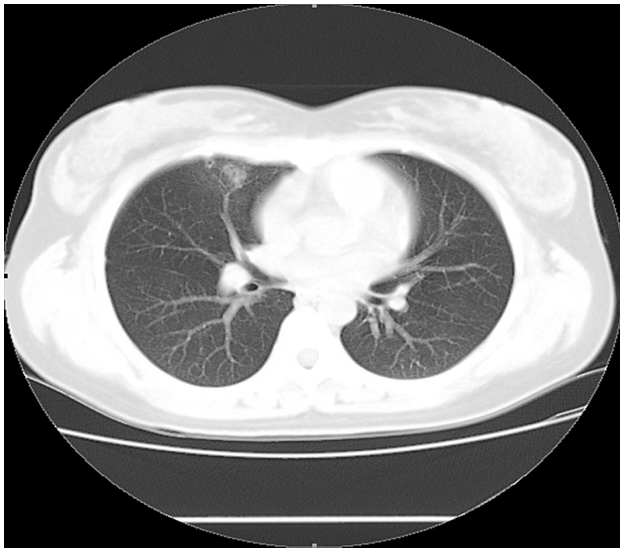


Figure 1. — A 27-year-old woman presented with menstrual hemoptysis. CT scan shows well-defined opacities and cystic changes. The location of the lesion is confined to the right middle lobe.

#### Underlying condition

Other than a history of drug-induced abortion (n=4) or menstrual colic (n=2), none of them had remarkable underlying diseases that could cause hemoptysis or pneumothorax (Table 1).

#### Clinical manifestation

All of the five patients had no history of fever, productive cough or chest pain. The physical examination and laboratory investigations were normal. Radiology evaluation: radiographic findings showed that the compression volume of left lung was 55% in the pneumothorax patient. The CT scans of the remaining four cases indicated that patchy opacification or infiltration (n=4) with uneven density and well-defined margin (Figures 1, 2). The location of the lesion was confined to the segments of the lungs, including the right upper lobe in one case, the right middle

Table 2. — *Misdiagnosis and treatment of pulmonary endometriosis.*

Patient	1	2	3	4	5
Misdiagnosis					
Spontaneous pneumothorax	+				
Bronchiectasis		+	+	+	+
Treatment					
Thoracentesis	+				
Hormone therapy		+	+	+	
Thoracoscopy					+

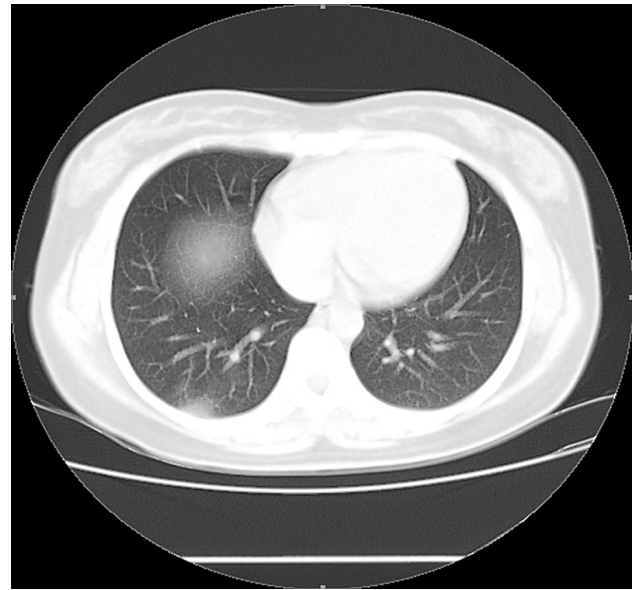


Figure 2. — A 33-year-old woman presented with catamenial hemoptysis. CT scan shows infiltration with uneven density. The location of the lesion is confined to the right lower lobe.

lobe in one case, the right lower lobe in one case, and the left lingular lobe in one case.

#### Pathology findings

Histopathologic examination of the resected specimen confirmed typical endometrial tissue in the lungs (n=1). The presence of both the stroma with hemosiderin-laden macrophages and endometrial-type epithelium met the diagnosis criteria of endometriosis. In addition, both the stroma and glands had the positive immunoreaction for estrogen and progesterone receptors.

#### Misdiagnosis

Misdiagnosis occurred involving spontaneous pneumothorax (n=1), pulmonary TB (n=3), and bronchiectasis (n=1). The recurrent pneumothorax case was admitted to hospital with misdiagnosis and endured thoracentesis or chest tube

drainage for several times. Misdiagnosis duration reach the length of six years. Three patients were misdiagnosed as TB and received diagnostic anti-TB chemotherapy for at least three months (Table 2).

### Treatment

The patient with pleural endometriosis reached pulmonary re-expansion after thoracentesis and chest tube drainage of three days duration. The patient accepted muscle injection with progesterone 20 mg per day and one week continuously. The reexamined radiographic finding showed the pneumothorax obtains the complete absorption in the left lung. The reason of surgery using thoracoscopy was recurrently severe hemoptysis in one patient (the amount of hemoptysis was 100 ml per day). The remaining three cases accepted diagnostic hormone therapy successfully after discharge from hospital – danazol for three to six months – and remained no recurrence after one year follow-up.

### Discussion

Pulmonary endometriosis can occur involving the pleura and manifest as catamenial hemothorax or pneumothorax, or it can affect the pulmonary parenchyma, resulting in catamenial hemoptysis [4]. This disease is prone to misdiagnosis and this partly attribute to the rarity of the condition but presence with common respiratory diseases, and the difficult achievement in histopathologic verification. However histopathologic confirmation has been obtained in less than one-third of reported cases [5]. In most cases, the diagnosis of pulmonary endometriosis is usually established on the basis of clinical grounds after excluding the recurrent symptoms of other origins. Different hypotheses have been postulated for the pathogenesis of pulmonary endometriosis. One theory postulates that endometriosis embolizes to the lung from the pelvis via venous or lymphatic channels. The other theory suggests that endometriosis travels from the peritoneal cavity to the chest via diaphragmatic defects, implanting on the pleural surface and adjacent sub-pleural lung [6]. Although pulmonary endometriosis is not malignant changes, it possesses the potentialities such as tumor-like metastasis and implantation. Most cases have occurred in the third and fourth decades of women life; the patents with pleural disease are more common and tend to be younger [3]. A further review of patient's history showed that their symptoms occurred during menses, indicating pulmonary endometriosis had the close association with the menstrual cycle.

Radiographic findings of pulmonary endometriosis include hemothorax or pneumothorax and lung lesions. According to a meta-analysis of previously published studies [3], pneumothorax was the presenting sign in 73%, hemothorax in 14%, hemoptysis in 7%, and pulmonary nodules in 6%. Over 90% of the manifestations located in the right hemithorax. CT findings in pulmonary endometriosis include ill- or well-defined opacities, nodular lesions, thin-

walled cavities, cystic changes, and bullous formation [7]. All of these lesions may vary in size during the menstrual cycle and may disappear after the menses [8]. If similar parenchyma changes during twice menstrual cycle present in same pulmonary segment, and no abnormality or hemoptysis cease during the inter-menstrual period, the pulmonary endometriosis should be suspicious.

The choice of treatment in pulmonary endometriosis should be individualized to application. Hormone therapy adjusting menstrual period could treat women of relatively elder or dispense with reproduction. Pulmonary endometriosis could be relieved naturally if women of reproductive age become pregnant. Lesions could be resected by surgery to cure recurrent life-threatening hemoptysis. As a benign lesion, pulmonary endometriosis is prone to be misdiagnosed as acute and chronic pneumonia, active TB/ tuberculoma, fungal infection or tumor, sarcoidosis, abscess, etc [9].

The combination of medical history and CT scans in association with menstrual cycle was useful to make the differential diagnosis after effective diagnostic treatment of hormone therapy. In the women of reproductive age, hemoptysis or pneumothorax without obvious inducing factors should be considered with a diagnosis of pulmonary endometriosis.

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