

Pulmonary Cryptococcosis Presenting as Endobronchial Lesions in a Patient under Corticosteroid Treatment

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Abstract

We report a case of pulmonary cryptococcosis in an immunocompromised patient who had focal endobronchial lesions. When we first examined her, she complained of a productive cough that had lasted for two months. Seventeen months prior to this examination, she had been diagnosed with Sjogren syndrome and Sweet syndrome. Since that diagnosis, her condition had been maintained with low-dose prednisolone. We performed a chest CT scan, which revealed a mass, 3 cm in diameter, in the upper lobe of her left lung. A bronchoscopic examination revealed 3 white, elevated lesions in the upper lobe bronchus of her left lung. After 40 days of treatment with fluconazole, the shadow of her lung mass decreased in size to that of a scarred lesion and her white, elevated bronchial lesions disappeared.

Key words: endobronchial cryptococcosis, pulmonary cryptococcosis, immunocompromised patient, bronchoscopy, lung mass, corticosteroid

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Introduction

There are only a few rare descriptions (1-3) of cryptococcus presenting itself as endobronchial lesions, which cause volume loss in the lung or lung collapse. We report a case of pulmonary cryptococcosis in an immunocompromised patient who had focal endobronchial lesions.

Case Report

A 54-year-old woman was referred to us for further evaluation of an abnormal shadow that was present on an X-ray of her chest.

At the time of her first consultation, she was hospitalized in a dermatology ward suffering from skin disease (pustular vasculitis). When she first entered the dermatology ward, she was given prednisolone at an initial dose of 40 mg. It was reduced by 20 mg/day 4 weeks after hospitalization, and to 7 weeks after hospitalization. Her condition was being maintained with a 7.5 mg daily dose of prednisolone. When we first examined her 10 weeks after hospitalization,

she complained of a productive cough that had lasted for 2 months. Seventeen months prior to this examination, she had been diagnosed with Sjogren syndrome and Sweet syndrome. Since that diagnosis, her condition had been maintained with low-dose (5.0-7.5) prednisolone. The patient presented no abnormal physical findings, except for skin eruptions.

In a routine blood test, we obtained the following abnormal results: her white cell count was 10200 mm³; her C-reactive protein level (CRP) was 5.77 mg/ml; and her erythrocyte sedimentation rate was 89 mm/hr during the first hour (Table 1). Her immunological test results were close to normal, except for a negative PPD skin test (Table 2).

A chest X-ray revealed a mass-like shadow in the upper lobe of her left lung and an elevation of her diaphragm due to a compression fracture of the thoracic and lumbar spine resulting from long-term administration of corticosteroids (Fig. 1). A chest CT scan revealed a mass, 3 cm in diameter, in the upper lobe of her left lung, and left hilar and mediastinal lymphadenopathy with several small nodules scattered throughout both of her lungs (Fig. 2).

A bronchoscopic examination revealed 3 white, elevated

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Table 1. Laboratory Data

Peripheral Blood		Blood Chemistry		Serology	
WBC	10200	TP	5.2	CRP	5.77
Neut	77	T-Bil	0.4	HTLV-1	(-)
Lymph	12	GOT	6	Cryptococcal Ag.	X 64
Mono	10	GPT	11	Sputum	
Eosino	1	ALP	178	Bacteria	normal flora
Baso	0	LAP	46	Mycobacterium tuberculosis	
RBC	310	γ -GTP	104		Negative
Hb	9.9	LDH	218	Cytology	class I
Ht	29.7	BUN	6	Tumor Marker	
Plt	37.5	Cr	0.4	CEA	3.0
ESR(1hr)	89	Na	135	CYFRA	0.6
		K	3.5		
		Cl	99		
		T-cho	158		
		FBS	91		

Table 2. Immunological Tests

CD3	59.8	CD4	45.3	CD8	26.1	CD4 / CD8	1.7
PPD	0 X 0						0 X 0
PHA	442.1	(74~508)	ConA	282.4	(52~458)		
NK activity							
E/T ratio 10:1	12.3	(8.9~29.5)					
E/T ratio 20:1	20.0	(17.1~48.5)					

lesions in the upper lobe bronchus of her left lung (at the spur of the upper lobe bronchus, at the orifice of the lingular and at the orifice of the left bronchus (B¹⁺²), all of which were subsequently biopsied (Fig. 3).

A histopathological examination of the transbronchial biopsy specimens revealed the presence of granulomatous lesions, including cryptococcal organisms, marked neutrophil infiltration, and some epithelioid cells and Langhans giant cells (Fig. 4).

The serum was positive for cryptococcal antigen, with a titer of 1 : 64. Based on these results, we diagnosed her as having endobronchial cryptococcosis. After forty days of treatment with fluconazole, at a daily dose of 400 mg, the shadow of her lung mass decreased in size to that of a scarred lesion and her white, elevated bronchial lesions disappeared (Fig. 5). Inflammation (white blood cell count, erythrocyte sedimentation rate, and CRP level) was almost normalized 5 weeks after treatment, and serum cryptococcus antigen decreased, with a titer of 1 : 2, within 5 months. Fluconazole treatment was stopped 5 months after it was started.

Discussion

Cryptococcosis is caused by the yeast-like fungus, *Cryptococcus neoformans*, which has a world-wide distribution. The USA and Australia have been described as having the highest prevalence of *Cryptococcus neoformans* (4), and more than one hundred cases of cryptococcosis have also



Figure 1. A chest X-ray showing a mass-like shadow in the upper lobe of the left lung and several small nodules scattered throughout both lungs.

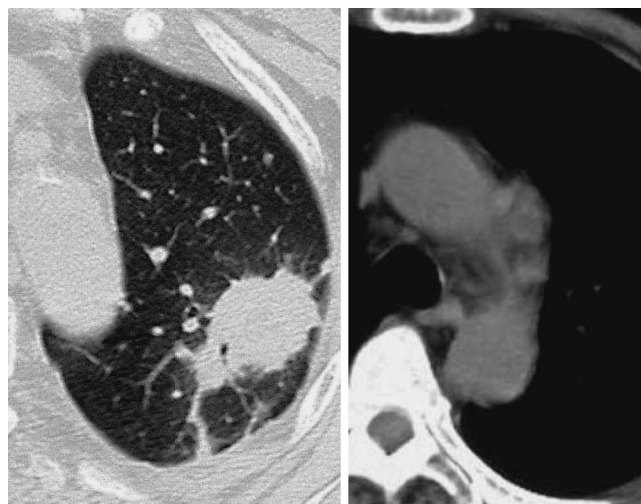


Figure 2. A chest CT scan revealing a mass, 3 cm in diameter, in the left upper lobe and left hilar and mediastinal lymphadenopathy.

been reported in Japan. Although pulmonary cryptococcosis occurs both in healthy individuals and in immunocompromised patients, it is frequently recognized as an opportunistic pathogen (50-80% of the time), particularly in lymphohaematological disorders and, more recently, in AIDS (4, 5). The infection is believed to originate in subpleural foci and then to spread to ipsilateral hilar lymph nodes, much like tuberculosis. It heals spontaneously in most cases but sometimes, in immunocompromised and occasionally in immunocompetent patients, it spreads to other parts of the body (5, 6). It occasionally spreads to the central nervous system and causes meningitis, a condition commonly associated with pulmonary occult infections (5, 6). It is often not evident on a chest X-ray due to the spontaneous recovery of lung lesions (7).

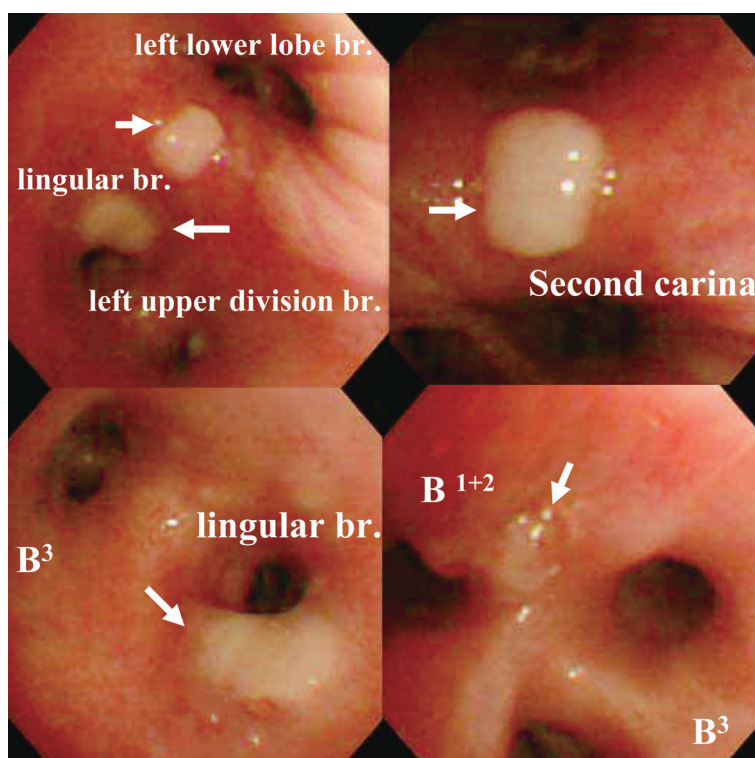


Figure 3. Bronchoscopic examination revealed 3 white elevated lesions (arrows) in the upper bronchus of the left lung (at the spur of the upper lobe bronchus, at the orifice of the lingular and at the orifice of the left upper division bronchus (B¹⁺²)).

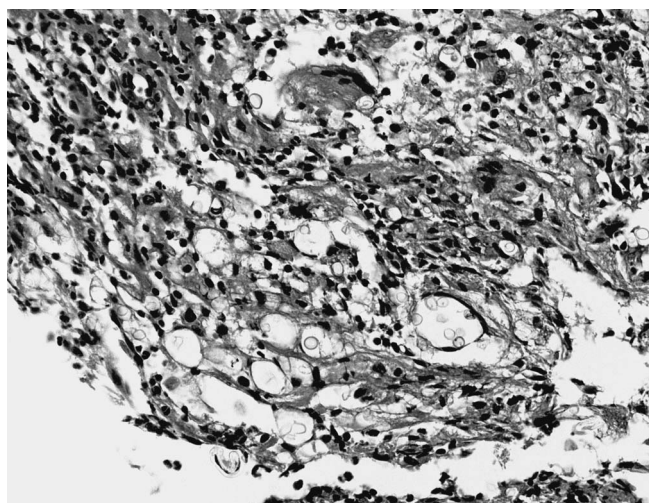


Figure 4. A histopathological examination of the transbronchial biopsy specimens revealed the presence of granulomatous lesions, including cryptococcal organisms, severe neutrophils infiltration, and some epithelioid cells and Langhans's giant cells (hematoxylin-eosin, original $\times 400$).

Cryptococcal lung lesions can differ, depending on the course of the underlying disease. A cryptococcal lung lesion is typically identified as a single, well-defined mass (often based in the pleura), as multiple nodules, or as a well-defined consolidation. The latter is more common in im-

munocompromised patients (8, 9). Radiological findings often mimic primary or metastatic malignancies, since cryptococcal lung lesions may manifest themselves as one or more pulmonary mass lesions.

In immunocompromised patients, some unusual features, such as cavitations, pleural effusion, and lymphadenopathy, may be present. Calcification, however, is extremely rare (8).

Endobronchial cryptococcosis causing complete lung collapse has, to the best of our knowledge, only been reported once (1). That patient had a complete left lung collapse, and a bronchoscopic examination revealed a mass lesion totally occluding the lower lobe bronchus of the left lung and partially occluding the upper lobe bronchus of the left lung. Another patient with an upper lobe consolidation of the right lung and a minor volume loss has also been reported (2). Another report (3) described a patient with a middle and lower lobe collapse of the right lung. This report stated that the lung collapse was due to a white, lobulated lesion (revealed in a bronchoscopic examination) that had completely obstructed the orifice of the bronchus intermedius (3).

Four other patients who had an endobronchial cryptococcal infection that did not lead to lung collapse have also been reported (7, 10-12). The first patient from this group had a middle lobe consolidation of the right lung. A bronchoscopic examination of this patient revealed a haemorrhagic lesion covering the carina that caused a subtotal obstruction of the main bronchus of the right lung and a par-

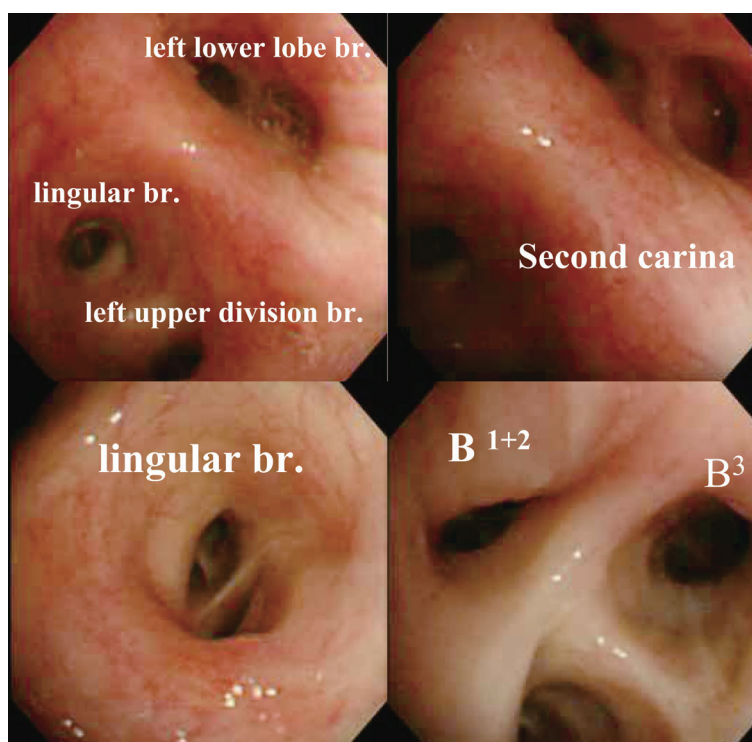


Figure 5. Bronchoscopic examination after 4 weeks of treatment revealed that the white elevated lesions in the upper lobe bronchus of the left lung had disappeared.

Table 3. Summarized Previous Case Reports of Endobronchial Cryptococcosis

Reporter	Age/Sex	Site	Endobronchial abnormality	Chest X ray or CT	Underlying disease
1. Long RF(1972)	36/male	right upper bronchus	Gelatinous mass	Consolidation of the upper bronchus	—
2. Town GI (1985)	26/male	Right main bronchus	Large hsemorrhagic lesion	Consolidaton in the right middle lobe	Immunocompetent
3. Chechani V(1990)	—	Trachea and major bronchi	White mucosal plaques	Bilateral miliary infiltrates	AIDS
4. Chechani V(1990)	—	Trachea and major bronchi	Cherry red plaques	Large bilateral nodules with cavitation Intrathoracic adenopathy	AIDS
5. Carter E A (1992)	65/male	Left lower and upper lobe bronchus	Mass lesion	Complete left lung collapse	Immunocompetent
6. Emmons WW (1995)	45/male	left main bronchus	soft, reddish broad-based lesion	Lingular mass, subcarinal mass	Immunocompetent
7. Mahida P (1996)	43 / male	Truncus intermedius	White lobulated endobronchial lesion	right middle and lower lobe collapse	Immunocompetent
8. Mito K (2000)	19/male	Trunchus intermedius	Reddish elevated lesion	multiple nodular shadows	Immunocompetent
9. Present case	54/female	left upper bronchus	three white elevated lesions	mass-like shadow	Immunocompromized

tial obstruction of the main bronchus of the left lung (7). The second patient from this group had a mediastinal mass and infiltration of the trachea and the main bronchi of the right and left lung (10). The third patient from this group had a lingular mass and was subjected to a segmental resection of the lingula. Following the resection, a chest CT scan revealed a mass in the subcarina. A soft, reddish, endobronchial lesion was observed on the medial wall of the main bronchus of the left lung (11). The fourth patient from this series had multiple nodular shadows in the right middle lung

field that displayed a fusing tendency. Bronchoscopy revealed an elevated lesion in the truncus intermedius (12). The last 2 patients were reported to have a small and focal bronchial lesion, while the other 2 patients had large masses and displayed bronchial obstruction or compression. These 2 patients experienced direct bronchial infiltration from a lymph node, much like patients with endobronchial tuberculosis. We suspect that the infection in the present patient spread via a similar pathway.

Cryptococcosis presenting as an endobronchial lesion has

rarely been described in 8 case reports (Table 3). White or reddish lesions were found as endobronchial abnormalities. The pathogenesis of endobronchial lesion may involve direct invasion from the intrathoracic lymph nodes like endobronchial tuberculosis (cases 4, 6, 8), and endobronchial cryptococcosis also can occur by direct extension from parenchymal involvement to cause endobronchial lesions (cases 1, 2, 5, 7). In the present case, chest CT revealed left hilar and mediastinal lymphadenopathy. The route through the lymphatic system may therefore play an important part in the progression of cryptococcosis to endobronchial lesion.

There is insufficient evidence available to link cryptococcal endobronchial lesions with the status of a patient's immune system. According to previous reports, the status of the immune system in 3 such patients was normal, in an-

other 3 patients it was unknown, and in 1 patient a skin allergy was verified. Five cases were immunocompetent ; thus, endobronchial lesion of cryptococcosis does not seem to be associated with immunodeficiency. The present patient was immunocompromised because she had been taking prednisolone for a long period of time. According to her medical history, many pigeons had taken refuge in her garden. Thus, it is likely that she inhaled a large quantity of cryptococcal organisms while she was in this vicinity.

This case report highlights the fact that cryptococcal lung infections mimic the radiological and bronchoscopic features of lung cancer. This case report also indicates that cryptococcosis should be considered as an alternate diagnosis when endobronchial lesions are detected.

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