A case report of pulmonary cryptococcosis presenting as endobronchial obstruction

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ABSTRACT Cryptococcosis presenting as endobronchial obstruction was scarce. We report a case of patient with cryptococcosis. A chest CT scan showed masses in the right upper lobe and right hilar, with evidence of narrowing of the right upper lobe bronchus. PET-CT scans showed the mass in the bronchus with the high mSUVs. A biopsy specimen was taken from the mass by lung puncture biopsy and showed cryptococcus infection. Culture of lung tissue was *C. neoformans*. The serum was positive for cryptococcal antigen, with a titer of more than 1:1,280. He was successfully treated using amphotericin B liposome. This case is worth discussing because it was cryptococcosis presenting as endobronchial obstruction that is often considered tumor.

KEY WORDS Cryptococcosis; airway obstruction; amphotericin B liposome

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Introduction

Cryptococcal infections are mostly common in immunocompromized patients such as AIDS, organ transplantation, or hematologic malignancy. Pulmonary cryptococcosis usually consists of pulmonary nodules or masses and focal areas of consolidation (1). Cryptococcosis presenting as endobronchial obstruction in immunocompetent patient has rarely been reported (2,3).

Case report

A 44-year-old male patient who presented with a 3-month history of cough, hemoptysis and 7 kg weight loss. He worked as a builder and smoked 40 cigarettes·day^{-1} for 20 years. Initial investigations revealed a leucocyte count of 8.6×10^9/L, fasting blood glucose of 5.4 mmol/L, serum albumin of 42 g/L, HIV testing was negative and normal arterial blood gases on room air. Sputum microbiology was negative. The patient was initially prescribed third-generation cephalosporins for pneumonia, but failed to improve.

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A chest CT scan (Figure 1A) showed a mass, 67.7 mm in diameter in the right upper lobe and 72.4 mm in diameter in the right hilar, with evidence of narrowing of the right upper lobe bronchus. PET-CT (Figure 2) scan showed the mSUVs for FDG uptake of lesions ranged from 9.86 to 10.99.

Brochoscopy confirmed a mass over the right main bronchus orifice that caused occlusion (Figure 3). Because of the risk of bleeding, the mass wasn't biopsied. A biopsy specimen was taken from the mass locating in the posterior segment of the right upper lobe by lung puncture biopsy and showed cryptococcus infection (Figure 4). Culture of lung mass was *C. neoformans* (Figure 5). The susceptibility was done (Table 1). The serum was positive for cryptococcal antigen, with a titer of more than 1:1,280.

Based on these results, we diagnosed his as having endobronchial cryptococcosis. The patient was given itraconazole, then voriconazole for more than one month but failed to improve (Figure 1B). During the period, the shortness of breath increased and a chest CT scan (Figure 1B) showed a mass with evidence of complete occlusion of the right main bronchus. Tracheal endoscopic mass ablation and tracheal stent implantation was done. Following a test dose of 20 mg amphotericin B liposome, given intravenously without systemic reaction, the patient was commenced on 100 mg amphotericin B liposome daily intravenously. After six weeks treatment, a follow-up CT scan (Figure 1C) has showed the mass was obviously absorbed. A repeat bronchoscopy (Figure 3B) confirmed the mass of right main bronchus was disappeared. The patient was discharged after 6 months antifungal therapy.

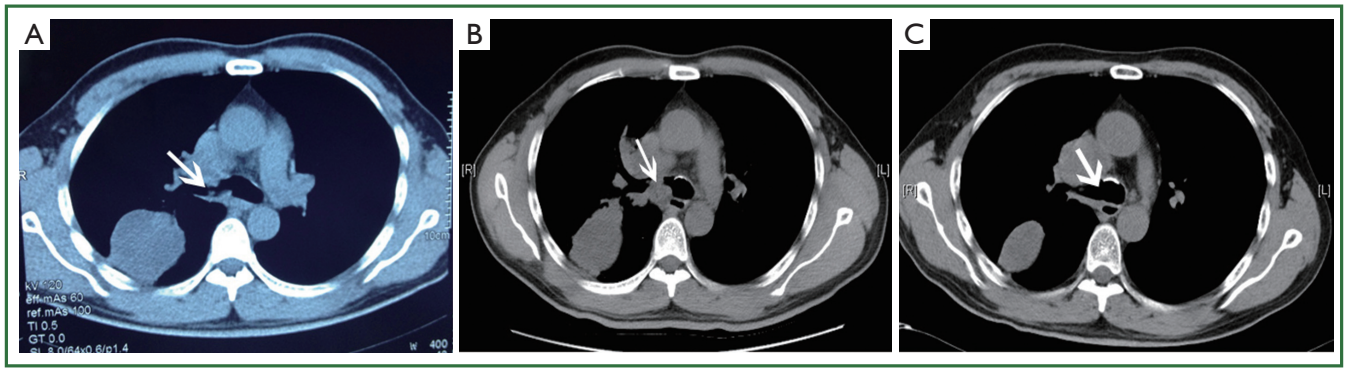

Figure 1. Computerized tomography (CT) scan. A. showing a mass in the right upper lobe and in the right hilar, with evidence of narrowing of the right upper lobe; B. showing a mass with evidence of complete occlusion of the right main bronchus; C. showing the mass was obviously absorbed and the mass of right main bronchus was disappeared.

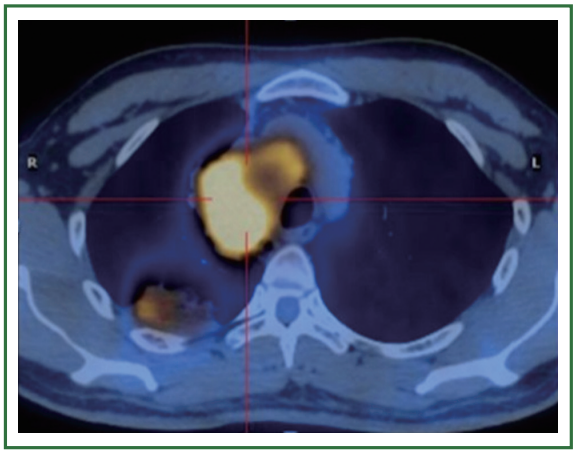

Figure 2. PET-CT scan showed the high mSUVs for FDG uptake of lesions.

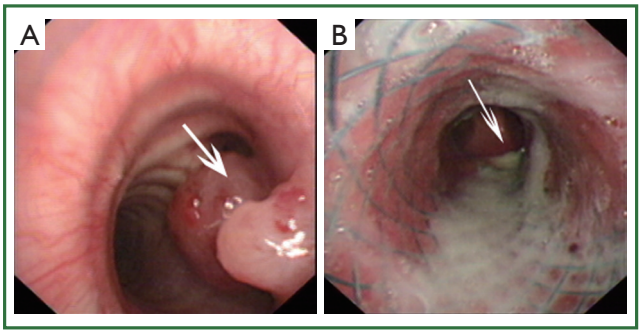

Figure 3. Bronchoscopic examination. A. showing a mass over the right main bronchus orifice that caused occlusion; B. showing the mass of right main bronchus was disappeared.

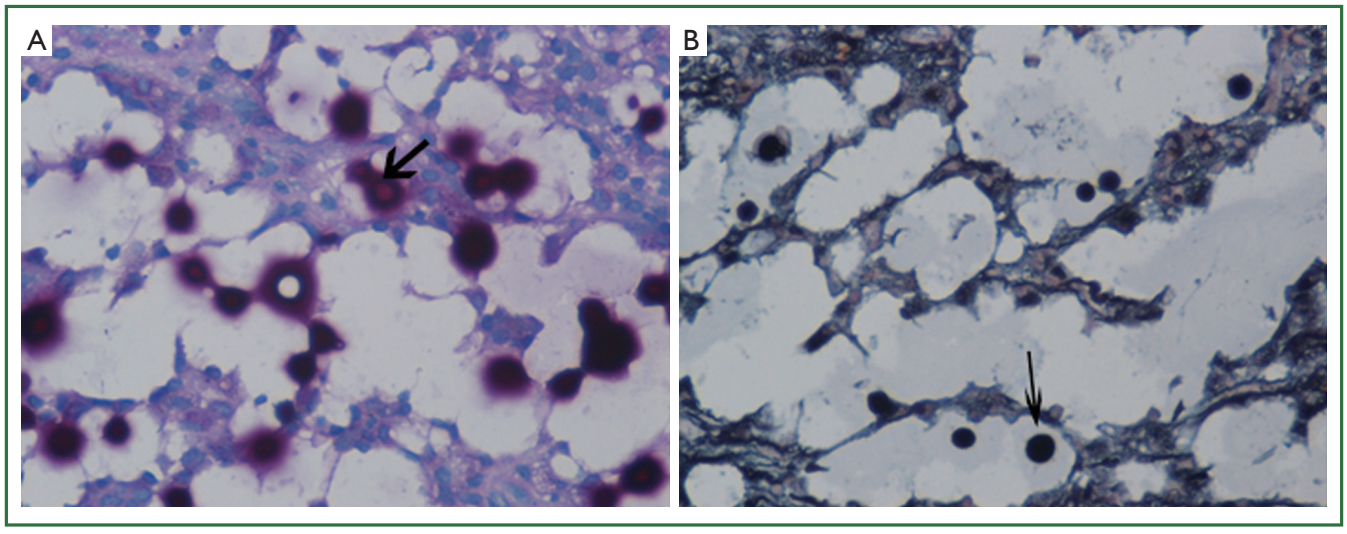

Figure 4. A histopathological examination of the lung puncture biopsy specimens revealed the presence of cryptococcal organisms (A. Hematoxylin-eosin, ×200; B. Grocott's Methenamine-silver stain, ×200).

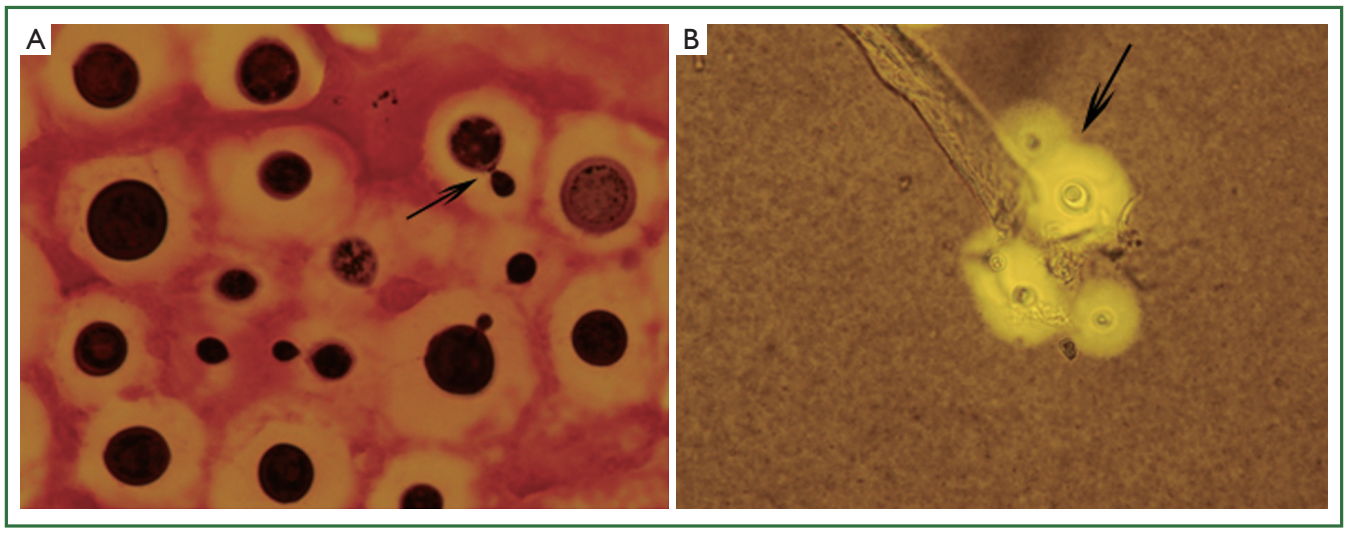

Figure 5. Culture of bronchoscopy with brush (thick capsule and budding of cryptococcal organisms).

Table 1. The drug susceptibility testing of C. neoformans, which was cultured from lung puncture biopsy.

Antifungal agents	Diameter (mm)	Result
Amphotericin B	18	S
Fluconazole	17	SDD
Itraconazole	26	S
Voriconazole	38	S

Discussion

Cryptococcosis typically occurs in immunocompromised patients such as those with HIV/AIDS, the incidence was 5% to 10%, it is estimated that approximately 1,000,000 cases of cryptococcal infection annual in HIV patients (4,5),but it can also occur in immunocompetent patients (6).

The most common radiographic characteristics of pulmonary cryptococcosis consist of solitary or multiple pulmonary nodules or mass, segmental or lobar consolidation, or reticulonodular pattern (7). The infection in immunocompetent hosts shows the most frequent pattern of lung abnormalities was patchy consolidation opacity and solitary pulmonary mass opacity (6,8).

Cryptococcosis presenting as an endobronchial tumor-like growth has rarely been described (3,9). Our case was unique, as the diagnosis of cryptococcosis was based on both histology and culture from multiple sterile samples, including lung and bronchial tissues. The patient had partial clinical and radiological improvement. We could find no evidence of immunocompromise in our patient, and there appears to be insufficient evidence from the literature that presentation with an endobronchial lesion is associated with the status of a patients immune system (10).

PET-CT can help identify tumors and benign lesions, but sixty percent of pulmonary cryptococcosis showed higher FDG uptake and the mSUVs for FDG uptake of lung parenchymal lesions ranged from 1.8 to 9.3 (11).

Early and appropriate antifungal therapy is essential for optimum patient outcomes in cryptococcosis infections. Fuconazole is commonly recommended to treatment of pulmonary cryptococcal disease in immunocompetent patients (12). But in recent years, the potential development of fluconazole resistance poses a threat to the management of cryptococcal disease. The ARTEMIS DISK Global Surveillance Group has identified from 1997-2007 a progressive increase in resistance to fluconazole among isolates of *C. neoformans* from the time periods 1997 to 2000 (7.3%), 2001 to 2004 (10.9%), and 2005 to 2007 (11.7%). Especially, in the Asia-Pacific region, fluconazole resistance among *C. neoformans* isolates increased from 5.1% to 22.6% over the 7-year period (13). The reasons of *C. neoformans* emerging resistance to fluconazole were not only the overuse of prophylaxis such as for oral candidiasis in immunocompromised patients, the widespread use of the antifungal as primary and maintenance therapy, but a potential alternative mechanism of heteroresistance (14).

Although no particular pattern of cross-resistance to other azoles was observed in the fluconazole-resistant cases, treatment was still relapsed even if voriconazole replace the fluconazole (15,16). Subsequent use of amphotericin B therapy in the majority of cases appears to have brought about their clinical recovery (16). Further studies that were fail to be treated with fluconazole would provide better therapy options and explore the reasons for poor treatment of fluconazole.

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