Int J Clin Exp Pathol 2017;10(9):9798-9801
www.ijcep.com /ISSN:1936-2625/IJCEP0059583

Case Report

Pulmonary cryptococcosis in immunocompetent patient: a case report

Bin Zhang*, Wei Cao*, Xiu Wu, Shengyu Wang

*Department of Pulmonary and Critical Care Medicine, The First Affiliated Hospital of Xi'an Medical University, Xi'an 710077, Shaanxi, PR China. *Equal contributors.*

Received June 14, 2017; Accepted August 16, 2017; Epub September 1, 2017; Published September 15, 2017

Abstract: Pulmonary cryptococcosis (PC) is an opportunistic and conditional disease. It commonly occurs in immunocompromised patients. We presented a case of PC in an immunocompetent patient. This patient had the complaints of irritating cough and shortness of breath. A variety of antibiotic treatment was ineffective. The patient eventually received percutaneous transcutaneous biopsy and PC was diagnosed. Patient was treated by intravenous fluconazole for two weeks. The patient's follow-up was performed by Pulmonary Department, and we learned that the patient was well.

Keywords: Pulmonary cryptococcosis, immunocompetent, percutaneous transcutaneous biopsy

Background

Pulmonary cryptococcosis (PC) is an opportunistic and conditional disease. The lungs and central nervous system in human are common organs invaded by cryptococcus, rarely in the bones, skin, mucous membranes and other organs [1]. Most patients with PC are immunocompromised, such as acquired immune deficiency syndrome (AIDS), subjects with immunosuppressive drugs and hematological malignancies [2]. Therefore, it is usual for immunocompetent subjects with PC to be ignored. Here, we describe a healthy subject of cough as the main symptom and final diagnosis of pulmonary cryptococcosis.

Case report

A 58-year-old male healthy subject was admitted to Pulmonary Department of the First Affiliated Hospital of Xi'an Medical University because of cough and shortness of breath for one month. One month before admission, he coughed and was short of breath. Levofloxacin and other antibiotics have no effect on his symptoms. Two days before admission, his cough was more severe and shortness of breath was progressive.

The patient's physical examination was normal. His temperature was 36.6°C, heart rate was 84 beats per minute, respiratory rate was 20 beats per minute and blood pressure was 130/90 mmHg. The results of chest wall examination revealed low breath sounds bilaterally. The findings of heart, abdominal and central nervous system examinations were unremarkable. Routine blood tests including white blood cell (WBC), hemoglobin (HGB) and blood platelet (PLT) were normal. Erythrocyte sedimentation rate (ESR) 60 mm/h. Serum 1,3-beta-glucan-D test (G test) 75 (normal range: 0-60 pg/ml). Tumor markers and autoantibody are normal. Tuberculosis antibody, peripheral blood T-spot, ANCA, Hepatitis B, Hepatitis C, syphilis and AIDS antibody were normal. A chest computed tomography (CT) scan revealed lower lobes of the bilateral lungs were patchy consolidation shadow (**Figure 1**).

The patient was admitted into the ward, and cefoperazone sulbactam was dispensed. However, his symptoms were not improved. The patient was examined by bronchoscopy. Bronchoscopies showed bilateral bronchial mucosa were normal, and bronchial alveolar lavage cultures were negative. The second chest CT scan showed patchy consolidation shadows in bilat-

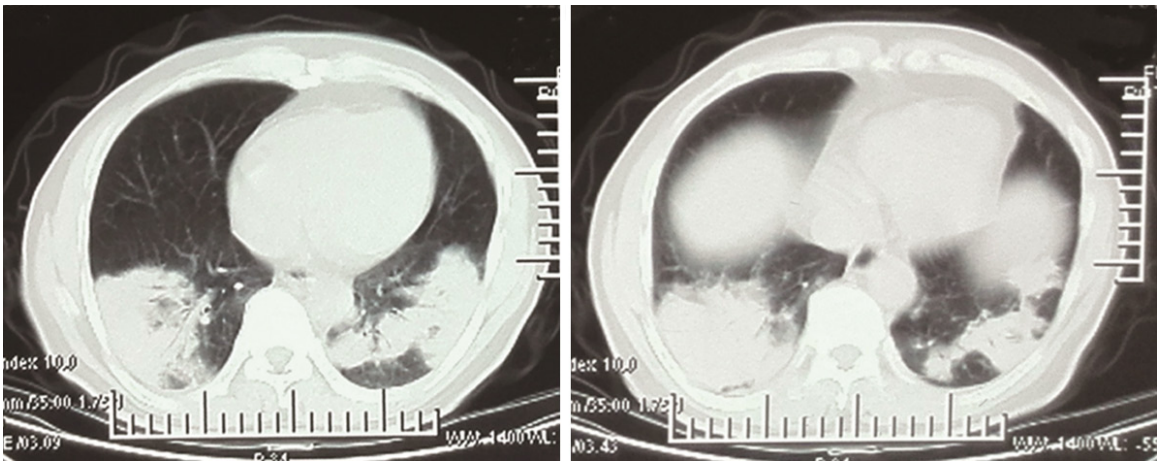

Figure 1. Chest CT scan at the first time revealed lower lobes of the bilateral lungs were patchy consolidation shadow.

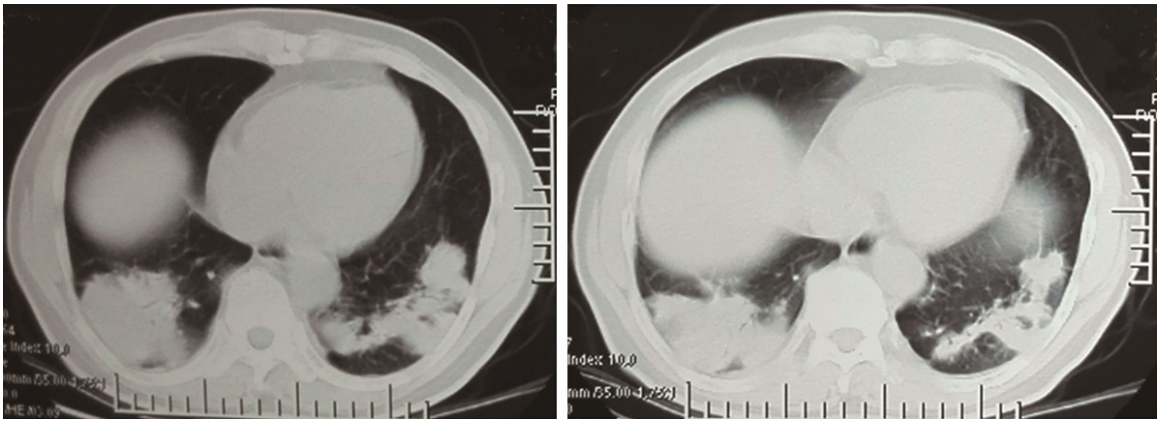

Figure 2. Chest CT scan at the second time showed lower lobes of the bilateral lungs were still patchy consolidation shadow.

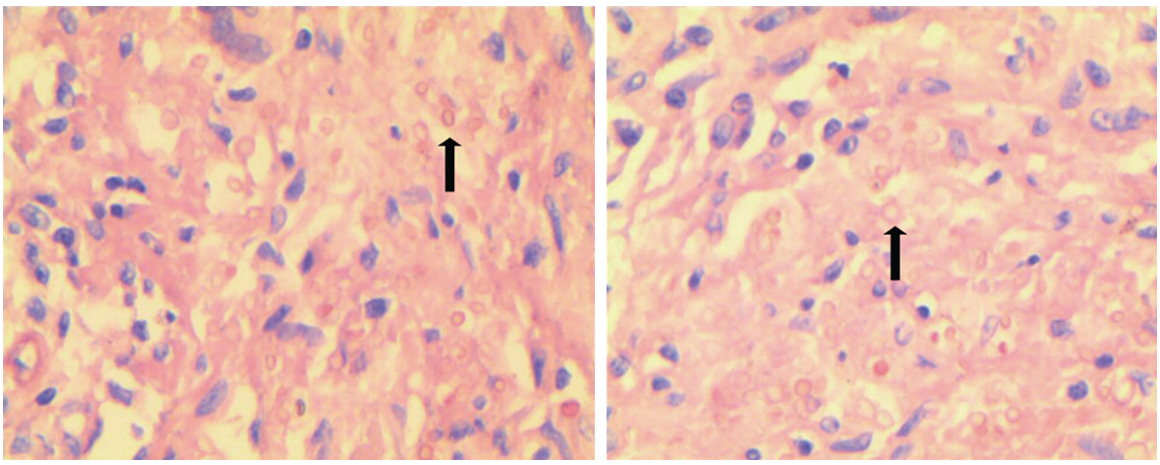

Figure 3. Histochemical staining in lung biopsy pathology revealed PAS was positive (black arrow) and anti-acid was negative.

eral lower lungs were not changed compared to last scan (**Figure 2**). After discussion with family, percutaneous lung biopsy (right lower lung) was performed. Pathology in small pieces of

lung showed granulomatous inflammation associated with necrosis. Further histochemical staining revealed Periodic Acid-Schiff (PSA) was positive and anti-acid was negative (**Figure 3**). Thus, pulmonary cryptococcal was diagnosed. After the treatment of intravenous fluconazole for two weeks, the patient's symptoms were relieved. The patient's follow-up was performed by Pulmonary Department, and we learned that the patient was well.

Discussion

Pulmonary cryptococcosis is caused by Cryptococcus neoformans, which has been discovered from soil contaminated with avian excreta, specifically pigeon droppings [3]. Cryptococcus can invade the numerous parts of human body, such as the lung, central nervous system, skin, gastrointestinal tract, skeletal system and so on [1, 2, 4]. Cryptococcal diseases are usual in the immunodeficiency subjects, and immunocompetent patients with cryptococcal infection are common to be neglected. Study shows that the incidence of pulmonary cryptococcosis is increasing in immunocompetent patients [5]. Besides, approximately one-third of immunoreactivity patients with pulmonary cryptococcosis were asymptomatic [6].

In this case, the subject has coughed for one month and his symptoms were not relieved by the repeated treatments. His lung lesions presented with scattered nodules in the chest CT, which was suspected to be either malignant neoplasms or another infectious disease such as tuberculosis. Finally, the diagnosis was confirmed by the histopathology with CT guided percutaneous lung biopsy. Thus, it is suggested percutaneous lung biopsy is performed as soon as possibly for subjects with long-term cough and patchy shadows in the pulmonary imaging.

Clinical symptoms and signs of pulmonary cryptococcosis were uncertainty, even sometimes were not compatible with the imaging performance of the lung in pulmonary cryptococcosis patients [7, 8]. The symptoms and signs were not constantly typical, even non-existent, but CT scan of lung lesions was often obvious. The mainly feature of the imaging was nodules and lumps damage, a few manifestations were parenchymal infiltrates, cavitary lesions, pleural effusion, hilar lymph nodes [6, 9, 10]. Therefore, combination of clinical and iconography should be thoughtful consideration for diagnosis [11-13]. The therapy of PC includes systemic use for antifungal drugs, surgical resection of the lesions, and support therapy [14-18]. For patients with an immune deficiency, rectification of the underlying disease is very significant [14]. If the lung inflammation could not be absorbed after anti-inflammatory treatment or anti-tuberculosis treatment, or cannot be diagnosed with any other unclearly disease, we should consider the probability of pulmonary cryptococcosis, especially in immunocompetent patient [3, 19]. It is basic to acquire all types of invasive biopsy specimens at the early phase of diagnosis [4]. Some noninvasive laboratory tests, such as the PCR test is also considered as convenient and effective diagnostic tool [20]. The histological certificate is a golden standard to diagnose pulmonary cryptococcosis [21-23]. It is significant to get an early lung specimen biopsy through bronchoscope or transbronchial lung biopsy (TBLB), even surgical resection of the lesion and all kinds of invasive techniques [3, 23, 24].

Conclusions

In conclusion, this case report indicates that pulmonary cryptococcosis in immunocompetent patients is a common disease to be ignored. The enormous variations and protean representations of its clinical aspect and image manifestation character often led to misdiagnosis. Recognition and invasive examination of immunocompetent patient's pulmonary cryptococcosis in the early period may assistance with improvement of diagnosis and prognosis.

Acknowledgements

This study was supported by funds from Respiratory Prevention and Treatment Center of Shaanxi Provincial Government (2016HXKF-09), Shaanxi Province Key Program Fund (2017SF-256).

Disclosure of conflict of interest

None.

Abbreviations

PC, pulmonary cryptococcosis; AIDS, acquired immunodeficiency syndrome; CT, Computed Tomography; ANCA, Anti-Neutrophil Cytoplasmic Antibodies; TBLB, transbronchial lung biopsy; CAP, Community Acquired Pneumonia.

Address correspondence to: Dr. Shengyu Wang, Department of Pulmonary and Critical Care Medicine, The First Affiliated Hospital of Xi'an Medical University, Xi'an 710077, Shaanxi, PR China. E-mail: wangshengyu@yeah.net

References

[1] Chang CC, Sorrell TC and Chen SC. Pulmonary cryptococcosis. Semin Respir Crit Care Med 2015; 36: 681-691.

[2] Lan CQ, Weng H, Li HY, Chen L, Lin QH, Liu JF and Huang JB. Retrospective analysis of 117 cases of pulmonary cryptococcosis. Zhonghua Jie He He Hu Xi Za Zhi 2016; 39: 862-865.

[3] Wu B, Liu H, Huang J, Zhang W and Zhang T. Pulmonary cryptococcosis in non-AIDS patients. Clin Invest Med 2009; 32: E70-77.

[4] Fisher JF, Valencia-Rey PA and Davis WB. Pulmonary cryptococcosis in the immunocompetent patient-many questions, some answers. Open Forum Infect Dis 2016; 3: ofw167.

[5] Galanis E, Macdougall L, Kidd S, Morshed M; British Columbia Cryptococcus gattii Working Group. Epidemiology of cryptococcus gattii, British Columbia, Canada, 1999-2007. Emerg Infect Dis 2010; 16: 251-257.

[6] Kishi K, Homma S, Kurosaki A, Kohno T, Motoi N and Yoshimura K. Clinical features and high-resolution CT findings of pulmonary cryptococcosis in non-AIDS patients. Respir Med 2006; 100: 807-812.

[7] Wang L, Shi Y, Ding Y, Wang Q and Su X. Pulmonary cryptococcosis: a retrospective analysis of 65 cases. Zhonghua Jie He He Hu Xi Za Zhi 2014; 37: 764-768.

[8] Yu JQ, Tang KJ, Xu BL, Xie CM and Light RW. Pulmonary cryptococcosis in non-AIDS patients. Braz J Infect Dis 2012; 16: 531-539.

[9] Wang SY, Chen G, Luo DL, Shao D, Liu ET, Sun T and Wang SX. 18F-FDG PET/CT and contrast-enhanced CT findings of pulmonary cryptococcosis. Eur J Radiol 2017; 89: 140-148.

[10] Xie LX, Chen YS, Liu SY and Shi YX. Pulmonary cryptococcosis: comparison of CT findings in immunocompetent and immunocompromised patients. Acta Radiol 2015; 56: 447-453.

[11] Xie D, Chen XF, Jiang GN, Xu ZF, You XF, Chen C, Zhou X and Ding JA. Clinical analysis of 81 cases of pulmonary cryptococcosis. Zhonghua Wai Ke Za Zhi 2012; 50: 430-433.

[12] Qu Y, Liu G, Ghimire P, Liao M, Shi H, Yang G, Xu L and Wang G. Primary pulmonary cryptococcosis: evaluation of CT characteristics in 26 immunocompetent Chinese patients. Acta Radiol 2012; 53: 668-674.

[13] Song KD, Lee KS, Chung MP, Kwon OJ, Kim TS, Yi CA and Chung MJ. Pulmonary cryptococcosis: imaging findings in 23 non-AIDS patients. Korean J Radiol 2010; 11: 407-416.

[14] Choi KH, Park SJ, Min KH, Kim SR, Lee MH, Chung CR, Han HJ and Lee YC. Treatment of asymptomatic pulmonary cryptococcosis in immunocompetent hosts with oral fluconazole. Scand J Infect Dis 2011; 43: 380-385.

[15] Yokomise H. Surgical treatment of pulmonary aspergilloma and pulmonary cryptococcosis. Kyobu Geka 2011; 64: 747-751.

[16] Walsh TJ, Anaissie EJ, Denning DW, Herbrecht R, Kontoyiannis DP, Marr KA, Morrison VA, Segal BH, Steinbach WJ, Stevens DA, van Burik JA, Wingard JR, Patterson TF; Infectious Diseases Society of America. Treatment of aspergillosis: clinical practice guidelines of the Infectious Diseases Society of America. Clin Infect Dis 2008; 46: 327-360.

[17] Kaplan JE, Benson C, Holmes KK, Brooks JT, Pau A, Masur H; Centers for Disease Control and Prevention (CDC); National Institutes of Health; HIV Medicine Association of the Infectious Diseases Society of America. Guidelines for prevention and treatment of opportunistic infections in HIV-infected adults and adolescents: recommendations from CDC, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. MMWR Recomm Rep 2009; 58: 1-207; quiz CE201-204.

[18] Yew WW, Wong PC, Wong CF, Lee J and Chau CH. Oral fluconazole in the treatment of pulmonary cryptococcosis in non-AIDS patients. Drugs Exp Clin Res 1996; 22: 25-28.

[19] Lu SH, Hou YY, Tan YS, Liu T, Wang Q and Bai CX. Clinicopathological analysis of primary pulmonary cryptococcosis. Zhonghua Jie He He Hu Xi Za Zhi 2009; 32: 430-433.

[20] Vilchez RA, Irish W, Lacomis J, Costello P, Fung J and Kusne S. The clinical epidemiology of pulmonary cryptococcosis in non-AIDS patients at a tertiary care medical center. Medicine (Baltimore) 2001; 80: 308-312.

[21] Okagaki LH, Strain AK, Nielsen JN, Charlier C, Baltes NJ, Chretien F, Heitman J, Dromer F and Nielsen K. Cryptococcal cell morphology affects host cell interactions and pathogenicity. PLoS Pathog 2010; 6: e1000953.

[22] Zhu LP, Shi YZ, Weng XH and Muller FM. Case reports. Pulmonary cryptococcosis associated with cryptococcal meningitis in non-AIDS patients. Mycoses 2002; 45: 111-117.

[23] Liu K, Ding H, Xu B, You R, Xing Z, Chen J, Lin Q and Qu J. Clinical analysis of non-AIDS patients pathologically diagnosed with pulmonary cryptococcosis. J Thorac Dis 2016; 8: 2813-2821.

[24] Sakurai H, Kaji M and Seumasu K. Clinicopathological characteristics of pulmonary cryptococcosis. Kyobu Geka 2009; 62: 863-867.