

Case Report

CLINICAL PRESENTATION, DIAGNOSIS AND TREATMENT OF PULMONARY FUNGUS BALL RELATED TUBERCULOSIS

Fenty Anggrainy¹, Irvan Medison², Deddy Herman¹, Sabrina Ermayanti¹, Yessy Susanty Sabri¹

Abstrak

Fungus Ball paru merupakan komplikasi yang sering terjadi pada Tuberkulosis (TB) paru dengan kavitas, terutama pada bekas TB paru. Agen penyebab selain *Aspergillus* sp yaitu *Candida* sp. Terapi definitif untuk penyakit ini adalah terapi bedah. Pada kondisi khusus dapat digunakan tatalaksana lainnya. Penelitian ini mengevaluasi 6 pasien *Fungus Ball* paru dengan riwayat obat anti tuberkulosis, dengan beberapa metode diagnosis dari tahun 2010 sampai 2013. Tatalaksana dan hasil pengobatan pasien dianalisis pada penelitian ini. Hemoptisis terdapat pada seluruh pasien dan tiga diantaranya dengan hemoptisis masif. Semua pasien memiliki gambaran yang khas untuk *Fungus Ball* paru dari radiologi toraks. Spesies jamur terkonfirmasi pada 5 pasien: pemeriksaan serologis (1), kultur jamur (2) dan pemeriksaan histopatologi (2). Spesies yang didapatkan adalah *Aspergillus* sp = 3, *Candida parapsilosis* = 1 dan *Candida* sp = 1. Dua pasien mendapatkan terapi bedah dengan tidak adanya keluhan hemoptisis setelah itu. Empat pasien yang hanya mendapatkan anti jamur, ternyata 75% memberikan respon yang baik secara klinis dan radiologis. Kavitas yang menetap pada TB paru dan bekas TB paru, dapat menimbulkan insiden *Fungus Ball* paru yang membutuhkan lobektomi sebagai terapi definitif. Pada kondisi tertentu dimana terapi pembedahan tidak dapat dilakukan, anti jamur dapat menjadi terapi alternatif dan memberikan hasil yang baik.

Kata kunci: fungus ball paru, tuberkulosis, terapi pembedahan, anti jamur

Abstract

Pulmonary fungus ball is common complication from pulmonary tuberculosis with cavity, especially from sequelae pulmonary tuberculosis. Etiologic agents not only Aspergillus sp but also Candida sp. Definitive treatment is surgical therapy. In special condition we can choose another treatment. We evaluated six pulmonary fungus ball patients with history of antituberculosis drugs, in several method of diagnosis from 2010 sampai 2013. We analyze the therapy and outcome from the patients. Hemoptysis presented in all patients and three of them got massive hemoptysis. All patients had specific appearance of pulmonary fungus ball radiologically. Fungus species confirmed in five patients: serologic examination (1), fungal culture (2), and histopathological examination (2). The species are Aspergillus sp = 3, Candida parapsilosis = 1 and Candida sp = 1. Two of them got surgical therapy and there is no more complaint of hemoptysis. Those four who took anti fungal only, so three of them (75%) good responsive both clinically and radiologically. Preexisting cavity in pulmonary tuberculosis and former pulmonary tuberculosis, renounce the incident of pulmonary fungus ball which need lobectomy as definitive treatment. In condition where they can't perform surgical treatment, antifungal can be alternative treatment and gave good outcome.

Keywords: Pulmonary Fungus ball, Tuberculosis, Surgical treatment, Antifungal

Affiliation: 1. Department of Pulmonology Faculty of Medicine Universitas Andalas, 2. Department of Pulmonology RSUP M. Djamil Padang

Correspondence: Fenty Anggrainy, email: fentyanggrainy@med.unand.ac.id

INTRODUCTION

Preexisting lung cavity that caused by variety underlying lung disease, could be colonized by

sacrophytic fungi such as *Aspergillus* (most common), *Candida*, *Nocardia*, *Sporothrix* and *Penicillium* resulted fungus ball.^{1,2} Most of these cavity were

related with tuberculosis (60%). Conglomeration of necrotic debris within the lung cavity and saprophytic growth on the lung surface occurs after inhalation of spores into the moist, warm, dark, aerated and protein-rich environment of the lung. Accumulation of layers of fungus, cellular debris, fibrin and inflammatory cells from a mobile, compact mass that may fill the cavity.^{1,3} The common clinical presentation is some combination of cough, expectoration, hemoptysis, chest pain, wheezing and night sweats. But the most common symptom is hemoptysis (50-90%), could be blood-tinged sputum or massive.^{1,3,4} Bleeding has been attributed to mechanical friction between the mobile fungus ball and the hypervascular cavity wall, to endotoxins liberated from the fungus ball, or to type III inflammatory reaction within the cavity wall.²

The classical plain chest radiograph and thoracic CT scanning features of a pulmonary fungus ball is characterized by the presence of a solid, round or oval mass with soft-tissue opacity within a lung cavity. Typically, the mass is separated from the wall of the cavity by an airspace of variable size and shape, resulting in the "air crescent" sign.^{1,2,4} The common sites of pulmonary fungus ball are the upper lobe and lower lobe superior segment.⁵

The causes of pulmonary fungus ball can be detected by microscopic, culture, serologic, PCR examination and histopathological examination.⁴ The specimen can be from sputum, bronchoalveolar lavage (BAL), brush from bronchoscopy. The selection of method and sampling based on examiner and the available facility on the hospital.⁶

Eventhough surgical resection is the definitive treatment for pulmonary fungus ball⁷, the best treatment for patients who are ineligible for surgery remains unknown.⁴ Patients with recurrent hemoptysis or massive hemoptysis, surgery is performed with considering the complication of surgery which mainly depend on pulmonary function and general condition. It is considered for embolization or anti fungal medication intracavitary if surgery cannot perform.^{1,2,6} Pulmonary resection is most common in the surgical

treatment but has high morbidity and mortality.⁷ This serial case report is going to perform six patients with pulmonary fungus ball related Tuberculosis in term of diagnose methods, treatment and outcome.

CASE

We found six patients, 4 men and 2 women with range of age 35-61 years old. The main symptoms were hemoptysis and cough (Table 1). Three patients suffered from massive hemoptysis and the rest were not suitable for massive criteria, but they got recurrent hemoptysis. The right upper lobe was the most common location of fungus ball (Table 2). All radiologic findings both in plain chest radiograph and thoracic Ct scanning, there was typical appearance such crecentic sign. Fungal species confirmed by serologic examination in one patient, fungal culture in two patients and histopathology examination in two patients. Two patients undergo thoracic surgery (lobectomy). Others who ineligible for surgery, got antifungal (Triazol): itrakonazol (2), flukonazol (1), flukonazol and itrakonazol (1). Antifungal given six month each, and three patients gave good response (Table 3). From clinical symptom there is nomore hemoptysis or bloody sputum in 6-12 months. From radiology, the pulmonary fungus ball is dissappear (Table 4).

Table 1. Present signs and symptoms of six patients with pulmonary fungus ball

Characteristic	Former Tuberculosis	Tuberculosis
Massive and recurrent hemoptysis	3	-
Recurrent hemoptysis	3	1
Cough/Sputum	-	-
Dyspnea	1	1
Fever		

Table 2. Location of pulmonary fungus ball of six patients with pulmonary fungus ball

Location	Number of patients
Right upper lobe	4
Left upper lobe	1
Right upper and left upper lobe	1

Table 3. The diagnosis, etiology, therapy and outcome of six patients with pulmonary fungus ball

Patients	Diagnosis Method	Species	Therapy	Outcome		
				Hemoptysis	Radiology	Free hemoptysis period (month)
1	Radiologically		Flukonazole	No	Decreasing in volume*	7
2	Fungal Serologic	Candida sp	Flukonazole + Itrakonazole	Still occurred	Minimal decrease	-
3	Histopathology examination	Aspergilosis	Lobectomy	No	Disappear	10
4	Histopathology examination	Aspergilosis	Lobectomy	No	Disappear	12
5	Fungal Culture	Candida parapsilosis	Itrakonazole	No	Disappear*	12
6	Fungal Culture	Aspergilosis	Itrakonazole	No	Disappear*	6

* More than 50%

** Empty cavity appearance

Table 4a. Radiologic findings pre and post therapy of six patients with pulmonary fungus ball




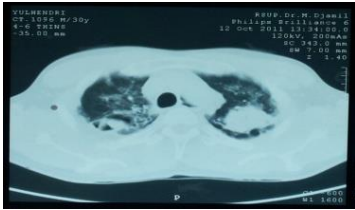

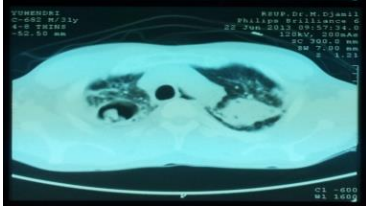






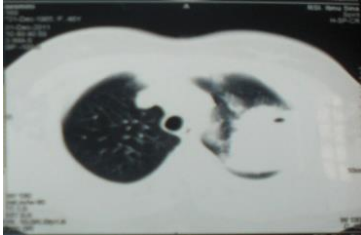
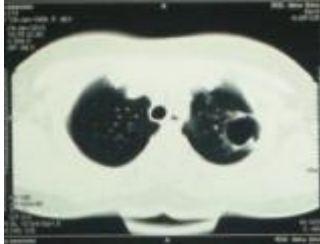
Patient	Pre	Post
1		
2	 	 

Table 4b. Radiologic findings pre and post therapy of six patients with pulmonary fungus ball

Patient	Pre	Post
3		
4		
5		
6		

DISCUSSIONS

Fungal could colonized preexisting cavity originated variety underlying lung disease like tuberculosis, sarcoidosis, bronchiectasis and bronchogenic carcinoma. Fungal mix with cellular debris, fibrin and inflammatory cell formed a mass that called fungus ball.¹ In this serial case we report six pulmonary fungus ball patients related to Tuberculosis, one in current tuberculosis and five as former tuberculosis. Tuberculosis has reported to be the most common underlying disease of pulmonary fungus ball (60%). It has been reported that the most common symptom associated pulmonary fungus ball is hemoptysis.^{1,3,4} It is similar with our series. Three of our patients had massive and recurrent hemoptysis and the rest just recurrent hemoptysis. The cause of haemoptysis is neovascularization of the diseased

segment from the internal mammary, intercostals and phrenic system of vessels. The pulmonary vascular system may also contribute to neovascularization. Other symptom that present in our series are chronic cough.

The apical portion of upper lobe especially right upper lobe were the common sites of disease in this series, which seem to reflect an association with pulmonary tuberculosis. Plain chest radiography is usefull in demonstrating the presence of a mass within a cavity. The lesions have been more frequently found in the upper lobes of the lungs, reflecting the predisposition of tuberculosis to cavitate in these areas A typical radiologic finding of pulmonary fungus ball is a solid, round or oval mass with soft-tissue opacity within a lung cavity, manifesting an “air crescent sign”

without significant enhancement.^{1,2,4} In our series, all patients had typical radiograph appearance both in plain chest x-ray and thoracic CT scan.

Surgery has generally been considered to be mainstay of treatment for pulmonary fungus ball. The main indication for surgery is massive and recurrent hemoptysis. The major mode of therapy for pulmonary fungus ball has been surgical resection of the cavity and removal of the fungus ball. Lobectomy is the most commonly employed procedure, although segmentectomy is sometimes adequate and pneumonectomy is occasionally required. Antifungal therapy is rarely considered as main treatment of pulmonary fungus ball. The main indication for medical therapy has been that the patient is not fit for surgical intervention or there is concern about concomitant tissue invasion by the fungus. As in our series, only two patients underwent lobectomy and the patients had no longer hemoptysis. Four others couldn't perform surgical treatment because of the patient had poor lung function (1) and rejection (3). For those, we gave antifungal as the treatment; fluconazole and itraconazole. Itraconazole has been used with some reduction of size of the fungus ball and has been shown being well penetrate in to the lung cavity.⁸ Fluconazole is extensively used for the prevention and treatment of superficial and invasive *Candida* infections.⁹ In our series, two patients with itraconazole for six months showed no more hemoptysis and decreasing in volume of fungus ball that caused by from *Candida parapsilosis* and *aspergillosis* radiologically. One patient responded with fluconazole for six months. Only one patient showed poor response from itraconazole and fluconazole clinically and radiologically.

CONCLUSION

Preexisting cavity in pulmonary tuberculosis and former pulmonary tuberculosis, renounce the incident of pulmonary fungus ball which need lobectomy as definitive treatment. In condition where they can't perform surgical treatment, antifungal can be alternative treatment and gave good outcome. Antifungal may create the opportunity for patient that

ineligible to perform surgical treatment. Nevertheless, larger number of patients and multicentre site still required to get more reasonable recommendation.

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