Surgical treatment for pulmonary aspergilloma in seventeenth years old female: case report

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Abstract. Aspergillosis is defined as a mycosis group caused by various pathogenic fungi of the Aspergillus genus. Aspergillus has more than 900 species that cause infection in human. The most common Aspergillus species that cause infection is Aspergillus fumigatus, about 90%. Other species, Aspergillus flavus, about 10% cause invasive disease. Have been reported a young girl 17-year-8-month-old woman was admitted to emergency with complaints of coughing up blood. The patient has diagnosed an aspergilloma and treated with thoracotomy bilobectomy right lower lung based on thorax scan. The patient took Fluconazole and surgical bilobectomyfor treated the aspergilloma and got improvement.

1. Introduction
Aspergillosis is defined as a mycosis group caused by various pathogenic fungi of the Aspergillus genus.[1] Aspergillus has more than 900 species that cause infection in human. The most common Aspergillus species that cause infection is Aspergillus fumigatus, about 90%. Other species, Aspergillus flavus, about 10% cause invasive disease. Aspergillus niger and Aspergillus terreus cause about 2% of invasive disease, respectively.[2]

Characteristic of host immune response determines the type of disease that will appear in Aspergillus exposure in order to be classified as saprophytic type in aspergilloma, allergic-type in allergic Aspergillus sinusitis, allergic bronchopulmonary aspergillosis (ABPA), pneumonia hypersensitivity, and invasive type as in invasive aspergillosis which is one form of disease due to hyperreactive immune response to Aspergillus fumigatus without tissue invasion.[1,2] In ABPA almost all abnormalities are found in asthmatics or cystic fibrosis especially those with atopic. The incidence of the disease varies widely and is estimated approximately about 7-18% of asthmatics and 5-10% of people with cystic fibrosis. Rapid diagnosis and early treatment are expected to prevent disease progression, pulmonary parenchymal defect, and pulmonary function impairment.[2,3] Surgery has been reserved for patients with unilateral, localized disease in IPA where curative resection is possible, as well as in patients with infection abutting the main pulmonary vessels to avoid fatal hemoptysis.[4,5]

2. Case
SRBS, female, age 17 years 8 months, with a major complaint of coughing up blood and after diagnostic procedures diagnosed with right pulmonary aspergilloma. The patient was treated in hospital for 18 days. On the first day of treatment, we are found anemia condition in laboratory examination. On physical examination we also found Symmetrical fusiform, suprasternal retraction,
right hemithorax breath sound was weakened and left hemithorax breath sound was normal. On September 6th, 2017 the patient took operative thoracotomy bilobectomy for indication of right pulmonary aspergilloma, duration of surgery was 7 hours 30 minutes, with the amount of bleeding ± 9000 cc. After the surgery patient was stabilized in a pediatric intensive care unit for 7 days. During postoperative care, the patient's condition is unstable with respiratory disorders, the presence of active bleeding in WSD tube, fever, hypoalbuminemia, hypocalcemia, and negative fluid balance. FFP and PRC transfusion is done to treat anemia and active bleeding conditions. On the 9th day, the patient's treatment is improving. On the 10th day of postoperative, the patient is planned to move to inpatient room from PICU.

Figure 1. Chest X-Ray on July 24th, 2017.

Figure 2. CT-Scan on July 31st, 2017.
3. Discussion
Chronic pulmonary aspergillosis (CPA) is more common in the developing countries due to the high prevalence of pulmonary tuberculosis.[6,7] Alongside this there has been an increase in the number of invasive aspergillosis cases in developed countries related to immunosuppression in cancer patients having intense chemotherapy and for other autoimmune diseases.[8] Like most published series.[9,10] We did the gene expert for tuberculosis detection, but the result was negative.

In most patients, the respiratory tract is the port de entry of aspergillosis and the site of infection. The disease is classified according to the site of localization by the attachment of miselial colonization or invasion to the tissue that is affected by the immune status. Noninvasive diseases usually manifest as aspergillosis bronchopulmonary abscess, aspergilloma, and allergic sinusitis, whereas invasive disease can extend to wide organ involvement, including lung, brain, eye, and skin. Immunodeficiency profile for anti-HIV was non-reactive, CD 4 was 35%, and CD 4 absolute was 407 cell/µL, which is still within normal range. So, we excluded immunodeficiency. Unfortunately, in this patient we did not performed titer of immunoglobulin G, and this is the limitation of this case.

3.1. Clinical Manifestation
Clinical symptoms characterized by fever accompanied by cellulitis, sinusitis, pneumonia, or esophagitis. Invasive aspergillosis is defined as a clinically marked infection with a microbiological etiology that does not respond to antibacterial agent.[2,4] This patient came with coughing up blood for almost 5 years and pale in 1 month. For the first time we assumed the diagnosis was pulmonary tuberculosis, but after several examination and laboratory findings were not confirmed.

In noninvasive aspergillosis such as ABPA often have a history of respiratory symptoms that worsen associated with asthma or cystic fibrosis. ABPA occurs in about 11% of patients with cystic fibrosis. The main complaints of the patient are wheezing and coughing. Greenberger and Patterson Classification (1986) divide ABPA.[11] Aspergillomas can be extremely variable in its course, ranging from undergoing spontaneous lysis (7-10%) to causing severe hemoptysis. Up to 30% of patients with minor hemoptysis may go on to develop life-threatening hemoptysis. Most series report hemoptysis as being the most common symptom with an incidence of around 80%.[12] The major complaint of this patient was coughing up blood or hemoptysis with volume about 50-500 ml/times, and it became worsen.

Computerized tomography (CT) examination in Aspergilloma found a solid circumscriptive mass and sign of increased airflow.[13] In the allergic bronchopulmonary aspergillosis (ABPA) based on thoracic images found parenchymal consolidation or bronchiectasis, the eosinophilic infiltrates and in CT scan examination found central bronchiectasis.[14] Thorax CT scan found solid mass and increase
air flow in right lung, the result was confirmed aspergilloma. The history of this patient was respiratory symptoms, we conclude as noninvasive aspergillosis.

3.2. Management
Amphotericin B is the most widely used drug as the first effective drug of choice for severe fungal infections and some systemic mycoses.[15] The aims of antifungal therapy are to prevent Aspergillus empyema and to prevent recurrence of CPA post-surgery or at least progression, if residual disease remains. Adjacent antifungal pharmacotherapy does not improve the results of surgical treatment for isolated pulmonary aspergillosis where a full curative resection has been carried out.[16] In this case, antifungal was given pre and post-operative, because it was not complete resection, and to prevent recurrence. We gave fluconazole based on availability in our hospital. Previous reports suggest that surgical resection for aspergilloma should be restricted to patients with severe hemoptysis who have adequate respiratory function.[17] Lobectomy is justified when there a risk of life-threatening hemoptysis, as long as the patient has a good pulmonary reserve, allowing a therapeutic success between 85 and 100%. In this case, surgical indication based on clinical manifestation, coughing up blood that happen in 5 years and become worsen day by day. Antifungal therapy alone did not showed improvement. So, we decided to perform surgical intervention, and continue antifungal after surgery. After 7 days at Pediatric ICU, this patient got improvement. The long-term results of surgical treatment for aspergilloma are encouraging. The rate of 5-year survival oscillates between 85% and 93%.[18-20]

4. Conclusion
Coughing up blood for 5 years was the main complain in this case. The diagnosis based on thorax CT scan. Anti-fungal and surgery were indicated for this patient. After fluconazole administration and lobectomy, the patient got improvement. Surgery results are good in terms of the low rate of recurrence and long-term survival. This patient requires a long-term follow-up.

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