Tanaffos (2005) 4(13), 71- 75

Membranous Tracheobronchitis caused by Aspergillus in a Lung Transplanted Patient: Case Report

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ABSTRACT

A form of aspergillus involvement of respiratory system is aspergillus tracheobronchitis which is mainly seen in HIV positive or lung transplanted patients.

This disease can result in a thick membrane caused by aspergillus and necrotic materials.

The treatment is with amphotericin B or itraconazole. In cases with thick and large membrane, it is usually necessary to remove the membrane with a rigid bronchoscope. A 60-year old man who underwent right lung transplantation as the result of pulmonary emphysema developed cough and dyspnea 3 weeks after the operation. In bronchoscopy, mucosal inflammation and a white thick membrane were noted in the right intermedius bronchus. In biopsy of the membrane, aspergillar hypha and fibrinoleuckocytic exudates were observed. The patient underwent treatment with Itraconazole and membrane debridement. The symptoms were all vanished and there were no complications in the bronchus in the later bronchoscopies except the minimal scarring at the site of lesion. ***(Tanaffos 2005; 4(13): 71-75)***

Key words: *Lung transplantation, Aspergillus, Tracheobronchitis*

INTRODUCTION

A form of aspergillus involvement of respiratory system is aspergillus tracheobronchitis which is mainly seen in HIV positive or lung transplanted patients (1, 2).

Aspergillus is a kind of fungus that can cause illness in immunocompromised patients and also in those without immunodeficiency (3, 4).

At least 5 different types of aspergillus related respiratory disorders have been found, including: infections which are mostly seen in immunodeficient Allergic aspergillosis (ABPA and allergic aspergillus sinusitis), saprophytic aspergillosis (pulmonary aspergilloma, sinus aspergilloma), aspergillus people (invasive pulmonary aspergillosis or acute and chronic necrotizing type, aspergillus rhinosinusitis) disseminated aspergillosis and finally obstructive airway aspergillosis or aspergillus tracheobronchitis (4).

Aspergillus tracheobronchitis is mostly seen in patients with HIV infection or lung transplant. It is notable that 25% of these patients have no immune

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deficiency (2).

Clinical manifestations of aspergillus tracheobronchitis are different from mild tracheobronchitis to ulcerative type and pseudomembranous tracheobronchitis (5).

Differential diagnosis of aspergillus colonization from actual (true) infection is difficult in lung transplanted patients. In symptomatic patients (80%) cough, fever and dyspnea (each one in less than 50% of the cases) chest pain, and hemoptysis are seen(4).

In most cases, the symptoms are mild and are attributed to other causes like transplant rejection.

As the disease progresses, the symptoms become more frequent and severe, and may cause unilateral wheezing and stridor (4). Death may occur due to respiratory failure as the result of airway obstruction.

Late diagnosis or late initiation of treatment may cause systemic spread of the fungus or even perforation of trachea or bronchus.

Bronchoscopy, biopsy, microscopic examination, and culture are the only means of diagnosis prior to death (4).

In bronchoscopy, the mucosa of the trachea and bronchus is red and ulcerative and contains profuse mucus secretions.

In patient with pseudomembrane, a thick gray layer is seen on the wall of the involved trachea or bronchus (4). Chest x. ray is usually normal at the beginning of the diseases but at later stages pulmonary infiltration may be seen.

In CT Scan, central lobular and peribronchial nodules may be seen. However, these findings are non-specific.

Biopsy of the material in the lumen usually shows necrotic cartilage which has been invaded by the fungi (1, 3, 6).

CASE PRESENTATION

A 60 year old non smoker farmer who had exertional dyspnea started 4 years ago and gradually worsened, came to Massih Daneshvari Transplant clinic in 2001.

In further evaluation, the patient had advanced pulmonary emphysema and bullous lung disease.

His pulmonary artery pressure was estimated at least 75 mmHg in echocardiography. The left ventricle was normal. In CT scan of the lung there were small and large bullae (maximum 12 cm) in both lungs specially on the right side. He was unable to do any activity and was using oxygen at home. The patient under went right lung transplant from a 17 year old donor who had brain death as the result of accident.

The donor lung had minimal purulent secretion, which was removed by suction.

Because of the severity of the recipient's condition, transplant operation was performed with antibiotic coverage (ceftazidime and vancomycin) of the donor and recipient before and after transplant. Two days after transplantation the patient developed mild reperfusion pulmonary edema which improved within 24 hours.

The drug used during post transplantation were ceftazidime, vancomycin and 3 pulse therapy with 500 mg methyl prednisolone (one of them administered during surgery) followed by 50 mg oral prednisolone daily, azatioprin 100 mg and cyclosporin 250 mg bid and ganciclovir 300 mg bid. From second week cotrimoxazol (2 alternating with 1 per day) was started.

Two weeks after the transplanatation, the patient developed dyspnea and stridor.

Suspecting stenosis of anastomotic site, emergency bronchoscopy was performed. The site of anastomosis had approximately 15 to 20 percent stenosis due to edema and inflammation but below the anastomosis, in the medial side of intermedius right bronchus, a thick large white membrane was

noted and the mucosa was erythematous. A biopsy was taken from the membrane and the report was fibrinoleuckocyte tissue with hypha of aspergillus. The patient was treated with parentral amphotericin, which was discontinued due to marked increase of creatinine level.

Inhalational amphotericin was started but the patient did not tolerate it due to bronchospasm crisis.

Oral itraconazole was started 200 mg tid. Three weeks after transplantation, the patient again developed dyspnea, fever, leuckocytosis and hilar infiltration of the transplanted lung. Bronchoscopy was repeated. Mucosal edema was decreased. However, the membrane was still present at its previous site and there was no purulent secretion. To prevent from possible spread of aspergillus, TBLB and biopsy was not performed. Due to improvement in signs of infection and negative smear of bronchial washing and absence of non-specific bacteria and fungi the patient was treated with pulse of methyl prednisolone with diagnosis of acute rejection.

The patient's general condition improved and he was discharged with gancyclovir, prednisolone, cyclosporine, azatioprin, and cotrimoxazol and itraconazole.

The patient was asymptomatic when he returned for check up after a month.

Bronchoscopy was repeated once more which again showed large and thick membrane at the right intermedius bronchus.

This time the membrane was completely removed by rigid bronchoscope (Fig 1, 2). Itraconazole was continued for 3 more months. At bronchoscopy performed 3 months later there was no abnormality, except a small scar at the root of membrane, and there was no stenosis at anastomotic site.

Only two types of antifungal drugs have been approved for treatment of aspergillosis, eventhough other treatments are under investigation. The effectiveness of these two current antifungal agents i.e. amphotericin B and itraconazole have been equal in different studies (7, 6, 4).

The choice of treatment is based upon toxicity, patient's tolerance and conditions affecting bioavailability of the drug.

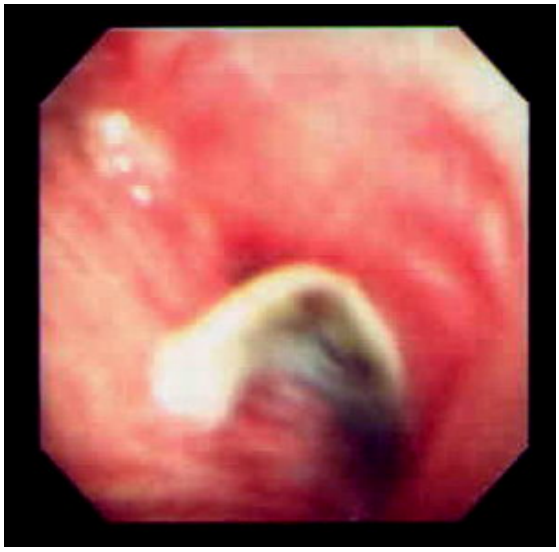

Figure 1. Bronchoscopy before Debridement of Membrane

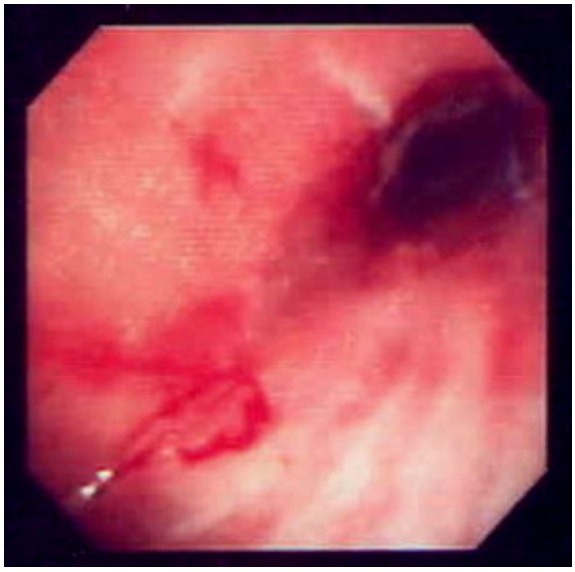

Figure 2. Bronchoscopy after Debridement of Membrane

DISCUSSION

Aspergillus tracheobronchitis, specially membranous type, is a rare complication after lung transplantation which usually improves with amphotericin B and/ or itraconazole treatment. If significant ulcerations are present, Intravenous therapy with lipid formulations of amphotericin B or caspofungin is started with a switch to itraconazole or voriconazole after treatment for 4 weeks (8). In many occasions removal of the membrane by bronchoscopy is required. In rare occasions, due to immunodeficiency caused by immunosuppressive drugs, the disease becomes disseminated and tissue invasion damages the lung and causes severe conditions of the patient which can lead to patient's death.

The patient which we discussed had aspergillus tracheobronchitis according to macroscopic findings at bronchoscopy and pathologic examinations. Fortunately with on-time treatment and removal of the lesions through the bronchoscope, the patient will have complete recovery.

Paying attention to this complication in lung transplanted patients with early diagnosis and treatment, improves the prognosis of the transplanted patient.

Acknowledgement:

We would like to thank the ICU personnel and bronchoscopy department of Masih Daneshvari and Imam Khomeini Hospital for their help and support in performing this research.

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