CASE REPORT

Productive cough and hemoptysis in elderly male with myelodysplastic syndrome

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Summary
Aspergilli are ubiquitous fungi with branched septate hyphae. Aspergillus produces a wide variety of diseases determined by the inoculating dosage, the ability of the host to resist infection at local and systemic levels, and the virulence of the organism. Invasive pulmonary aspergillosis is more common in neutropenic, immunocompromised patients. We describe the case of elderly male, recently diagnosed with myelodysplastic syndrome presenting with complaints of repeated hemoptysis.

Introduction
Aspergillus tracheobronchitis (AT) is an uncommon clinical form of invasive pulmonary aspergillosis. Airway disease due to Aspergillus ranges from relatively mild tracheobronchitis with excess mucus production and inflammation to ulcerative tracheobronchitis with ulcers and extensive pseudo-membranous tracheobronchitis.

Case report
A 74-year-old white male presented with productive cough, associated with mild production of blood-streaked sputum for a period of 4 weeks. On further questioning he admitted having shortness of breath on exertion, intermittent chest pain and weakness.

His prior medical history was significant for hypertension, myocardial infarction, stroke, COPD, aortic valve replacement, coronary artery bypass graft surgery, carotid endarterectomy and myelodysplastic syndrome. He had a remote history of smoking. Recently he received two courses of outpatient antibiotics with no significant improvement in clinical or functional status.

On physical examination he had normal vital signs, purpura and ecchymoses on the arms, scattered rhonchi bilaterally. Laboratory values were significant for anemia, thrombocytopenia and mild elevation of white blood cells.

Admission chest radiograph did not show any acute infiltrates. While in the hospital, the patient was treated for a respiratory infection, but he did not show significant improvement in symptoms. He continued to have productive
cough with blood-streaked sputum. Computerized tomography (CT) of the chest showed patchy bilateral reticular infiltrates with predominant peripheral distribution.

Flexible bronchoscopy showed a friable mucosa, white plaques more pronounced in the left upper lobe (Figure 1). These plaques were endoscopically biopsed. The biopsy showed Aspergillus species with acute and chronic inflammation of respiratory mucosa. The patient received Voriconazole for a total of 8 weeks. After the treatment he improved significantly with resolution of symptoms. The following surveillance bronchoscopy demonstrated a normal airway (Figure 2).

Discussion

Invasive AT is an uncommon form of invasive aspergillosis, where Aspergillus is limited predominantly to the tracheobronchial tree, and is isolated in cultures with histopathological proof of tissue invasion, necrosis, ulceration or pseudomembranes on bronchoscopy.

The first description of AT was done by Wheaton in 1890. This entity is commonly associated with lung/heart transplantation, AIDS, neutropenia, hematologic stem cell transplant and hematologic malignancy, but it was also reported in patients with burns, underlying lung disease, SLE, malaria, viral infections, diabetes mellitus, renal and hepatic failure. The reported incidence is around 7% in patients with hematological malignancies, or severely immunocompromised; however, about 25% of patients with AT are not apparently immunocompromised.

The airway form of Aspergillosis is subdivided into obstructive tracheobronchitis where thick mucous plugs are present without inflammation, ulcerative tracheobronchitis with limited involvement of the tracheobronchial tree and pseudomembranous necrotizing bronchial aspergillosis with membranes containing Aspergillus and extensive inflammation of the tracheobronchial tree.

Host immunodeficiency (55% with neutropenia), T-cell abnormalities and altered local defense mechanisms (endotracheal tube, anastomosis in lung transplant) play a significant role in pathogenesis. AT is more common in less severely immunocompromised patients, which may explain the endobronchial localization. Young et al. observed that patients with AT were less neutropenic and had less exposure to steroids and cytotoxic drugs than did the patients with pulmonary parenchymal involvement.

Clinically 80% of patients with AT are symptomatic presenting with -specific complaints such as fever, dyspnea, chest pain, cough, hemoptysis, but each symptom is only seen in less than 50% of patients. On auscultation unilateral wheezing can be heard when airways are obstructed by inflammation, mucus plugs and fungal masses.

Chest radiograph may not be helpful in the diagnosis of AT and varies from normal to bilateral consolidation. CT findings might show peribronchial consolidation/wall thickening, with centrilobular nodules and branching linear opacities known as “tree-in-bud” pattern. Bronchoscopy is diagnostic, where yellow-white pseudomembranes are seen, but endobronchial biopsy may be hazardous because of possible transmural and vascular invasion.

Assays for the detection of the fungal cell wall constituents (galactomannan, (1,3)-b-D-glucan) have high sensitivity in patients with hematological diseases, and low sensitivity in patients with low risk for neutropenia. A leakage of fungal cell wall components into the circulation will depend on tissue invasion, causing limitation of these tests in patients with AT. For instance, in one of the series of patients who were diagnosed with AT, the highest galactomannan serum ratio was below the cut-off level.

AT is fatal in about 40% of cases despite appropriate therapy with a noticeable increase of mortality rate in the pseudomembranous necrotizing group (>90%) and in mechanically ventilated patients.

Management is similar to the other forms of invasive aspergillosis. Treatment with azoles appears to be superior to that of systemic amphotericine B. In cases of invasive aspergillosis refractory to conventional treatment Caspofungin is indicated. If pseudomembranes cause an obstruction, the treatment of choice is mechanical ablation or intubation with suctioning.
With the growing number of immunosuppressive agents, the incidence of Aspergillus infection has significantly increased. It warrants high clinical suspicion and awareness among the pulmonologists, which can result in a prompt diagnosis to facilitate early and appropriate treatment with an attempt to prevent mortality or at least decrease morbidity.

**Conflict of interest statement**

None of the authors have a conflict of interest to declare in relation to this work.

**References**