Invasive Aspergillus Pseudomembranous and Obstructive Tracheo-bronchitis in an Immuno-competent Patient

Ramesh S Pal¹, Sonam Spalgais², Amit Kumar Murar², Umesh Chandra Ojha¹

Abstract
A 19 year female, presented with life threatening haemoptysis and cough with minimum expectoration for 3 months. Bronchoscopy showed multiple nodules in airway. The direct microscopy and culture of sputum revealed fungal elements and Aspergillus flavus respectively. Serum Galactomannan was positive. Thus diagnosis of invasive aspergillus tracheo-bronchitis made. She responded to voriconazole. Aspergillus tracheo-bronchitis is a rare form of invasive pulmonary aspergillosis in immuno-competent host. Aspergillus spp in respiratory samples should not be routinely discarded as colonization.

Introduction
Aspergillus tracheo-bronchitis is a unique feature of invasive pulmonary aspergillosis (IPA). It represents isolated invasion of tracheo-bronchial tree by Aspergillus spp. The risk factors for invasive aspergillosis in critically ill patients include neutropenia, haematological malignancy, solid organ transplant, prolonged use of corticosteroid, inherited severe immuno-deficiencies, chronic obstructive pulmonary disease, chronic liver disease, diabetes mellitus and HIV infection.¹ Aspergillus tracheo-bronchitis present as obstructive, ulcerative or pseudomembranous disease; however they may coexist. Aspergillus tracheo-bronchitis may also be coexistent with other forms of aspergillus related pulmonary diseases.² The mortality rate of invasive pulmonary aspergillosis (IPA) exceeds 50% in neutropenic patients and reaches 90% in haematopoietic stem cell transplant recipients. Aspergillus spp can present as invasive tracheo-bronchitis even in immunocompetent. Cases involving patients with normal immunologic function are limited to individual reports³. We report a case of invasive tracheo-bronchitis in young immune-competent girl without involvement of pulmonary parenchyma with complete clinico-radiological improvement.

Case Report
A 19 year old female, presented with life threatening haemoptysis. She had cough with minimum expectoration for last 3 months. There was no history of any chronic illness in the past except two episodes of massive haemoptysis in last 15 days. She was admitted and treated with supportive treatment in the form of haemostats, cough suppressant, antibiotics and other symptomatic treatment. On examination her general physical examination was normal. Vitals were normal limit. On respiratory examination there was decreased movement of the chest wall in left mammary, suprascapular and interscapular regions. Breath sounds were decreased on the left axillary and infra-axillary areas. Fine crepitation in left infraclavicular area and occasional rhonchi were heard. Others systemic examination was normal. There was no history of pulmonary tuberculosis, chronic pulmonary disease, diabetes mellitus, hypertension, cancer chemotherapy, corticosteroid therapy, joint pain, recent surgery, use of antibiotic or viral fever. Her routine Haematological (Haemoglobin, TLC, DLC and platelets counts) and biochemical (KFT, LFT, blood glucose level and serum electrolytes) investigation were normal. Chest X-ray revealed collapse of left lower lobe (Figure 1). CECT chest showed sub-segmental collapse of left lower lobe with partial luminal obstruction of left main bronchus (Figures 2a and b). Fiberoptic videobronchoscopy detected multiple tiny nodules in trachea and left lower lobe bronchi with plugging of left lower lobe and dark brown intra luminal thready material protruding from it (Figures 3a, b and c). Bronchial aspirate from left lower lobe consisted of thready brownish material (Figure 3d). Cytology of bronchial aspirate showed infiltrate with fungal hyphae with septations suggestive of Aspergillus spp. Biopsy from nodules of tracheobronchial tree showed chronic non-specific inflammation. The direct microscopy from sputum also showed fungal elements while culture of sputum grew Aspergillus flavus species. Patient’s serum Galactomannan was done and showed positive result. So patient was diagnosed with invasive aspergillus tracheo-bronchitis as per ERS criteria.⁴ Patient was further investigated with including serological test for HIV, hepatitis B and C which were negative. Immunoglobulin level of IgG/IgA and C3, C4 complement component were also normal. Treatment was started with intravenous voriconazole for one month followed by oral voriconazole for next 2 months. She was discharged on improvement. Her chest X-ray improved with resolution of left lower collapse (Figure 4). Repeat serum Galactomannan was negative after 3 month of treatment. On follow-up for last one and half year, the patient had no history of haemoptysis.

Discussion
Aspergillus is a saprophytic filamentous fungus, wide spread in the environment. Transmission occurs via inhalation of aerosolized spores Although Aspergillus can affect any organ system, the respiratory tract is involved in more than 90% of
affected patients. On reaching the alveoli, these spores germinate to give hyphae and colonization of fungi takes place, leading to infarction, necrosis, edema, and haemorrhage in distal tissue. It can give rise to various clinical conditions depending upon the host’s immunological status. Invasive pulmonary aspergillosis (IPA) is now recognized as an important cause of pulmonary morbidity with a mortality rate near 80%. Aspergillus tracheobronchitis (ATB) is a rare presentation of IPA occurring infrequently with absence of pulmonary parenchyma involvement. Patient affected with ATB are most often immuno-compromised secondary to hematological malignancy, HIV/AIDS, solid organ transplant or chronic steroid therapy. ATB has also been described in patients with connective tissue diseases, hepatic failure and obstructive lung disease. Many published cases of IATB have not been diagnosed until post mortem. Chest computed tomography was useful to detect bronchial obstruction and left lower collapse in present case. Performing bronchoscopy with microscopic examination of tracheal and bronchial specimen is the most sensitive diagnostic tool for early diagnosis of pseudomembranous aspergillus tracheo-bronchitis (PMATB) and obstructive airway tracheo-bronchitis (OATB). Characteristic finding on bronchoscopy includes tracheal ulcer, raised nodules and presence of pseudomembrane in distal trachea and bronchus as in this case. Mainstay of therapy remains early diagnosis and initiation of antifungal therapy.

Conclusion

Aspergillus tracheo-bronchitis is a rare form of Invasive pulmonary aspergillosis in immune-competent host. The finding of Aspergillus species in respiratory tract samples in critically ill patients should not be routinely discarded as colonization, even in immune-competent hosts.

References