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International Journal of Current Research
Vol. 7, Issue, 10, pp.21229-21231, October, 2015

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

CASE STUDY

ENDOBRONCHIAL ASPERGILLOSIS, A RARE CASE

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ARTICLE INFO

Article History:
Received 21st July, 2015
Received in revised form
09th August, 2015
Accepted 25th September, 2015
Published online 20th October, 2015

Key words:

Aspergillosis, Biopsy, Bronchus.

ABSTRACT

Invasive pulmonary aspergillosis is the most common form of infection by aspergillus species among immune-compromised hosts, involving respiratory tract in 90% of cases. Although this infection frequently involves the lung parenchyma, it is unusual to find it limited to tracheobronchial tree, a condition known as invasive aspergillus tracheobronchitis (IATB). Endobronchial Aspergillosis, a variant of Invasive Aspergillus tracheobronchitis, a rare manifestation, where disease is limited to tracheobronchial tree without invasion of lung parenchyma.

***Citation*:** Deepak, U.G., Vinod Joshi, Agarwal, K. C., Sanjay, S., Narendra, U. and Mohan, J. 2015. "Endobronchial aspergillosis, A rare case", *International Journal of Current Research*, 7, (10), 21229-21231.

INTRODUCTION

A 45 year old male presents with complaints of dry cough, breathlessness on moderate exertion since last one and half months, symptoms were insidious in onset and gradually progressive associated with constitutional symptoms like fever, malaise and weight loss. Patient was adequately treated for pulmonary tuberculosis 15 years back. Patient is a known diabetic since last 8 years for which patient is on oral hypo-glycaemic drug metformin 500mg bd. sputum smear for AFB was negative. A routine laboratory investigation shows Hb 11.2gm%, TLC 13200/cumm, differential count shows neutrophils 80 %; lymphocytes 17%; eosinophils 03% and platelets 2.8 lacs/cumm, RBS 223 mg/dl. LFT and RFT were within normal limits. HIV and Hbsag was negative. Chest X-ray showed inhomogenous opacity in left lung with ipsilateral mediastinal shift. spirometry shows moderate obstructive pattern. CT scan chest shows patchy air space consolidation with loss of volume of left lung and compensatory hyperinflation of right lung. Since CT Scan also showed soft tissue opacity in left upper lobe bronchus causing its abrupt cut-off, we planned for bronchoscopy. On bronchoscopy, a fungating, polypoidal growth was seen at the opening of left upper lobe bronchus covered with necrotic material. 3- 4 Biopsies were obtained from the growth and sent for histopathological examination. Histopathological examination shows numerous fungal filaments having branching at acute angle associated with few spores. These filaments are present in a fibrinous background suggestive of aspergilloma bronchus. Aspergillin skin prick test type 1 was positive and serum aspergillin IgG was 24 IU/ml. We put patient on anti-fungal agent Itraconazole 200 mg /day in divided doses and Glibenclamide 1mg BD along with metformin since RBS was raised.

DISCUSSION

Human aspergillosis can be classically divided as invasive, saprophytic or allergic. Aspergillus fumigates is the species most commonly responsible for invasive aspergillosis, followed by Aspergillus flavus, Aspergillus niger and Aspergillus terreus (Barnes and Marr, 2006). Invasive pulmonary aspergillosis is a severe disease and can be found in severely immunocompromised patients, critically ill patients and those with COPD.

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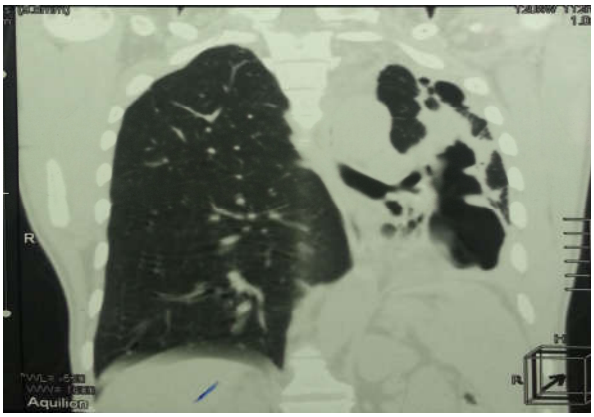
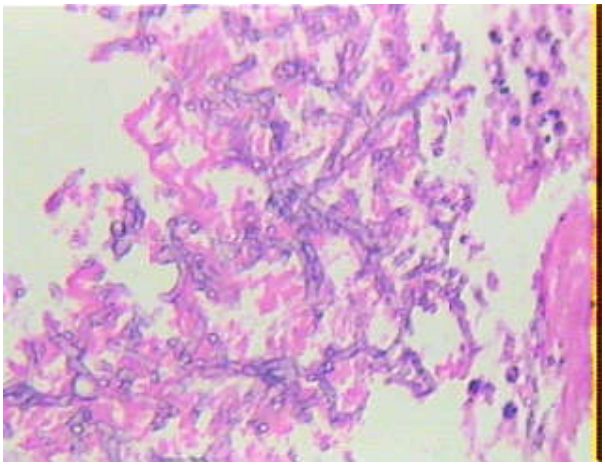
Chest x-ray shows inhomogenous opacity in left lung with ipsilateral mediastinal shift



CT Chest reconstructed coronal image shows abrupt cut-off of left upper lobe bronchus with compensatory hyperinflation of right lung



Histopathological examination shows numerous fungal filaments having branching at acute angle with spores

These fungi can use the lower respiratory tract, sinuses or skin as entry portals to cause invasive infections. Inhalation of airborne aspergillus spores results in colonization of the respiratory mucosal surfaces. The progression from colonization to tissue invasion and the type of disease that patients develop depend mainly on their immune status and on local defense mechanisms (Kramer *et al*., 1991; Clark *et al*., 1981). Three factors that always must be considered are, whether patient is immunocompromised (higher risk of Invasion), whether disease is progressing and hyphae are seen (signalling invasive disease) (Denning *et al*., 2003). Aspergillus tracheobronchitis, a variant of IATB is a rare and severe form of invasive pulmonary aspergillosis in which infection is entirely or predominantly confined to tracheobronchial tree, mainly affecting immunocompromised patients in approximately 75%. Young *et al*. reviewed the post-mortem findings in 98 cases of aspergillosis and found that the infection was limited to the tracheobronchial tree in only five patients (Young *et al*., 1970). Denning proposed a classification and unified terminology consisting of three types of Aspergillus tracheobronchitis (Tasci *et al*., 2006): obstructive tracheobronchitis, ulcerative tracheobronchitis and pseudomembranous necrotizing bronchial aspergillosis (PNBA) (Denning, 1995). The obstructive form is characterized by non inflammatory, massive intraluminal growth of aspergillus species associated with thick mucus plugs that generally produce atelectasis. Ulcerative lesions can penetrate through the tracheo-bronchial wall and can create bronchoesophageal or bronchoarterial fistulas that may produce fatal hemorrhage (Patel *et al*., 2006; Putnam *et al*., 1994).

PNBA is characterized by extensive formation of whitish pseudomembranes composed of hyphae, fibrin and necrotic debris. Rather than three distinct entities, these morphologic variants may just represent different stages in the development of IATB (Clark *et al*., 1981; Tasci *et al*., 2006). The outcome of ulcerative ATB is generally favourable with antifungal therapy, on the other hand, the prognosis is poor in patients with pseudomembranous and obstructive ATB with mortality reaching 78% (Patel *et al*., 2006). The clinical manifestations of IATB are entirely different from those of invasive pulmonary aspergillosis. The insidious presentation with non-specific symptoms and the paucity of findings in chest roentgenograms often delay the diagnosis, giving this disease an ominous prognosis (Machida *et al*., 1999; Sayiner *et al*., 1999). Airway-related symptoms such as cough, dyspnea, wheezing and hemoptysis are cardinal features.

There is little documentation of the radiologic features of IATB in the literature. Bronchial aspergillosis can present radiologically with an obstructive pneumonia. The diagnosis of IATB is almost always confirmed by bronchoscopic examination. If possible biopsy needs to be taken even though it is invasive. Histopathological examination is required to establish diagnosis (Wallace *et al*., 1998) since isolation of Aspergillus from respiratory secretion has poor predictive value for invasive pulmonary Aspergillosis in immunocompromised patients. Histopathological examination showing septate, acute branching hyphae is definitive for fungal infection (Hope *et al*., 2005), it also allows to rule out other diseases like malignancy and non fungal infections. This type of infection can progress very rapidly, leading to invasion of major vessels in the time between CT imaging and bronchoscopy, making routine

bronchoscopic manipulation and sampling of debris extremely dangerous and even fatal.

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