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A Rare Cause of Acute Respiratory Failure - Allergic Bronchopulmonary Aspergillosis

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ABSTRACT

Allergic bronchopulmonary aspergillosis(ABPA) is a complex immune hypersensitivity reaction to *Aspergillus fumigatus*, usually complicating the course of patients with asthma and cystic fibrosis.[1] The common radiological manifestations encountered are fleeting pulmonary opacities, bronchiectasis and mucoid impaction.[1] Herein we report a case of 40- year- old male patient who presented with acute hypoxaemic respiratory failure . On further evaluation, he was diagnosed to have ABPA.

I. INTRODUCTION

Allergic bronchopulmonary aspergillosis (ABPA) is a disorder caused by a hypersensitivity reaction to antigens of the Aspergillus species most frequently *Aspergillus fumigatus*.[2] ABPA was first described in 1952 by Hinson *et al*.[3] ABPA usually affects patients with allergic diseases, including asthma or cystic fibrosis(CF).[4] The various risk factors implicated are chronic obstructive pulmonary disease[5], low body mass index[6] , long term use of corticosteroids, lowered immune resistance , chemotherapy or after organ transplantation.[7]

II. CASE REPORT

A 40 - year - old male truck driver with no respiratory illness in the past presented to emergency department with complaints of breathlessness and cough with mucoid expectoration of 1 week duration. The breathlessness progressed from grade 1 mMRC to grade 4 mMRC over 1 week . There was no history of haemoptysis, chest pain , wheeze , fever, loss of weight or loss of appetite. He has no known comorbids. On examination patient was conscious, coherent , oriented to time and place , the heart rate was 125 beats per minute, pulse oximetric saturation was 76% on room air , respiratory rate was 37 breaths per minute and blood pressure was 110/80 mmHg. There was no pallor, icterus, cyanosis, clubbing, lymphadenopathy or pedal edema. Jugular venous pressure was not elevated .Auscultation of the chest revealed bilateral polyphonic wheeze in all the areas of chest. Chest radiograph revealed perihilar opacities . Arterial blood gas analysis was suggestive of type 1 respiratory failure (p^H - 7.44, P_aO_2 - 46 mmHg, $PaCo_2$ - 20 mmHg, HCO_3 - 21 mmol/L). HRCT chest revealed peri bronchial hyperdense opacities with air bronchograms in all the lobes . Fibreoptic bronchoscopy performed after intubation revealed thick secretions and mucus plugs in the right main bronchus and the left main bronchus . Therapeutic bronchial wash was performed and the secretions were aspirated and sent for gram staining, culture sensitivity , fungal staining and fungal cultures . Bacterial cultures were sterile, fungal staining with KOH wet mount showed septate hyphae and fungal culture grew *Aspergillus fumigatus*. Serum total IgE levels were raised (2300 IU/ml) and aspergillus specific IgE also raised (13.2 kUA l^{-1}). Skin test with aspergillus antigen showed cutaneous hyper reactivity (induration was 12mm). A final diagnosis of allergic bronchopulmonary aspergillosis was made ,and the patient was initiated on prednisolone 40 mg/day . After 4 weeks patient was symptomatically improved with radiological resolution .

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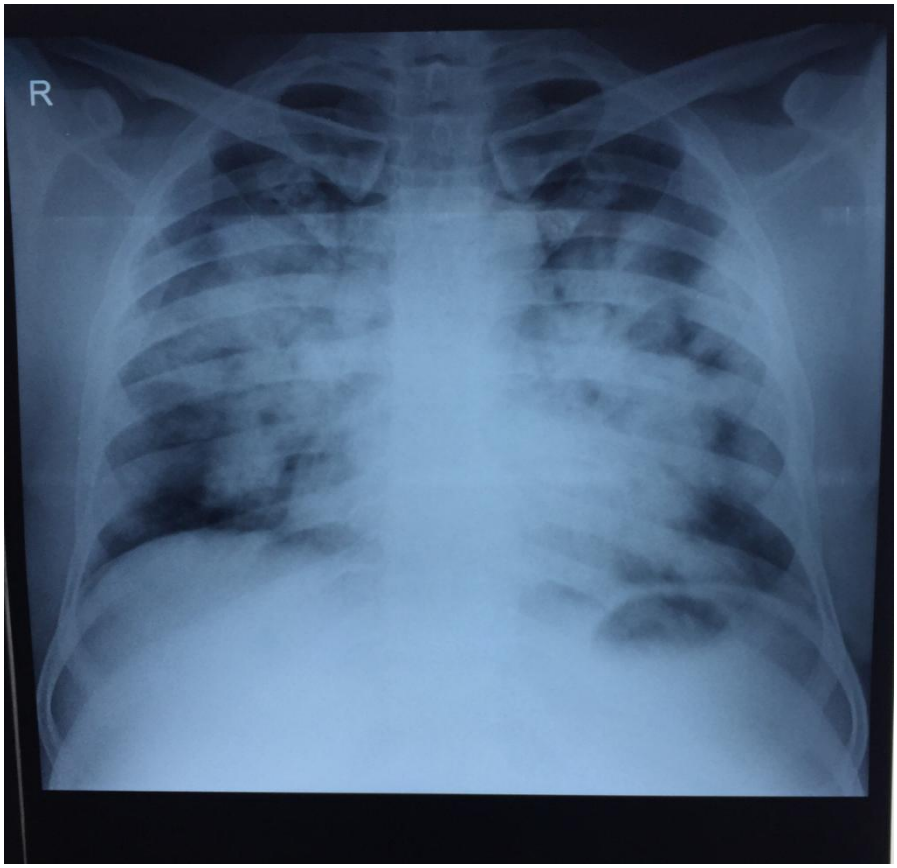

Figure 1: Chest radiograph showing bilateral perihilar homogenous opacities

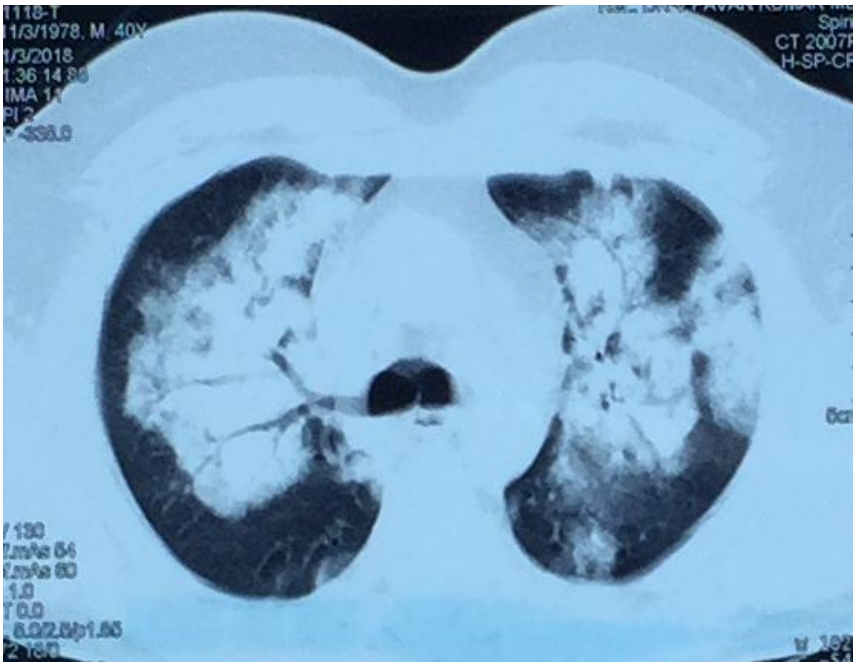

Figure 2

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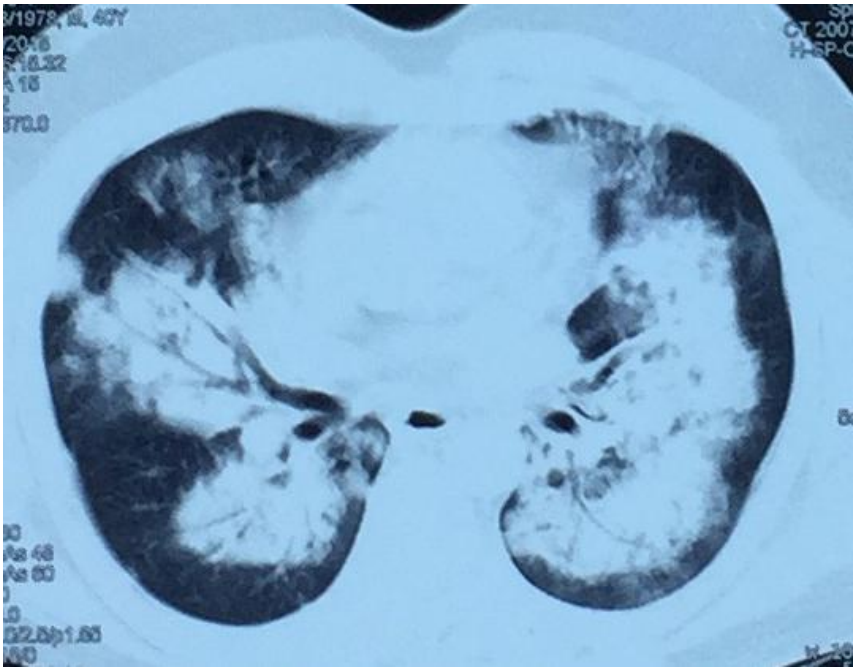

Figure 3

Figure 2 & 3 : HRCT showing Peri bronchial hyperdense opacities with air bronchogram

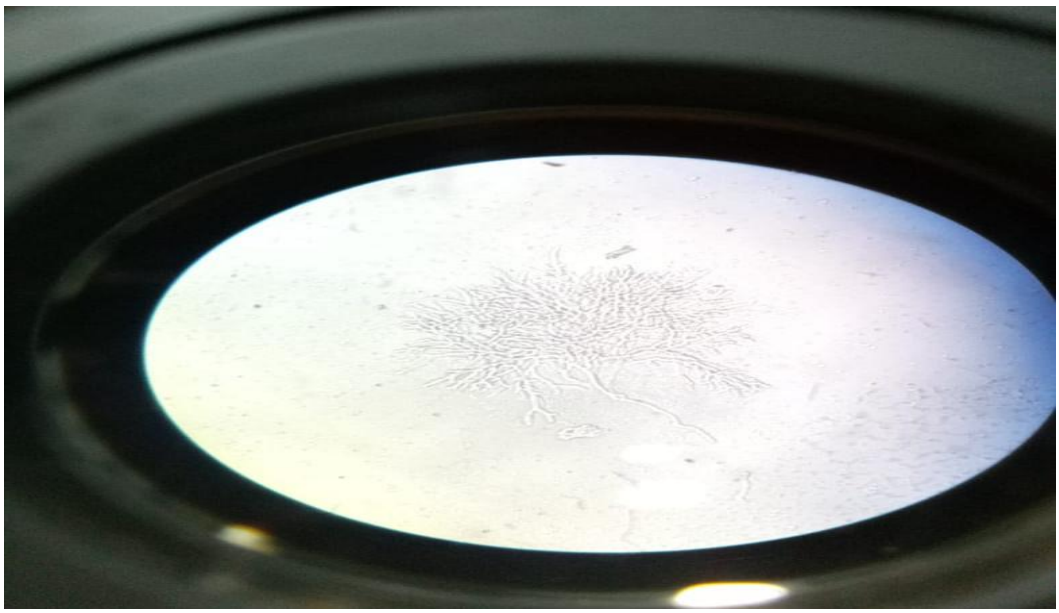

Figure 4: Potassium Hydroxide(KOH) wet mount showing branching hyphae

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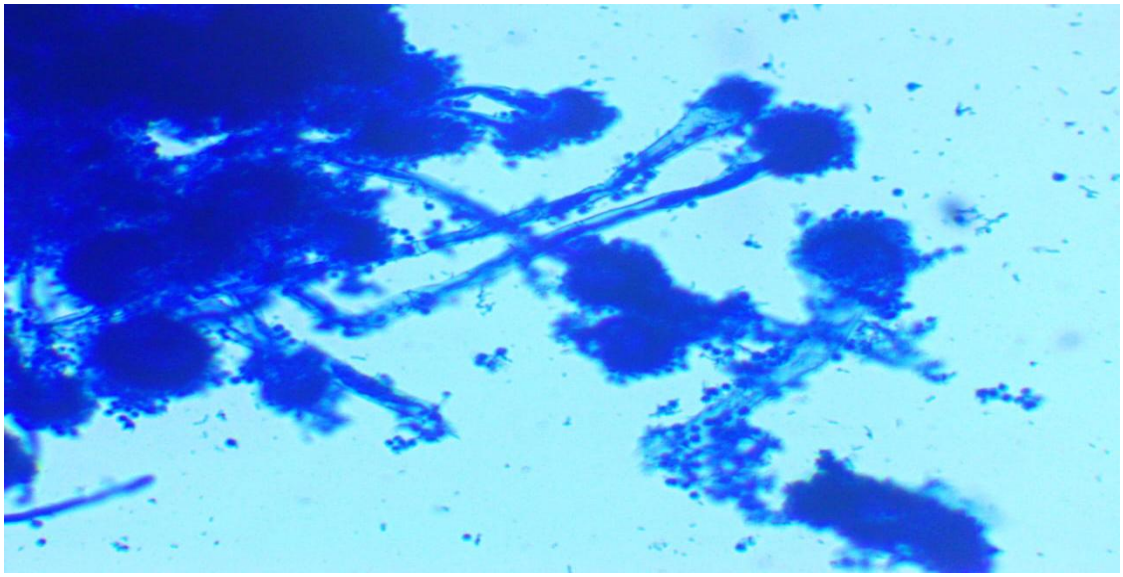

Figure 5

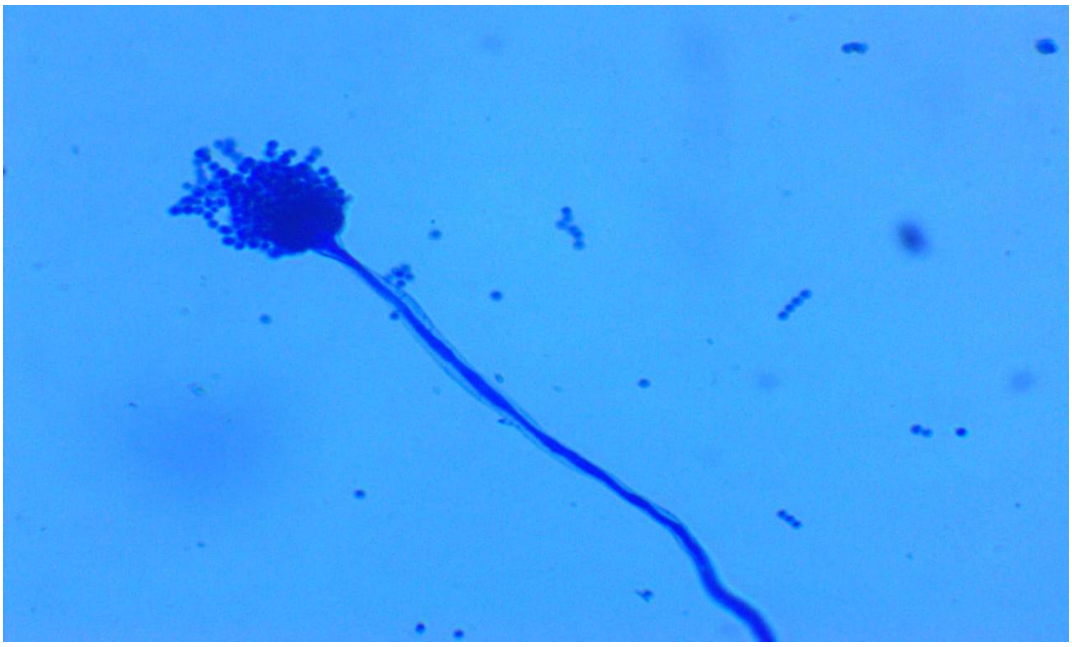

Figure 6

Figure 5 & 6: Lactophenol cotton blue mount showing Aspergillus fumigatus phialides and conidia extend from the top of the vesicle.

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Figure 7: *Aspergillus fumigatus* colonies on Blood agar plate .

III. DISCUSSION

Allergic bronchopulmonary aspergillosis (ABPA) is an idiopathic inflammatory disease of the lung, characterized by an allergic inflammatory response to colonization of the airways by aspergillus fumigatus or other fungi.[8] Among the atypical presentations of ABPA Berkin et al, in 1982 described four patients with complete or partial atelectasis without a history of asthma in whom the final diagnosis was ABPA[9]. In 2006, Agarwal et al described a case of 60 year old female evaluated due to the widening of the left hilum on chest x-ray later diagnosed as ABPA.[10] Primary treatment for ABPA is with systemic corticosteroids to suppress the allergic response rather than with antifungal therapy targeted at the fungal organism. Oral corticosteroids are still the therapy of choice for ABPA.

In this case the patient is truck driver and he transports bamboo from forest to the paper factory. Aspergillus fumigatus can contaminate many agricultural crops such as timber and fruit trees . The handling of moulded materials causes airborne dispersal of spores, mycelium fragments and fungal metabolites which can cause allergic immune response .This is the first case presented ABPA as bilateral perihilar homogenous opacities with acute respiratory failure.

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