Pulmonary Aspergilloma in Rheumatoid Arthritis

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Introduction

Aspergillus is a common opportunistic pathogen of the lungs especially in immunocompromised or immunosuppressed individuals. The radiological manifestations of aspergillosis include colonization of pre-existing cavity (Aspergilloma), invasive aspergillosis and allergic bronchopulmonary aspergillosis. Aspergillomas are also known to colonize rheumatoid lung. The aim of this presentation is to emphasize the evolution of the fungal ball in aspergillosis.

Case Report

A 50 year-old female, a known case of steroid dependent rheumatoid arthritis presented with fever and cough with haemoptysis of two weeks duration. On examination, the hands revealed adduction deformities at the metacarpophalangeal joints and she was febrile with bronchial breathing in the left infrascapular region. The radiograph of both hands showed periarticular osteopenia, erosions at the metacarpophalangeal, interphalangeal and carpal joints with secondary osteoarthritic changes (Fig 1). Chest radiograph showed evidence of a cavitary lesion with multiple internal strands presenting as spongework appearance with air lucencies trapped within (Fig 2). CT scan of the chest showed a large cavity occupying almost the entire left upper lobe with multiple internal thick linear strands interspread in the air filled cavity with presence of a small air fluid level (Fig 3). Bronchoscopy with bronchoalveolar lavage was carried out and hyphae were isolated. *Aspergillus fumigatus* was cultured from the aspirate. However, no acid fast bacillus (AFB) was isolated on microscopic examination or culture. Radiograph chest (Fig 4) and CT scan three weeks later revealed formation of a well defined rounded soft tissue density ball lying free in the cavity (Fig 5) with a crescent of air. The mass moved within the cavity with change of patient's position (Fig 6). This study demonstrated the evolution of a fungal ball from a spongework with entrapped air appearance in pulmonary aspergillosis.

Discussion

The clinical and radiological manifestations of pulmonary aspergillosis depend on the underlying status of the patient's lung parenchyma and immunologic

Fig. 1 : Radiograph of both hands shows typical features of rheumatoid arthritis

Fig. 2 : Chest radiograph shows a large cavitary lesion in the left upper lobe with spongework appearance

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Fig. 3 : CT chest shows a large cavity with linear strands

Fig. 4 : Chest radiograph (done three weeks later than Fig. 2) shows development of the fungal ball with an air crescent

response to the infecting agent, most commonly *Aspergillus fumigatus*. Thus, many different manifestations of pulmonary aspergillosis have been described, with distinct clinical, pathological, and radiological characteristics. Aspergillomas (mycetomas) result from *Aspergillus* colonization of pre-existing lung cavities [1]. *Aspergillus* colonization of pre-existing tubercular cavities is common. It is occasionally seen to complicate acute necrotising bacterial infection, lung infarction, necrotic neoplasm, bronchiectatic cavity, ankylosing spondylitis or rheumatoid necrobiotic nodules [2,3]. Pulmonary rheumatoid arthritis lesions are either non-specific (effusions, fibrosis, arteritis or obliterative bronchiolitis) or the specific necrobiotic nodules that constitute Caplan's syndrome in association with pneumoconiosis. The necrobiotic nodules are usually pleural or subpleural and rarely occur in the bronchial tree. Pulmonary necrobiotic nodules can appear before, coincident with or after the onset of arthritis [4]. Some nodules and lung cavities do not have the histology of the typical necrobiotic nodule but it is unlikely that they are fundamentally different [5]. CT scan of the chest

Fig. 5 : CT chest in supine position shows development of fungal ball within the cavity in the left upper lobe

Fig. 6 : CT section at the same level as Fig. 5 but in prone position shows that the mass moves within the cavity with change in patient's position

with lateral mobilizations leads to early diagnosis and precise anatomical localization of aspergillomas which is essential for effective treatment of their complications. It helps to identify small aspergillomas with possible communication between the main cavity and bronchial tree [6]. Classically, aspergillomas have been described as a solid soft tissue ball partially surrounded by a crescent of air within a cavity [7]. Typically the position of intracavitary opacity changes when the patient is scanned in supine and prone position [3]. Initially, the aspergilloma appears as an irregular spongework filling the cavity with intervening air spaces [6]. Presumably this appearance reflects the presence of irregular fongs of fungal mycelia mixed with some residual intracavity air. Furthermore, thickening of the wall of the cavity can be a finding of superimposed fungal infection prior to development of a fungal ball as has been demonstrated in this case.

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