PULMONARY CAVITIES COLONIZED BY ACTINOMYCETES: REPORT OF SIX CASES

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SUMMARY

Six cases of a cavitary pulmonary ball formed by Actinomycetes are reported. They were observed in the state of Bahia, Brazil. All patients complained of cough and hemoptysis and the pathological study showed bronchiectasis and small cavities in the lungs. The lesions contained micro-colonies of Actinomyces, identified by morphology, staining properties and culture in two cases (thioglycollate media). In the six patients the disease was limited to the lungs. In one patient grains were found, within micro-abcesses in the surrounding parenchyma. Probably the invasion occurred due to ulceration of bronchial mucosa that was covered by granulation tissue. The author suggests that as in nocardiosis actinomycosis may have an invasive form, a saprophytic one may and colonize pulmonary cavities.

KEY WORDS: Pulmonary cavities; Actinomycetes.

INTRODUCTION

The expression pulmonary fungus ball describes a syndrome resulting from the occupation of a pulmonary cavity, usually preexistent, by a mass formed by the entanglement of fungus filaments. The cavity colonized by fungus is frequently a result of previous tuberculosis; however, it may also be the result of bronchiectasis, drained abscesses, cystic infarct or cysts. The fungus mass consists of hyphae of Aspergillus sp.1,3,5 and, less commonly, Pseudallescheria boydii6,7,11, Coccioidoides inimitis, Candida sp or Zygomyces1,2.

Macrococolonies of Actinomyces1,4,8,10,12 or conglomerates of bacteria can also occupy a pulmonary cavity7. Nine cases of actinomycotic pulmonary balls have been reported, two of which in Brazil. With the exception of two of these cases, in which the etiologic agent was not isolated, the remaining ones were caused by Nocardia sp and Nocardia asteroides1,4,8,10,12.

This report deals with six cases of pulmonary ball consisting of a mass of a gram positive and non acid fast filamentous microorganism.

Details of the six cases are given in Table 1. Chest X-ray (case 4) is showed in Figure 1.

PATHOLOGY

The gross appearance of the lung tissue resected showed in all cases bronchiectasis and...
Fig. 1 - Chest X-ray showing irregular areas with condensation involving the anterior and posterior segments of the right upper lobe.

Fig. 2 - Cross section of the right upper lobe with detail of the cavities and grains. (Case 5)

Fig. 3 - H&E stain - Lung tissue with bronchiectasis and in the lumen, small grains represented by entangled filaments. (X 400). (Case 5).

Fig. 4 - Grocott stain - Entanglement of filament with inflammatory cells. (X 1000). (Case 5).
Cavities with irregular walls. These cavities were filled with a pasty dark-brown material and in case four small grains were also found (Fig. 2). Microscopically the bronchiectasis and cavities were covered by an altered mucosa with areas of metaplasia and ulceration (Fig. 3). Both were colonized by grains formed by thin coiled filaments non-septate and non-ramificated (Fig. 4). The microorganism were gram positive but non-acid fast. Case 5 showed also small abscesses centered by small grains and surrounded by neutrophils and mononuclear cells.

**DISCUSSION**

Nine cases of pulmonary ball caused by *Actinomycetales* have been reported. In seven of these cases the agent was isolated in culture and identified as *Nocardia asteroides* (3 cases) and *Nocardia sp* (4 cases). In the remaining two cases, both from Brazil, the microorganism could not be isolated in culture; however, the histological examination revealed gram-positive non-acid-fast filaments, suggesting *Nocardia asteroides* sp.

In the six cases presented in this report, the histological examination exhibited a microorganism presenting gram positive but non-acid fast filaments; in two of the cases the microorganism was isolated anaerobically in thioglycolate medium. Grains were found (case 5) in microabscesses in the parenchyma, close to the colonized cavity. These facts permit the identification of the agent as a species of Actinomyces, probably an Actinomyces. In all the six patients, the disease was limited to the lungs where, macro and microscopically, bronchiectasis or bronchiolectasis were characterized, beside chronic inflammatory alterations and pulmonary fibrosis. In the dilated bronchi the respiratory columnar lining was partially preserved while the ulcerated areas were covered by granulation tissue. This finding seems to explain the invasion of the parenchyma surrounding the actinomyccetal micro-colonies.
It is our proposition that the spectrum of actinomycosis is similar to that observed in nocardiosis, in both cases the fungus may be invasive, saprophytic or appear as colonies in pulmonary cavities.

RESUMO

Cavidades pulmonares colonizadas por actinomicetos: relato de 6 casos.

Seis casos de bula pulmonar intracavitária formada por Actinomyces são descritos. Eles foram observados no Estado da Bahia, Brasil. Todos os pacientes queixavam-se de tosse e hemoptise e o estudo histopatológico mostrou bronquiectasias e pequenas cavidades no tecido pulmonar. Tais lesões eram ocupadas por microcolônias de Actinomyces, identificados morfológicamente através de propriedades tintoriais e cultura em dois casos (nioço de tioglicolato). Nos seis casos, a doença estava limitada aos pulmões. Em um paciente grávida foram encontrados, próximo à cavidade colonizada, dentro de micro-abscesso no interior do parênquima. Provavelmente a inovação ocorreu devido à ulcerção da mucosa brônquica que estava coberta por tecido de granulação. O autor sugere que à semelhança da nocardiose, o espectro da actinomicose deve ter uma forma invasiva, uma saprophytica, podendo apresentar uma terceira, como colonizador de cavidades pulmonares pré-existentes.

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REFERENCES
