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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 (thioglycolate media). In the six patients the disease was limited to the lungs. In one patient grains were found, within micro-abscesses 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 actinomycosys 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 preexistant, 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, **Pseudoallescheria boydii**[6,7,11], **Coccidioides immitis**, **Candida sp** or Zygomicetes[1,2].

Macrocolonies of **Actinomyces**[1,4,8,10,12] or conglomerates of bacteria can also occupy a pulmonary cavity[9]. Nine cases of actinomicetic 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 asteroides** [1,4,8,10,12].

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 I. 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

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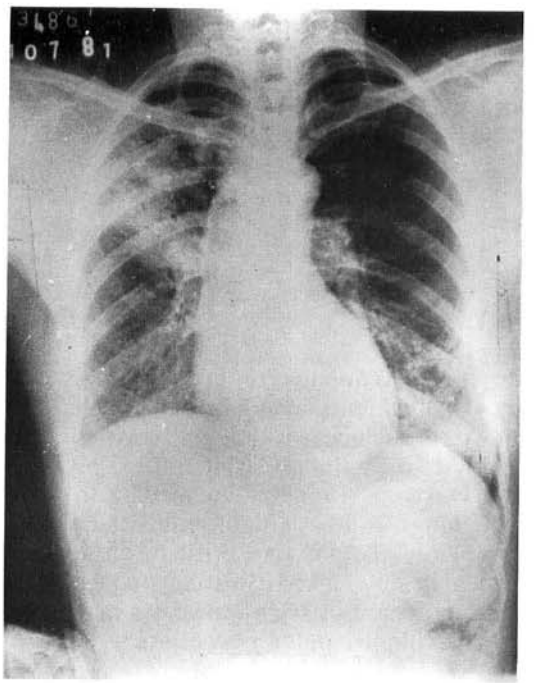

Fig. 1 – Chest X-ray showing irregular areas with condensation involving the anterior and posterior segments of the right upper lobe.

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

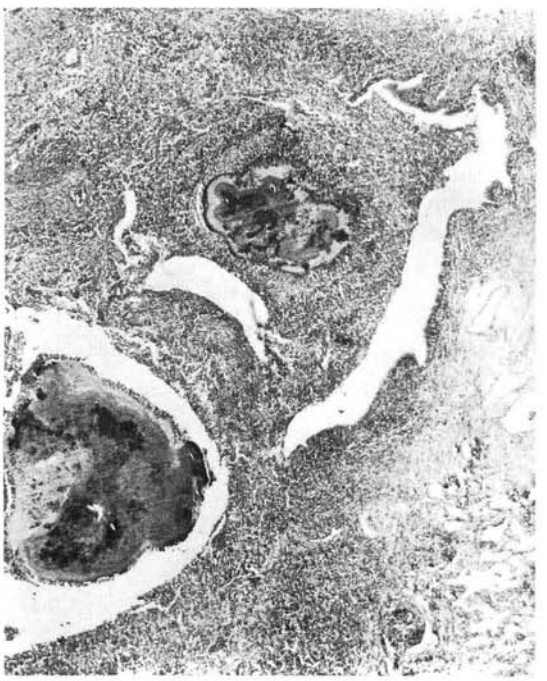

Fig. 3 – H.E. Stain – Lung tissue with bronchiectasis and in the lumen, small grains represented by entangled filaments. (X 400). (Case 5).

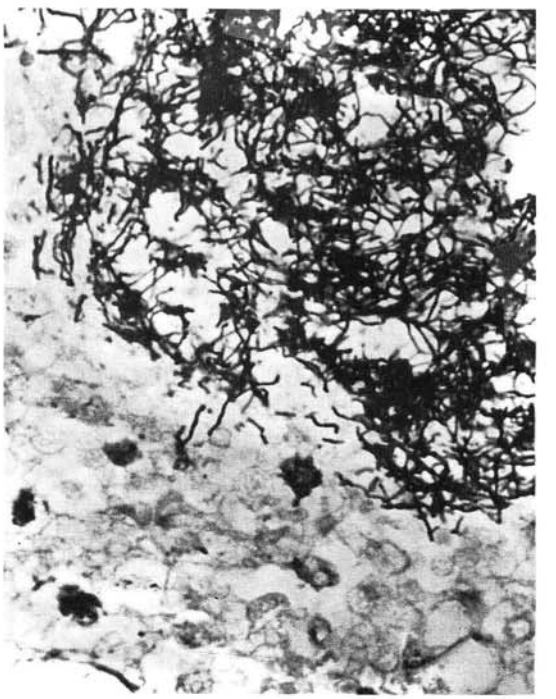

Fig. 4 – Grocott stain – Entaglement of filament with inflamatory cells. (X 1000) (Case 5).

TABLE I

Pulmonary cavities colonized by **Actinomycetaceae**
Clinical – Radiological and Pathologic Data

Case Number	Age	Sex	Symptoms	Chest X-Ray	Gross Appearance of Ressected Lung
1	30	Female	Cough, hemoptysis	Cavity and irregular consolidations in the left lower lobe.	Bronchiectasis and cavity with "fungus" ball
2	26	Male	Cough, hemoptysis	Cavity and irregular consolidations in the left lower lobe.	Bronchiectasis and small cavity with "fungus" ball
3	37	Female	Hemoptysis	Irregular consolidations in the right upper lobe.	Bronchiectasis and cavity with grains
4	57	Male	Hemoptysis	Irregular consolidations and cavity in the right upper lobe.	Bronchiectasis and cavity with "fungus" ball
5	26	Male	Cough, hemoptysis	Irregular consolidations and thickening of bronchial walls in the left lung.	Bronchiectasis and cavity with "fungus" ball
6	39	Male	Cough, hemoptysis	Irregular consolidations with small cavity in the left lower lobe.	Bronchiectasis and cavity with "fungus" ball

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[1,4,8,10,12]. 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 **Nocardiacease 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 Actinomycetes, 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 dilatated bronchi the respiratory columnar linning was partially preserved while the ulcerated areas were covered by granulation tissue. This finding seems to explain the invasion of the parenchyma surrounding the actinomycetacetal 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, saprophitic or appear as colonies in pulmonary cavities.

RESUMO

Cavidades pulmonares colonizadas por actinomicetos: relato de 6 casos.

Seis casos de bola pulmonar intracavitária formada por **Actinomycetes** 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 morfologicamente através de propriedades tintoriais e cultura em dois casos (meio de tioglicolato). Nos seis pacientes, a doença estava limitada aos pulmões. Em um paciente grãos foram encontrados, próximo à cavidade colonizada, dentro de microabscesso no interior do parênquima. Provavelmente a invasão ocorreu devido à ulceração 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 saprofítica, podendo apresentar uma terceira, como colonizador de cavidades pulmonares pré-existentes.

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