Pulmonary Aspergilloma*

Report of Two Cases

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Pulmonary intracavitary fungus ball, or pulmonary aspergilloma is a roentgenologic and pathologic entity which has been recognized for many years. Approximately 200 cases have been reported in the world’s literature.

Roentgenographic diagnosis is predicated on the demonstration of a thin-walled cavity containing an ovoid or spheroid mass. Visualization of an air meniscus which, wholly or in part, surrounds the mass, is essential for diagnosis. Involvement usually occurs in the upper pulmonary lobes. Approximately 20 cases of bilateral aspergilloma have been reported.

Mobility of the fungus ball may be demonstrated on radiologic study in various projections, or during fluoroscopy. Occasionally multiple intracavitary masses may appear as a chain of sausage-like densities. In such instances, multiloculated, thin-walled cyst or bleb-like formations are usually present (emphysematous cysts?). Usually the fungus ball presents a solid, homogeneous density; however, in some instances air bubbles, irregular coral-like calcification, or peripheral laminated calcification may be demonstrated. Ordinarily, posteroanterior or lordotic views will suffice for diagnosis, but when the pulmonary apices are involved or in cases with an associated pneumonitis, laminography may be necessary.

The most common presenting clinical complaint is hemoptysis which may be of recurrent type. Often this is the only complaint and the patient otherwise may be in

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Figure 1A: Note ill-defined density in the apical and infraclavicular portion of upper lobe of the right lung. Figure 1B: Laminography reveals three sausage-like soft tissue densities in the medial and apical portion of the right upper lobe demarcated at the apex and lateral border by a meniscus of air. Multiple bleb-like formations are also seen in the apical portion of upper lobe of the left lung.
excellent health. Hemoptysis usually results from erosion and ulceration of the cyst wall by the fungus ball.

**Case Reports**

**Case 1**

W. D., a 61-year-old white man, was admitted August 20, 1960 with hemoptysis. There was no other complaint.

At the age of 18, he was hospitalized four months because of tuberculosis. In 1931, he experienced an episode of hemoptysis, otherwise, he had been asymptomatic.

Survey films of the chest revealed increased opacity in the apex of the right lung (Fig. 1). Laminographic studies demonstrated multiloculated, cystic-like areas at the apical and medial portions of both upper lobes. Three contiguous, soft tissue densities measuring 3.5 x 2.5, 2 x 1.8, 2 x 1.3 cm. were demonstrated in the upper lobe of the right lung at its apical and medial portion and were demarcated by air.

At thoracotomy, fibrous adhesions were noted at the apex of the right side of the chest and an area of induration was noted in the upper lobe of the lung. Lobectomy was performed and pathologic study revealed well defined, capsulated cystic lesions containing masses of firm, partly calcified, greyish yellow material. *Aspergillus fumigatus* was cultured on study of this material. He was discharged on September 17, 1960 with complete recovery.

**Figure 2A:** Note curvilinear density (arrow) which is partly obscured by the clavicle. Increased density can be seen more medially.

**Figure 2B**

**Figure 2C**

**Case 2**

D. B., a 43-year-old white man, was admitted on October 28, 1962 with a five-day history of hemoptysis, and chronic productive cough during the last 15 years. He smoked two and one-half to three packages of cigarettes daily for 30 years. Otherwise, the history was noncontributory.

Physical examination was negative. Sputum studies were negative for acid-fast bacilli but were positive for *Aspergillus*.

Radiographic studies of the chest, which included laminograms, revealed a thin-walled cystic cavity in the lobe of the right lung measuring approximately 4.5 x 3 cm. containing a solid mass which was demarcated peripherally by a meniscus of air (Fig. 2).

Lobectomy was performed and pathologic study revealed a cavity in the medial apical portion of the upper lobe of the right lung which measured 4.5 x 3 cm. This cavity contained a mass of soft tan colored material measuring 4 x 2 x 2 cm. The mass was separated from the wall of the cavity by a space containing pink tan exudate and soft necrotic material. The wall of the cavity was smooth and communicated with one of the segmental bronchi through an opening 3 mm. in diameter. A small number of blebs were noted at the apex of the lung. Microscopically the bronchi exhibited marked hyaline thickening of the basement membrane with considerable fibrosis and marked diffuse chronic, inflammatory cell infiltration in the lamina propria. There was squamous metaplasia of the bronchial epithelium. The large cavity was lined with pseudo-stratified columnar epithelium, part of which was ulcerated and replaced with granulation tissue. There was no evidence of tuberculosis. The contents of the cavity consisted of a tangled meshwork of relatively broad, septate, branching mycelia from which colonies characteristic of...
aspergillus were grown. The fungus was limited to the cavity and there was no infiltration of the surrounding lung substance.

The postoperative course was uneventful and the patient was discharged on November 17, 1962 and since that time has remained in good health.

**DISCUSSION**

Most authorities believe that pre-existing pulmonary diseases, i.e., lung abscess, chronic tuberculosis, bronchogenic cyst, bronchietasis, hydatid disease, or malignancy is a prerequisite for involvement by the aspergillus fungus which, following invasion of a diseased area, leads a saprophytic existence. The fungus ball consists of a mass of mycelia lying free in a pulmonary cavity which communicates with the bronchial tree. Colonies of *Aspergillus fumigatus* may be grown on culture of the fungus ball. Less often *Candida albicans* will be identified, and in some instances, cultures may be sterile.

**REFERENCES**


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