In 1938 Dévé described a hitherto unreported form of aspergillosis of the lung, the megamycetoma, later also named aspergilloma4 or intracavitary fungus ball5.

This anatomo-radiological entity consists of a mass of mycelium filaments lying loose in a cavity in the lung and separated from the wall by a characteristic layer of air which is easily visible on radiography.

Recently we observed two interesting cases of mycosis of the lung: the first, a typical aspergilloma, but unusual because of its bilateral localization; the second, an endobronchial form of the disease, in which the whole left bronchial tree was filled with a mass of fungus identical with that found in an aspergilloma.

Case 1: This 52 year old man was admitted to the department of chest diseases on November 18, 1955, with haemoptysis and recurrent bloody sputum for one week.

In 1947, on a routine fluoroscopic examination, he was found to have some “opacity” in the apex of both lungs. Although no x-ray film was made at that time, it was thought to be an old and stabilised tuberculous lesion.

Up to 1951 he had no bronchopulmonary complaint. He then developed cough and blood-stained purulent sputum, but little fever. Tuberculostatic treatment was instituted for one month; he thereafter felt improved and resumed his occupation.

In 1954 he was admitted elsewhere for recurrence of bloody sputum. There was no fever and repeated examination of the sputum, both by direct and culture methods, failed to demonstrate tubercle bacilli.

At that time x-ray films of the lungs showed lesions identical with those observed when he was admitted to the hospital 15 months later. Despite the absence of acid-fast bacilli, he again was treated by tuberculostatics and rest.

Besides these bronchopulmonary symptoms, he gave a history of pain and stiffness in the back, shoulders and hips of 25 years duration, due to rheumatoid spondylitis.

On November 18, 1955, he was admitted to the department of lung diseases at Louvain, because of a new grave haemoptysis. On admission he did not appear acutely ill. The haemoptysis had ceased and there was no fever. Over the apex of the left lung anteriorily, there was dulness on percussion, and auscultation revealed bronchial breathing. X-ray films and planigrams showed a circular shadow with a small clear zone surrounding it, localized in the left apex (Figure 1). One identical but smaller lesion was noted in the right apex (Figure 2). From these radiological appearances a tentative diagnosis of bilateral aspergilloma was made.

Subsequent cultures of sputum and of a puncture biopsy of the left mass gave an abundant growth of a fungus which was identified as aspergillus fumigatus. Tubercle bacilli were never found. Operation was avoided on account of the bilateral localization of the disease and the accompanying spondylo-arthritis.

Case 2: This 53 year old woman was admitted on April 25, 1955, because of cough productive of copious purulent sputum and recurrent haemoptysis. She had enjoyed good health until September 1946, when she gradually developed cough and purulent expectoration. Acid-fast bacilli were not found in the sputum at that time. X-ray films showed atelectasis of the entire left lung clearing rapidly after treatment with penicillin, but leaving a patchy infiltration over the whole left lung.

She continued to have some cough and in 1948 atelectasis of the left upper lobe was noted. She refused treatment, as she had but minor complaints.

In September, 1954 a new period of cough and purulent sputum ensued which grew progressively worse. On two occasions she had haemoptysis. Again tubercle bacilli were not found in the sputum.

X-ray films in January, 1955 showed a destroyed left lung with opacification of the whole parenchyma and diffuse bronchiectasis. In the apex a giant thin-walled cavity was noted.

She was admitted to the department of chest diseases at Louvain on April, 1955, complaining of cough and copious purulent sputum. She had lost weight but otherwise appeared fairly well. Bronchial rales and impairment of the percussion note over the

*Department of Chest Diseases, University Clinics.

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left lung were noticed. X-ray films and planigrams were identical with those of January, 1955. On bronchography the left main bronchus was seen to be irregularly stenosed; further on the whole bronchial tree showed enormous saccular and cystic bronchiectasis. In many of these cystic dilatations filling defects were noted (Figure 3).

Repeated examinations of the sputum failed to demonstrate acid-fast bacilli. The white blood count was normal and there was no eosinophilia.

As the right lung appeared normal, a left pleuro-pneumonectomy was performed on June, 1955. The postoperative course was uneventful and she made a good recovery.

**FIGURE 1**

*Figure 1 (Case 1): Planigram of the apex of the left lung showing a circular shadow surrounded by a small and characteristic clear zone.*

**FIGURE 2**

*Figure 2 (Case 1): Planigram of the right apex showing an identical but smaller circular shadow also surrounded by a clear zone.*

**FIGURE 3 (Case 2):** Bronchography on admission; in most cystic dilatations filling defects, due to intrabronchial fungus masses, are noted.
Pathology: The left lung was markedly collapsed, the main bronchus and the ascending branch of the upper lobe just before the bifurcation, were grossly stenosed. There was diffuse bronchiectasis and almost all the bronchi were filled with amorphous debris, brownish in the large bronchi and whitish in the bronchioli. This material was nowhere adherent to the wall and could easily be removed. In the apico-posterior segment was a cavity, about the size of a lemon, with a white smooth surface, and containing but little of the brownish material. On microscopic examination the bronchi were lined by ciliated columnar epithelium. Microscopy of the bronchial wall revealed ciliated columnar epithelium beneath which was found a considerable inflammatory exudate. Immediately under the epithelium this consisted chiefly of plasma cells but in the submucosa lymphocytes predominated.

The large bronchi were filled with a dense meshwork of interwoven mycelia interspersed with and separated from the bronchial wall by a layer of pus (Figs. 3 and 4). Eosinophils were not noted. In the bronchioli the mycelium was sparser, the whitish material consisting chiefly of pus. Nowhere in the bronchial walls, the lung parenchyma or the lymph nodes was evidence of tuberculosis found.

Mycology: The mycelial filaments are septate, belonging probably to the group of Fungi Imperfecti. Cultures were not made.

Discussion

In the classical form of mycosis of the lung, the fungus invades the tissues, producing bronchial lesions, mycotic granulomata or abscesses in the parenchyma. Two other types are also recognized: the intracavitary fungus ball (aspergilloma) and the allergic form. Our first case is a typical aspergilloma: the history of recurrent haemoptysis and blood-stained sputum never containing tubercle bacilli, the good general condition, together with the radiological appearances, were highly suggestive of this disease. An Aspergillus Fumigatus was found in the sputum both by direct microscopical examination and by culture. The final diagnosis was affirmed by culture of the same fungus from puncture of the mass in the left apex.

Although no puncture was done in the right mass, the same etiology may be assumed since the radiological appearances were identical. Such a bilateral localization, visible on x-ray films, is a great rarity.

The allergic type was first described in 1952 by Hinson, Moon and
Plummer.\textsuperscript{3} It is characterized by recurrent collapse and consolidation in different parts of the lungs, caused by bronchial obstruction with typical "plugs." These plugs consist of sparse mycelium filaments aggregated together with mucus, fibrin, eosinophils, Curshman's spirals and Charcot-Leyden crystals, into rounded, brown, dull granular masses about one centimeter in diameter. The patients have asthmatic complaints and show blood eosinophilia.

The clinical course of our second case, especially the history of relapsing atelectasis, bears some resemblance to the description of Hinson, Moon and Plummer. However, in our case asthma and eosinophilia were lacking. No plugs were ever coughed up, and the atelectases were always confined to the left lung, the right one remaining completely intact. Moreover, the anatomopathological findings were quite different; in contrast to the usual composition of the plugs, the mass that filled the whole bronchial tree of this lung chiefly consisted of a very dense network of hyphae, containing few other elements. This is the microscopic appearance of a true megamycetoma or intracavitary fungus ball. We therefore believe it is a special form of such a megamycetoma: an endobronchial fungus mass.

Bronchiectasis frequently develops beyond a bronchial stenosis of any etiology. In our second patient, the restriction of the fungus growth to the post-stenotic part of the bronchial tree, seems to indicate that the fungus developed in a bronchus already bronchiectatic, and the theory that the fungus itself was the primary cause of the bronchial dilatation ("l'aspergilome bronchiectasiant" of Monod) cannot be accepted here. The cause of the stenosis of the left main- and upper-lobe bronchus remains unknown and no specific lesion has been found in the serial sections of the stenosed bronchus.

**SUMMARY**

Two cases of mycosis of the lung are reported. The first a typical aspergiloma, but with bilateral localization; in the second case the same fungus mass as found in an aspergiloma was filling the whole left bronchial tree. It is believed to be an endobronchial form of the same disease.

**RESUMEN**

Se describen dos casos de micosis pulmonar. La primera es un aspergiloma típico pero de localización bilateral. En el segundo caso se encontró el total del árbol bronquial izquierdo llenado por la misma masa fungosa que se encuentra en un aspergiloma. Se cree que se trata de una forma endobronquial de la misma enfermedad.

**RESUME**

Les auteurs rapportent deux cas de mycose du poumon. La première est un aspergilome typique, toutefois à localisation bilatérale; dans l'\textsuperscript{2} second cas, la même masse fungique que celle que l'on rencontre habituellement dans l'aspergilome remplissait la totalité de l'arbre bronchique gauche. Ils pensent qu'il s'agit d'une forme endobronchique de la même affection.
ZUSAMMENFASSUNG

Bericht über 2 Fälle von Mycose der Lungen.
Der erste ist ein typisches Aspergillom, jedoch mit bilateraler Lokalisation; bei dem zweiten Fall füllte die gleiche Pilzmasse, wie man sie bei einem Aspergillom findet, den ganzen linken Bronchialbaum aus. Es wird angenommen, dass es sich um eine endobronchiale Form der gleichen Erkrankung handelt.

REFERENCES