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Aspergillosis of the central nervous system

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The authors report an unusual case involving a 38 year-old man who developed a intracranial abscess caused by *Aspergillus* of the parietal lobe. Cerebral aspergilloma of an initial pulmonary origin developed in a patient with "Fungus Ball" secondary to tuberculosis sequelae. The diagnosis was made through the isolation of *Aspergillus* from the secretion of the brain abscesses. The patient was treated with drainage of the abscesses and Amphotericin B. He presented a progressive regression of the radiological images (brain and pulmonary) over a period of 55 days. This report emphasizes the importance of combined anti-fungal therapy and surgical resection as a treatment for cerebral aspergilloma. Furthermore, an early initiation of therapy should improve the prognosis in such cases.

UNITERMS: *Aspergillus*. Brain abscesses. Amphotericin B.

INTRODUCTION

Aspergilloma was the first mycotic infection described by Virchow in 1856, and a case of Aspergillosis involving the brain was reported by Oppe in 1897. *Aspergillus*, a soil organism found in warm, damp climates, usually infects a host who has some underlying debilitating disease. There are 330 species of *Aspergillus*, although only a few are pathological, with *Aspergillus fumigatus* the most common among man. Infection by *Aspergillus* has recently become being more frequent. This is probably a consequence of the increasing use of antibiotics, steroids,¹ cytotoxic drugs and antimetabolites. Other predisposing factors include: cardiac surgery with fungal

endocarditis; hepatic failure; Cushing's disease; and immunosuppressing diseases.^{2,3} Through the inhalation of the spores, the common focus of infection is the lung; the major site from which the infection develops.

CASE REPORT

A 38 year-old black male was admitted to the Central Emergency Unit of Santa Casa of São Paulo Medical School in São Paulo, SP, Brazil, complaining of weakness on the left side of his body, which had started the day before. The first symptoms began 15 days before, with a continuous and progressive throbbing headache. Ten days before admission to the hospital, the patient noticed the presence of tonic-clonic movements of his left arm and left leg for very short periods, 2 or 3 times a day. The day before admission, the patient felt a decrease of left side

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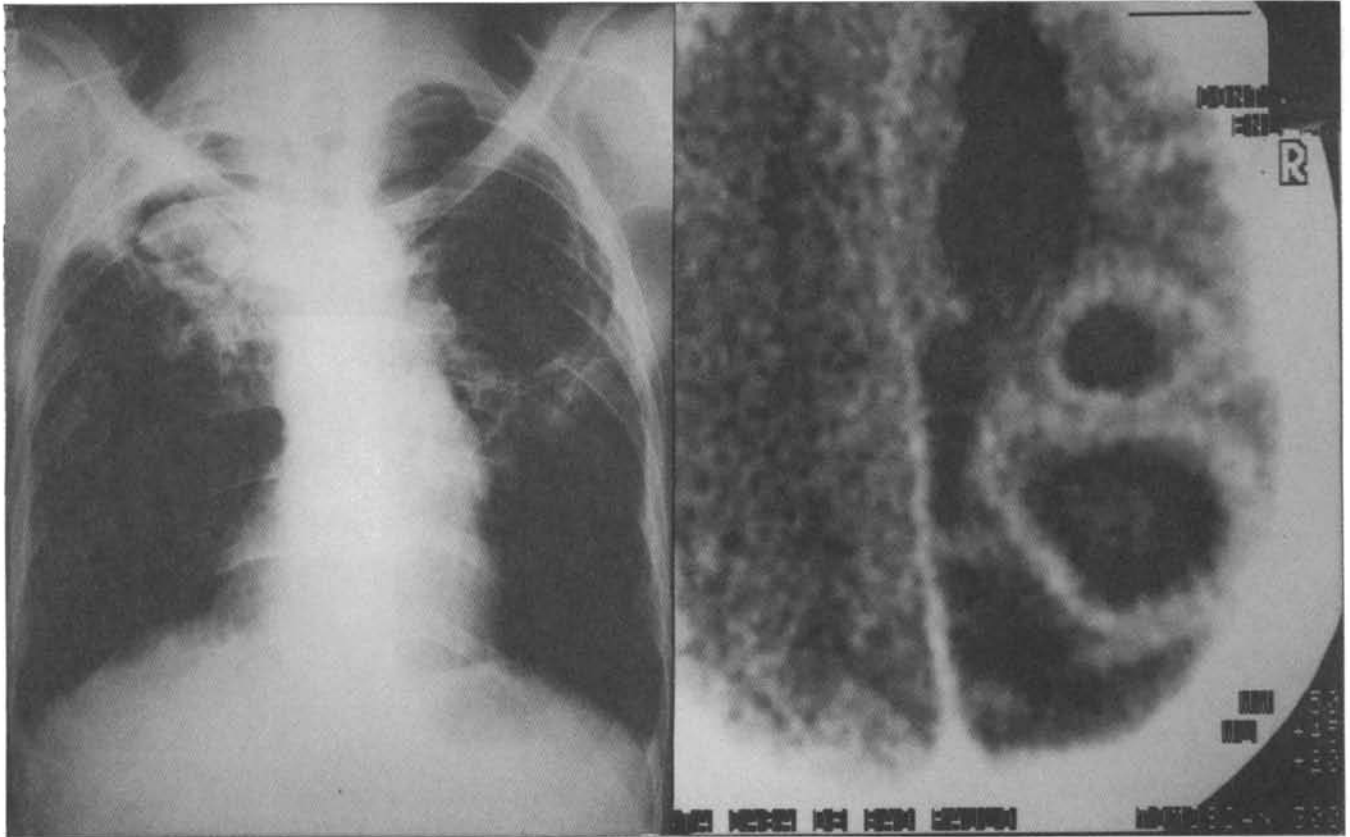


Figure 1 - Left (A). Chest x-ray shows well-defined "Fungus Ball" within a thick-walled right upper lobe cavity. Right (B). Contrast-enhanced, computed tomography reveals two large brain abscesses in the right parietal lobe.

muscle movement and a shift of the right side of his lips. The patient did not have fever, nausea or vomiting during this period. The patient mentioned that 17 years before he had pulmonary tuberculosis and was treated for one year. Seven years later the disease relapsed, and the treatment was started again for three additional years. The patient had been a painter and sandblaster for six years, up until seven years before his admission to hospital. He also used to smoke 20 cigarettes a day, and did not belong to the AIDS risk groups.

During the physical examination, there were observed signs of pulmonary consolidation in the upper right thorax. The neurological examination revealed the presence of a complete and disproportional left hemiparesis with brachial predominance. A chest x-ray showed the presence of a cavitory area in the right upper lobe with a tumoral image inside, suggesting a "Fungus Ball". Fibrous lines were also observed in both the middle and upper regions with right pleural apical thickening, and shift of the trachea to the same side (Fig. 1, left). The cranial x-ray was normal. A contrasted computed tomography (CT) scan of the brain showed two expansive processes in the right posterior parietal region. The lesion presented mass effect

with a shift of the median line to the left. There was an important hypodense area surrounding this lesion (Fig. 1, right). Acid-fast bacillus and fungus could not be found in the sputum tests. The results were negative for HIV antibodies (ELISA) and Western blot.

Twenty-four hours after admission, a surgical trepanation was indicated, with the drainage of purulent secretions (20 ml) from the brain abscess of the right posterior parietal region. The bacterioscopic exam was positive for *Aspergillus*. Treatment with dexamethasone (16 mg/day) and Amphotericin B intravenous (1 mg/kg/day) was started.

Due to the use of high doses of steroids, prophylactic treatment for tuberculosis was introduced. The culture of the material obtained was positive for *Aspergillus fumigatus* (thirtieth day of culture in Sabouraud's medium).

The patient received an accumulated dosage of 1500 mg of Amphotericin B during the time he stayed at the hospital. A control thorax X-ray at the end of this treatment showed the disappearance of the "Fungus Ball" inside the apical pulmonary cavity in the upper right lobe (Fig. 2, left). The CT scan of the brain showed involution of the abscess (Fig. 2, right).

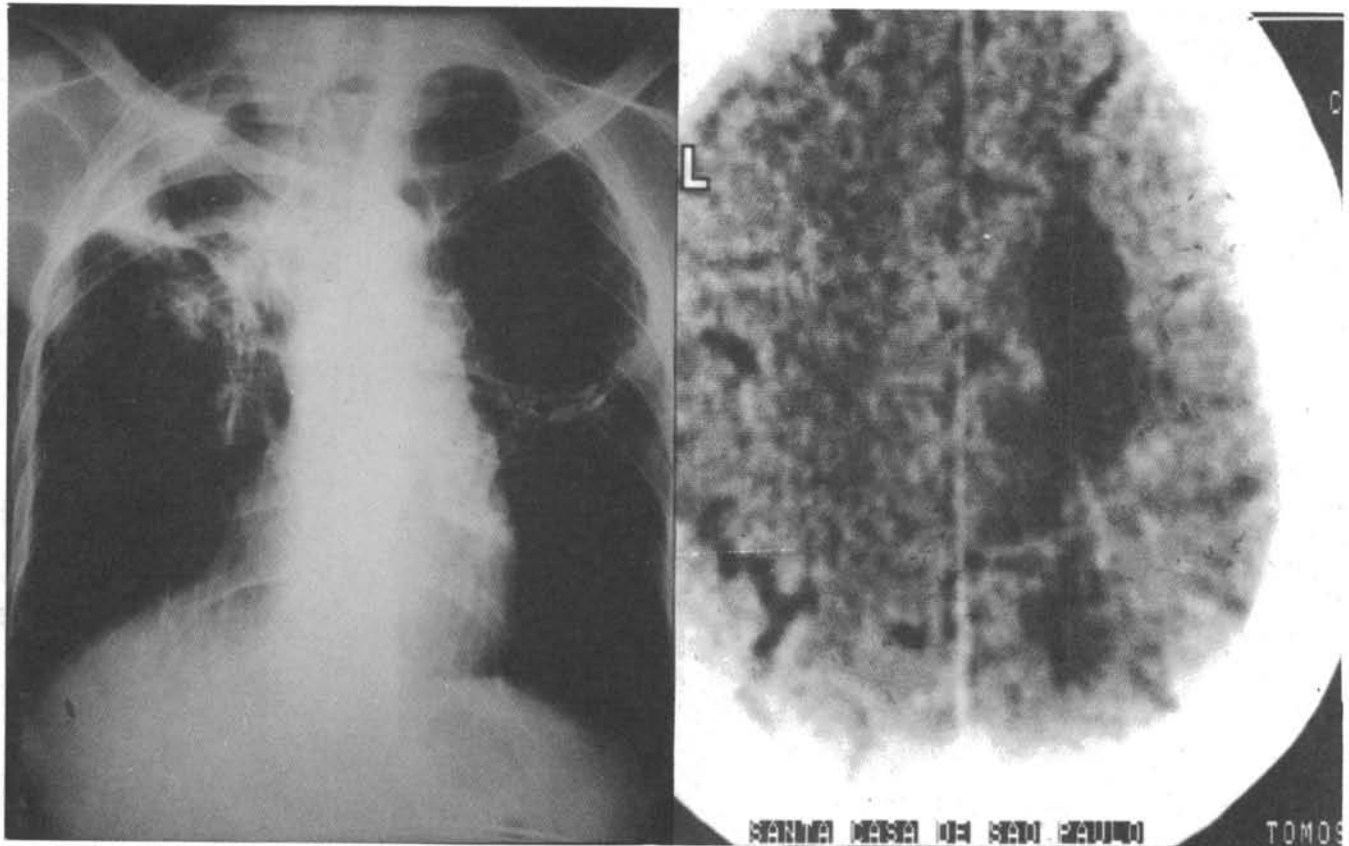


Figure 2 - Left (A). Chest x-ray shows absence of the "Fungus Ball". Right (B). Computed tomography shows involution of both abscesses, an area of decreased density only in the right parietal lobe, without a shift of the midline structures.

On the fifty-fifth day, the patient was discharged and prescribed only phentoin, izoniazid and rifampicin.

DISCUSSION

Aspergillosis is increasing in prevalence, especially in patients with chronic respiratory disease and immunosuppression. Among the immunosuppressed, aspergillosis is the second most common agent after candidiasis as an opportunistic mycosis. Both are increasing in frequency because of the improved methods of controlling bacterial infection.

The natural history of aspergilloma is quite variable. Lesions may remain stable for long periods of time, grow or shrink along with the surrounding cavity, or undergo spontaneous lysis (about 10 percent of the cases). Hemoptysis is encountered in 60 to 75 percent of cases. Sputum cultures are positive in 60 percent. Diagnosis requires a suggestive chest radiography combined with either positive serum precipitins (20 percent of cases) or a

positive culture obtained directly from the cavitory lesion (60 percent). *Aspergillus* may reach the central nervous system by three different routes. The first one is by hematogenous dissemination from a remote extracranial site, usually the lung.⁴ The second one is by the extension from a contiguous cranial focus. This focus is most often the nasal cavity and the paranasal sinuses from which the fungus may reach the intracranial cavity by direct propagation. The third possibility is by direct introduction into patients who develop intracranial Aspergillosis after neurosurgical procedures.

In our patient, pulmonary infection was suspected, although fungus in the bronchial secretion was not found. This suspicion was based on the radiological picture that showed a free cavity caused by pulmonary tuberculosis with a "Fungus Ball" inside. The diagnosis of cerebral Aspergillosis, probably via a hematogenous route, was made through an isolation of *Aspergillus* from the brain abscess. Based on the suspicion of pulmonary infection and confirmation of the cerebral Aspergilloma, intravenous Amphotericin B was introduced. The recommended dosage is 0.5 to 1.0 mg/kg daily. The total dosage should be no less than 2.0 grams, but the treatment was stopped

after completion of 1.5 g due to clinical and radiological improvement. Amphotericin B administered intrathecally and/or intravenously, and Itraconazole⁵ and Flucytosine⁴ administered orally are the three forms of therapy that have

demonstrated clinical usefulness. In our reported case, the patient was treated with continuous intravenous Amphotericin B and cerebral drainage, with clinical and radiological improvement.

RESUMO

Os autores relatam um caso raro de um homem de 38 anos, que desenvolveu abscesso intracraniano, interessando o lobo parietal causado por *Aspergillus*. O aspergiloma cerebral teve origem através de um aspergiloma pulmonar em um paciente com uma "bola de fungo" secundária a seqüela de tuberculose. O diagnóstico foi realizado através do isolamento do *Aspergillus* da secreção dos abscessos cerebrais. O paciente foi tratado com drenagem dos abscessos e Anfotericina B endovenosa. Apresentou regressão progressiva das imagens radiológicas (cerebral e pulmonar) num período de 55 dias. Este relato enfatiza a importância da terapia antifúngica associada à drenagem cirúrgica no tratamento do aspergiloma cerebral. Ressaltam também a importância da terapia precoce no prognóstico desses casos.

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