Case Reports and Reviews

Case Report

Pulmonary Cryptococcosis in a Patient with Cavitated Lung Metastasis

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Abstract

The opportunistic mycosis known as pulmonary cryptococcosis can be spread on by inhaling the spores of the *Cryptococcus neoformans* or *Cryptococcus gattii* complex. It can affect both immunocompromised and immunocompetent people and can manifest as clinically asymptomatic and symptomatic as hemoptysis, coughing, and/or chest pain. It can be detected by tomography. manifest as cavitations, consolidations, single or numerous masses, or focal nodules. We report the case of pulmonary cryptococcosis in a 77-year-old man who had cavitated lung metastases from tonsillar carcinoma. The mass behavior was distinct from other lung masses that were characteristic of his condition.

- Received Date: 10 Jul 2024
- Accepted Date: 18 Aug 2024
- Publication Date: 21 Aug 2024

Keywords

cryptococcosis, lung metastasis, pulmonary mycosis, hemoptysis

Case presentation

A 77-year-old man was assessed 48 hours ago for minor hemoptysis; he had no signs of hemodynamic instability, fever, chest discomfort, or respiratory distress. He had a one-year history of tonsil cancer and was treated with gemcitabine for three cycles of chemotherapy, carboplatin, docetaxel, cetuximab, and 5-fluorouracil for four cycles, cisplatin for six cycles, pembrolizumab for seven cycles, and methotrexate for eight cycles. In addition, he undergoes radiation.

Upon physical examination, he had an 89% room air saturation, a heart rate of 90 beats per minute, and a respiratory rate of 18 beats per minute. There were no superimposed noises audible during pulmonary auscultation. Leukocytes (7,920 mm^3), neutrophils (5740 mm^3), lymphocytes (1,430 mm^3), hemoglobin 12.4 g/dl, hematocrit: 39.6%, platelets 241,000

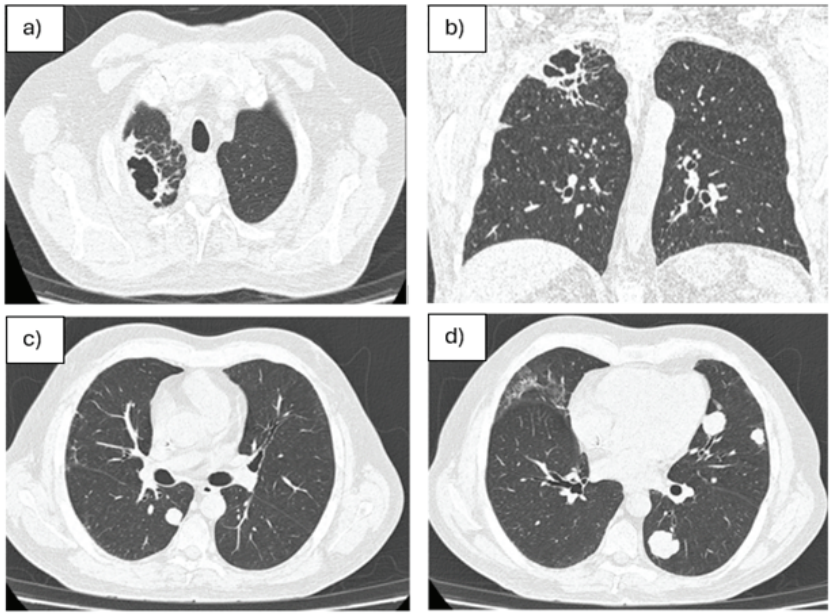

Figure 1. *Computed axial tomography showing a) and b) cavitated metastasis. c) and d) Multiple nodules and masses of metastasis from tonsil cancer..*

Citation: Diaz CLM, Bermeo RAM, Jácome GGG, Rojas LB. Pulmonary Cryptococcosis in a Patient with Cavitated Lung Metastasis. Case Rep Rev. 2024;4(1):041

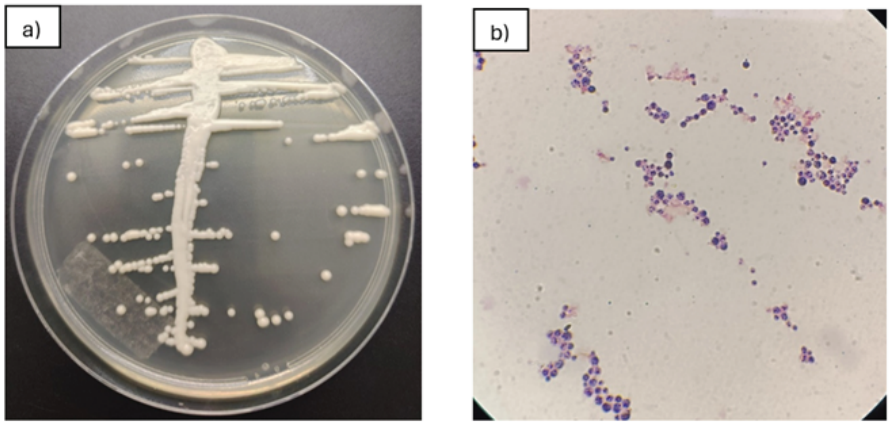

***Figure 2**. a) C. neoformans: growth after 4 days of incubation: white, creamy and smooth colonies on Sabouraud Dextrose Agar (SDA) medium supplemented with Chloramphenicol. b) Gram stain of colony after growth on Sabouraud Dextrose Agar (SDA) supplemented with Chloramphenicol.*

mm^3, c-reactive protein (4 mg/L), creatinine (0.89 ml/dl), urea (44 mg/dl), AST (24 U/L), ALT (16 U/l), total bilirubin (0.40 mg/dl), direct bilirubin (0.10 mg/dl), and indirect bilirubin (0.30 mg/dl).

A simple chest CT scan revealed many nodules and masses varying in size, dispersed across both lungs, which had been identified in earlier research as tonsillar carcinoma metastasis. In the anterior segment of the right upper lobe cavitated metastasis was observed (Figure 1).

A microbiological study involving bronchoscopy and bronchoalveolar lavage (BAL) produced the following results: germ culture with normal microbiota, BAAR negative, genxpert for tuberculosis negative, fungal culture with growth of Cryptococcus neoformans identified by Sanger sequencing with an Identity of 99.81% (Figure 2).

Treatment with oral fluconazole was initiated in the event of a localized lesion and no signs of disseminated disease. No adverse effects were reported. During the next 3 months after starting the medication, the patient did not report new symptoms of hemoptysis and his tomographic control showed stabilization of the cavitated metastasis but with an increase in size and number of other masses of metastatic origin (Figure 3). Given these findings, it was decided to restart chemotherapy.

Discussion

In recent years, the incidence of pulmonary cryptococcosis has quickly grown, reaching 38 cases per million persons [2]. The most frequent topographic finding in pulmonary and cryptococcosis is nodules or isolated masses with peripheral distribution, particularly in the lower lobes [3]. Other studies report that their presence has not been associated with a specific location, while cavitations occur in immunocompromised patients with a greater probability of developing more serious disease, and can mimic lung cancer, tuberculosis, pneumonia or other mycoses [4].

Laboratory diagnosis can be carried out using various methodologies, such as staining of respiratory samples, identifying yeast morphotypes with decreased sensitivity and specificity. Additionally, capsular antigen studies can be performed on various samples. In blood it is useful to identify cryptococcosis in disseminated infections, while in bronchoscopy with BAL its sensitivity ranges from 40 to 80% with specificity close to 99% [5,6].

The culture is the key for identification of the germ, in conventional media such as Sabouraud Dextrose Agar (SDA), obtaining the growth of white or yellow, mucoid and smooth colonies after 48 to 72 hours of incubation at 35°C.

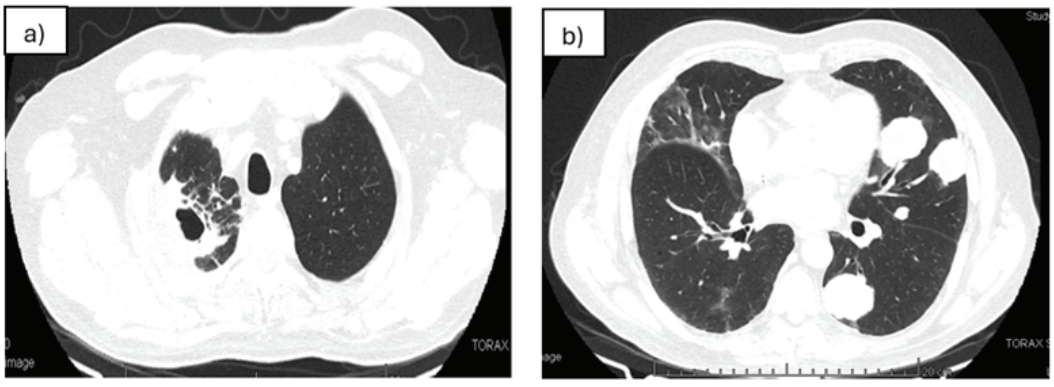

***Figure 3**. Control axial computed tomography 3 months after starting fluconazole and stopping chemotherapy showing a) cavitated metastasis, b) Increase in size of pulmonary metastases from primary tonsil..*

After isolation, the identification of genus and species is carried out performed by manual techniques (direct staining, urease), automated (Vitek®, Phoenix, etc.) or by colony DNA sequencing [5-7].

We report a case that shows the coexistence of pulmonary cryptococcosis in a patient with metastasis of primary tonsil. This is a rare presentation, so recognizing it can be challenging; however, in this case, the diagnosis was suspected because of the patient's distinct metastasis behavior.

Treatment depends on the severity of the disease and/or involvement of other organs such as cryptococcal meningitis, requiring more aggressive and prolonged regimens such as the use of amphotericin B. Amphotericin B is advised for patients with disseminated pulmonary and/or meningeal cryptococcosis, whereas fluconazole 200 mg or 400 mg per day is indicated for those with moderate symptoms who do not have widespread lung disease or meningeal involvement [8]. Because there were no symptoms of meningeal or disseminated cryptococcosis in the present case, oral fluconazole was prescribed instead of amphotericin B because the patient had previously received chemotherapy, which had been stopped for a month before the antifungal treatment began.

The patient did not exhibit any new hemoptysis symptoms over the first 30 days of fluconazole treatment, and his control tomography showed stability of the cavitated metastasis. Chemotherapy was not administered during this time. However, when it was discovered that more metastases were growing exponentially, therapy was resumed. Considering this situation, it was determined to keep using oral fluconazole and chemotherapy for a full six months without suffering any unfavorable side effects, such elevated liver enzymes.

Conclusion

With a higher frequency in non-immunocompromised individuals, pulmonary cryptococcosis is a potentially lethal condition. While the association of this condition with lung metastases is rare, the presence of cavitation in these lesions, in addition to other symptoms like hemoptysis, compels us to rule out pulmonary cryptococcosis as a possible diagnosis.

Conflict of Interest

The authors have read and approved the final version of the manuscript. The authors have no conflicts of interest to declare.

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