

Pulmonary aspergillosis diagnosed by endoscopic ultrasound fine-needle aspiration

Eduardo Rodrigues-Pinto, Susana Lopes, Fernando Príncipe¹, Jennifer Costa², Guilherme Macedo

Departments of Gastroenterology, ¹Hematology and ²Pathology, Centro Hospitalar São João, Porto, Portugal

ABSTRACT

Pulmonary aspergillosis generally occurs in patients with prolonged neutropenia or immunosuppression. Definitive diagnosis depends on the demonstration of the organism in tissue, as positive culture result from sputum, needle biopsy, or bronchoalveolar lavage fluid. Even though endoscopic ultrasound (EUS) fine needle aspiration (FNA) of paraesophageal/mediastinal lesions has been used numerous times, this is the first case that reports an aspergilloma diagnosed by EUS-FNA, allowing us to reach a definitive diagnosis. We present a patient with a nodular lesion located in the right upper lobe lung, with ground-glass opacity. Upper EUS revealed an ill-defined hypoechoic paraesophageal lesion with a central annular image. Culture results from EUS-FNA were positive for *Aspergillus fumigatus*. There are no previous reports of EUS imaging features of pulmonary aspergillosis. We believe that this central annular image in an ill-defined hypoechoic paraesophageal lesion may be a characteristic feature.

Key words: EBUS, endoscopic ultrasound, fine needle aspiration, pulmonary aspergillosis, sarcoidosis and sjögrenæs syndrome

INTRODUCTION

Pulmonary aspergillosis generally occurs in patients with prolonged neutropenia or immunosuppression.^[1] Healthy persons usually do not develop aspergillosis; but hypersensitivity, structural lung disease, and immune compromise are the three factors that mainly determine the spectrum of disease caused by this mold. Invasive pulmonary aspergillosis is a serious complication in immunocompromised patients, occurring mostly in patients with hematologic malignancies who are undergoing chemotherapy and in those who have undergone bone marrow or organ transplantation and concomitant immunosuppressive therapy.

Computed tomography (CT) images may demonstrate a characteristic halo sign (area of ground-glass infiltrate surrounding nodular densities) suggestive of aspergillosis;^[2] however, definitive diagnosis depends on the demonstration of the organism in tissue, as positive culture result from sputum, needle biopsy, or bronchoalveolar lavage fluid.^[3]

CASE REPORT

We present a female patient, 74-year-old, diagnosed in 2009 with acute myeloid leukemia secondary to a myelodysplastic syndrome, with leukemic evolution in 2014, despite treatment with lenalidomide and filgrastim. She was placed under treatment with a test protocol POLO-AML-2, presenting later with febrile neutropenia. Pulmonary CT revealed a nodular lesion with 28mm located in the right upper lobe, with ground-glass opacity [Figure 1]. Given the absence of clinical improvement despite broad-spectrum antibiotherapy (imipenem and vancomycin), with no

Access this article online

Quick Response Code:



Website:

www.eusjournal.com

DOI:

10.4103/2303-9027.175923

Address for correspondence

Dr. Eduardo Rodrigues-Pinto, Department of Gastroenterology, Centro Hospitalar São João, Porto, Portugal. E-mail: edu.gil.pinto@gmail.com

Received: 2014-10-20; Accepted: 2015-03-04

cultural growth in septic screen, upper endoscopic ultrasound (EUS) was performed, revealing an ill-defined hypoechoic paraesophageal lesion, 30 × 22 mm [Figure 2], with a central annular image, and no vascular flow [Figure 3]. After correction of thrombocytopenia with platelet transfusion, EUS-fine needle aspiration (FNA; EchoTip® 25G ProCore™, Cook Medical) was performed (two passages). Cytology was consistent with inflammation [Figure 4], with no blast cells, and lesion microbiology was positive for *Aspergillus fumigatus*. There was clinical and imaging improvement after treatment with voriconazole, the patient now being in the second round of chemotherapy.

DISCUSSION

Aspergillus species are ubiquitous molds found in organic matter. Although more than 100 species have been identified, the majority of human illness is caused by *Aspergillus fumigatus* and *Aspergillus niger* and, less frequently, by *Aspergillus flavus* and *Aspergillus clavatus*. The transmission of fungal

spores to the human host is via inhalation. Invasive pulmonary aspergillosis is a serious complication, that occurs almost exclusively in immunosuppressed, and especially myelosuppressed patients; although there have been rare patients without any grossly apparent immune defect. The most common form of *Aspergillus* species infection in immunocompromised patients is invasive pulmonary aspergillosis. The frequency of invasive aspergillosis reflects disease states and treatments that result in prolonged neutropenia and immunosuppression. Invasive aspergillosis is estimated to occur in 10%-20% of patients who are receiving intensive chemotherapy for leukemia. It may manifest as persistent fever and pulmonary infiltrates despite of broad-spectrum antibiotic therapy. Radiographic and CT images may reveal characteristic patterns, including nodules, cavitory infiltrates, and focal infiltrates.

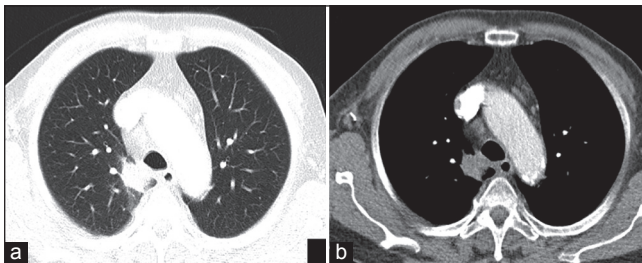


Figure 1. Pulmonary computed tomography (CT). Nodular lesion with 28mm located in the right upper lobe, with ground-glass opacity; (a) pulmonary window and (b) tissues window

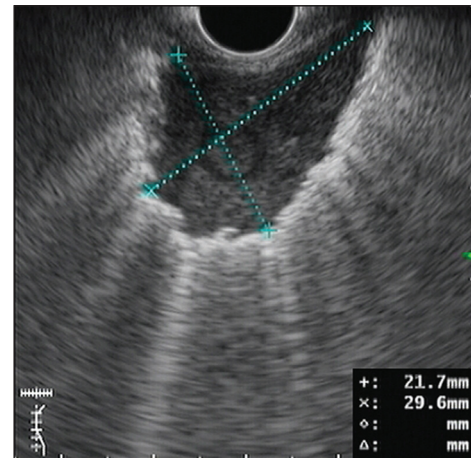


Figure 2. Upper endoscopic ultrasound (EUS). Ill-defined hypoechoic paraesophageal lesion, 30 × 22 mm with a central annular image, and no vascular flow

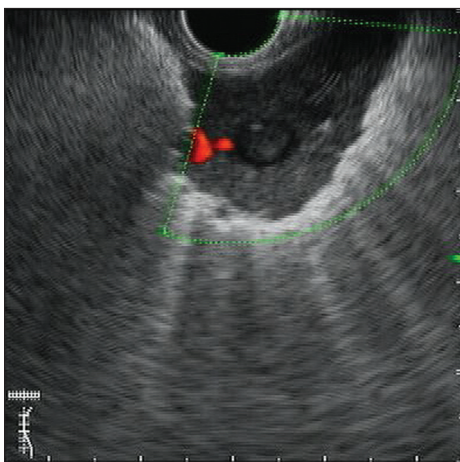


Figure 3. Upper endoscopic ultrasound (EUS). Ill-defined hypoechoic paraesophageal lesion, 30 × 22 mm with a central annular image, and no vascular flow

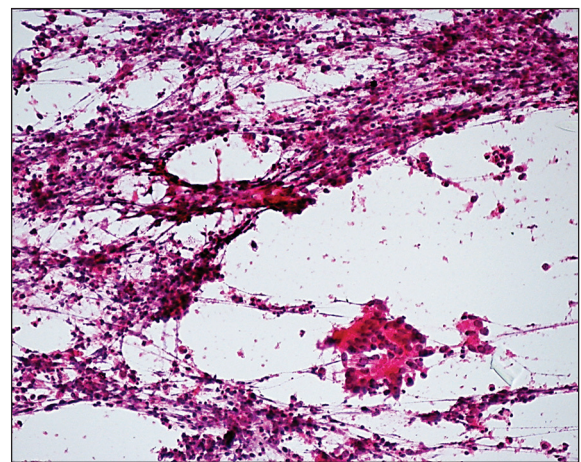


Figure 4. EUS histology. Abundant presence of neutrophils, macrophages, and ciliated columnar cells; no neoplastic cells were identified (hematoxylin and eosin [H and E, 200x])

Definitive diagnosis depends on the demonstration of the organism in tissue, through visualization of the characteristic fungi (Gomori methenamine silver stain or Calcofluor) or through positive culture results. Procedures that may be helpful for the diagnosis include bronchoscopy, transbronchial biopsy, and open lung biopsy. Peripheral lesions may be amenable to transthoracic needle aspiration and biopsy. Open lung biopsy through a small thoracotomy or by video-assisted thoracoscopy may be the only way to obtain tissue samples large enough to confirm the presence of *Aspergillus* organisms in tissue. Central lesions may be reachable by bronchoscopy or endobronchial ultrasound,^[4] as well as EUS, if they are paraesophageal/mediastinal in location. In this particular case, despite the lesion was located behind the trachea, it was in closer contact with the esophagus. A good access was available at EUS, being EUS-FNA of paraesophageal/mediastinal lesions a well-known and safe technique in these cases. To our knowledge, this is the first case that reports an aspergilloma diagnosed by EUS-FNA, allowing us to reach a definitive diagnosis.

There are no previous reports of EUS imaging features of pulmonary aspergillosis. We believe that this central annular image in an ill-defined hypochoic paraesophageal lesion may be a characteristic feature.

REFERENCES

1. Agrawal S, Jones B, Barnes R, *et al.* A practical critique of antifungal treatment guidelines for haemato-oncologists. *Crit Rev Microbiol* 2012;38:203-16.
2. Godet C, Elsendoorn A, Roblot F. Benefit of CT scanning for assessing pulmonary disease in the immunodepressed patient. *Diagn Interv Imaging* 2012;93:425-30.
3. Perfect JR. Fungal diagnosis: How do we do it and can we do better? *Curr Med Res Opin* 2013;29:3-11.
4. Casal RF, Adachi R, Jimenez CA, *et al.* Diagnosis of invasive aspergillus tracheobronchitis facilitated by endobronchial ultrasound-guided transbronchial needle aspiration: A case report. *J Med Case Rep* 2009;3:9290.

How to cite this article: Rodrigues-Pinto E, Lopes S, Principe F, Costa J, Macedo G. Pulmonary aspergillosis diagnosed by endoscopic ultrasound fine-needle aspiration. *Endosc Ultrasound* 2016;5:58-60.

Source of Support: Nil. **Conflicts of Interest:** None declared.