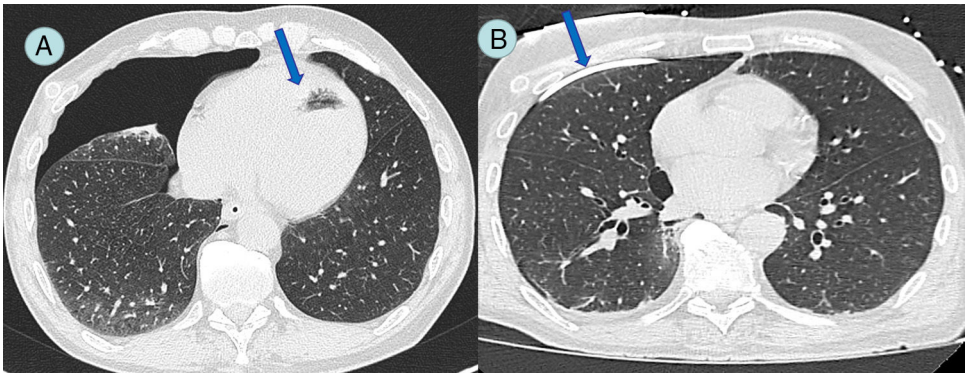

Fig. 1. (A) Right pneumothorax associated with left ventricular air embolism (arrow). (B) Drainage catheter in the pleural space (arrow) with resolution of right pneumothorax and air embolism.

CT-guided aspirations are safe procedures with a complication rate of 10%–25%, depending on the series, the most common being pneumothorax. Intracardiac air embolism is an extremely rare and potentially fatal complication, and reports in the literature are few.[2]

Our patient presented pneumothorax associated with intracardiac air embolism, rarely reported in the literature to date. The proximity of the lesion to the inferior pulmonary vein with the consequent production of intracardiac air embolism is a mechanism known to cause this type of complication.[3] Procedures performed under general anesthesia and positive airway ventilation may increase the chances of it occurring.

The therapeutic alternative of using a hyperbaric chamber is controversial, and moreover, unavailable in many hospitals.

Administration of 100% oxygen while placing the patient in the Trendelenburg position, along with intensive hemodynamic monitoring has been shown to be a safe treatment in the management of complications.[4,5]

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1579-2129/

Bronchiolitis Obliterans Following Hematopoietic Stem Cell Transplantation: Importance of Expiratory Computed Tomography☆

Bronquiolitis constrictiva tras trasplante de progenitores hematopoyéticos: importancia de la tomografía computarizada espiratoria

To the Editor,

Bronchiolitis obliterans (BO) after hematopoietic stem cell transplantation (HSCT) is a serious, potentially fatal complication, which generally appears in the context of graft-vs-host disease (GVHD).[1,2] The clinical presentation of BO after HSCT is non-specific, and no universal consensus is available on the diagnostic criteria of this entity, although imaging studies, particularly computed tomography (CT), dynamic inspiratory CT (iCT), and expiratory CT (eCT), are of growing diagnostic value in the detection of this complication.[3,4]

We report the case of a 44-year-old woman with a history of acute myeloid leukemia, treated 6 months previously with unrelated donor HSCT, who consulted due to dyspnea and dry cough. As a complication of the HSCT, the patient had transitory cytomegalovirus viremia and cutaneous GVHD grade III, which responded favorably to treatment with corticosteroids. No parenchymal opacities were observed on chest radiograph, but chest iCT and eCT revealed a marked mosaic pattern in the pulmonary parenchyma in the expiratory phase, and multiple areas of air trapping were identified in both lungs (Fig. 1), while infectious complications were ruled out. Areas of air trapping on CT can be better viewed with the use of the minimum intensity projection (minIP), an algorithm for visualization of images

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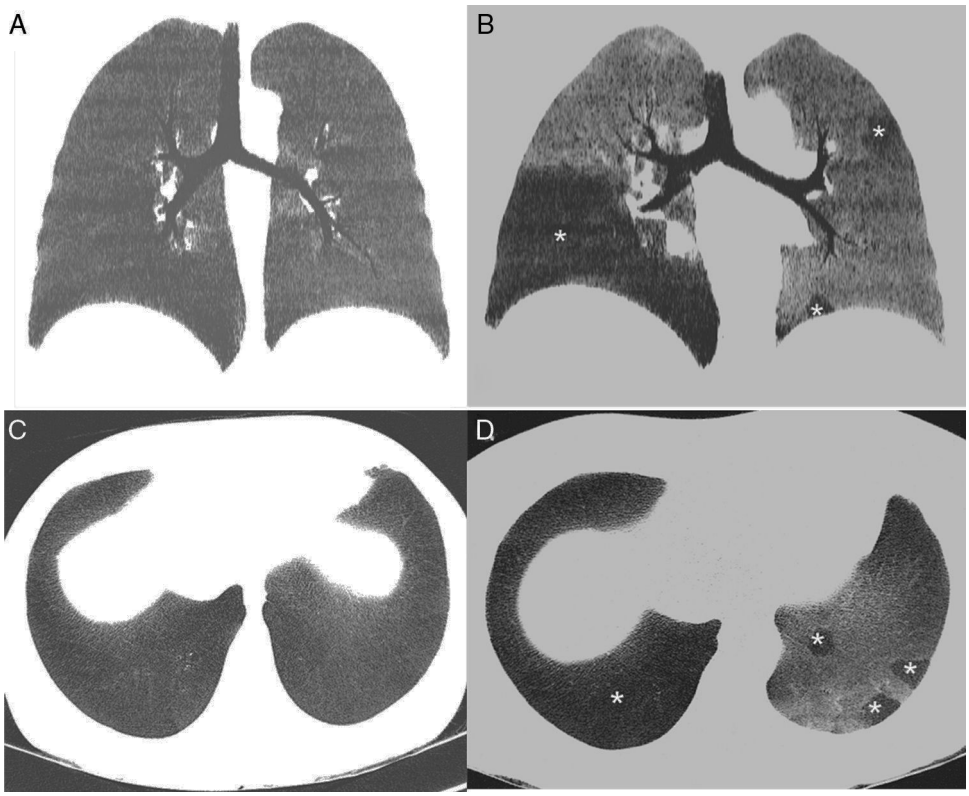

Fig. 1. (A) minIP coronal reconstruction of the chest inspiratory CT showing homogeneous pulmonary parenchyma with uniform attenuation. (B) minIP coronal reconstruction of chest expiratory CT, showing a mosaic pattern of the pulmonary parenchyma, with areas of low density (asterisk), alternating with areas of greater attenuation. Low density areas (affecting particularly the right lower lobe and the left lung in a patchy pattern) correspond to areas of air trapping, while the areas of greater density correspond to normal pulmonary parenchyma. (C) minIP axial reconstruction of the chest inspiratory CT showing homogeneous pulmonary parenchyma. (D) minIP axial reconstruction of chest expiratory CT, showing areas of low density (asterisks), related with areas of air trapping.

that enhances areas of less attenuation. Lung function tests (LFT) showed a mild reduction (<20%) in forced expiratory volume in 1 second (FEV1) and increased residual volume (RV) (138%) with respect to pre-HSCT values. No changes were observed on fiberoptic bronchoscopy and bronchoalveolar lavage ruled out opportunistic infections. Given these findings, a diagnosis of BO was given, and the patient responded favorably to treatment with high-dose systemic corticosteroids (stabilization of functional tests).

BO is the most common non-infectious complication of HSCT, and is usually diagnosed about 6–12 months post-transplantation.[1] Some risk factors for the development of post-HSCT BO include age over 20 years, pre-HSCT airflow obstruction, the appearance of viral respiratory infections in the early post-transplantation months, but the most significant of all is the presence of chronic GVHD.[2] Clinical presentation is often insidious, and symptoms are unspecific (cough, dyspnea), although 20% of patients can be asymptomatic. Long-term prognosis is generally poor, and the aim of treatment is to prevent progression of airflow obstruction. No universally accepted diagnostic criteria have been accepted for the diagnosis of post-HSCT BO, but the National Institutes of Health of the United States suggest the following criteria: (1) demonstrated airflow obstruction (FEV1/forced vital capacity [FVC] < 0.7 and FEV1 < 75% predicted value); (2) evidence of air trapping on iCT and eCT, RV > 120% predicted value, or histological confirmation of BO; and (3) absence of respiratory tract infection (clinically, radiologically, or microbiologically documented).[5] The most significant radiological finding of BO is the demonstration of air trapping on eCT (with respect to iCT), which has a sensitivity of 91% and 94% in some studies, respectively; these radiological changes can precede LFT changes.[2,3] We believe that dynamic CT (iCT and eCT) should be performed in all symptomatic HSCT patients for the early detection of BO, since this serious pulmonary complication cannot be detected on iCT alone.

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Diagnosis of *Actinomyces graevenitzii* Lung Infection Using Linear EBUS☆

Diagnóstico mediante EBUS lineal de infección pulmonar por Actinomyces graevenitzii

To the Editor,

We report the case of a 58-year-old woman with a history of subclavian-jugular deep vein thrombosis in 2014, with secondary pulmonary thromboembolism and pulmonary hypertension not investigated due to refusal of consent by the patient, moderate tricuspid regurgitation and intermittent bronchial asthma. She is a native of Morocco, and last visited the country in September 2013. She lives in an urban environment, and has 2 dogs which are regularly seen by the veterinarian. No other significant epidemiological data, family history, known drug allergies, toxic habits, or occupational exposure were reported. She attended the respiratory medicine department in February 2015, referred by her primary care physician, 6–8 weeks after onset of a clinical picture of dysthermia, with undocumented fever, dyspnea on moderate exertion, cough with sparse, thick, whitish expectoration, loss of appetite, and asthenia. Physical examination revealed mild tachypnea, septic mouth with several teeth missing, no mouth ulcers, rhythmic heart sounds with no murmur, and generally reduced breath sounds with fine crackles in both lung bases. No other data of interest. Laboratory tests showed a slight increase in C-reactive protein and mild leukocytosis. No pathological findings were reported in repeat sputum samples (sputum smear and culture). Chest radiography showed general cardiomegaly and right basal interstitial-alveolar infiltrate. Chest computed tomography (CT) showed bilateral hilar and mediastinal lymphadenopathies of significant size, the latter in the lower paratracheal and subcarinal region, and alveolar infiltrate in the right lower lobe. Given the CT findings, a positron emission tomography (PET) study was performed, which confirmed increased metabolism in the lower right paratracheal region (standardized uptake value [SUV] 4.7) (Fig. 1), bilateral hilar region (SUV 2.2), and in the area of the right basal alveolar infiltrate (SUV 2.3), consistent with an infectious/inflammatory process. Flexible bronchoscopy was performed, revealing no endobronchial changes, and microbiological and cytological results were normal. Linear endobronchial ultrasound (EBUS) was subsequently performed, showing enlarged lymph nodes in level 4R, measuring 12 mm in the short axis, which was aspirated in 3 passes with a 22G cytology needle. Cytology *in situ* revealed ramified structures in part of the material studied. The samples were sent for cytological and microbiological analysis, and ciprofloxacin-resistant *Actinomyces graevenitzii* (*A. graevenitzii*) was isolated from all samples submitted for microbiological study. After administration of targeted antibiotic treatment with amoxicillin-clavulanate and clindamycin, the patient's clinical situation improved.

Actinomycosis is a chronic, slow-progressing granulomatous disease, caused by Gram-positive filamentous anaerobic or microaerophilic bacteria of the *Actinomycetaceae* family (genus *Actinomyces*). *A. graevenitzii*, specifically, was first described in 1997 by Ramos et al.[1] Like other actinomycetes, *A. graevenitzii* forms part of the oropharyngeal flora and was initially isolated from the surface of dental implants. However, little is known about the clinical characteristics and pathogenesis of this bacteria. Pulmonary involvement occurs in up to 15% of cases of actinomycosis, thought to be mainly due to inhalation or aspiration of gastrointestinal or oropharygeal material. Infection can involve the pulmonary parenchyma, airways, pleura, mediastinum, and chest wall, causing clinical complications, such as bronchial obstruction, pleural empyema, fistulae, rib destruction, and superior vena cava syndrome.[2] The most important risk factors for developing pulmonary actinomycosis include poor oropharygeal hygiene (as was the case with our patient), pre-existing dental disease, and alcoholism. Moreover, lung diseases, such as chronic obstructive pulmonary disease, bronchiectasis, chronic myobacterial disease, and aspergilloma are also considered to be risk factors due to the creation of an anaerobic environment in damaged lung tissue, which favors the growth of this bacteria.[3] Immunosuppressed patients or those admitted to intensive care units are equally vulnerable to infection by opportunistic pathogens. Diagnosis can be reached with the help of endoscopic ultrasound techniques. Given the non-specific nature of the clinical and radiological characteristics of this entity, differential diagnosis with other diseases, such as lung cancer, tuberculosis,[4] pneumonia, granulomatous diseases, and pulmonary abscesses, must be considered. Very few cases describing *A. graevenitzii* infection have been published, and this is the first known case in which diagnosis was established by linear EBUS-guided lymph node aspiration.[5]

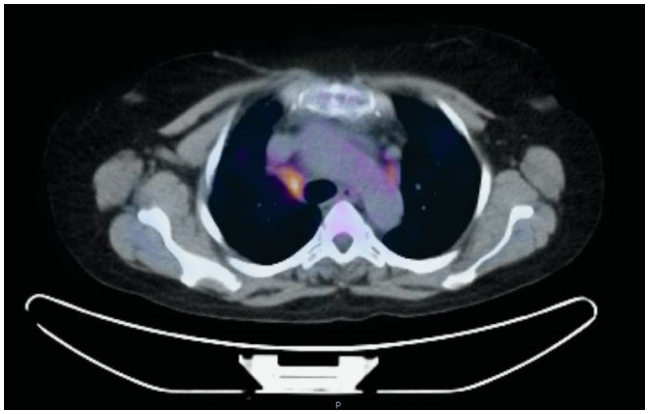

Fig. 1. PET/CT with hypermetabolic focus in the right lower paratracheal lymph node station (4R).

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