Right Intraventricular Metastasis of Lung Squamous Cell Carcinoma Detected on 18F-Fluorodeoxyglucose Positron Emission Tomography-Computed Tomography

Abstract
Cardiac metastasis from lung cancer is rare. They are clinically silent and often diagnosed only postmortem. Cardiac magnetic resonance imaging (MRI) provides interesting information about the tissue characterization and vascularization of the tumor. The 18F-fluorodeoxyglucose positron emission tomography-computed tomography (18F-FDG PET/CT) shows hypermetabolism in the cardiac metastasis. We present a case of a 74-year-old male, diagnosed with squamous cell carcinoma of the lung, who underwent cardiac MRI which showed a right intracavitary mass. We share interesting images, detected on 18F-FDG PET/CT, of cardiac metastasis.

Keywords: 18F-Fluorodeoxyglucose positron emission tomography-computed tomography, cardiac metastasis, lung cancer, magnetic resonance imaging

Metastatic cardiac tumors are extremely rare.[1] Melanoma, carcinoma (lung, breast, esophagus, and rarely colorectal), and hematologic malignancies (leukemia and lymphoma) are the leading causes for cardiac metastasis.[2-4] Tumors spread can occur, in the descending order, to the pericardium, myocardium, epicardium, and endocardium and less frequently to the intracavitary regions with predominance to the right side of the heart. Possible pathways for cardiac tumor spread are hematogenous, lymphatic, transvenous, or direct.[1] Most secondary tumors of the heart are clinically silent (over 90%) and are often diagnosed only postmortem.[5] Echocardiography remains the most efficient method for initial diagnosis. It assesses clinical signs and symptoms of heart failure, detects cardiac masses and pericardial effusion, and provides information on the location, size, and mobility of cardiac masses.[1] Supplemental diagnostic imaging methods are computed tomography, positron emission tomography-computed tomography (PET-CT), and magnetic resonance tomography that add information on the tumor size and morphology, location, invasiveness, and vascularization. These methods provide sections of cardiac, mediastinal, pulmonary, and thoracic structures in any plane without overlapping. The use of fluorodeoxyglucose (FDG) as a contrast agent is useful. Malignant

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Fenna Ahsino, Adil Zegmout, Hicham Souhi, Elouazzani H. Hanane, Ismail Rhorfi, Ahmed Abid
Department of Pulmonology, Mohammed V Military University Hospital, Rabat, Morocco

Address for correspondence:
Dr. Fenna Ahsino,
Department of Pulmonology,
Mohammed V Military University Hospital, Rabat, Morocco.
E-mail: fenna.ahsino@gmail.com

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Figure 1: Echocardiography showing an intracardiac mass at the apical part of right ventricle

Figure 2: Cardiac magnetic resonance imaging: Sagittal (a), coronal (b), and axial (c) images showing an intracardiac mass of the right ventricle

Figure 3: Cardiac images on fluorodeoxyglucose positron emission tomography-computed tomography
tumors show increased glucose metabolism, which helps to differentiate malignant from benign tumors. Clinical presentation will define the most appropriate management modality. As cardiac metastases are seen in patients with advanced malignant disease, many patients will have already undergone surgical treatment or receive radio/chemotherapy for the original tumor. For the majority of patients, the goal of the treatment is to provide palliation of the symptoms and prevent tumor recurrence.

We report a case of a 74-year-old male, smoker, presented with left chest pain and dyspnea for the past 2 months. Chest computed tomography (CT) showed a left basal pulmonary process (66 mm × 74 mm) with a hypodense material of the right ventricle (RV). Histological examination of a pulmonary biopsy CT-guided showed squamous cell carcinoma. Echocardiography revealed an intracardiac mass at the apical part of RV (50 mm × 32 mm) [Figure 1]. Cardiac magnetic resonance imaging (MRI) confirmed the presence of a mass, filling the apical two-third of the RV (56 mm × 39 mm) which has an iso-signal on T1 and T2, taking no contrast on the first pass of gadolinium. On the delayed sequence, late heterogeneous enhancement with hyposignal fragments [Figure 2]. PET-CT revealed a posterobasal hypermetabolic left pulmonary mass (SUVmax = 14.3) of 67 mm × 72 mm × 74 mm lysing the posterior arches of the 8th and 9th left ribs, associated with a hypermetabolic right anterior–inferior intracardiac mass (SUVmax = 11.2) of 38 mm × 61 mm × 39 mm coming in contact with the pericardium, which is highly suggestive of malignancy and a hypermetabolic mass of the left iliac wing (SUVmax = 12.1) with visible bone lysis in favor of secondary bone localization [Figure 3]. The patient was referred to the oncology department for chemotherapy.

Declaration of patient consent
The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

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