CLINICAL VIGNETTE

Focal heart uptake of 18F-fludeoxyglucose in a patient with lung tumour undergoing positron emission tomography/computed tomography

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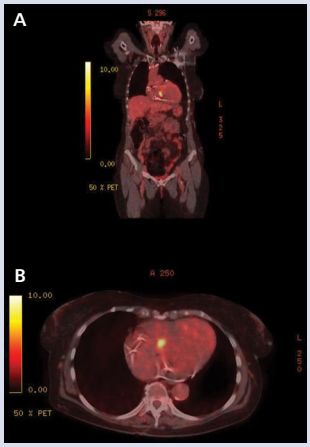

Figure 1. First positron emission tomography/computed tomography: focal heart uptake of tracer localised in the basal segments of the interventricular septum — an artefact rather than cardiac metastases; **A.** Coronal view; **B.** Axial view

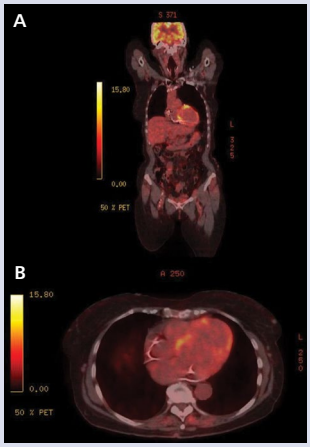

Figure 2. Comparative positron emission tomography/computed tomography performed after one month: more dispersed foci of tracer uptake of increased activity localised in the left ventricular myocardium — artefacts; **A.** Coronal view; **B.** Axial view

A 76-year-old woman diagnosed with left lung tumour of uncertain origin was admitted to our department to explain the correlation between focal heart and lung co-uptake of 18F-fludeoxyglucose (18F-FDG) visualised in positron emission tomography/computed tomography (PET/CT) image reconstructions. In the past the patient underwent several percutaneous coronary interventions and developed heart failure with left ventricular ejection fraction (LVEF) of ~30%, requiring a subsequent implantation of a cardiac resynchronisation therapy cardioverter-defibrillator (CRT-D). The first PET/CT revealed solitary heart uptake of tracer in the basal segments of the interventricular septum (IVS), in no relationship with any of the electrodes for CRT-D (Fig. 1). There was no evidence of a device-related infective endocarditis: there were no clinical symptoms, markers of inflammation (white blood cells, C-reactive protein, and procalcitonin) were within reference ranges, and blood cultures were negative. There were no symptoms of cardiac metastases such as significant progression of LVEF impairment, dyspnoea or chest pain, or metabolic activity of mediastinal lymph nodes. Transthoracic echocardiography (TTE) performed on admission showed IVS thickness of 8 to 11 mm in the basal segments with thinning in the mid-cavity and apical segments, enlarged left ventricle and both atria, LVEF of 30%, and no pericardial effusion. After one month a comparative PET/CT was performed, revealing a few dispersed foci of increased activity localised in the left ventricular myocardium, which were suspected to be artefacts (Fig. 2). Meanwhile, the patient was referred for surgical biopsy of the lung tumour diagnosed in histopathology as a non-small cell lung carcinoma (NSCLC). According to the histopathologic diagnosis, the heart uptake of 18F-FDG should be considered as a potential metastatic lesion [1] rather than an artefact [2, 3]. Late gadolinium-enhanced cardiac magnetic resonance (MR) was contraindicated due to the presence of a non-MR conditional device and expected artefacts related to electrodes for CRT-D placed in the magnetic field, therefore the patient finally underwent contrast-enhanced cardiac computed tomography angiography as a first-line diagnostic approach to discover the nature of the lesion. The examination revealed homogeneous IVS, mildly hypertrophied (up to 11 mm) in the basal segments, with no evidence of low-attenuation infiltrating mass typical for cardiac metastases [4] in the regions of tracer uptake (Fig. 3). Based on the literature it was concluded that 18F-FDG uptake in the heart may have been an artefact associated with previous treatment for coronary artery disease or locally hypertrophied myocardium. TTE performed on a follow-up visit six months after NSCLC excision showed stable IVS thickness in all segments, enlarged left ventricle and both atria, LVEF of 28%, and no pericardial effusion. Based on complete excision of the lung tumour and the heart without evident metastases, the patient was considered to be cured of neoplastic disease and has not been referred for complementary treatment.

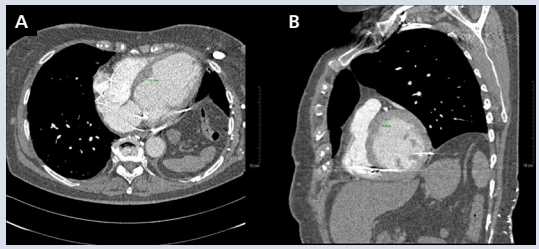

Figure 3. Cardiac computed tomography angiography performed after non-small cell lung carcinoma excision: regular, homogenous interventricular septum (IVS), mildly thickened (up to 11 mm) in the basal segments; no pathological infiltrating masses in IVS or left ventricular myocardium; **A.** Four-chamber view; **B.** Short-axis view of basal segments

References

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Conflict of interest: *none declared*