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in the PET/CT scan

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Changing appearance of lipomatous hypertrophy of the interatrial septum in the PET/CT scan

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We present a rare imaging case of the lipomatous hypertrophy of interatrial septum (LHIS), which may be correlated with arrhythmia and sudden death. We discuss possible presence of brown adipose tissue within LHIS.

A 70-year-old female, with pancreatic cancer, underwent a positron emission tomography (PET/CT) examination, during follow-up, to evaluate the presence of metastases. Two months before the scan, the patient was treated with a pancreatoduodenectomy, which was complicated by an abscess. The PET/CT showed some post-operative inflammatory lesions in the area of surgery and no metastases were found. However, some unusual increased cardiac ¹⁸F-fluorodeoxyglucose (¹⁸F-FDG) uptake was noted (Figure 1). The focus was located in the area of the interventricular septum. The area had a density of the adipose tissue and following dimensions: 27 × 14 × 36 mm. The ¹⁸F-FDG uptake was relatively high (maximum standard unit value = 5.7).
Until now, the patient did not suffer from any cardiovascular disease, the echocardiogram did not reveal any pathologies of the heart. Due to the unusual finding, the patient was referred to a cardiologist. The patient underwent the 24-hour monitoring of electrocardiogram, which did not show any significant arrhythmia. In order to exclude an intracardiac malignancy, the patient was referred to cardiac magnetic resonance (CMR), since it can characterize the tissue of the heart and indicate malignancies [1]. The CMR examination consisted of: the cine images, T1-, T2-, T2*-weighted images with or without fat suppression, T1-mapping and late gadolinium enhancement (LGE) 10–15 min after intravenous gadolinium contrast injection [2, 3]. The CMR images showed hyperintensive signal on T1-weighted sequences before and after contrast injection and on LGE. Native T1-maps of the mass was 174 ms which confirm the lipomatous tissue.

Based on the CMR, the LHIS was diagnosed. Further management of the pancreatic cancer in this patient included chemotherapy. A follow-up PET/CT scan performed seven months later confirmed complete cancer remission. Interestingly, there was no increased 18F-FDG uptake in the interventricular area in the follow-up scan. The lipomatous hypertrophy of interatrial septum is usually a benign disease and appears as diffused thickening of septum extending from fossa ovalis to the posterior wall of the right atrium and between great vessels [1]. It is rarely diagnosed, usually unintentionally, echocardiography, CMR or in autopsy. Adipose tissue is physiologically present around the heart, however, in LHIS, there is a relevant idiopathic overgrowth of the adipose tissue. LHIS may stay asymptomatic or cause a supraventricular arrhythmia or even sudden cardiac death [4]. Fortunately, our patient was free from the life-threatening arrhythmia throughout the observation period. Further observation is still needed. The conflicting results of two PET/CT scans in an individual patient are relatively common and the mechanism of 18F-FDG uptake in LHIS is controversial [2, 5]. It may indicate the presence of metabolically active brown adipose tissue (BAT) within the LHIS. BAT presents different metabolic activity depending on body temperature. BAT is activated by exposure to cold and associated with thermogenesis. Some studies demonstrated the different 18F-FDG uptake, caused by BAT metabolic activity in some adults [5].
REFERENCES


Figure 1. PET/CT images with increased activity of F-FDG in the interatrial septum. The whole body PET. **A.** Post-operative lesions in the abdomen (red arrow) and unusual cardiac activity (black arrow). **B.** and **D.** In the PET/CT fused images (B — transaxial image; D — sagittal image) the focal cardiac uptake (white arrows) corresponds to the area of fat density in the interatrial septum. **C.** Sagittal CT image, white arrows.

Abbreviations: LA, left atrium; LV, left ventricle; RA, right atrium; RV, right ventricle