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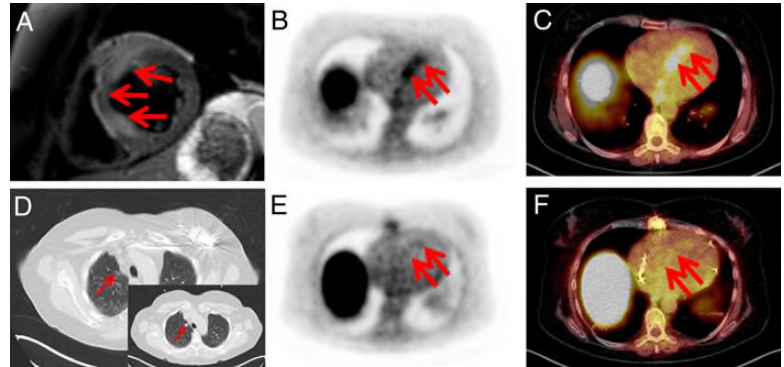
Detection of cardiac sarcoidosis by macrophage-directed somatostatin receptor 2-based positron emission tomography/computed tomography

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A 54-year-old patient with suspected atypical myocarditis was referred. Coronary artery disease had been excluded by coronary angiography. Cardiac magnetic resonance imaging (CMR) revealed acute myocardial damage of the septal and anterior wall in T2 and contrast-enhanced images (Panel A). Macrophage-directed positron emission tomography/computed tomography (PET/CT) using a somatostatin receptor (SSTR) ligand (⁶⁸Ga-DOTA-TOC) showed corresponding areas of abnormally increased tracer uptake consistent with inflammatory changes (Panels B and C; arrows). Additionally, enlarged mediastinal lymph nodes and pulmonary nodular lesions were documented. Suspected sarcoidosis was confirmed by transbronchial biopsy.



The patient developed bifascicular block with increasing frequencies of tachyarrhythmias including haemodynamically unstable sustained ventricular tachycardia. A biventricular cardioverter defibrillator was implanted. β -Blockers for further heart rate control as well as glucocorticoids for systemic treatment were concordantly started. Ten months after the initial presentation, a response of pulmonary (Panel D; insert: baseline CT) and cardiac involvement (Panels E and F) could be recorded.

Sarcoidosis is a heterogeneous, non-caseating, and granulomatous disorder of unknown etiology. Whereas clinical evidence of myocardial involvement is reported in 5% of patients with systemic sarcoidosis, autopsy studies indicate that subclinical cardiac involvement is present in up to 70% of cases. Cardiac magnetic resonance imaging and/or PET with ¹⁸F-fluorodeoxyglucose (FDG) are indicated in patients with abnormalities on Holter monitoring and/or echocardiography. However, FDG-PET is non-specific. Here, we report on the use of SSTR2A-targeted PET with ⁶⁸Ga-DOTA-TOC. Since SSTRs are highly expressed on the cell surface of activated macrophages, SSTR-directed PET might prove a specific tool to directly visualize myocardial inflammation *in vivo*.