Diagnosis and treatment response evaluation of cardiac sarcoidosis using positron emission tomography/magnetic resonance imaging

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A 32-year-old man presented with general malaise, acute retrosternal chest pain (CCS III), repeated episodes of fever, dizziness, and palpitations. The ECG demonstrated an incomplete right bundle branch block, persistent precordial S-waves, and a flattened T-wave in lead III. A positron emission tomography/magnetic resonance imaging (PET/MRI) examination of the heart with 18F-fluorodeoxyglucose (FDG) was performed (Biograph mMR, Siemens Healthcare, Germany). To suppress physiological glucose uptake in the myocardium, the patient was prepared with a high-fat, low-carbohydrate diet in a period of 24 h before the examination and was intravenously administered 50 IU/kg body weight of unfractionated heparin 15 min before the FDG injection.

In the initial PET/MRI scan, a bihilar lymphadenopathy (Panel A, stars) and patchy late-gadolinium enhancement (LGE) in lateral left-ventricular wall was found (Panel A, arrows), which was in excellent agreement with the increased FDG uptake found in PET images (Panel B, arrows). Based on the imaging findings, sarcoidosis with cardiac involvement was diagnosed and treatment with a corticosteroid pulse therapy and sequential dose tapering was initiated.

While LGE in the lateral left-ventricular wall remained constant in follow-up scans, FDG uptake was slightly reduced after 4 weeks (Panel C) and significantly reduced after 4 months (Panel D). The decreasing FDG uptake correlated with the improvement of clinical symptoms.

Cardiac sarcoidosis often requires immunosuppressive therapy, which needs to be carefully balanced regarding side effects. Positron emission tomography/magnetic resonance imaging seems to be well suited for diagnosis and monitoring of disease activity with the objective of drug titration.

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