Utility of cardiac FDG-PET imaging coupled to magnetic resonance for the management of an acute myocarditis with non-informative endomyocardial biopsy

Nicolas Piriou1,2*, Jérôme Sassier2, Amandine Pallardy1, Jean-Michel Serfaty3, and Jean-Noël Trochu2

1Department of Nuclear Medicine, Nantes University Hospital, Hôpital G. et R. Laennec, Boulevard Jacques Monod, Saint Herblain, 44093 Nantes, France; 2Inserm, UMR 1087, Institut du Thorax, CHU Nantes, Nantes, France; and 3Department of Cardiovascular Imaging, University Hospital of Nantes, Nantes, France

* Corresponding author. Tel: +33 2 53 48 27 81; Fax: +33 2 40 16 55 29; E-mail: nicolas.piriou@chu-nantes.fr

A cardiac magnetic resonance (CMR) imaging was performed 7 days after the admission of a 41-year-old woman referred for an acute coronary syndrome and normal coronary angiography, high-sensitive Tc troponin increase, and impaired left ventricle ejection fraction (LVEF). T2-weighted sequences showed increased subepicardial signal in anterior and inferior walls in favour of a myocardial oedema (Panel A). Late gadolinium enhancement (LGE) sequences showed a diffuse and circumferential mid-wall enhancement (Panel B). CMR data were judged consistent with the diagnosis of acute myocarditis. Endomyocardial biopsies (right side of the septal wall) did not reveal any specific aetiology. Anti-remodelling medications were introduced, but the functional status of the patient deteriorated 3 months later. Concomitant CMR showed a drop of LVEF with persistent LGE in anterior and inferior walls (Panel D). Despite the absence of residual signs of myocardial inflammation on CMR, troponin blood levels remained elevated, suggesting the persistence of an inflammatory process. A cardiac positron emission tomography (PET) with 18-fluorodeoxyglucose (FDG) was performed after prolonged fasting following carbohydrates-high fat diet to reveal myocardial inflammation. PET showed a significant cardiac FDG uptake in CMR LGE territories, consistent with the persistence of inflammation in these areas (Panel C). High-dose corticotherapy was initiated, leading to an improvement in functional status and LVEF, associated with an increase of the regional function of septal and inferior walls (see Supplementary data online, Video) and serum troponin dosage normalization.

Tracking residual myocardial inflammation in cardiac tissue, FDG-PET can provide useful information in addition to CMR for decision making regarding specific strategies in patients after an acute myocarditis.

Supplementary data are available at European Heart Journal—Cardiovascular Imaging online.