A 36-year-old man was admitted to our hospital because of exertional dyspnea and syncope. The ECG showed complete A-V block (Figure 1A), and a pacemaker was implanted. Although his chest X-ray did not detect bilateral hilar lymph node enlargement, his acute clinical course with complete A-V block suggested cardiac sarcoidosis. Thus, we performed thoracic computed tomography, which revealed multiple enlarged paratracheal lymph nodes. Pathological examination of one lymph node showed noncaseating granulomas, consistent with sarcoidosis (Figure 2). Radionucleotide scintigram of myocardium showed decreased uptake of thallium in the basal septal segment. Cardiac fluorine-18-deoxyglucose (18FDG)/nitrogen-13-ammonia (13NH3) positron emission tomography (PET) also showed strongly enhanced 18FDG uptake in the basal anteroseptal segment, which is a site of the A-V nodal pathway, and reduced 13NH3 uptake in the same region (Figures 3A and 3B). Ga-citrate whole-body scintiscan revealed increased activity in the inferoposterior myocardial segment but not in the basal septal segment. Given these results, we diagnosed cardiac sarcoidosis and administered prednisolone acetate (40 mg daily). Thirty days after the initiation of steroid therapy, we performed a second cardiac PET scan. Surprisingly, the elevated 18FDG uptake in the basal anteroseptal segment had clearly disappeared and the reduced 13NH3 uptake in this region normalized, indicating that steroid therapy had improved the flow metabolism mismatch (Figures 3C and 3D). However, the 201-thallium scintiscan on nearly the same day of the second PET scan showed no definitive change. Ga-citrate scintiscan revealed that the increased uptake in the inferoposterior myocardium disappeared at the time of the second PET scan; however, abnormal Ga uptake or changes in Ga uptake pattern were seen in the basal septal segment, which is the site of the A-V nodal pathway. Complete A-V block did not change at the time of the second cardiac PET scan, but surprisingly, it had improved to a first degree A-V block 20 days after the second PET scan (Figures 1B and 1C). This case strongly suggests that 18FDG/13N-ammonia PET is a useful tool, not only for the diagnosis of cardiac sarcoidosis, but also for the prediction of improvement of A-V nodal dysfunction, which is sometimes associated with this disease along with left ventricular dysfunction.
Figure 1. A, ECG at the attack of syncope showed complete AV-block. The longest RR interval reached up to 12 seconds. B, ECG obtained at the time of second PET scan showed no change of complete AV-block but showed left-bundle-branch block due to the effect of his pacemaker. C, ECG, 50 days after the steroid therapy, improved to first-degree A-V block.

Figure 2. Biopsy specimen of one thoracic lymph node revealed many noncaseating granulomas.

Figure 3. Cardiac PET images before steroid therapy revealed markedly elevated 18FDG uptake in basal septum (A) and reduced 13NH3 uptake in basal septum (arrows) and posterior wall (B). Cardiac PET images after steroid therapy showed normalized 18FDG uptake in basal septum (C) and improved 13NH3 uptake in basal septum segment (D).
Positron Emission Tomography Predicted Recovery of Complete A-V Nodal Dysfunction in a Patient With Cardiac Sarcoidosis

Circulation. 2002;105:1144-1145
doi: 10.1161/hc0902.103432

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the
World Wide Web at:
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