Successful cardiac resynchronization therapy after heart transplantation

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We describe a case of a 56-year-old male patient, who developed refractory dilated cardiomyopathy 5 years after heart transplantation. An atriobiventricular pacemaker was implanted when indication criteria of cardiac resynchronization therapy (CRT) were seen. The intraventricular dyssynchrony was significant before CRT, while synchronous contraction was demonstrated later with the beneficial reverse remodelling of the left ventricle. Resynchronization therapy resulted in significant improvement of the patient’s clinical parameters. The success of this therapy points out the possible role of CRT in the treatment of chronic allograft failure after heart transplantation.

Introduction

Despite the favourable outcome of the non-pharmacological treatment of heart failure [implantable cardioverter defibrillator (ICD, CRT)], heart transplantation remains the only definitive therapy for patients with therapy-refractory heart failure. Nevertheless, a significant ratio of patients suffers from non-specific graft failure after heart transplantation. In these patients, there is no clinical experience with CRT therapy. We describe a case of successful CRT in a patient with chronic refractory allograft failure.

Case report

A 56-year-old male patient underwent orthotopic cardiac transplantation because of primary dilated cardiomyopathy. Signs of chronic allograft vasculopathy were found by coronary angiography in the second year. Signs of congestive heart failure developed in the fifth year, the left ventricular (LV) ejection fraction decreased (EF) to 40% despite conventional pharmacological therapy of heart failure (angiotensin-converting enzyme-inhibitor, beta-blocker, digoxin, and diuretics). His functional status was NYHA class II–III, left bundle branch block developed. After the surgery, because of a rectal carcinoma, septic renal failure occurred, superimposed on the previous moderate, chronic renal insufficiency, haemodialysis had to be performed. In the next 3 years, further deterioration of the cardiac function was detected, the patient’s functional status worsened to NYHA class IV. Criteria for CRT (refractory heart failure, NYHA class IV, LVEF <35%, QRS complex duration longer than 120 ms) were fulfilled. Tissue Doppler imaging (TDI) showed a significant intraventricular dyssynchrony, the posterior and inferior segments of the LV were delayed compared with the other segments (83 ms). Intraventricular dyssynchrony was characterized by the difference in the onset of systolic myocardial contraction (Tso) in the five basal LV myocardial segments (septal, anterior, lateral, posterior, and inferior). The Tso was measured from the beginning of the QRS complex to the onset of systolic contraction by pulsed wave TDI.

An atriobiventricular pacemaker (InSync III 8042, Medtronic, MN, USA) was implanted 8 years after heart transplantation. LV over-the-wire electrode (Attain OTW, Medtronic) was positioned into the lateral side-branch of the coronary sinus. Passive fixation electrodes were implanted into the right atrial appendage and the right ventricular septum. The duration of the QRS complex decreased from 140 to 110 ms with biventricular stimulation. Echocardiographic parameters showed a significant improvement, with an initial improvement of ejection fraction followed by the beneficial reverse remodelling of the left ventricle. The intraventricular dyssynchrony diminished. The echocardiographic and clinical parameters are listed in Table 1. Three months after the pacemaker implantation, encouraged by the decrease of fluid retention, haemodialysis could be abandoned. The dose of diuretics could be reduced, while dose of beta-blocker increased. After 2 years, the patient is in NYHA class II and there was no hospitalization for heart failure.

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Discussion

After heart transplantation, significant ratio of patients suffers from chronic allograft failure, which may lead to the necessity of retransplantation. Biventricular pacing resynchronizes the left ventricle, improves the patient’s functional status, decreases mortality. Our case appears to indicate that resynchronization therapy can be successfully used in post-transplant allograft failure, associated with left ventricular dysfunction and intraventricular dyssynchrony.

Conflict of interest: none declared.

References