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Case Report

DDD pacemaker for severe heart failure-alternate to CRT

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ABSTRACT

Patients with severe systolic Heart Failure continue to have poor quality of life and increased mortality in spite of optimal medical management. Cardiac Resynchronization Therapy [CRT] is promising modality in patients with systolic heart failure and electrocardiographic [ECG] evidence of left bundle branch block [LBBB]. Cost issues continue to elude many deserving cases of this therapy in our society. Relatively cost effective Dual chamber pacing [DDD] with right atrial and isolated left ventricular pacing [RA-LV] can be a good alternative.

1. Introduction

During the past one decade Cardiac Resynchronization Therapy [CRT] using Biventricular [Bi V] pacing has emerged as a promising technique in improving the quality of life, exercise tolerance and mortality in some cases of systolic heart failure.[1] CRT is class 1 indication in patients with severe heart failure and ECG evidence LBBB.[2] The rationale of CRT is based on the hypothesis that correcting inter and intraventricular asynchrony the Bi V pacing improves LV functions and favorably affects clinical condition and prognosis of these patients.[3] Isolated LV pacing for improving symptoms and long term mortality benefits has been studied.[4] Using a simple Dual chamber [DDD] pacemaker in CRT indicated heart failure patients can improve symptoms and quality of life with lots of economic benefits especially in our society.Reporting here a case of severe heart failure and LBBB with implantation of DDD Pacemaker with RA-LV pacing mode resulting in significant improvement in all parameters.

2. Case report

A 77yr old diabetic diagnosed as dilated cardiomyopathy since about 2years presented to the emergency department with sudden onset severe breathlessness and was in a circulatory collapsed state. He was immediately put on ventillatory support and initial high doses of parenteral Inotropes. His ECG showed sinus tachycardia and LBBB with QRS duration of 160 ms. Echocardiography showed dilated LV with global hypokinesia and left ventricular ejection fraction [LVEF] of 15%–18%. Later he could be weaned off the ventilator but was dependent on inotropic support. The biochemical parameters stabilized. He showed no atrial or ventricular arrhythmias. His earlier echocardiography showed dilated left ventricular and LVEF of 20% and coronary angiography revealed normal coronaries. He had been on full medical treatment and the need for CRT device was strongly explained to the patient but the financial constraints prevented it to be implanted. After explaining the pros and cons a Dual Chamber Pacemeker [DDD] was implanted with Right Atrial [RA] – isolated Left Ventricular [LV] pacing, using J curve atrial [isoflex 52 cm is1] lead for right atrum and S curve LV bipolar [isoflex 86 cm is 1] lead for LV pacing via Coronary sinus and into the left postero-lateral coronary vein (Fig. 1). AV synchrony and LV pacing were tested. The lead parameters were atrial capture 0.5 V and impedence 473 ohm and the Left Ventricular capture was 0.7 V and impedence 648 ohm. The ECG showed change from LBBB to RBBB (Fig. 2). Using Echo-Doppler guidance Pacemaker AV interval was set at 90 msec. His hemodynamics showed an encouraging immediate increase in the central pressures and showed a change in the contours of the pressure waves from a bifid to sharp upstroke (Fig. 3). The inotropic support was immediately withdrawn. Patient showed remarkable clinical improvement and the Echocardiography post implantation showed disappearance of IVS jerky movement and LVEF of 30% −35%. Patient was discharged in 2 days

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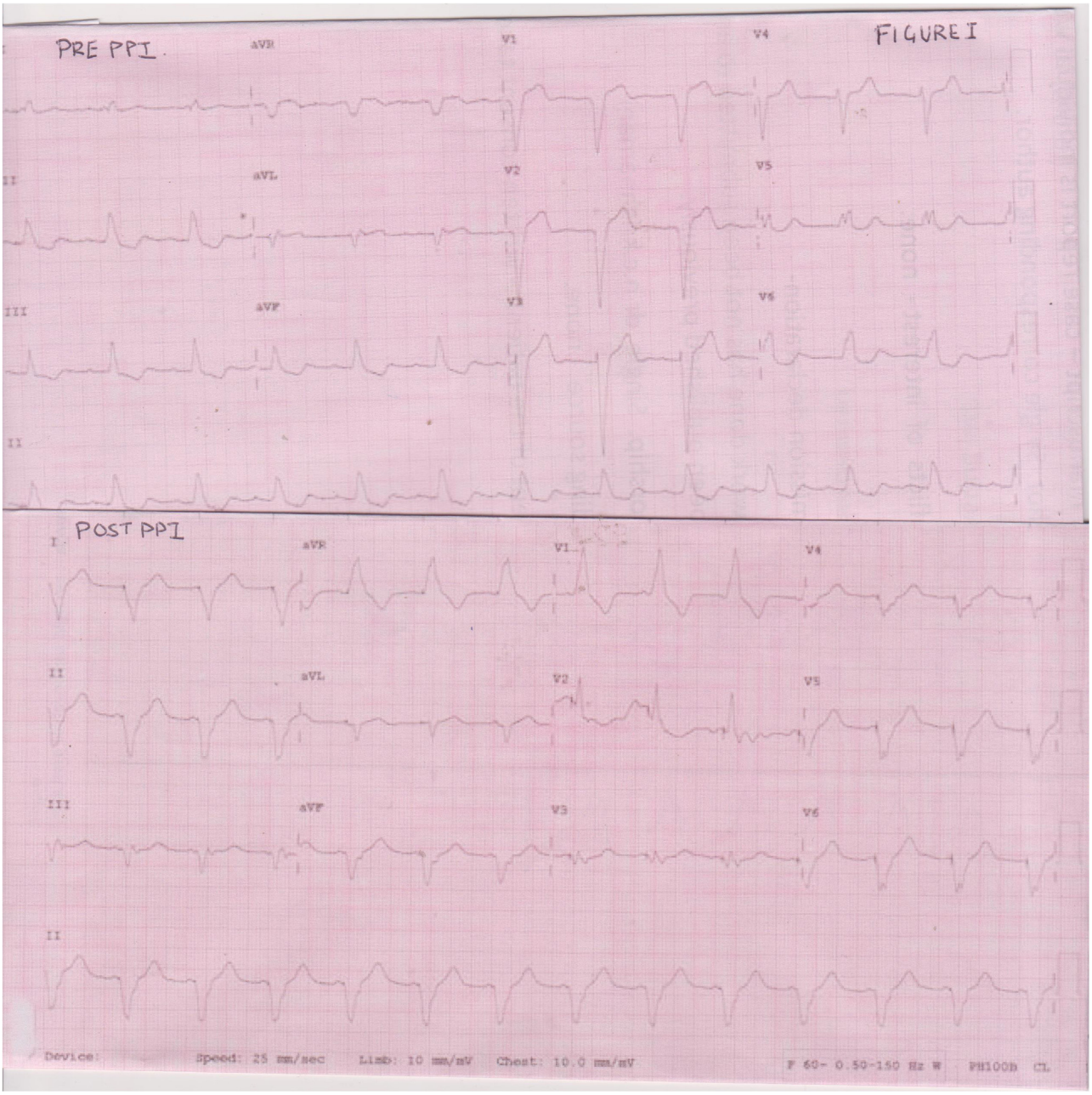

Fig. 1. E.C.G. pre and post pacemaker implantantation.

and in the followed up regularly at two weeks interval. At the end of four months patient is completely asymptomatic,and ECG repeatedly showed RA sense and LV pacing. Echocardiography showed at four months a decrease in LV dimensions and global LVEF of 50%–55%. Patient is not only has now a good exercise tolerance but also has a normal social life.

3. Discussion

Heart failure constitutes a large section of the patients attending the cardiology clinics all over our country with poor quality of life and increased mortality. Heart transplantation still is not very progressive in our practice due to various reasons. Cardiac resynchronization therapy [CRT] therapy especially in severe systolic heart failure with LBBB is one of the important modalities of treatment.[2] Cost of therapy deprives lots of such patients of CRT in our society. The biventricular versus left univentricular pacing with ICD backup in Heart failure [B-LEFT-HF] trial found that isolated LV pacing was noninferior to Bi-V pacing in terms of composite outcome consisting of NYHA functional class and >5 mm reduction in LV end systolic diameter at 6 months.[4] In a multicentric, doubleblind crossover trial [GREATER-EARTH trial] involving 211 patients the effects of isolated LV pacing and Bi-Ventricular pacing were compared at 6 months and 12 months and no statistical difference was observed in increase in exercise duration, improvement of LVEF, reduction in LV end systolic volume and positive remodeling response and they concluded that there was no clear advantage of one pacing mode over the other.[5] In the present case a simple dual chamber pacemaker was implanted with pacing leads in right Atrium and Left ventricle

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