CASE PRESENTATION

Fusion CRT pacing in a superresponder with „permanent" atrial fibrillation - 13 years of follow-up

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INTRODUCTION

Cardiac resynchronization therapy (CRT) in patients with persistent or even permanent atrial fibrillation (AF) and left atrium (LA) dilatation may induce resumption of sinus rhythm and significant decrease in LA volume[1,2].

CASE REPORT

A 59 years old female patient was hospitalized in May 2005 for worsening heart failure (HF) and rapid AF with LBBB 160 ms QRS duration (Figure 1a). She was treated elsewhere for „permanent" AF for 1 year already. Her left ventricle (LV) end diastolic volume (LVEDV) was 120 ml, ejection fraction (EF) 45%, mild degenerative mitral regurgitation, severe LA dilatation (LA diameter 5.1 cm, volume 91 ml). She received standard drug therapy for HF and oral AVK (LA appendage thrombosis diagnosed by transesophageal echocardiography) and electroconversion to sinus rhythm (SR) was successfully performed.

Regular follow-ups were performed until 2009 when she decided to stop the medication. The patient was readmitted once again for aggravated HF and AF (July 2010) with 32% EF and 123 ml LA volume (Figure 2a). Although several standard optimal medications for HF and rhythm control strategy were tried during several months, the AF was recurrent and EF did not improved. Therefore triple chamber pacemaker (Figure 1b) with septal RV, lateral LV and right atrial lead was implanted although AF was persistent (September 2010). Significant EF improvement after implantation of 45% was noted even SR was not successfully restored using amiodarone. Since the patient had normal coronary arteries, flecainide 100mg b.i.d., was introduced for 3 days and SR was obtained after cardioversion. CRT super responder profile was obtained one month later after sustained SR (Figure 1c) and further increased LV EF 52% was assessed. Moreover, an improvement in the diastolic filling profile from type III - restrictive filling, in to type I - impaired relaxation was obtained in a period of 6 months (Fig.2b). Regular exercise test (ET) guided CRT-P optimization (to obtain constant fusion CRTP) with LV only pacing mode were meticulously conducted in long term follow-ups each 6 months. ET was performed to quantify exercise functional capacity and to detect rhythm changes such as loss of ventricular capture, sinus tachycardia above upper tracking limit or shortening of the intrinsec PR interval during ET. The patient maintained SR for a total of 4 years then AF recurred, and further switch of AA drug to sotalol (160 b.i.d.) was required to maintain SR. LV only pacing was the preferred option each time if the patient maintained SR more than 3 months under biventricular pacing (LV first with VV interval 50 ms).The purpose of device optimization was to obtain the best compromise between longest diastolic filling, presence of R wave in V1, q or Q wave in V6 on ECG and best echocardiographic parameters (AV, interventricular, intra-LV synchrony parameters). She is furt-

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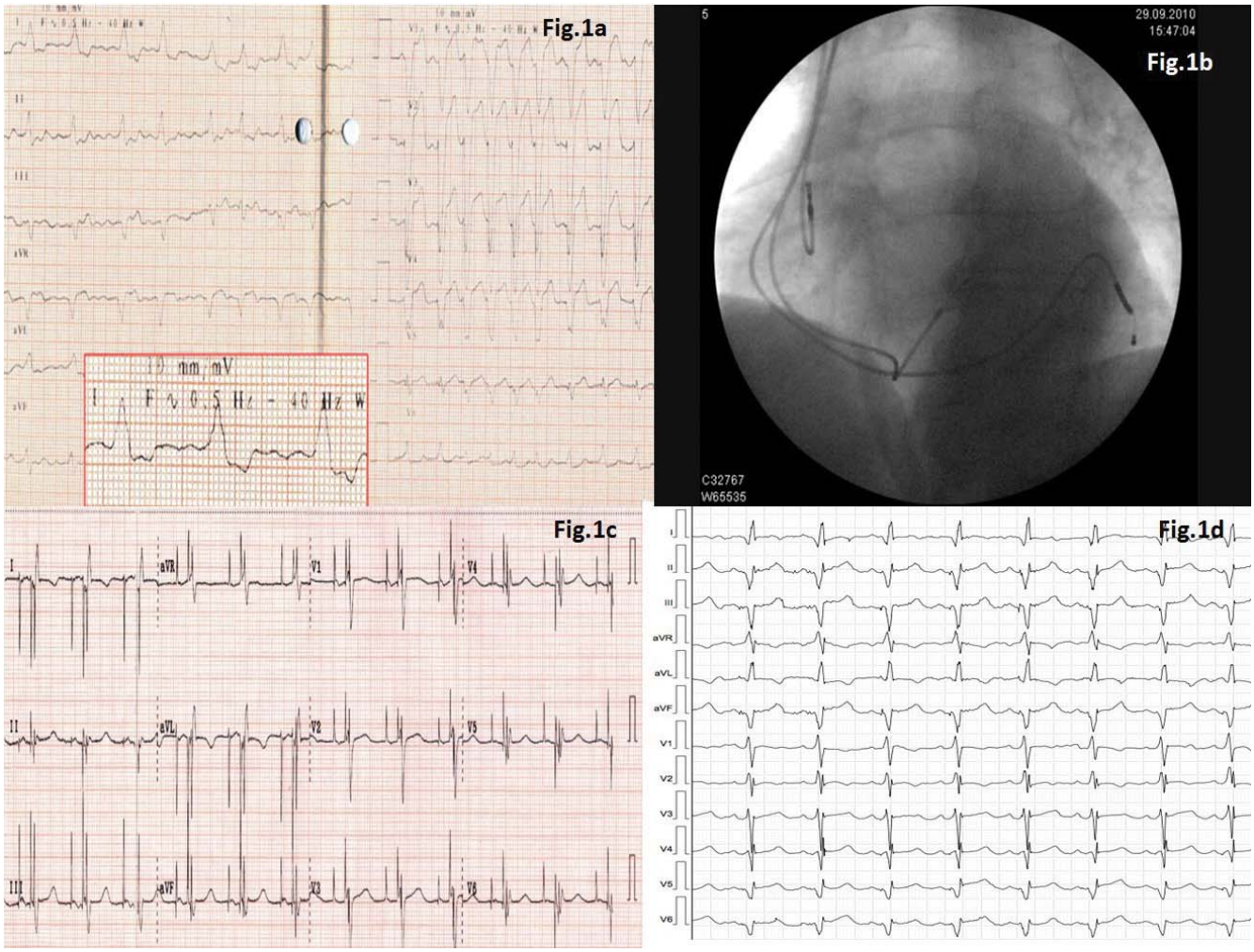

Figure 1. CRT essentials: a. ECG on admission – May 2005: atrial fibrillation, 100 b/min, LBBB with related repolarization abnormalities; b. Antero-posterior fluoroscopy - 3 leads: right atrium appendage, right ventricle mid-septum and a lateral branch of the coronary sinus; c. October 2010: atrial and biventricular paced rhythm with R wave in V1, V2, and q wave in D1, avL, V5, V6; d. LV only pacing CRT at last follow-up in January 2018.

her today in SR (Figure 1c) after a total 13 years follow up and AF ablation was not needed to be performed with an LA volume of 86 ml (Figure 2c).

DISCUSSIONS

Our case is pointing out essential role of complex follow-up in maintaining SR performed in a deteriorated systolic function in a LBBB female superresponder CRTP patient with non-ischemic cardiomyopathy. Beyond medical therapy it was performed CRTP with LV only preference[3], rigorous follow-ups, complex optimization of device programmation and routinely ET to check the quality and quantity of fusion CRTP[3,4]. Some key moments in our patient's evolution were noted: the development of a cardiomyopathy with markedly reduced LV systolic function followed by a triple-chamber cardiac pacemaker implantation for cardiac resynchronization therapy and finally LV only fusion pacing versus biventricular stimulation. GREATER-EARTH study demonstrated that 21% of clinically non-responder patients, and 17% of echocardiographically non-responders to biventricular stimulation are responsive to LV fusion pacing[5,6].

CONCLUSIONS

This case report shows a superresponse to LV only pacing CRTP with further left atrial reverse remodeling and SR maintenance although initially severe dilatation and "permanent" AF. Complete and rigorous follow-up with regular exercise test (if possible) and reprogramming according to status should be the option in all CRT patients.

Conflict of interest: none declared.

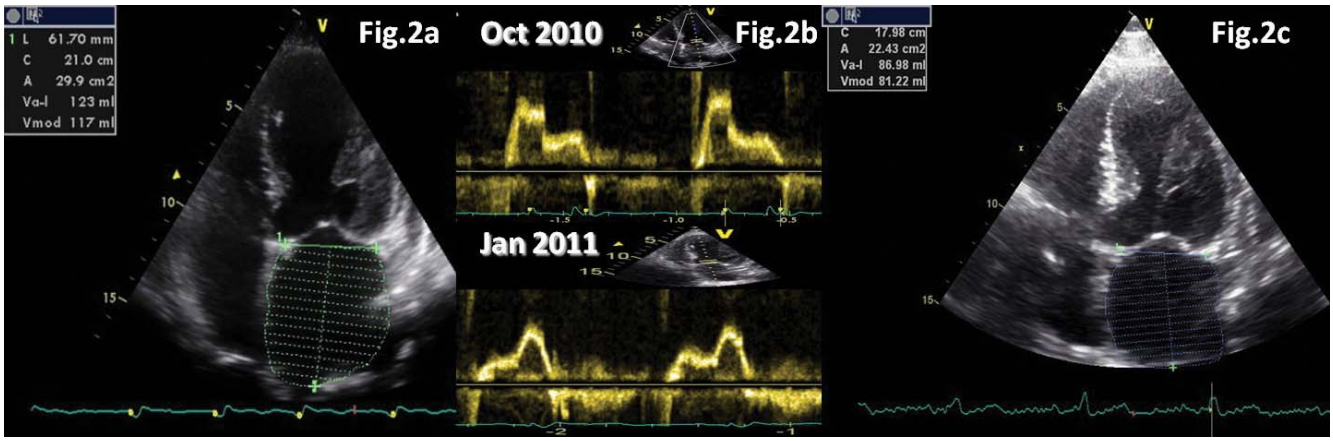

Figure 2. Echocardiography essentials: a. September 2010 - severe LA dilatation (LA volume 123 ml); b. diastolic filling profile improvement: from type III - restrictive filling (October 2010) to type I - impaired relaxation (January 2011); c. LA volume 86 ml in January 2018.

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