

Long-term effects of cardiac resynchronization therapy in patients with chronic right ventricular stimulation upgraded to biventricular devices

André Viveiros Monteiro, Mário Martins Oliveira, Pedro Silva Cunha, Nogueira da Silva, Joana Feliciano, Luisa Branco, Pedro Rio, Ricardo Pimenta, Ana Sofia Delgado, Rui Cruz Ferreira

Centro Hospitalar Lisboa Central - Hospital de Santa Marta

Chronic right ventricular (RV) pacing, provided either by conventional pacemakers or cardioverter-defibrillators (ICD), can have unpredictably deleterious effects on the systolic left ventricular (LV) function, eliciting or aggravating pre-existent LV dysfunction. Upgrading to biventricular (BIV) pacing can be a vital therapeutic option in order to obtain LV reverse remodeling. **Aim:** to assess long-term echocardiographic evolution and clinical outcome of patients (P) with chronic RV pacing who developed severe heart failure (HF) with LV dysfunction and underwent upgrade to BIV stimulation. **Methods:** Twenty-seven consecutive P (23 men; age 68.3 ± 10.7 years) with a previous pacing device who underwent successful implantation of a LV lead to upgrade their conventional system to BIV stimulation. All P had HF symptoms (NYHA class III) and LV ejection fraction $<35\%$, and received the maximum tolerated medical therapy before the upgrade. 14P (51.9%) had ischemic heart disease, of which 48.1% were previously submitted to percutaneous coronary intervention or surgical revascularization. The upgrade to BIV pacing was performed 60.3 ± 41.3 months after beginning pacing therapy ($>65\%$ of RV pacing). The initial device was an ICD in 15P (55.6%) and a conventional pacemaker in 12P (44.4%). Echocardiographic evaluation and clinical assessment were performed before the upgrade procedure and at the end of follow-up (mean duration: 38.6 ± 36.9 months). **Results:** During follow-up, LV end-diastolic diameter (72.3 ± 2.0 mm vs. 70.2 ± 2.0 mm; $p=NS$), and LV end-systolic diameter (61.0 ± 2.3 mm vs. 54.0 ± 2.6 mm; $p=0.002$) decreased, compared with baseline. Changes in LV diameters were accompanied by a significant increase in LV ejection fraction ($27.0 \pm 1.3\%$ vs. $36.6 \pm 2.4\%$; $p<0.001$). Left atrium diameter (53.9 ± 2.2 mm vs. 55.0 ± 2.0 mm; $p=NS$) and the rate of P with moderate to severe mitral regurgitation (22.7% vs. 22.7% ; $p=NS$) did not change significantly. Regarding clinical response, 60% (16P) improved NYHA functional class, 25.9% (7P) had hospital readmissions due to HF decompensation (7P) and 7.4% (2P) due to device dysfunction. One P died of end stage HF 3 months after the upgrade. **Conclusion:** In P with advanced HF and chronic RV pacing, upgrading to a BIV system can result in significant reverse LV remodelling with a good rate of clinical responders. Whether this translates into an improved prognosis remains to be determined.