

Additional acute improvement in left ventricular function after solving residual mechanical dyssynchrony in cardiac resynchronization patients

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Background: After cardiac resynchronization therapy (CRT), AV delay is usually set by "out of box" value while optimal VV interval is set using intracardiac electrocardiogram method (IEGM) according to the narrowest QRS width (**Figure 1**), regardless of the actual mechanical response of the left ventricle (LV).^{1,2} Our aim was to assess the presence of residual mechanical dyssynchrony after IEGM device optimization using echocardiographic parameters and to define echocardiographic and functional response in patients with early echo-guided optimization ("zero" OPT).

Patients and Methods: 98 CRT patients (Pts), with native LBBB, were included in the study. Early post implantation IEGM device optimization was performed in all Pts followed by „zero“-OPT prior to discharge in only 44 Pts – group 1. Other 54 Pts formed the control group – group 2. In Group 1, LV preexcitation (in sequential 10 ms intervals) was modified according to the presence of early presystolic septal motion („septal flash“), LV ejection fraction (LVEF) and global longitudinal strain (GLS). Pts were followed for one year after CRT implantation and their functional capacity was evaluated using six-minute walk test/stress test/cardiopulmonary stress test. They were classified into NYHA class according to the results of the testing. The same functional evaluation was performed prior to CRT implantation in all Pts.

Results: There was no difference in mean biventricular paced QRS duration between the groups before CRT-optimization: group 1 vs. group 2 - 169,7 vs 177,9 ms, as well as after one year follow-up - 134,3 vs. 137,6 ms, with no difference in biventricular pacing rate - 98,4 vs 97,7 %. Mean IEGM VV delay was 16 ms, after "zero" OPT mean VV delay was significantly prolonged to 36 ms). Interventricular mechanical delay (IV MD) also has not been changed significantly (mean 35,3 vs 30,0 ms). Mean IEGM AV delay (112 ms) was very slightly modified to mean SAV of 115 ms. Early after implantation diastolic dysfunction was mostly grade 1 (77% Pts), with grade 2 present only in 11.7% and grade 3 in 8.8%. Mean E/e' ratio was 14 with diastolic filling time corrected for RR interval 43.1±1.6%. In the group 1, after IEGM optimization

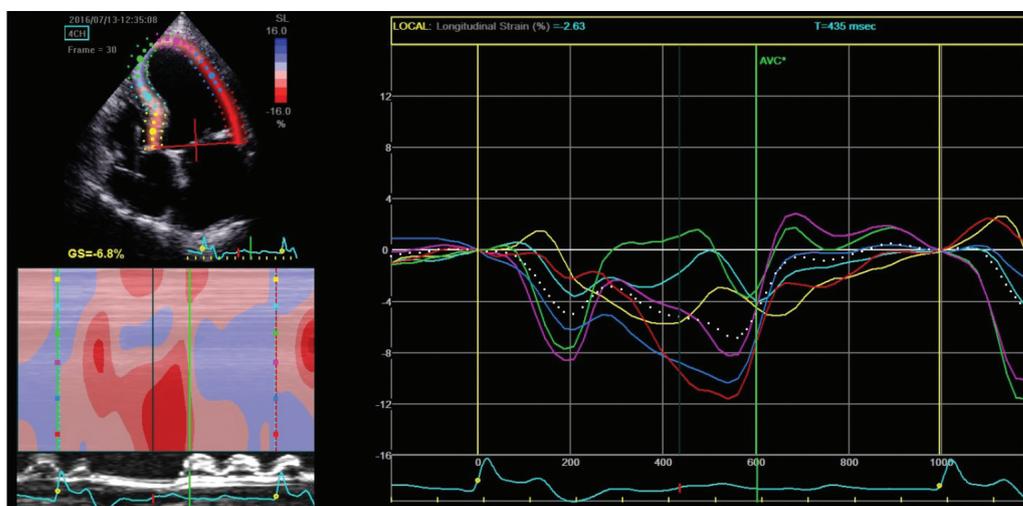


FIGURE 1. Global longitudinal strain in a patient after IEGM-based device optimization is severely reduced to -6.8%.

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