

Diastolic dyssynchrony in patients with LV only fusion pacing CRT without RV lead

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Background: CRT improves both systolic and diastolic function, thus increasing cardiac output. However, less data is available concerning diastolic dyssynchrony and fusion pacing CRT. The aim of our study was to assess the outcome of LV diastolic asynchrony in a population of fusion pacing CRT without right ventricular (RV) lead.

Methods: Prospective data were collected from a cohort of patients (pts) with right atrium/left ventricle leads (RA/LV CRT). Baseline and every 6 months follow-up included standard ETT and classical dyssynchrony parameter measurements. Diastolic dyssynchrony was done by offline speckle-tracking derived TDI timing assesment of the simultaneity of E" and A" basal septal and lateral wall 4 chamber view. New parameters were introduced: E" and respectively A" time (E"T / A"T) as the time difference between E" (respectively A") peaks septal and lateral wall. Exercise tests, drugs optimization and device individual programming were systematically performed in order to maintain constant fusion and improve CRT response. Patients were divided in three groups: super-responders (SR), responders (R) and non responders (NR).

Results: Sixty-two pts (35 male) aged 62 ± 11 y.o. with idiopathic DCM implanted with a RA/LV CRT were analyzed: 34%SR / 61%R / 5%NR. Baseline initial characteristics: QRS 164 ± 18 ms; EF 27 ± 5.2 ; 29% had type III diastolic dysfunction (DD), 63% type II DD, 8% type I DD. Average follow-up was 45 ± 19 months; mean LVEF at the last follow-up was $37 \pm 7.9\%$. The E"T decreased from 90 ± 20 ms to 25 ± 10 ms in SR with significant LV reverse remodelling (LV end-diastolic volume 193.7 ± 81 vs 243.2 ± 82 ml at baseline, $p < 0.0028$) and lower LV filling pressures (E/E" 13.2 ± 4.6 vs 11.4 ± 4.5 , $p = 0.0295$). DD profile improved in 65% of R with a reduction in E/A ratio (1.46 ± 5.3 vs. 0.82 ± 3.9 at baseline, $p = 0.4453$). Non-sudden cardiac death occurred in 3 NR pts (2%) with type III DD, severe LA volume and larger E" T / A"T (E"T > 85 msec A"T > 30 msec). Significant cut off value calculated by ROC curve for LV diastolic dyssynchrony is E"T > 80 ms and A"T of > 25 msec.

Conclusions: Fusion pacing CRT without RV lead showed a positive outcome; improving LV diastolic dyssynchrony in responders and super-responders patients is obvious. Larger randomized studies are needed to define the role of diastolic asynchronism as a predictor of favorable response in fusion pacing.

Abstract Figure. Typical TDI patterns in LV fusion pacing

