Right Ventricular Outflow Tract Pacing Reveals a Different Left Ventricular Synchronization According to the Degree of the Atrio-Ventricular Conductivity

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Background: We previously reported right ventricular outflow tract (RVOT) pacing results in a greater cardiac output comparing with mid-septal (RVMS) and apical (RVA) pacing. However, the precise mechanism of the RVOT pacing predominance is unknown. [Purpose] We aimed to clarify the pacing-site-dependent differences in left ventricular (LV) synchronization, and compared them according to the atrio-ventricular conductivity.

Methods: In 76 patients, the LV wall motion was visualized by 2D strain echocardiography (2DSE) and the SD in the time-to-peak systolic strain was measured in 18 LV segments. The differences in the LV synchronization were assessed between the sick sinus syndrome (SSS) and complete atrio-ventricular block (cAVB) patient groups.

Results: The SD in the time to peak systolic strain was smaller with RVOT pacing than RVMS or RVA with no remarkable difference between the RVMS and RVA. In the SSS group (n=31), RVOT pacing tended to minimize the SD compared with RVMS and RVA (69.9±4.3, 77.8±4.7 vs. 82.8±5.4ms), whereas the cAVB group (n=24) exhibited no significant difference in the SD among the three pacing positions (68.8±3.0, 73.9±4.4 vs. 76.0±3.7ms).

Conclusion: The beneficial effect of RVOT pacing was depicted clearly by 2DSE. However, the superiority of the RVOT over the RVMS and RVA differed according to the atrio-ventricular conductivity.

Keywords: right ventricular outflow tract pacing, 2D strain echocardiography, left ventricular synchronization