## Abstract

The QRS complex shortening by cardiac resynchronization therapy (CRT) has been associated with improved outcomes. We hypothesized that (*1*) the absence of QRS duration (QRSd) prolongation by right ventricular septal pacing may indicate a complete left bundle branch block (cLBBB), and (*2*) that the interval between the right-ventricular pacing stimulus and left-ventricular lead electrogram (RVP-LV) is a better predictor of the electrocardiographic effect of CRT than the interval Q-LV.

We prospectively collected 12-lead surface ECG and intracardiac electrograms during CRT implant procedures. Digital ECG and intracardiac recordings were edited and manually measured. The outcome measure was the QRS duration change induced by CRT (deltaCRT). Several outcome predictors were investigated: native QRS duration (QRSd), cLBBB (as defined by Strauss), Q-LV and RVP-LV intervals, and a newly proposed index defined by the difference between the right-ventricle-paced QRSd and native QRSd (deltaRVP).

We included 133 consecutive patients in the study and found that the baseline QRSd, deltaRVP, and Q-LV represent strong independent predictors of electrocardiographic response to CRT (deltaCRT). DeltaRVP correlates tightly with the CRT effect on QRSd and outperforms predictive value of the ECG-based cLBBB. Strong predictivity by deltaRVP for deltaCRT may be explained by the fact that the absence of QRSd prolongation by right-ventricular septal pacing (small deltaRVP) reflects the presence of the cLBBB. On the other hand, the RVP-LV interval, unlike deltaRVP and Q-LV, failed to predict the electrocardiographic effect of the CRT (deltaCRT).



**Key words:** heart failure, cardiac resynchronization therapy, left-bundle branch block, therapy optimization