

Echocardiographic Assessment of Ventricular Dyssynchrony in Left Ventricular Systolic Dysfunction and Valvular Heart Disease

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Abstract

Background- Mechanical dyssynchrony is common in patients with heart failure and its presence predicts patient response to cardiac resynchronization therapy (CRT). The quantification of left ventricular dyssynchrony using tissue Doppler imaging (TDI) may improve the selection of these patients. We aimed to evaluate the prevalence of dyssynchrony in patients with heart failure and valvular heart disease with either normal or prolonged QRS durations.

Methods- Patients with left ventricular (LV) systolic dysfunction and significant organic valvular heart disease were evaluated. Using conventional and tissue Doppler echocardiography, an interventricular mechanical delay >40 ms was defined as significant interventricular dyssynchrony. Intraventricular dyssynchrony was evaluated using the calculation of the septal-to-lateral wall delay, the SD of the time from the Q wave to the peak systolic wave of 6 basal and 6 mid segments, and the maximum difference in the time from the Q wave to the peak systolic wave of all 12 segments.

Results- Forty-four patients (22 female, mean age 47 ± 15.2 years) were evaluated. Interventricular dyssynchrony was present in 12 (27%) patients. Intraventricular dyssynchrony was present in 17 (39%) to 19 (43%) patients, depending on the method used. Interventricular and intraventricular mechanical dyssynchrony had a significant association with LV volume and QRS duration (independent of the type of valvular heart disease). We found almost perfect agreement between maximum difference and total dyssynchrony index ($\kappa = 0.91$), and the overall agreement among septum-to-lateral delay, maximum difference, and total dyssynchrony index was good ($\kappa = 0.72$).

Conclusion- Although ventricular dyssynchrony in patients with valvular heart disease and LV dysfunction is not highly prevalent, it has a significant association with QRS duration and LV size (*Iranian Heart Journal 2009; 10 (2):5-14*).

Key words: echocardiography ■ dyssynchrony ■ valvular heart disease

Abbreviations

Cardiac resynchronization therapy (CRT), left ventricle (LV), heart failure (HF), standard deviation (SD), tissue Doppler imaging (TDI), ejection fraction (EF), mitral stenosis (MS), mitral regurgitation (MR), aortic stenosis (AS), aortic insufficiency (AI), milliseconds (msec), septum-to-lateral delay (SLD), maximum difference (MD), total asynchrony index (TAI)

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