

Left ventricular stiffness assessed by diastolic wall strain predicts asymptomatic atrial high rate episodes in patients with pacemaker implantation

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Background: Asymptomatic atrial fibrillation has been reported to be associated with an increased risk of embolism.

Purpose: We investigated whether the left ventricular (LV) stiffness assessed by diastolic wall strain (DWS) predicts atrial high rate episodes (AHREs) in patients with pacemaker implantation (PMI).

Methods: One hundred forty seven patients (76 males, 75.2±8.9 years, 62 with sick sinus syndrome; SSS and 85 with atrioventricular block) who did not show atrial tachyarrhythmia before PMI were studied. DWS and other measurements were assessed using transthoracic echocardiography before DDD-pacemaker implantation. DWS was calculated from the M-mode echocardiographic measurement of the LV posterior wall thickness at end-systole (PWs) and end-diastole (PWd), and DWS was defined as (PWs-PWd)/PWs.

Results: AHREs (>5 min and >180 beats/min) were detected in 50/147 patients during follow-up periods (38.3±13.8 months). Patients with AHREs showed reduced DWS (0.29±0.07 vs. 0.39±0.06, $p<0.0001$), larger left atrial volume index, elevated E/e' ratio, thicker LV PWd, higher prevalence of SSS, and left bundle branch block pattern during ventricular pacing. On multivariate analysis, DWS was only independently associated with AHREs ($p<0.0001$, HR 1.987 for each 0.1 decrease in DWS, 95% CI 1.553–2.650). Patients with reduced DWS (<0.33) had a higher risk of incidences of AHREs (Figure 1).

Conclusions: LV stiffness assessed by DWS predicts AHREs in patients with PMI.

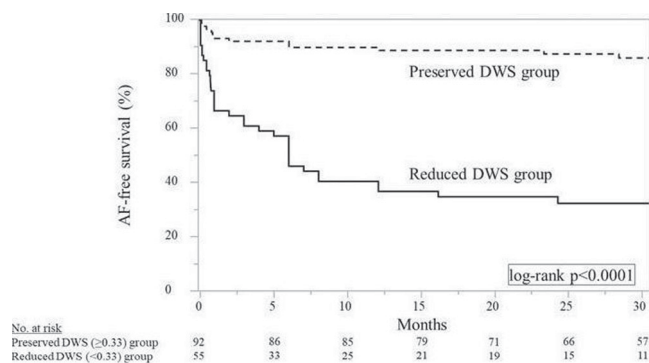


Figure 1