Right Ventricular Pacing Increases Tricuspid Regurgitation Grade Regardless the Mechanical Effect of the Electrode Placement

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Background: The effect of RV pacing on tricuspid regurgitation (TR) is still debatable and is related to interference in valve closure by the electrode. The study aimed to determine the pacing impact on TR grade.

Methods: Patients with permanent pacemaker (PM) (electrode at the RV apex) were studied. Exclusion criteria: PM dependence, atrial fibrillation and LV dysfunction. Each patient had a baseline echocardiography study followed by PM programming: if in sinus rhythm, the PM was set on a pacing mode (≤ 5 heartbeats of baseline rate) and vice versa. Echo study was repeated immediately thereafter. The TR was graded by vena contracta (TRvc). RV and LV areas (end-diastolic and systolic in the apical view) and the RV base systolic diameter (septum to free wall) were measured (arrow in Figure).

Results: Twenty-one patients (12 males, 79±12 years, 81% with DDD pacing) were included. RV pacing was associated with increase in TRvc (from 0.2±0.2 to 0.4±0.2 cm, $p<0.0001$) and in the average TR grade (from mild to mild-moderate, $p<0.0001$). RV and LV areas and RV systolic pressure were not changed by the acute change in the pacing mode. However, RV base systolic diameter increased with pacing (3.3±0.7 vs. 2.9±0.5 cm, $p=0.001$) and was accompanied by visually leftward deviation of the basal septum (Figure).

Discussion: RV pacing is associated with a small (but significant) increase in TR grade, independently of the electrode's presence. It is suggested that pacing increases TR via induction of dyssynchrony in RV contraction.

Figure