

PICM in patients with preserved ejection fraction undergoing permanent cardiac pacemaker placement

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Background/Aims: Chronic right-ventricular (RV) pacing can worsen heart failure in patients with a low ejection fraction (EF), but little is known about pacing-induced cardiomyopathy (PICM) in patients with preserved EF. We aimed to investigate risk factors of PICM in these patients during long-term follow-up.

Methods: The prospective registry at Chosun University Hospital, South Korea, included de novo patients with preserved EF undergoing transvenous permanent pacemaker (PPM) implantation for atrioventricular blockage from 2017 to 2021. Patients with EF \geq 50% and ventricular pacing \geq 40% were included. Composite outcomes were cardiovascular death, hospitalization, PICM, and biventricular pacing (BVP) upgrade.

Results: 168 patients (69 men, 76.3 \pm 10.4 years) were included. During three years of follow-up, three patients died, 14 were hospitalized, 16 suffered PICM, and two underwent BVP upgrade. Composite outcomes were associated with diastolic variables (E/e', LAVI), prolonged paced QRS duration (pQRSd), and low global longitudinal strain (GLS). Cox regression analysis identified pQRSd (hazard ratio [HR], 1.267; 95% confidence interval [CI], 1.037-1.549; P = 0.020) and GLS (HR, 2.548; 95% CI, 1.291-5.028; P = 0.007) as independent predictors of composite outcomes. GLS showed high predictive accuracy for composite outcomes, with an area under the curve of 0.85 (95% CI 0.712-0.962; P < 0.001) [GLS -12.0, 78% sensitivity, and 80% specificity].

Conclusions: RV pacing increased the risk of pacing-induced heart failure in patients with preserved EF. Low GLS and prolonged pQRSd could help identify individuals at high risk of pacing-induced heart failure even with preserved EF.

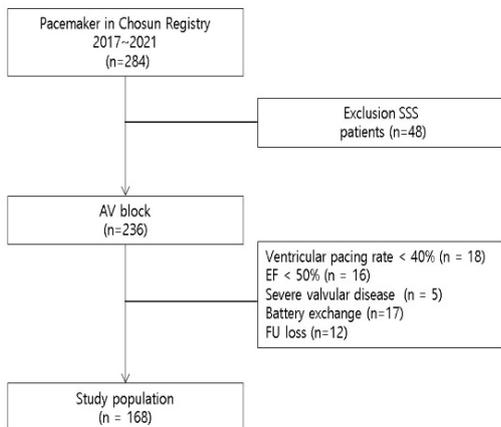


Figure1. Study Flow

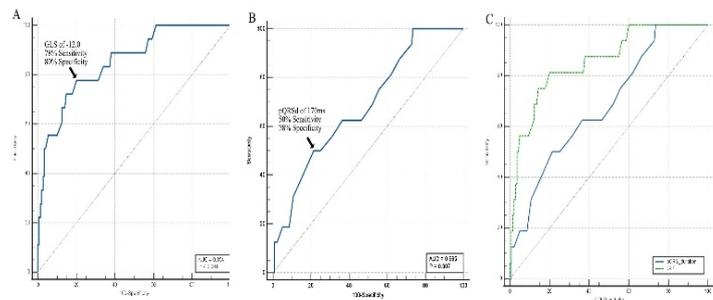


Figure2. ROC curve