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Association Between Periprocedural Heart Rate Trend and Postprocedural Worsening Heart Failure in Patients Receiving Catheter Ablation for Atrial Fibrillation
— Reply —

We thank Drs. Kataoka and Imamura for their meaningful comments and opinions. We would like to reply their letter.

Unfortunately, we have no data of right heart catheterization during the procedure. However, we have collected echocardiography data before the procedure (**Table**). There were some differences in echocardiography data between patients with and without decompensated heart failure (DHF); for example, patients with DHF had a lower left ventricular ejection fraction. In contrast, there was no difference in markers of left ventricular diastolic function, such as the E/A ratio, e' velocity, and E/e', between patients with and without DHF.[1,2] Although left ventricular systolic function was impaired in patients with DHF, left ventricular diastolic function seemed to be similar between patients with and without DHF. As we discussed in the limitations section in our paper,[3] we could not fully eliminate confounding factors because our study was a retrospective study.

As Drs. Kataoka and Imamura note, the optimal heart rate in atrial fibrillation (AF) patients is unclear, and a few patients in our study had bradyarrhythmia that required pacemaker implantation. However, as discussed in the paper, sinus node dysfunction is found in AF patients.[4] In such patients, the heart rate tended to decrease under the influence of sedation during the procedure,[5] and a failure of cardiac function to adapt to the decrease in heart rate may cause DHF.

In the case of a decrease in heart rate after catheter ablation, patients should be closely observed, and, when pulmonary congestion is found on chest X-rays or elevated intracardiac pressure is found on echocardiography, early interventions to prevent DHF, such as the administration of diuretics and/or nitrates, should be considered. If a considerable decrease in heart rate occurs, prevention of bradycardia by temporary cardiac pacing may be also considered as optional therapy.

Disclosures

None.

IRB Information

This study complied with the Declaration of Helsinki and the ethical standards of the Kansai Rosai Hospital Cardiovascular Center on human experimentation. The study was approved by the Kansai Rosai Hospital Institutional Review Board (Reference no.: 2001030).

Table. Echocardiography Data of Patients With and Without DHF

	All (n=1,004)	DHF		P value
		With (n=22)	Without (n=982)	
LV end-diastolic diameter (mm)	47±6	50±7	46±6	0.02
LV end-systolic diameter (mm)	31±7	37±9	31±7	0.01
Interventricular septal thickness (mm)	9±1	10±1	9±1	0.10
LV posterior wall thickness (mm)	9±1	10±1	9±1	0.23
LV mass index (g/m^2)	108±30	128±29	108±30	0.002
LA diameter (mm)	40±7	45±8	40±7	0.001
LA volume index (mL/m^2)	45±18	56±15	44±18	0.009
LVEF (%)	62±12	51±16	62±12	0.006
Peak E wave velocity (m/s)	0.8±0.2	0.9±0.2	0.8±0.2	0.06
Peak A wave velocity (m/s)	0.7±0.2	0.6±0.4	0.7±0.2	0.56
E/A ratio	1.3±3.9	1.4±0.9	1.3±3.9	0.96
e' velocity (septal; cm/s)	8±3	8±3	8±3	0.96
E/e'	11±4	12±5	11±4	0.15
Deceleration time (ms)	174±52	151±35	175±53	0.007
Mitral regurgitation ≥mild	349 (35)	11 (52)	338 (35)	0.09
Aortic regurgitation ≥mild	187 (19)	6 (29)	181 (19)	0.25
Tricuspid regurgitation ≥mild	333 (34)	13 (62)	320 (33)	0.005

Unless indicated otherwise, data are given as the mean±SD or n (%). DHF, decompensated heart failure; LA, left atrium; LV, left ventricle; LVEF, left ventricular ejection fraction.

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