Comparison between leadless pacemaker and single-chamber conventional pacemaker

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Introduction: In Japan, leadless pacemaker (LPM) was available from September 2017. However, appropriate patient selection, efficacy and safety are unknown in Japanese patients. The purpose of this study was to clarify which patients suitable for LPM and, efficacy and safety of LPM.

Methods: Among consecutive 271 pacemaker implantations from September 2017 to May 2019 in our hospital, we compared 29 patients implanted with LPM with 6 patients with implanted with single-chamber conventional pacemaker (S-CPM).

Result: In S-CPM group, 5 patients had atrial fibrillation with bradycardia and 1 patient had sick sinus syndrome. In LPM group, 11 patients had atrial fibrillation with bradycardia, 4 patients had atroventricular block and 14 patients had sick sinus syndrome. There was no significant difference between two groups in age, sex, white blood cell, hemoglobin, C-reactive protein and hospitalization period. Twelve patients (41%) with LPM had prior device infection or infection status and no patient (0%) in S-CPM had. Eleven patients (59%) with LPM had prior open-heart surgery and no patient (0%) in S-CPM had. Procedure time was shorter in patients with LPM than those with S-CPM (58±14 vs 96±30, P<0.001). Sensing threshold was smaller in patients with LPM than those with S-CPM (8.4±4.2 vs 13.1±3.1 mV, P = 0.014). There was no significant difference between 2 groups in pacing threshold (0.7±0.4 vs 0.6±0.1 mV, P = 0.056) and impedance (737±171 vs 660±95 mV, P = 0.296). However, 3 months after discharge, there was no significant difference between two groups in sensing threshold (12.9±3.8 vs 13.5±1.4 mV, P = 0.747) as well as pacing threshold (0.7±0.5 vs 0.8±0.2 mV, P = 0.701) and impedance (558±100 vs 637±64 mV, P = 0.105). The sensing threshold in patients with LPM significantly increased after discharge from implantation (P<0.001). During median interquartile range follow-up period of 284 [182, 445] days in patients with LPM and 483 [202, 495] days in those with S-CPM, there was no complication in both groups.

Conclusion: Even in chronic phase, the LPM is effective and safe for chronic as well as S-CPM.