Anatomically precise atrial higher septum pacing helps in management of elderly atrial fibrillation patients with tachycardia-bradycardia syndrome

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Introduction: Recently, catheter ablation (RFCA) for atrial fibrillation (AF) has been reported often as a method of enabling AF patients with tachycardia-bradycardia syndrome (TBS) to avoid permanent pacemaker implantation by suppressing AF. Especially for younger AF patients with TBS, RFCA is a promising therapeutic option. However, for the elderly, RFCA is challenging in terms of physical burdens from the procedure, potential clinical outcomes and the extent of sinus node dysfunction. In contrast, atrial septal pacing averts sinus node pause, and, in addition, possibly suppresses AF more often than right atrial appendage pacing (RAA). The mechanism of suppressing AF by atrial septal pacing is explained as follows. Atrial septal pacing can reduce dispersion of atrial refractory period between left and right atrium because pacing the adjacent Bachman bundle leads to earlier left atrium excitation. However, when using the existing pacing lead delivery system, it is not easy to screw the pacing lead into the right atrium higher septum. Often we have to give up on atrial septal pacing or accept placing the lead into the atrium lower septum. As a result, we wondered if therapeutic effect of the atrial septal pacing has been underestimated. Recently, a new pacing lead delivery system (SelectSecure, Medtronic) using a pre-shaped guiding sheath can precisely place the pacing lead into the atrium higher septum. In the current study we investigated whether the precise atrial higher septal pacing (AHSP) using the new delivery system can help us manage elderly AF patients with TBS.

Methods: Since 2018, we have performed AHSP for 75 years old and over AF patients with TBS who rejected RFCA for AF or were predicted to have difficulty in undergoing RFCA using the new lead delivery system. We analyzed 8 consecutive patients regarding the safety of the procedure, the precision of AHSP and the therapeutic effect for AF. We also retrospectively reviewed 36 cases of RAA performed for AF patients with TBS since 2015 and compared outcomes from AHSP with those from RAA.

Result: Eight cases underwent AHSP (Age: 82±4, 6 male). The procedure was successfully performed in all cases. Atrial wave height was 2.2±1.2 mV. Pacing threshold was 1.0±0.5 V at 0.5 msec. The polarity of the P wave in the inferior lead was positive in all cases, suggesting that the location of the atrial lead was screwed higher in the septum. No AF was observed for 7 days after the lead implantation. Conversely, out of 36 of the RAA patients, 8 patients (22.3%) had an AF attack within 7 days of the implantation.
**Conclusion**: AHSP using the new lead delivery system is a promising therapeutic option for elderly AF patients with TBS.