Procedure feasibility and mid-term follow-up of left bundle branch area pacing using stylet-driven pacing leads with a fixed-curve delivery sheath in patients with structural heart disease

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Background: Recently, left bundle branch area pacing (LBBAP) has been performed using stylet-driven extendable screw-in leads with newly introduced pre-shaped delivery sheath in South Korea. There are limited data on the feasibility of LBBAP in patients with structural heart disease (SHD).

Purpose: To evaluate LBBAP procedure feasibility and mid-term follow-up data of LBBAP lead profile in patients with SHD

Methods: Patients, in which LBBAP was attempted, were consecutively enrolled at the Seoul National University Hospital from January 2021 to December 2022. LBBAP was performed with stylet-driven lead (Solia S60, Biotronik) delivered through a delivery sheath (Selectra 3D, Biotronik). Procedure feasibility, LBBAP success rate, and mid-term LBBAP lead threshold were evaluated in patients with or without various type of SHD.

Results: A total of 121 patients were enrolled (mean age 73.5±12.2 years). Atrioventricular block was the most common indication (n=94, 77.7%), followed by atrial fibrillation with slow ventricular rate (n=12, 9.9%), sick sinus syndrome (n=10, 8.3%), and heart failure indicated cardiac resynchronized therapy (n=5, 4.1%). LBBAP success rate was 89.3% of total study population, deep septal pacing was achieved in 4.1%, and right ventricle apex pacing were performed in 6.6%. Fifty-one patients (42.1%) were accompanied by SHD (Figure). Patients with SHD had significantly lower left ventricular ejection fraction than those without SHD (54±13% vs. 62±5%, p<0.001). Baseline QRS duration was longer in patients with SHD (107±26 ms vs. 135±35 ms, p=0.005). Although LBBAP success rate was significantly lower in patients with SHD than those without in total study population (80.4% vs. 95.7%, p=0.007), LBBAP success rate was not differ between two groups after excluding first 30 cases (98.1% in patients without SHD vs. 97.4% in patients with SHD, p=0.811) (Figure). Among patients with successful LBBAP, total procedure time was longer in patients with SHD, but there was no significant difference of fluoroscopic time, bipolar V sensing, V pacing threshold, and V impedance between the two groups (Figure). Patients with SHD had longer left ventricular activation time (LVAT) (80±13 ms vs. 72±9 msec, p=0.003), but there was no statistically significant difference in the final QRS duration between the two groups (104±14 ms in patients without SHD vs. 111±14 msec in patients with SHD, p=0.955). During mean 19±6 months follow-up, there was no significant V threshold increase in both groups.

Conclusion: LBBAP using stylet-driven pacing leads in patients with SHD is feasible and safe as in patients without structural heart disease, even by an early experienced operator with LBBAP procedure.