Feasibility and Efficacy of Left Ventricular Lead Placement Guided by Subselection Inner Catheter Alone in Cardiac Resynchronization Therapy Device Implantation

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Introduction: In general, subselection inner catheter (Inner-Cath) has been adjunctively used with outer guide catheter (Outer-Cath) in failure cases of LV lead placement in a target vein of coronary sinus (CS) tributaries with Outer-Cath during cardiac resynchronization therapy (CRT) device implantation. This study aims to investigate the feasibility and efficacy of LV lead placement which is guided by Inner-Cath without Outer-Cath as a first-line methodology.

Methods: A total of 53 patients (age 68 ± 13 years, 41 males) who underwent de novo CRT implantation in a single center from January 2017 to May 2019 were included. LV lead placement was initially guided by Inner-Cath in 33 patients (Inner-Cath group) and Outer-Cath in 20 patients (Outer-Cath group). In the Inner-Cath group, 7Fr Inner-Cath was advanced to CS using a 5Fr EP-catheter through 7Fr sheath inserted in a subclavian vein. Meanwhile, 9Fr Outer-Cath was used in the Outer-Cath group. Procedural outcomes regarding success rate of LV lead placement, additional use of inner or outer catheters and procedure-related complications were retrospectively investigated and compared between the 2 groups.

Results: In most of the study patients, LV lead placement was successfully performed in both groups, (100 % in Inner-Cath group vs. 90 % in Outer-Cath group; P=0.138). However, 2 patients of Outer-Cath group required to abandon LV lead placement due to the CS perforation or CS dissection that was caused by the repeated CS cannulations with Outer-Cath. The procedure time was significantly shorter in Inner-Cath group compared with Outer-Cath group (154 vs. 181 minutes; P=0.023). The additional use of Outer-Cath in Inner-Cath group was significantly less frequent than that of Inner-Cath in Outer-Cath group (9.1 % vs. 30 %, P=0.006). Any significant procedure-related complications except 2 patients with CS perforation and CS dissection in Outer-Cath group were not observed in both groups.

Conclusion: LV lead placement guided by Inner-Cath alone was feasible in about 90 % of the CRT device implantations without any complications. This methodology for LV lead placement with Inner-Cath may be preferred in CRT candidates with severe LV dysfunction in terms of shorter procedure time, smaller size of guiding sheath and less procedure-related complications.