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

Kazuto Hayasaka
Takeshi Sasaki
Ko Akimoto
Kento Yabe
Chisashi Toya
Masahito Suzuki
Masahiko Goya
Tetsurou Sasano

**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.

**Result**: 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.