Left Atrial Appendage Closure with Zero Fluoroscopic Exposure Via Intracardiac Echocardiographic Guidance

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Introduction: Application of intracardiac echocardiography (ICE) to guide left atrial appendage closure (LAAC) procedures has been recognized advantageous comparing to transesophageal echocardiography (TEE). We aimed to explore the feasibility and safety of ICE-guided LAAC using the LAmbrèTM devices without fluoroscopic exposure.

Methods: Seven non-valvular AF patients with high risk of stroke and bleeding (male 5/7, mean age 71.7±8.8 years, mean CHA2DS2-VASc score 5.1±2.1; mean HAS-BLED score 3.0±1.2) were enrolled. Absence of LAA thrombus was confirmed prior procedure. All procedures were performed under local anesthesia. ICE probe (Cartosound™) was advanced into left atrium (LA) navigated by Carto3™ electroanatomic mapping system after the geometry reconstruction of LA, pulmonary veins (PVs) and LAA. LAA sizing and device implantation were assessed by ICE from triaxial views (Axis-X: left PVs to LAA; Axis-Y: right PV ostium to LAA; Axis-Z: lower LA to LAA).

Result: The mean diameters of ostia and landing zone of LAAs were 21.4±3.9mm and 20.4±4.2mm, respectively. There were two cauliflower-like, two chicken-wing-like and three cactus-like LAAs. LAmbrè devices with mean umbrella diameters of 23.7±4.2mm and cover disc diameters of 29.4±3.6mm were successfully implanted and acute complete LAA sealing without peri-device leak detected by ICE were achieved in all cases. The mean procedure duration was 73.0±21.4min. No fluoroscopy exposure nor contrast consumption were applied during procedures. No procedure-related complications were documented. The mean peri-device leak detected by TEE was 0.8±1.0mm at 45-day follow-up. No stroke nor thromboembolic events were recorded during follow-up.

Conclusion: LAAC procedure could be achieved under the ICE guidance efficaciously and safely. Fluoroscopy and general anesthesia are not necessities for LAAC procedures. Disc-designed occluders such as LAmbrèTM are optimal for fluoro-free LAAC procedures.