

Letters

RESEARCH CORRESPONDENCE

Minimalistic Approach to Left Atrial Appendage Occlusion Using the LAmBRE Device



Left atrial appendage occlusion (LAAO) is predominantly performed under general anesthesia, guided by transesophageal echocardiography (TEE) or intracardiac echocardiography (ICE). The LAmBRE (Life-tech Science, Shenzhen, China) is a novel LAAO device that allows: 1) a less selective transseptal puncture site for device implantation; 2) confirmation of device stability by 4 fluoroscopic signs and a tug test; 3) only angiographic assessment of adequate left atrial appendage (LAA) sealing; and 4) implantation without guidance by TEE or ICE (1-3). The aim of this pilot study was to assess the safety and feasibility of a minimalistic approach to left atrial appendage occlusion (MALAAO) using LAmBRE under local anesthesia without sedation and with fluoroscopic guidance alone.

A standardized protocol was adopted. Pre-procedural TEE was performed on the same day. Lignocaine was injected locally before femoral venous puncture. A pigtail catheter was placed in the left pulmonary artery to obtain a delayed filling phase left atrial angiogram in oblique projections. Transseptal puncture was performed under angiographic guidance. LAA angiography was performed to measure the dimension of the LAA orifice, landing zone, and length. Device implantation was performed according to the instructions for use (1,2). Left atrial angiography was performed to assess device position, LAA sealing and impingement on surrounding cardiac structures, and tug test to ensure device stability before release. Patients were fully conscious throughout the procedure and were mobilized 4 h after access site hemostasis. Transthoracic echocardiography was performed the next day to exclude pericardial effusion and gross device impingement on surrounding structures before discharge. Follow-up TEE was performed at 3 months to assess for

peridevice leak or device-related thrombus. Clinical outcomes including bleeding and thromboembolic events were assessed every 6 months.

We prospectively recruited 17 patients between April 2014 and September 2015 from Prince of Wales Hospital, Hong Kong (Table 1). The mean age, CHA₂DS₂-VAsC score, and HAS-BLED score were 69.0 ± 6.8 years, 3.9 ± 1.3 , and 2.8 ± 0.9 , respectively. The mean procedure (defined by total on-table time) and fluoroscopy times were 89.1 ± 22.6 min and 12.5 ± 4.3 min, respectively. LAAO was successful with no periprocedural complications in all patients. All patients received 3 months of aspirin plus clopidogrel, then lifelong aspirin. Sixteen patients (94.1%) underwent 3-month follow-up TEE, which showed no significant peridevice leak (>5 mm) or device-related thrombus. There was no stroke or systemic embolism, with a median follow-up duration of 39.3 months (range 4 to 45 months). One patient died of intracranial hemorrhage at 21 months while on aspirin alone. Similar procedural and follow-up results were achieved using the same MALAAO (except without left atrial angiography to guide transseptal puncture) in 14 patients from 2 centers in Germany (Table 1).

A streamlined “minimalistic approach” using local anesthesia or monitored anesthetic care without intraprocedural transesophageal echocardiographic guidance has been reported for other structural interventions, such as transcatheter aortic valve replacement, to be noninferior or even superior to traditional transcatheter aortic valve replacement using general anesthesia and transesophageal echocardiographic guidance (4). Similarly, we anticipate MALAAO to be a future trend with expanding volume and increasing experience in LAAO. Benefits of MALAAO include: 1) reduced procedural cost by obviating the need for anesthesiologists and echocardiographers; 2) avoiding the risk of general anesthesia or monitored anesthesia care and prolonged TEE (e.g., esophageal thermal injury); and 3) improved patient comfort and recovery time. Although guidance with ICE can be performed under local anesthesia (5), it is sometimes technically challenging to obtain adequate imaging of the LAA to guide device implantation and evaluate device stability and peridevice leak using ICE. Placement of

TABLE 1 Demographics and Outcomes of Minimal Approach to Left Atrial Appendage Occlusion

	PWH, April 2014 to September 2015 (n = 17)	CCB + NH, October 2016 to September 2017 (n = 14)
Demographics		
Male	12 (70.6)	8 (57.1)
Age (yrs)	69 ± 6.8	79 ± 7.0
CHA ₂ DS ₂ -VAsC score	3.9 ± 1.3	4.6 ± 1.5
HAS-BLED score	2.8 ± 0.9	4.5 ± 0.8
Procedural outcomes		
Procedural time (min)	89.1 ± 22.6*	36.1 ± 18.0†
Fluoroscopy time (min)	12.5 ± 4.3	7.6 ± 8.8
Length of stay (days)	2.3 ± 1.0	2.1 ± 0.3
Device success	17 (100.0)	14 (100.0)
Periprocedural complications	0	0
Follow-up TEE		
Peridevice leak		
Significant (>5 mm)	0	0
3–5 mm	1	2
<3 mm	7	1
Device-related thrombus	0	0
Clinical outcomes		
Median follow-up duration (months)	39.3 (4–45)	9 (3–14)
Ischemic stroke	0	0
ICH	1 (5.9)	0
CV death	2 (11.8)	0
Non-CV death	2 (11.8)	0
Major bleeding events	0	0

Values are n (%), mean ± SD, or median (range). *Procedural time defined as total catheterization laboratory on-table time. †Procedural time defined as wound puncture to closure time.

CCB = Cardioangiologisches Centrum Bethanien; CV = cardiovascular; ICH = intracranial hemorrhage; NH = Neubrandenburg Hospital; PWH = Prince of Wales Hospital; TEE = transesophageal echocardiography.

ICE in the coronary sinus, right ventricular outflow tract, left pulmonary artery, or left atrium may improve image quality, but not without risk.

To the best of our knowledge, this is the first reported case series of MALAAO using LAMbre, which appeared feasible and safe. This approach might be adopted as the initial approach to LAAO or an alternative for those at risk for TEE (e.g., esophageal varices) or who wish to avoid repeat TEE. However, evaluation in larger number of patients from different populations and institutions is needed before widespread adoption of this approach.

Chak-yu So, MBChB

Yat-yin Lam, MBBS, MD

Gary Shing-him Cheung, MBBS

Christy K.Y. Chan, MSc

Shaojie Chen, MD

Anna Kin-yin Chan, MBChB

Jai-wun Park, MD

Boris Schmidt, MD

*Bryan P. Yan, MBBS

*9/F, Division of Cardiology

Department of Medicine and Therapeutics

Clinical Sciences Building

Prince of Wales Hospital

Shatin, N.T.

Hong Kong SAR, China

E-mail: bryan.yan@cuhk.edu.hk

<https://doi.org/10.1016/j.jcin.2018.01.275>

© 2018 by the American College of Cardiology Foundation. Published by Elsevier.

Please note: Dr. Lam is a clinical proctor for the LAMbre device. All other authors have reported that they have no relationships relevant to the contents of this paper to disclose.

REFERENCES

1. Lam YY. A new left atrial appendage occluder (Lifetech LAMbre™ device) for stroke prevention in atrial fibrillation. *Cardiovasc Revasc Med* 2013;14:134–6.
2. Lam YY, Yan BP, Doshi SK, et al. Preclinical evaluation of a new left atrial appendage occluder (Lifetech LAMbre™ device) in a canine model. *Int J Cardiol* 2013;168:3996–4001.
3. Huang H, Liu Y, Xu Y, et al. Percutaneous left atrial appendage closure with the LAMbre device for stroke prevention in atrial fibrillation: a prospective, multicenter clinical study. *J Am Coll Cardiol Interv* 2007;10:2188–94.
4. Petronio AS, Giannini C, De Carlo M, et al. Anaesthetic management of transcatheter aortic valve implantation: results from the Italian CoreValve registry. *EuroIntervention* 2016;12:381–8.
5. Korsholm K, Jensen JM, Nielsen-Kudsk JE. Intracardiac echocardiography from the left atrium for procedural guidance of transcatheter left atrial appendage occlusion. *J Am Coll Cardiol Interv* 2017;10:2198–206.

RESEARCH CORRESPONDENCE

Early Introduction of Pulmonary Endarterectomy or Balloon Pulmonary Angioplasty Contributes to Better Health-Related Quality of Life in Patients With Chronic Thromboembolic Pulmonary Hypertension



Pulmonary endarterectomy (PEA) and balloon pulmonary angioplasty (BPA) have showed beneficial effects on hemodynamics and exercise tolerance in patients with chronic thromboembolic pulmonary hypertension (CTEPH) (1,2). Although several publications have demonstrated improvement in health-related quality of life (HRQOL) after treatment with PEA or BPA, as measured by Medical Outcome