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Left atrial appendage occluder implantation for stroke prevention in elderly patients with atrial fibrillation: acute and long-term results

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Atrial fibrillation (AF) is the most common cardiac arrhythmia in clinical practice with an increasing incidence and prevalence.[1] With ageing, the risk of thromboembolic and hemorrhagic events increases dramatically. As it has been reported previously, 3-year survival rate among patients with AF over 75 years of age after stroke is less than 50%, and almost 90% of those patients will remain disabled.[2] Anticoagulant therapy administration, even in elderly patients, can significantly improve the survival rate in this group, primarily by reducing the risk of ischemic stroke.[3] Inability of an adequate international normalized ratio (INR) control, severe renal failure, drug intolerance and risk of bleeding are the most common reasons preventing the use of anticoagulants.[4] It is believed that most of these restrictions are conditional, and some of them can be neglected. Yet, frailty remains one of the most powerful independent factors influencing the anticoagulation therapy in elderly patients.[5] Patients with severe frailty were often excluded from large randomized trials because of the difficulties in performing follow-up visits, thus resulting in the lack of evidence for the efficacy and safety of oral anticoagulant therapy in elderly population. This group of patients is most susceptible to trauma, is more likely to suffer from dementia, and they are more likely to be disabled. Often, a physician is simply not sure that the patient will return for a follow-up visit for further status assessment and dosage adjustment, which is most relevant while taking vitamin K antagonists. Either way, elderly patients are among the most difficult group of reference, because they have the shortest life expectancy and reduced quality of life. All these circumstances force clinicians to look for alternatives to oral anticoagulation therapy. Left atrial appendage (LAA) is a well-known source of thromboembolism in AF. LAA percutaneous closure is an effective and safe method of non-pharmacological prevention of thromboembolic complications in patients with AF. Moreover, it reduces the drug load of the patient.[6] Nowadays, LAA endovascular closure has become the only alternative to anticoagulant treatment. The analysis of available reports of large-scale studies and registry data on LAA closure safety and efficacy clearly shows intraoperative complications' reduction as the result of procedure technique improvement.[7–11]

On the other hand, there is a lack of data on LAA occlusion procedure safety in elderly patient population. Clinical characteristics and comorbid status of patients, enrolled in large randomized trials, assessing the comparative efficacy and safety of LAA closure with oral anticoagulants (OACs, vitamin K antagonists), typically differs from those in the elderly population.[6]

We performed a single-centre, retrospective observational study. From 2012 to 2016, LAA endovascular occlusion was performed in 72 patients for prevention of ischemic stroke. The indications for LAA closure were: non-tolerance of OACs (42 patients), recurrent bleedings (30 patients). Patients were divided in two groups according to age: ≤ 75 years [group 1, n = 54 (75%)] and >75 years [group 2, n = 18 (25%)]. Baseline clinical and demographic characteristics of patients are present in Table 1. All patients underwent preprocedural contrast-enhanced CT of the left atrium (LA) and pulmonary veins. The LAA occluder implantation procedure was performed under fluoroscopy and transesophageal echocardiography (TEE) guidance, a single transseptal puncture was performed and LAA angiography

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Table 1. Baseline patient characteristics.

	Group 1 *n* = 54	Group 2 *n* = 18	*P* value
Age, yrs	65.7 ± 5.7	77.8 ± 3.1	*P* = 0.008
Female	62.9%	77.8%	*P* = 0.566
Atrial fibrillation			
Paroxysmal	20.7%	5.6%	*P* = 0.016
Persistent	41.4%	38.9%	*P* = 0.900
Permanent	37.9%	55.6%	*P* = 0.793
Ischemic stroke	58.6%	66.7%	*P* = 0.965
Hemorrhages	46.5%	61.1%	*P* = 0.959
CKD	62.5 ± 7.4	51.5 ± 6.9	*P* = 0.748
Coronary artery disease	15.1%	33.3%	*P* = 0.161
Left ventricle ejection fraction	52.4%	48.6%	*P* = 0.084
CHA_2DS_2-VASc score	4.82 ± 1.48	5.27 ± 1.64	*P* = 0.047

Data are expressed as mean ± SD or percent. CKD: chronic kidney disease.

was carried out. Occlusion device type and size, and a delivery system were chosen according to the integrated information from CT angiography, TEE and fluoroscopy. In 38 patients, the Amplatzer Cardiac Plug (ACP) occluder was used, and in 34 patients the Watchman device (WD) occluder was selected. In both groups, antithrombotic therapy was continued for a period of 3 to 6 months after the procedure. At follow-up visits (45 days, 3 months and 12 months) control TEE was performed. After 12 months further monitoring was carried out remotely. The total follow-up period was 164.9 patient-years.

Statistical analysis was performed using Statistica 10.0 for Windows (StatSoft Inc., USA). Continuous variables were present as mean ± SD. Comparisons between two groups were performed by two-sided Student *t* test and two-sided Fisher's exact test, as appropriate. Kaplan-Meier analysis was performed to estimate survival over time. A *P* value ≤ 0.05 was considered to be significant.

Successful LAA occluder implantation was performed in all patients (100%). There was no significant difference in a mean procedural time (68.23 ± 17.34 min *vs*. 67.8 ± 19.9 min, *P* = 0.622) between age groups, nor in a mean contrast media volume used (116.2 ± 31.52 mL *vs*. 124.25 ± 24.16 mL, *P* = 0.732) and hospital stay time (7.6 ± 2.1 days *vs*. 7.8 ± 1.6 days, *P* = 0.324) (Table 2). In group 1, one procedure-related death occurred the next day (1.85% retroperitoneal fatal bleeding). There were no other procedure- and device-related complications, including cardiac tamponade, ischemic stroke, device dislodgement/migration. During the follow-up period, there were no cerebral and other embolic events (Figure 1).

At first follow-up visit (45 days), silent thrombus formation on the atrial surface of the device was detected by TEE

Table 2. Procedural data and complications.

	Group 1 *n* = 54	Group 2 *n* = 18	*P* value
Implanted device			
ACP	30 (55.6%)	8 (44.4%)	*P* = 0.430
WD	24 (44.4%)	10 (55.6%)	*P* = 0.430
Mean procedure time, min	68.23 ± 17.34	67.8 ± 19.9	*P* = 0.622
Mean volume of contrast media, mL	116.2 ± 31.52	124.25 ± 24.16	*P* = 0.732
Total number of complications	1 (1.85%)	0	*P* = 1.000
Mean hospital stay, days	7.6 ± 2.1	7.8 ± 1.6	*P* = 0.324

Data are expressed as mean ± SD. ACP: Amplatzer cardiac plug; WD: Watchman device. There are no significant differences in procedural data and complication rates between groups.

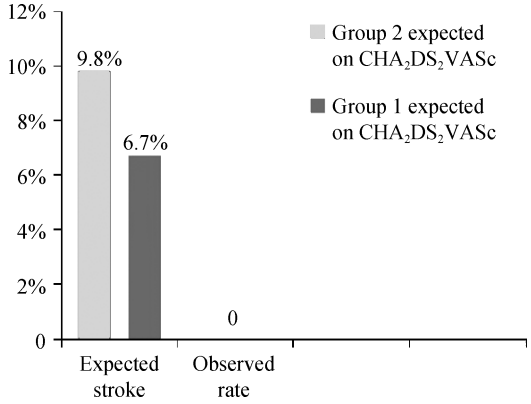

Figure 1. Expected and observed rate of cardioembolic events. The expected stroke rate according to CHA_2DS_2VASc score without OACs was 6.70% for group 1 and 9.80% for group 2. No thromboembolic events were detected in our study.

in two cases (one patient from each group). In both cases, thrombus resolved on LMWH therapy (within 21 days) without any sequelae. At further follow-up visits (3 months and 1 year), there was no other evidence of LA thrombosis. Oral anticoagulation therapy was discontinued after 3-6 months in all patients. Additionally, antiplatelet therapy was also ceased in five patients. During the follow-up, five patients died in both groups, with no significant difference in the overall mortality between the groups (Figure 2, 0.056 *vs*. 0.112; *P* = 0.434).

The major finding of our study is that LAA closure device implantation procedure success and complication rates do not differ between elderly patients aged more than 75 years compared to younger patients. Moreover, there was no significant difference in all-cause mortality between both groups during the follow-up period.

Our results correlate with the data from the study by Freixa, *et al*.,[12] showing that endovascular LAA occlusion procedure in elderly patients is safe and not associated with

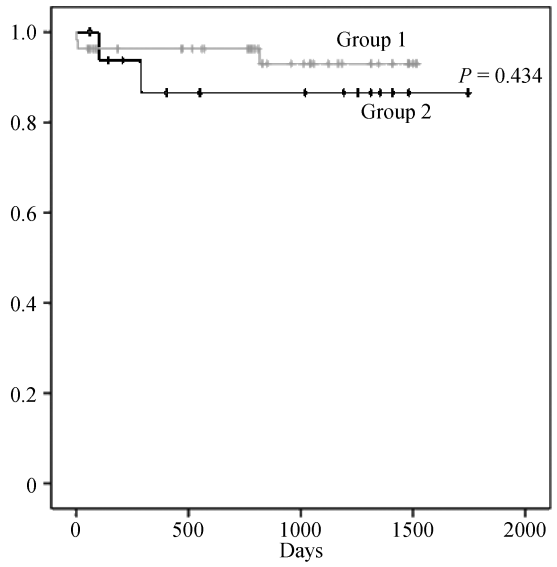

Figure 2. Kaplan-Meier survival analysis in group 1(gray line) and group 2 (dark line) during the overall follow-up. There is no significant difference in survival rate according to age (P = 0.434).

an increased cardiovascular mortality, during mean follow-up of 16.5 months, in comparison with a younger cohort.[12] In our case series, there were no cardiovascular events in the elderly group despite an expected high stroke rate according to CHA_2DS_2VASc score without OACs (Figure 1). Considering that patients in both groups were not suitable for lifelong anticoagulation therapy, and had high thromboembolic and hemorrhagic risks, the expected benefit of LAA occlusion strategy for life prognosis seems to be very high.

In conclusion, percutaneous LAA closure is efficient and safe in elderly patients with high thromboembolic and hemorrhagic risks. However, this study was a retrospective analysis of procedures performed by one experienced operator, and the study results should be interpreted in the light of these limitations. Another limitation is the small number of patient included.

References

1 Chugh SS, Havmoeller R, Narayanan K, *et al*. Worldwide epidemiology of atrial fibrillation: a Global Burden of Disease 2010 Study. *Circulation* 2014; 129: 837–847.

2 Wang T, Li B, Gu H, *et al*. Effect of age on long-term outcomes after stroke with atrial fibrillation: a hospital based follow-up study in China. *Oncotarget* 2017; 8: 53684–53690.

3 Hart RG, Pearce LA, Aguilar MI. Meta-analysis: antithrombotic therapy to prevent stroke in patients who have nonvalvular atrial fibrillation. *Ann Intern Med* 2007; 146: 857–867.

4 Pugh D, Pugh J, Mead GE. Attitudes of physicians regarding anticoagulation for atrial fibrillation: a systematic review. *Age Ageing* 2011; 40: 675–683

5 Induruwa I, Evans NR, Aziz A, *et al*. Clinical frailty is independently associated with non-prescription of anticoagulants in older patients with atrial fibrillation. *Geriatr Gerontol Int.* Published Online First: April 18 2017. DOI 10.1111/ggi.13058.

6 Alli O, Doshi S, Kar S, *et al*. Quality of life assessment in the randomized PROTECT AF (Percutaneous Closure of the Left Atrial Appendage Versus Warfarin Therapy for Prevention of Stroke in Patients With Atrial Fibrillation) trial of patients at risk for stroke with nonvalvular atrial fibrillation. *J Am Coll Cardiol* 2013; 61: 1790–1798.

7 Holmes DR, Reddy VY, Turi ZG, *et al*. Percutaneous closure of the left atrial appendage versus warfarin therapy for prevention of stroke in patients with atrial fibrillation: a randomized non-inferiority trial. *Lancet* 2009; 374:534–542.

8 Boersma LV, Schmidt B, Betts TR, *et al*. Implant success and safety of left atrial appendage closure with the WATCHMAN device: peri-procedural outcomes from the EWOLUTION registry. *Eur Heart J* 2016; 37: 2465–2474.

9 Holmes DR, Kar S, Price MJ, *et al*. Prospective randomized evaluation of the watchman left atrial appendage closure device in patients with atrial fibrillation versus long-term warfarin therapy: the PREVAIL trial. *J Am Coll Cardiol* 2014; 64: 1–12.

10 Reddy VY, Gibson DN, Kar S, *et al*. Post approval U.S. Experience with left atrial appendage closure for stroke prevention in atrial fibrillation. *J Am Coll Cardiol* 2017; 69: 253–261.

11 Reddy VY, Holmes D, Doshi SK, *et al*. Safety of percutaneous left atrial appendage closure: results from the Watchman Left Atrial Appendage System for Embolic Protection in Patients with AF (PROTECT AF) clinical trial and the Continued Access Registry. *Circulation.* 2011; 123: 417–424.

12 Freixa X, Gafoor S, Regueiro A. Comparison of efficacy and safety of left atrial appendage occlusion in patients aged < 75 to ≥ 75 Years. *Am J Cardiol* 2016; 117: 84–90.

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