

## Editorial



# Is Left Atrial Appendage Occlusion Always Better than Direct Oral Anticoagulants?

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## OPEN ACCESS

**Received:** Jun 1, 2021

**Accepted:** Jun 13, 2021

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### Funding

The author received no financial support for the research, authorship, and/or publication of this article.

### Conflict of Interest

The author has no financial conflicts of interest.

### Data Sharing Statement

The data generated in this study is available from the corresponding author upon reasonable request.

► See the article “Percutaneous Left Atrial Appendage Occlusion Yields Favorable Neurological Outcomes in Patients with Non-Valvular Atrial Fibrillation” in volume 51 on page 626.

Proportion of nonvalvular atrial fibrillation (AF) patients at high risk of stroke patients based on Congestive heart failure, Hypertension, Age $\geq$ 75, Stroke, Vascular disease, Age 65–74, Vascular disease, female sex (CHA<sub>2</sub>DS<sub>2</sub>VASc) score as well as prevalence of AF has been increasing.<sup>1)</sup> With introduction of direct oral anticoagulants (DOACs), use of oral anticoagulation in nonvalvular AF patients at high risk of stroke has been increased in Korea.<sup>2)</sup> While multiple large-scale randomized clinical studies demonstrated not only superiority of DOAC over warfarin in terms of intracranial hemorrhage, and major bleeding, but also non-inferiority in terms of ischemic stroke and mortality, a significant number of patients discontinued DOAC due to bleeding.<sup>3)</sup>

Left atrial appendage occlusion (LAAO) demonstrated reduction of total mortality and major bleeding in nonvalvular AF patients at high risk of stroke and unsuitable for long-term warfarin treatment.<sup>4)</sup> There has been a paucity of data comparing LAAO followed by single antiplatelet drug therapy (SAPT) vs. DOAC. Recent study which compared safety and efficacy of LAAO vs. DOAC in AF patients showed that similar efficacy in stroke prevention and better safety in major bleeding and total mortality, resulting in reduced composite primary end points (stroke, major bleeding or total mortality) in LAAO group.<sup>5)</sup>

Whilst we are waiting for results of randomized clinical trials (NCT03642509, NCT04226547, and NCT04394546) of LAAO with DOAC, here we have an article comparing neurologic outcomes between LAAO vs. DOAC user after stroke. Lee et al.<sup>6)</sup> analyzed neurologic outcomes of patients with LAAO (n=30 of 1,427 patients from 3 registries) and DOAC users (n=86 from 1,691 patients from a registry) retrospectively. Clinical characteristics were well balanced between the groups (age, sex, and CHA<sub>2</sub>DS<sub>2</sub>VASc score). There were 19 strokes and 11 transient ischemic attacks (TIA) in LAAO group vs. 85 strokes and 1 TIA in DOAC group. While stroke severity assessed by modified Rankin scales (mRS) was similar between the groups at discharge, stroke severities at 3 and 12 months were significantly less severe in LAAO group than NOAC group. They suggested 1) less thrombus formation in the left atrial appendage in LAAO group and 2) lower tendency to progress to hemorrhagic stroke as probable mechanisms of improved outcome in LAAO group.

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They also provided valuable information about possible cause of stroke, acute treatment and mechanisms of stroke in DOAC group. Off-label Low-dose DOAC was administered in 43% of DOAC group, which proving the gap between the international guidelines and real practice. Whereas acute stroke treatment in LAAO was not presented, 17 patients (20%) received intravenous thrombolysis and/or endovascular treatment in DOAC group. Approximately 1/3 of AF patients have non-cardioembolic causes of stroke, which implies accurate determination of the cause of stroke and appropriate implementation of appropriate treatment such as use of recommended DOAC dose, blood pressure control and so on.<sup>7)</sup> We still do not have sufficient data to determine which is effective and safe treatment in recurrent stroke survivors on adequate dose of DOAC—change to another DOAC or LAAO—or vice versa. Considering very high risk of major bleeding with the use of DOAC and SAPT, LAAO+SAPT is assumed a preferred option to DOAC+SAPT or DOAC alone in stroke survivors with additional cause or condition of stroke (large vessel disease, etc.).

Even though rehabilitation improves functional status and symptoms in stroke survivors, there are major disparity of rehabilitation service between high vs. middle-low income countries.<sup>8)9)</sup> Though we presented baseline characteristics and neurologic outcomes in each group at each timeline, we are still blinded to ethnicity, socioeconomic status, educational level of patients, proportion of in-hospital rehabilitation service and proportion of rehabilitation after discharge, and level and frequency of rehabilitation service in which patients participated in each group as pointed out as limitations by authors. We noted that mRS was assessed by neurologists who knew patient's treatment rather than independent clinicians, which is an inherent limitation of retrospective study. Lastly, they used only mRS score among many tools to be used for assessing functional recovery.

It is good news that structural heart disease specialists or interventional electrophysiologists could improve neurologic outcomes in stroke survivors. Whatever the reason underlying improved neurologic outcome in stroke survivors with LAAO might be, clinicians taking care of AF patients should consider LAAO over reduced dose of DOAC in patients at high risk or history of bleeding because major bleeding has a grave impact on survival.<sup>10)</sup>

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