Electrical Isolation of the Left Atrial Appendage: Is It Safe?

Nathaniel Thompson, MD; Pierre Jais, MD

Pulmonary vein isolation is an accepted cornerstone for all atrial fibrillation (AF) ablation. This is true for both paroxysmal and persistent AF, although other atrial structures have been demonstrated to be involved in the initiation and maintenance of AF. Including the left atrial appendage (LAA), Di Biase et al demonstrated that the LAA may be responsible for AF recurrence in a subset of patients, and isolation of the LAA could achieve freedom of AF in patients with demonstrated triggered activity. Electric uncoupling of the LAA is not without its potential risks. However, the authors reported that thrombus was not observed in any of the 204 patients with electric LAA isolation. No cerebrovascular events were reported.

In this issue of Circulation: Arrhythmia and Electrophysiology, Rillig et al present their investigations of electric LAA isolation and the incidence of LAA thrombus and cerebrovascular events. They report cerebrovascular events in 3 of 50 patients (stroke in 2 patients and transitory ischemic attack in 1 patient), who underwent LAA electric isolation. In addition to these 3 symptomatic complications, another 21% of patients had thrombus detected by transesophageal echocardiogram. Oral anticoagulation was recommended for all patients and LAA closure in patients who underwent LAA electric isolation. Of the 3 cerebrovascular events, 1 did not receive oral anticoagulation, whereas of the 10 patients who had LAA clot detected, 1 did not receive oral anticoagulation. In comparison, in the control group of 50 patients who did not undergo LAA electric isolation, there were no LAA thrombi detected or cerebrovascular events.

These findings raise serious concerns about the safety of electric isolation of the LAA, in the context of an extensive ablation procedure, and are in contrast to the results published by Di Biase et al. The authors point out that the high incidence of LAA thrombus detected on transesophageal echocardiogram could be explained by a more extensive approach than that of Di Biase et al, with a wider area of atrium used to isolate the appendage. There was a trend toward a larger isolated area in patients with LAA thrombus and cerebrovascular events, although it did not reach statistical significance. Significantly, the authors report that in 1 patient with stroke, LAA reconnection was confirmed at the time of LAA closure, implicating that alteration of contractility alone is not enough to create a risk for a cerebrovascular event. However, no details are provided on the mechanical performance of the reconnected appendage and on the timing of its contraction in the cardiac cycle, if any. One could argue that any ablation strategy with significant alteration of LAA contractility and contractility is an unnecessary risk.

There are ethical concerns about the extensive ablation strategy used by Rillig et al particularly in patients with paroxysmal AF (40% of patients who underwent LAA isolation). After pulmonary vein isolation, the majority of patients with LAA isolation received a mitral isthmus line (94%) and an anterior line (90%). Linear lesions sets are effective to break the circuits of macro-reentrant tachycardias, and to a lesser degree transsect the reentrant circuits of persistent AF. However, there is a little effective role for linear lesions for paroxysmal AF and as such poses an unnecessary risk for the patient. In addition, the combination of a mitral line and anterior line seems to be a poor choice because the addition of these linear lesions yielded unintentional LAA isolation in 42% of patients.

As it stands, electric isolation of the LAA remains controversial and should only be attempted in selected cases with more limited ablation lesion sets, rigorous use of oral anticoagulation, and a preference for the use of LAA occlusion devices. What is unknown is what if any ablation strategy to isolate the LAA is truly safe. The more limited strategy used by Di Biase et al appears as a more prudent option, although as we have seen, altered conduction alone is a potential risk of a thromboembolic event. More work is required to delineate the risks, benefits, and hemodynamic impact of LAA isolation, and the methods to achieve this. We must thank Rillig et al for reporting what had been a more theoretical risk with electric LAA isolation, and their work should serve as an important guide and resource to the reader.

Disclosures

None.

References


**Key Words:** editorials ■ atrial appendage ■ atrial fibrillation ■ stroke
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Circ Arrhythm Electrophysiol. 2016;9:
doi: 10.1161/CIRCEP.116.004209

Circulation: Arrhythmia and Electrophysiology is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
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Print ISSN: 1941-3149. Online ISSN: 1941-3084

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circep.ahajournals.org/content/9/5/e004209

An erratum has been published regarding this article. Please see the attached page for:
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In the editorial by Thompson and Jaïs (Thompson N, Jaïs P. Electrical isolation of the left atrial appendage: is it safe? Circulation: Arrhythmia and Electrophysiology. 2016;9:e004209, doi: 10.1161/CIRCEP.116.004209), which published May 6, 2016, and appeared in the May 2016 issue of the journal, corrections were needed.

The authors apologize for this error.

On p 1, left column, lines 11–13 of the second paragraph, the sentence that read “Of the 3 cerebrovascular events, 1 did not receive OCA, whereas of the 10 patients who had LAA clot detected, 1 did not receive OCA” has been corrected to read, “Of the 3 cerebrovascular events, 1 did not receive oral anticoagulation, whereas of the 10 patients who had LAA clot detected, 1 did not receive oral anticoagulation.”

These corrections have been made to the current version of the article, which is available at http://circep.ahajournals.org/content/9/5/e004209.full.

(Circ Arrhythm Electrophysiol. 2016;9:e000016. DOI: 10.1161/HAE.0000000000000016.)
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Circ Arrhythm Electrophysiol is available at http://circep.ahajournals.org

DOI: 10.1161/HAE.0000000000000016