Reviewer's report

Title: Global peak left atrial longitudinal strain assessed by transthoracic echocardiography is a good predictor of left atrial appendage thrombus in patients in sinus rhythm with heart failure and very low ejection fraction - an observational study

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Reviewer: Jun-Bean Park

Reviewer's report:

The present manuscript, "Global peak left atrial longitudinal strain assessed by transthoracic echocardiography is a good predictor of left atrial appendage thrombus in patients in sinus rhythm with heart failure and very low ejection fraction - an observational study" is an original article investigating the prognostic value of peak left atrial longitudinal strain (PLAS) in predicting the risk of left atrial appendage thrombus (LAAT) in heart failure patients with sinus rhythm. This study suggests potential usefulness of echocardiographic assessment of LA function as an imaging biomarker that can identify individuals at high-risk for stroke. Their efforts deserve praise, but the reviewer has major concerns regarding this article.

Major comments

Comment #1

1. Although participants with known atrial fibrillation or atrial fibrillation on the index ECG were excluded, it is not clear how asymptomatic paroxysmal atrial fibrillation was excluded in this study. More aggressive efforts to diagnose paroxysmal atrial fibrillation, such as 24-hour holter ECG, are usually needed among patients with left atrial appendage thrombus (LAAT). The lack of such efforts to exclude the presence of paroxysmal atrial fibrillation is a major limitation of the present study.

There is a single sentence near the end of the manuscript that attempts to dismiss this concern. The authors should more clearly describe whether they used ECG data obtained by cardiac implantable electronic devices (CIED) for the purpose of detecting short episode of paroxysmal atrial fibrillation and the proportion of patients who had CIED.
2. The authors stated that the reproducibility of global LA strain measurement is high based on previous studies. However, they should provide data on reproducibility of peak left atrial longitudinal strain (PLAS) derived from own data, such as intra-observer and inter-observer variabilities of PLAS. In the present study, the difference in PLAS between participants with and without LAAT is only 2.4%. Furthermore, this study attempted to establish a cutoff of PLAS for the prediction of the presence or absence of LAAT. In this setting, reproducibility of PLAS is much more critical.

3. This study protocol did not include assessment of the presence or severity of valvular heart disease, such as mitral stenosis or regurgitation, which can affect the risk of LAAT as well as the degree of left atrial enlargement. The authors should provide comprehensive information on valvular heart disease, including the presence/absence, type, and severity.

4. The authors noted that collected clinical data included the etiology of heart failure (HF), but it seems that they only examined whether patients with HF had an underlying ischemic etiology or not. The authors should add descriptive data on the type of non-ischemic cardiomyopathy. In the setting of similar left ventricular (LV) systolic function, certain types of non-ischemic cardiomyopathy, such as hypertrophic cardiomyopathy or cardiac amyloidosis, have higher LV filling pressure than other types, which is an important determinant for the value of PLAS.

5. Patients with active cancer were included in this study, which can substantially confound the results. For example, some patients with active cancer may have hypercoagulable status or contrarily, some cancer patients may have coagulopathy, such as prolonged prothrombin time due to hepatic failure. The author should exclude patients with active cancer, or at least should perform subgroup analyses after excluding those patients.

6. The author should provide data on medications used in the study population, including antiplatelet agents, statins, diuretics, beta-blocker, calcium-channel blocker, renin-angiotensin system antagonist, and digoxin.

7. Who performed transesophageal echocardiography (TEE) for the detection of LAAT? Who conducted LA strain analysis? Is there any pre-specified sequence of performing tests, such as TEE first, and then LA strain analysis or vice versa? The authors should also clarify whether the examiner(s) was blinded to the results of prior measurements and clinical data.
8. Please add data on systolic and diastolic blood pressure in Table 1.

9. The background section of the abstract is too lengthy.

10. The introduction of main text is also lengthy and poorly structured, making it difficult to follow.

Minor comments:

Comments #1

Grammar, punctuation, and typographical errors should be fixed.

Comments #2

Please check abbreviations through manuscript and tables. First of all, define an abbreviation at its first use in text. For instance, the full name "left atrial appendage thrombus" and its abbreviation "LAAT" were used inconsistently throughout the abstract. Furthermore, the abbreviation "LAAT" was abruptly used in the main text and thereafter "left atrial appendage thrombus" was used with mentioning the abbreviation "LAAT" in the parenthesis. Another examples include apical four chamber (A4C) and the apical two chamber (A2C); abbreviations "A4C" and "A2C" should be stated at their first use in the brackets after the full terms "apical four chamber" and "apical two chamber".

Level of interest

Please indicate how interesting you found the manuscript:

An article whose findings are important to those with closely related research interests

Quality of written English

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Needs some language corrections before being published
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