Reviewer’s report

Title: Left atrial reservoir strain combined with E/E' as a better single measure to predict elevated LV filling pressures in patients with coronary artery disease

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Reviewer: Giulia Elena Mandoli

Reviewer's report:

Lin and colleagues conducted a diagnostic study investigating whether left atrial (LA) strain could be useful in detecting diastolic dysfunction in patients with coronary artery disease (CAD) and preserved ejection fraction, claiming that a combination of LA reservoir strain and a conventional marker of left ventricular (LV) filling pressures could be superior to the ASE/EACVI recommended criteria to diagnose diastolic dysfunction in these patients.

The results of this study are clear, and the paper is overall well-written. However, I have some major and minor issues to be addressed:

Major issues:

- How do you explain the superiority of septal E/E' in your analysis, in contrast to other research and recommendation papers, which always prefer the use of lateral E/E' or medium E/E'?

- The characteristics of the population has to be more clearly explained. Are they stable CAD or acute coronary syndrome patients? I think they are stable CAD subjects, but in this case LA enlargement would have been expected, which is not consistent with your results. On the other hand, if they are acute coronary syndrome patients, I believe it could have been more useful to measure LA strain after a certain period to assess if the ischemic event had led to LA maladaptive remodeling with a rise in LV filling pressures, despite normal ejection fraction.

Finally, were the patient symptomatic for angina or similar before being treated?

- You enrolled patients with coronary artery stenosis &gt; 50%. I suppose these are based on visual assessment. Did you also perform fractional flow reserve (FFR) or instant wave-frame ratio (iFR) in 50-70% stenosis to confirm their hemodynamic relevance?

- In the exclusion criteria you mentioned "old myocardial infarction". However, in Table 1, among the main characteristics, there are prior myocardial infarction and revascularizations. Could you precisely explain what you meant for "old"?
- Was there a second echocardiographer who operated speckle tracking offline analysis? Was he blinded to clinical and basic echocardiographic findings?

- The Table 1 needs to be completed with the following variables: baseline blood pressure, use of loop diuretics, E/A ratio (which you mentioned in the Methods section), since LV filling pressures could be conditioned by these elements.

- Did you measure systolic pulmonary artery pressures (sPAP), mitral regurgitation grade, global longitudinal strain (GLS), LA emptying fraction? If yes, please include them in Table 1. These are indices which could influence LA function and the presence of diastolic dysfunction, so it is crucial to consider them for a complete evaluation of your results.

- In my opinion, a classification of the population based on regionality of coronary disease is needed to better understand your findings. Location of culprit lesion and coronary dominance should be included. In fact, since circumflex coronary artery is usually the major determinant of myocardial oxygenation of the LA, this could be more affected by ischemic damage in patients with circumflex artery culprit lesions than in patients with other vessels culprit lesions (as demonstrated by Lee et al. in Echocardiography. 2015 Jul;32(7):1094-100).

- I suggest it would be useful for readers if you mention the normal reference values for diastolic function, which are reported in the NORRE study: Caballero L et al. Eur Heart J Cardiovasc Imaging. 2015 Sep;16(9):1031-41.

- The clinical utility of your findings needs to be better addressed in the discussion section. Would you mean to propose the use of LA strain to reveal subtle CAD in asymptomatic patients with normal ejection fraction? Or to predict worse prognosis in patients with known coronary lesions, given that a negative prognostic role of LV diastolic dysfunction in CAD has already been demonstrated? Please provide a complete explanation so the readers could catch the take-home-message of your work.

Minor issues:

- The article needs further English proofreading.

- You used intraclass correlation coefficients to test intra- and inter-observer variability of LA strain values. I suggest the use of a Bland-Altman Plot, which would be interesting for a visual assessment of LA strain feasibility.

- Please spell the abbreviated terms not only in the abstract, but also in the main text.


Please correct reference 23 with the correct format for the journal: Am J Cardiol instead of The American Journal of Cardiology.

You used the average LA strain value of four and two- chamber views to calculate LA strain, even if the latest European standardization document (that you cited as reference 21) recommend the use of four chamber alone and to leave the biplane assessment as an option. However, the two methods appear to perform similarly. Why not to add a sub-analysis of both methods to test the feasibility of using 4-chamber view alone, in order to provide further evidence, which could lead to a simplification of LA strain routine assessment?

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Please indicate how interesting you found the manuscript:

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