Reviewer's report

Title: Longitudinal shortening remains the principal component of left ventricular pumping in patients with chronic myocardial infarction even when the absolute atrioventricular plane displacement is decreased

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Reviewer: Zhong Liang

Reviewer's report:

The authors quantified the atrioventricular plane displacement (AVPD) and investigated the longitudinal, septal and lateral contributions to LV pumping in a group of MI patients. It was concluded that the contribution percentage from AVPD remains the same in MI patients compared to normal controls.

1. This was a retrospective study with small number of patients. The results demonstrated limited clinical value. It would be more clinically impactful if a study is designed to investigate the diagnostic and predictive performance of the method and parameters described in this manuscript.

2. The contribution to LVSV from longitudinal, septal and lateral movement was quantified in this study. However, LVEF would be a more important and clinically relevant parameter that worth investigation. Are there any differences in the contribution to LVEF from each component in the patient group in comparison to controls?

3. The control subjects in this study were much younger than MI patients (31 yrs vs. 59 yrs). The authors should only include age- and gender-matched control group, since some cardiovascular structure and function are related to chronological age including LV volume, wall stiffness as well as AVPD.

4. For the AVPD calculation, AVPD was measured as the difference from ED to ES in the basal part of the LV in two points in each long-axis views using manual method. How to select these two points? Different location along the line connecting the septal and lateral atrioventricular points will give different AVPD results. Some automated method based on CMR feature tracking shall improve the process (Leng et al AJP 2015; 309:H1923-35; Leng et al. Annals of Biomedical Engineering; 2016;44(12):3522-3538.)
5. Page 7 line 43, the patient with a MI in the RCA territory has normal AVPD? Is this a typical example? Since significantly reduced AVPD in RCA MI patients was reported in Table 1.

6. A detailed intra- and inter-observer reproducibility results should be given (in a table or figure) using correlation, Bland-Altman, intra-class correlation coefficient for all measurements, including absolute AVPD, short-axis area, contribution percentage from AVPD, septal and lateral movement.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

No

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

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Please indicate the quality of language in the manuscript:

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