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: Dirk Lobnitzer

Reviewer's report:

The authors present a paper aiming to determine the amount of longitudinal, septal and lateral contribution to LV-function after myocardial infarction. The study group includes one group of patients with LV, one group with RV infarction and a control group. Although AVPD (atrioventricular plane displacement was reduced in patients after MI, the longitudinal contribution to LV stroke volume was unchanged in MI and controls.

Major comments:

- the control group was much younger than the infarct group which can affect volumes and function significantly (see age group in normal MRI values by the ESC)

- no Information is provided on the time delay between the MI and the MRI, remodeling can take longer than 3 months

- there is no information on the revascularisation, medical therapy, the extend of coronary disease as well as the clinical status of the included subjects

- data on transmurality of the myocardial scar would be helpful to understand and describe the extend of the infarct

- you suggest a near normal systolic function under stress in the individual case in figure 6 with a large apex aneurysm which I can't believe based on the the amount of dilatation, the reduced LVEF, reduced ASPD and especially on the background of your explanations on reduced MAPSE and their correlation to worse outcome data

- there is no information on RV function after RV infarct
RV infarction which affects the posterior LV wall usually also affect the inferior part of the interventricular septum as shown in figure 2. This part of the septum might be included in a standard 4 chamber orientated MRI image and have some impact on your measurements.

- Illustration of the short axis measurements are missing

- There is no discrimination of the contribution of the anterior, lateral and posterior free wall of the LV

- The discussion suggest that there is always a dilation of the LV after MI. This depends on the infarct size and location.

- Comparison of the complex 3-dimensional movement of the LV is not at all comparable with a simple piston pump movement (the LV is not a cylinder)

Minor comments:

- Page 7 line 47 increased systolic movement of the LV after RV infarction is not demonstrated in the figures

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.

Yes

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

No
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