Reviewer’s report

Title: Evaluation of left atrial volume and function using single-beat real-time three-dimensional echocardiography in atrial fibrillation patients

Version: 0 Date: 16 Feb 2017

Reviewer: Marcus Carlsson

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The paper compares 3D echo for left atrial volume assessment with conventional 2D echo using Simpson’s method. The paper includes 50 atrial fibrillation patients and controls. There are scientific value of the results but there are some major revisions that needs to be addressed.

1. "Currently, two-dimensional echocardiography (2DE) using Simpson's method is commonly used to assess LA volume in clinical practice [7, 8]."

Reference 7 does not use Simpson’s method for LA volume. Reference 8 is a CMR paper on volume measurements. Please change to references that support your statement.

Also, the two most common methods for LA size is the area in an apical 4-chamber view or a dimension in the parasternal view.

Simpson’s method is less common in clinical practice.

I suggest that you refer to guidelines (e.g. ESC or AHA) on how to report LA volumes.

2. "It is safe, painless and appears to hold significant promise as a noninvasive technology to improve the assessment of ventricular myocardial function. Besides, 2DE is available to assess different cardiac structures and can be performed at the patients' bedside [9]."

I suggest to delete this passage as this is a research manuscript and not a textbook.

3. The word "non-stitched" is a technical term not easily understood by anyone outside of the 3D-echo field. Please avoid or explain the term.

4. Page 3 line 51 to page 4 line 12 has the feeling of a review article. This can be shortened substantially to state what is known and what is not known.

5. Page 3 line 20 introduces segmental EF in the aims. Please explain in a section above why we should care about segmental EF instead of inserting it in the aim.

6. Delete "Single beat RT-3DE was validated against 2DE Simpson's method." The next sentence has the same meaning.
7. Define what Dynamic electrocardiography (DCG) means and how that differs from ECG. It is not a standard method. Do you mean that you recorded ECG over time? If so, for how long. Do you mean ambulatory ECG?

8. Page 7 line 33, "as compared with that of the case group" replace with "in contrast to…"

9. Results: Change Correlation to Bias.

10. Page 9 "It offers a volume width of 90° × 90° and a depth of 16 cm". A degree measure does not mean a volumetric coverage. Please revise.

11. Page 9. "In our study, the regional volume-time curves and segmental EF of LA generated by RT-3DE system were disorder in the case group, which provided valuable information for LA function in AF patients visually." Delete this sentence as this is not supported by data and "valuable information" is not a quantified measure

12 Delete the sentence "Moreover, measurements of beat-to-beat variation in LAEF by 2D and RT-3D will be performed in our next study."

13 Conclusion. Delete "Collectively" and change "proved" to "showed" and " a highly positive correlation" to "low bias". Change "virtual" pathologic anatomy to "3D anatomy"

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

Yes

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.

Yes

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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I am able to assess the statistics

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