Author’s response to reviews

Title: Left ventricular short-axis systolic function changes in patients with hypertrophic cardiomyopathy detected by two-dimensional speckle tracking imaging

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Version: 2 Date: 05 Dec 2017

Author’s response to reviews:

Dear Prof. Susana Ravassa,

Thank you very much for giving us an opportunity to revise our manuscript. We would also like to thank the reviewers for the critical but constructive comments. We have extensively revised our manuscript, according to the comments and suggestions of the reviewers and editor, and responded, point by point to, the comments as listed below, and all changes made to the text are highlighted in red so that the reviewers may be easily identified. Although we acknowledge that the overall priority score assigned to our previously submitted manuscript may not be sufficient for publication in your journal, we believe that our work is of merit and our manuscript has been further improved by incorporating and implementing the comments of the reviewers. I would like to submit this revised manuscript to BMC Cardiovascular Disorders. I hope it is acceptable for publication in the journal.

Looking forward to hearing from you.

With kindest regards,

Yours sincerely
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Ozkan Candan (Reviewer 1):

Major issue:

1. Evaluation of longitudinal strain along with short axis and rotational movements may provide more accurate information about myocardial function. Thus, information about which myocardial fibers are more sensitive could be obtained.

Answer: Thanks to the reviewer. On Volume 2017;2;17(1):214, we published a manuscript “Left ventricular systolic function changes in hypertrophic cardiomyopathy patients detected by the strain of different myocardium layers and longitudinal rotation” in BMC Cardiovasc Disord. This research was mainly on the longitudinal cardiac systolic function in HCM patients. However, the short-axis function as circumferential and radial is also essential like longitudinal function. So, in this study, we mainly assess the short-axis function in HCM patients. According to the two papers, we have found accurate information about myocardial function in HCM patients.

2. The greatest limitation of this study is that the relationship of decreasing short axis functions to a clinical outcome or event is not investigated.

Answer: We are sorry for the limitation in the study. In the follow-up study, we may investigate the relationships of decreasing short- and long- axis functions to a clinical outcome or event. And in the last part of the study, we added the limitations section.

3. Since only cardiac myocardial fiber functions are evaluated, it may be more accurate to evaluate the relationship with cardiac MR.

Answer: Thanks to the reviewer’s constructive ideas. In our institution, department of Echocardiography and Radiology are independent. Also we have asked the department of Radiology, they told us they did not have the software to analysis the cardiac myocardial fiber functions, such as strain and strain rate in the long- and short- axis.
4. Another important limitation is the small number of patients.

Answer: Before the study, we have enrolled 45 HCM patients, but 5 of them had poor quality of
the echocardiography images, and 3 of them had the LVEF < 50%, so we excluded the 8 HCM
patients from the study. We added this to the limitations section.

Minor:

Results section: Some findings are incompatible with table 2.

- line 42-48, the middle myocardial and epicardial (not endocardial) layers of septum wall had
significant…

Answer: We are sorry for our careless. We had corrected it in the manuscript.

- line 48-52, Posterior wall strain in all layers (endocardial, mid, epicardial) was greater than
controls.

Answer: We are sorry for our careless. We had corrected it in the manuscript and Table 2.

Thomas Zegkos (Reviewer 2):

1. The results would be rewritten in a simpler and more understandable way. The repetition of
the phrase "there was a significant difference, the absolute values were lower" is
unnecessary. It could be rephrased simply as "the strain absolute values are significantly
lower"

Answer: Thanks to the reviewer, we had changed the Results section in the manuscript.

2. The discussion section repeats the results in the first paragraph.

Answer: We had deleted the repeats contents in the discussion section.

3. The discussion section neither justifies the results of the study adequately nor uses adequate
references. For example, in the twist parameters reported, the mid myocardial level follows
the base both in HCM and normal patients. However, in normal subjects mid myocardial
level follows the apex (1, 2). Moreover, the pathophysiology of the different strain values
between HCM and normal subjects should be explained thoroughly in order to draw valuable conclusions about the mechanics of the diseased myocardium.

Answer: Thanks to the reviewer, we have extensively revised the discussion.

Zhang HJ et al. [23] investigated whether left ventricular twist analysis can detect the extent of myocardial fibrosis in patients with HCM, and found that, left ventricular twist mechanics are associated with the extent of myocardial fibrosis, and LV-twist assessment by STI may be clinically useful. Carasso S et al. [24] found middle LV rotation was clockwise (opposite to normal), they found that, in both HCM and normal subjects, LV rotation, viewed from the apex, was clockwise at the base, and count-clockwise at the apex, the difference was in the middle level. Ni XD et al. [25] found that in normal subject the transition from basal clockwise rotation to apical counterclockwise rotation is located at the papillary muscle level. Our research was according with the previous studies. The base-to-apex twist plane in HCM patients was changed. The peak rotational degrees at the base and middle short-axis levels in HCM patients were larger than normal subjects. Sengupta PP et al. [26] told us in the LV myocardial wall, the myofibers geometry changes smoothly from a right-handed helix in the endocardium to a left-handed helix in the epicardium such that the helix angle varies continuously from positive at the endocardium to negative at the epicardium. When the myofibres contract and relax, the cardiac have three motions: longitudinal, circumferential and radial, also produced the rotational motion. The pathogenesis of abnormal rotation at the middle level and the different rotation degrees are not clear. When the LV fibrosis, hypertrophied and stiffening, the LV myofibres were remodeling, the original balance of endocardial, middle myocardial, and epicardial myofibres was changed. Because the longitudinal and radial function were decreased in HCM patients, so for another possible reason was, in order to keep normal LV systolic function. HCM patients enhanced the peak rotational degrees at the base and middle short-axis levels.

References


4. Is there a clinical implication of the study?

Answer: The study can help us to know the early cardiac dysfunction of HCM patients, then to give them early treatment and assess the effect after the treatment. We have added the sentence in the conclusion section.