Reviewer’s report

Title: Regional Myocardial Strain Analysis via 2D Speckle Tracking Echocardiography: Validation with Sonomicrometry and Correlation with Regional Blood Flow in the Presence of Graded Coronary Stenoses and Dobutamine Stress

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Reviewer: Roberta Esposito

Reviewer's report:

Stendahl et al. present a unique preclinical large animal model study that integrates echocardiography, advanced sonomicrometry, and microspheres to assess regional myocardial strain and perfusion.

The study shows the direct, fundamental relationship between regional myocardial blood flow and function and demonstrates that 2D STE identifies regional changes in circumferential and radial strain produced by graded coronary stenoses and low-dose dobutamine stress.

The paper is very well-written, the study protocol and statistical analyses are appropriate and well-conducted, giving a comprehensive good quality to the manuscript.

However, the clinical impact and contribution of the study appear to be very limited because of the great complexity of experimental setting.

The lack of longitudinal strain evaluation in this study could be an important limitation because lower reproducibility and reliability of radial and circumferential strain than longitudinal strain (both global and regional) is just well known, also in human study.

Conversely, the findings of present study could suggest minor clinical usefulness of radial and circumferential 2D STE in the assessment of ischemic heart, given their only moderate correlation with sonomicrometry.

It could be of interest study finding of non-linear correlation between both radial and circumferential 2D STE and sonomicrometry, and regional myocardial blood flow, measured by microsphere analysis, consistent with previous studies.

It could be useful for clinically oriented audience that, in discussion, the authors write more considerations about the translation of study results to human clinical scenarios.

Level of interest
Please indicate how interesting you found the manuscript:

An article of limited interest

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable
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