Reviewer's report

Title: Ventricular-arterial uncoupling after myocardial infarction in dogs - invasive versus echocardiographic evaluation

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Reviewer: Juichiro Shimizu

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The authors investigated the cardiac systolic and diastolic function in the ejection fraction preserved heart failure caused by myocardial infarction. They evaluate the ultrasound cardiographic indices, measured the left ventricular pressure and volume with conductance catheter method to evaluate the end-systolic and the end-diastolic pressure-volume relations. They found several significant correlation between the ultrasound cardiographic indices and the invasively obtained left ventricular systolic and/or diastolic parameters.

General comments

1. End-systolic pressure-volume relation (ESPVR, well known as Emax and Ees) is the most useful and reliable index of the cardiac contractility. However, there are several limitations to evaluate the cardiac contractility in the failing heart by ESPVR. Regional ischemia but not global ischemia shows downward convex ESPVR and rightward shift of ESPVR. The mechanism of these change in the regional ischemic heart has been reported in the following article (K Sunagawa, WL Maughan, and K Sagawa, Effect of regional ischemia on the left ventricular end-systolic pressure-volume relationship of isolated canine hearts Circ. Res., Feb 1983; 52: 170 - 178). So the authors have to mention about the limitation about the application of ESPVR to the regional ischemia model.

2. Discussion,2nd paragraph, line 6, “To evaluate systolic function, the measurement of Ees/Ea would be the theoretically superior to Ees as taking into account the capability of a ventricule to adapt its intrinsic contractile state to afterload.”

Ees or Emax is one of the index of cardiac contractility. Ea is the effective arterial elastance. Both indices are derived from a left ventricular pressure-volume loop. Ees/Ea or Ea/Ees is usually used for index of the ventriculo-arterial coupling but not for systolic function. Authors have to pay attention to original meanings of these indices.

Minor comment

1. Method, Magnetic resonance imaging, 1st paragraph, line 4, “Total infarct volume was calculated as the summation of the contrast-enhanced volumes from all contrast-enhanced MRI images.”

Authors have to indicated the contrast agent. This reviewer cannot understand the method fo the infarct volume measurement. Infarct volume should be
calculated as the subtraction of the contrast-enhanced volume from the entire left ventricular myocardial volume, or the summation of the product of non contrast-enhanced area and slice thickness of all left ventricular MRI images.

2. Figure. 1. To obtain the end-systolic pressure volume relation, authors performed posterior vena cava occlusion. However the 166 mmHg of end-systolic pressure before posterior vena cava occlusion is too high for the control animal. Authors had better to re-make the graph with reasonable and representative sample.

3. Conclusion is not completed.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests' below.