Reviewer's report

Title: Agreement of Left Ventricular Mass in Steady State Free Precession and Delayed Enhancement MR Images: Implications for Quantification of Fibrosis in Congenital and Ischemic Heart Disease

Version: 1 Date: 2 November 2009

Reviewer: Raja Muthupillai

Reviewer's report:

Review of paper entitled:
Agreement of Left Ventricular Mass in SSFP and DE-MRI: Implications for quantification of fibrosis in congenital and ischemic heart disease

Summary:

The authors of this well-designed study sought to test if the left ventricular (LV) mass estimated using the cine Steady State Free Precession (SSFP) sequence is comparable to the LV mass estimated using the delayed enhancement MRI (DE-MRI) sequence in children, and in adults (with and without ischemia). The authors used ex-vivo pig model for confirming their findings.

The study is well designed, and performed, and the statistical analysis is complete.

Major Compulsory Revision:

(a) The LV mass measured via the DE-MRI technique is strongly dependent on the myocardial-to-blood contrast-to-noise ratio. This myocardial-blood contrast in a DE-MRI varies a great deal based on the time of imaging after contrast administration (contrast wash-out), as well as on the choice of inversion time (TI) chosen for myocardial nulling. Some variation in the blood-myocardial contrast could account for the variation in LV mass computed using DE-MRI. Did the authors measure the blood-to-myocardial contrast on all the in-vivo animal images? If this data is not available, please add a few sentences in the discussion addressing this issue.

Minor Essential revisions:

1) Table 2, may be removed, and the parameters can be integrated as a paragraph in the text.
2) Include the animal study (in-vivo) results as an additional column in Table 3.
3) Eliminate Figures 2, and 3, and provide the r2 value as a part of the Table.
4) The authors state that ex-vivo imaging was done on a quadrature head coil in the Methods section, but Table 2, shows that SENSE was used. This appears to
be in error. Please verify.

Discretionary Revisions:

(a) It is somewhat surprising that the authors did not directly weigh the ex-vivo LV ventricle to estimate the mass (after pruning the explanted heart of unnecessary tissue). This would have provided an independent estimate of LV mass that was not based on imaging, and would have substantially strengthened the paper. If the authors do not have this data, it is probably worthwhile to add a couple of sentences in the discussion.

(b) For the ex-vivo imaging, it is curious that the authors did not use the same set of sequences used in-vivo in addition to the high-resolution T1-weighted images that they acquired, by soaking the specimen in a blood mimicking fluid. Doing so, would have permitted them to discretely assess the effect of the imaging technique (spatial resolution, as well as contrast resolution) in-an ex-vivo setting.

Overall, this is a well designed study, and I recommend the publication of the above manuscript.

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, and I have assessed the statistics in my report.

**Declaration of competing interests:**

I declare that I have no competing interests