Reviewer’s report

Title: Evaluation of ultrasound Tissue Velocity Imaging: a phantom study of velocity estimation in skeletal muscle low-level contractions.

Version: 2 Date: 14 February 2013

Reviewer: Knut Matre

Reviewer’s report:

Comments to: Evaluation of Tissue Velocity Imaging: a phantom study of velocity estimation in skeletal muscle low-level contractions.

General comments:
With new imaging methods introduced in clinical medicine it is important that the accuracy and variability of these methods are tested in vitro. Thus this paper is an important addition to the existing literature on in vitro studies of methods measuring velocity and deformation of contracting muscle. Particularly because there are few reports concerning the use of these methods on conditions mimicking skeletal muscle contractions.

The study is to my knowledge original and the report in general is well written although some improvement can be made (see below)

My comments to this report:

Major Compulsory Revisions
- Why only evaluating velocity? A previous study from the same authors (Lindberg et al 2011, reference 10 in this report) also study TVI using deformation of a similar phantom set-up. It would be interesting to evaluate the effect of the different PRF’s for deformation variable like strain rate and strain as well. There is some comments on this in the discussion section about their choice to evaluate the accuracy of velocity only. I feel this important aspect should also be included in the introduction section of the report.

- Is an error of approximately 20 % or more (table 2) acceptable? This should be discussed including some comments on the clinical implications of this level of error.

- A question of interest is the following, at what PRF does the error in the measured velocity (especially for the low velocities) increase? To answer this fully more experiments would possibly have to be performed at other PRF’s. Please comment.

Minor Essential Revisions
- Table 2. The mean velocity difference (column 3) should have units cm/s.
- Abstract gives highest peak velocity of 0.3 cm/s, in the methods and table 2 this velocity is given as 0.26 cm/s. What is correct?
- References. Here several ways is used to refer to previous work in the text: e.g. page 3: (Mårtensen et al) and [7,8]. Please use the correct reference system for BMC.

- Page 4/line 17: The mass concentration adds up to more than 100% (85 + 15 + 3) Please correct.

- The speed of sound in the phantom material was measured to be 1530-1580 m/s. How was this carried out? In addition, why this large range of velocities, did this result from an inaccurate method of velocity measurements or did the production of the PVA phantoms lead to a large variation in stiffness? Please comment.

- How was the velocity of the immersing fluid measured?

- Figure 1: Why is not the superimposed color-coded TVI information shown in the figure. This would make the figure more informative for the reader.

Some examples of suggestions for improving the manuscript

- Page 2/line 18: …can be applicable on….. change to ….can be applied to …

- Page5/line 21: Horten not Horton

- Page 5/line 23: ……frame rates from 66 from 214… , change to ….66 to 214…

- Page 5/line 24: change to: An example of a gray scale image is…….

- Page 6/line 23: Please change to ….was replaced before each recording

- Page 7/line 10: Delete Text in start of sentence.

- Page 7/line 18: …..how the all values are ….please rewrite

- Page 10/line 5 … can applicable on low-level……,change to: can be applied to low-level …..

**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:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interest