Reviewer's report

Title: A rigid barrier between the heart and sternum protects the heart and lungs against rupture during negative pressure wound therapy

Version: 1 Date: 3 May 2011

Reviewer: Rune Haaverstad

Reviewer's report:

The paper "A rigid barrier between the heart and sternum protects the heart and lungs against rupture during negative pressure wound therapy" by Lindstedt and colleagues, is of common interest for cardiothoracic surgeons. The language is good and it easy to follow.

Therapeutic failure of mediastinitis treatment with recurrent infections aggravates an already difficult situation, and may result in complications and higher mortality. In VAC-treatment, special attention must be given to the underlying heart, especially the fragile right ventricle. If VAC-treatment is planned, it is mandatory to mobilize at least one of the sternal edges from the right ventricle during sternal reopening and protect the anterior of right ventricle with several layers of paraffin gauze dressing. If both sternal edges stay adherent to the heart, this may shear or cut the right ventricle during accelerated sternal movement as in forced respiration or episodes of coughing.

With respect to be sufficient for publication the manuscript raises some concerns, which have to be clarified.

1. The hypothesis behind the work, and the endpoint mortality has to be specified. The cause of death has to be described. What is the most important factor for right ventricle rupture, the sharp sternal edges, or the negative pressure alone?

2. In mediastinitis patients treated with VAC we always use paraffin gauze dressing as a rigid barrier against heart- and lung rupture as a lethal complication. It is necessary that the investigators specify what are being new findings to current treatment. It is not acceptable to compare a method with complete protection of the heart versus no protection at all as probably nobody perform VAC without protection by use of Jelonet etc x 1-3 and single or double layer with foam. Particularly the use of at least a double layer of foam is important to avoid injury of the sternal edges.

3. The pictures should include a sketch or fig of how the experiments were performed.

4. It is possible to identify other significant risk factors of right ventricle rupture or lung rupture in pigs treated with VAC.

5. Maybe they should also clarify and discuss the practical impact of their findings, and what important information may be learned from this study.
**Level of interest:** An article of importance in its field

**Quality of written English:** Acceptable

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