

# Effects Of Unilateral Superimposed High-Frequency Jet Ventilation On Porcine Haemodynamics And Gas Exchange During One-Lung Flooding

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## Answer to reviewer (**Reviewer ID: 03093768**)

Dear reviewer,

thank you very much for the reviewing and the in-depth analysis and tips that helped us a lot. Below I would like to answer the questions.

**1. Difference of the two subgroups resulting from the random order of the timing of the ventilation mode in each body position (SHFJV first followed by PCV or vice versa)**

The random order of the time point of the ventilation mode in each body position has two reasons, first to minimize the number of laboratory animals, and second to exclude the influence of time point in ventilation mode on gas exchange efficacy associations with animal position. As a result, six animals underwent SHFJV or PCV at the beginning of a new body position and six each at the end of the position holding time (please refer to page 9, line 214-217).

The data of the two subgroups in each body position were compared using the Mann-Whitney-U test (ventilation mode at the beginning vs. the same ventilation mode at the end of each body position).

We found no differences between the different time points, so that we have been merged the data. We agree, these data processing is not described and we will add to the Methods (please refer page 11; line 249-255).

**2. Lateral body position with the flooded lung side up. What is the clinical application value of studying this position?**

There are two application techniques of high intensive focus ultrasound ablation, the ultrasound guided and the MR guided focused ultrasound ablation. MR guided high intensive focus ultrasound ablation requires a lateral position where the flooded lung is dependent (down) [the HIFU transducer is integrated in the MR table], which seems to be the preferred technology of the future, also because it enables MR thermometry. Currently, this technique is used in the clinic for ablation of uterus myoma. In contrast, the ultrasound guided focused ultrasound ablation requires the lateral position with the flooded lung non-dependent (up). In this position, the transcutaneous and the intraoperative application (during videothoracoscopy) are possible. In the first step, we aim to apply the focus ultrasound ablation of lung tumors on humans using the laparoscopic HIFU probe. (please refer to page 5, line 114-119)

We agree, there is clearly a risk of severe fluid flowing into the healthy lung when flooded lung lies up (please refer page 9, line 208-211). But, in animal experiments with pigs there is much more risk of dislocation of the double lumen tube (DLT) compared with human because the left main bronchus is very short. That's why we developed a special DLT for pigs with a weight of about 30 kg.

As long as the DLT position was correct (repeated fiberoscopic control is necessary) and the cuff was blocked sufficient at 50 cm H<sub>2</sub>O using a cuff controller, we didn't observe any DLT dislocation (please refer to page 7, line 156-162).

### **3. Time point of data collection in the experimental group.**

Data were collected after 15 minutes after the ventilation mode (SHFJV or PCV) was started. Both ventilation modes were applied on the same animal in each position successively. According to randomization, 6 animals received SHFJV or PCV at the beginning and the other half at the end of each body position. The data of each ventilation mode have been merged because there was no difference between the time points of application.

(please refer page 9, line 204-206; page 9, line 214-217; page 11, line 249-255).

### **4. X-ray images**

We added x-ray images in the Results (please refer page 13, line 293-296; page 29-31)

The revised/ added contents in the revised manuscript are highlighted with yellow color.

I hope we were able to answer your questions to your satisfaction.

With best regards,

Thomas Lesser