Author’s response to reviews

Title: BIOMECHANICAL EFFECTS OF METASTASIS IN THE OSTEOPOROTIC LUMBAR SPINE

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ANSWER TO REVIEWERS

Reviewer reports:

Rosanna Wustrack, MD (Reviewer 1): Please include all comments for the authors in this box rather than uploading your report as an attachment. Please only upload as attachments annotated versions of manuscripts, graphs, supporting materials or other aspects of your report which cannot be included in a text format.

Please overwrite this text when adding your comments to the authors.

Much improved version.

I noted one typo: Line 81 says "scortical" instead of cortical.

-> We modified it.
In the abstract you state that there was an increase in VB and VH, this is confusing as the increase is actually in the change in vertebral height negatively. You should clarify that there was actually a decrease in height, not increase in actual height and what you are seeing in an increased amount of height decrease.

-> We thank the reviewer for her suggestion, we agree with her that it can be confusing. We rephrased the abstract and some sentences in the methods section in order to let the reader understand that VH is the difference between the vertebral height before and after load. Moreover, we expressed VH as a positive value in order to make the results better understandable.

We rephrased the Abstract: “VB and VH represent respectively radial and axial displacement and they have been correlated to burst fracture.”

We added the following sentences in the Methods section (line 1-14, pag 5): “The distance between two standard nodes at the mid-height of L4 on the sagittal plane was measured (Radial Distance, Fig 3). VB was calculated as the difference between the Radial Distance before and after the axial compressive load was applied (VB = Radial Distance after load – Radial Distance before load).

The distance between two standard nodes at the center of the inferior and superior endplates of L4 was measured (Axial Distance, Fig 3). VH was calculated as the difference between the Axial Distance before and after the axial compressive load was applied (VH = Axial Distance before load – Axial Distance after load).”

We updated Fig 3 and Fig 4 in order to be consistent with the modified text.

LePing Li, PhD (Reviewer 3): I think the current version of the manuscript is almost ready for publishing after the first revision. Just like any other finite element analysis, there are a number of limitations that have been fully discussed. The only thing I would like to recommend for a revised version is to make the conclusions more specific, both in the abstract and conclusion section. Currently, it says "this study highlights the biomechanical effects of ...", which is not really a conclusion. The readers wish to know how the study highlights anything and what biomechanical effects the results reveal. Moreover, the phrase, "regardless of metastasis size", is somewhat misleading, because there is a size effect.

-> We thank the reviewer for his suggestion. We modified the conclusions in the abstract and conclusion section.