**Reviewer's report**

**Title:** Reducing the extent of facetectomy may decrease morbidity in failed back surgery syndrome

**Version:** 0 **Date:** 28 Jan 2019

**Reviewer:** Christian Pfeifle

**Reviewer's report:**

Reviewer's comments

General Comments

This paper investigates the weakening of the superior articular process as a reason for failed back surgery syndrome after percutaneous transforaminal endoscopic discectomy using an FE model of the lumbar spine.

According to the authors, a facetectomy is indispensable for the successful implementation of PTED. This statement cannot be confirmed regarding the current literature. In most cases a single expansion of the neuroforamina is described in the current literature. Facetectomy is hardly performed in single PTED.

Nevertheless, the problem of the weakening of the dorsal structures of the spine, especially the facet joints, is well worked out by the present study and underlines that as little bone as possible should be removed in the area of the facet joints during access to the intraspinal region.

Due to the good processing of the problem on the basis of the FE model and the conclusive statement of the paper, I recommend the editor to accept this paper for publication with minor changes.

Introduction

Page 5, Line 2
The underlying pathology of an interbody fusion does not have to be the same as that of a pure discectomy. A comparison is not possible here and should be omitted.

Page 5, line 17
A facetectomy is not inevitable during PTED. Neither the papers cited nor the current literature mention a facetectomy. Expansion of the neuroforamen is a sufficient procedure to get the discectomy done. Facetectomy is used as an additional decompression technique or in cases of hypertrophy of the facet joints.
Methods

Page 7, line 7
Why using a healthy volunteer for performing CT-scans to gain the FE model? One should find enough DICOM data of healthy lumbar spines without using extra ionizing radiation in the database of a hospital. The use of ionizing radiation on a healthy volunteer without need is ethically questionable.

Page 8, line 14
Constant load of 800N is not a realistic load whilst the load for one segment of the spine is changing between 100 and over 2000N. The facet joints may react different in case of heavier loads.

Results

Page 9, line 12
The authors are doing a good evaluation of their FE model with changing loads. Why not testing different loads with the facetectomy samples?

Conclusion

According to the lack of different tested axial loads one can't state that a small degree of facetectomy may not increase morbidity. Higher load may also lead to increased morbidity. The conclusion should be: the less facetectomy the better. Please change the conclusion this way.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

Not relevant to this manuscript

**Quality of written English**
Please indicate the quality of language in the manuscript:

Acceptable

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