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**ESPS Peer-review Report**
**Name of Journal:** World Journal of Orthopedics
**ESPS Manuscript NO:** 2583
**Title:** BIOMECHANICAL COMPARISON OF STRAIGHT MEDIAN STERNOTOMY AND INTERLOCKING STERNOTOMY
**Reviewer code:** 02444697
**Science editor:** Huang, Xin-Zhen
**Date sent for review:** 2013-03-03 17:34
**Date reviewed:** 2013-03-09 03:46

| CLASSIFICATION | LANGUAGE EVALUATION | RECOMMENDATION | CONCLUSION |
|---|---|---|---|
| [ ] Grade A (Excellent) | [ Y] Grade A: Priority Publishing | Google Search: | [ ] Accept |
| [ Y] Grade B (Very good) | [ ] Grade B: minor language polishing | [ ] Existed | [ ] High priority for publication |
| [ ] Grade C (Good) | [ ] Grade C: a great deal of language polishing | [ ] No records | |
| [ ] Grade D (Fair) | | BPG Search: | [ ]Rejection |
| [ ] Grade E (Poor) | [ ] Grade D: rejected | [ ] Existed | [ Y] Minor revision |
| | | [ ] No records | [ ] Major revision |

**COMMENTS TO AUTHORS**
This is an excellent paper of relevance for patient service. The article has a proper style and structure. The study is performed well. There is just one minor comment for reconsideration. The authors state in the frist sentence of results that 4 sterna were excluded due to fracture. Information how they were broken and if this has any relationship to the tests or relevance for the results should be presented.

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**Reviewer code:** 00505415
**Science editor:** Huang, Xin-Zhen
**Date sent for review:** 2013-03-03 17:34
**Date reviewed:** 2013-03-11 00:43

| CLASSIFICATION | LANGUAGE EVALUATION | RECOMMENDATION | CONCLUSION |
|---|---|---|---|
| [ ] Grade A (Excellent) | [ ] Grade A: Priority Publishing | Google Search: | [ ] Accept |
| [ ] Grade B (Very good) | [Y] Grade B: minor language polishing | [ ] Existed | [ ] High priority for publication |
| [ ] Grade C (Good) | [ ] Grade C: a great deal of language polishing | [ ] No records | [ ]Rejection |
| [Y] Grade D (Fair) | [ ] Grade D: rejected | BPG Search: | [ ] Minor revision |
| [ ] Grade E (Poor) | | [ ] Existed | [Y] Major revision |
| | | [ ] No records | |

**COMMENTS TO AUTHORS**
This is an interesting topic to study. I have not seen sternotomies addressed as an orthopedic issue before, but the issues related to research are in line with many orthopedic studies. 1. Figure captions: More descriptive figure captions would be helpful. I particularly do not understand the relevance of the arrows in Fig. 3. 2. Biomechanical testing: A more detailed description of the fixtures would be helpful. Also, please clarify the order of testing for the displacement directions. 3. Statistical methods: Specify the displacement value chosen. Was it the displacement for the last cycle? 4. Results: The measure of surface area was not included in the Methods section. There seems to be an error with XX's in the table. The table should list p-values. Without the results of the statistical analysis, we can not accept the statement that the displacement was lower with the interlocking technique. 5. Discussion: The limitations of the study should be listed. The order of testing could influence the results. The fact that two specimens failed in each group could alter the results. If two interlocking specimens had large displacements, but were eliminated due to failure, that could skew the results. If no significant differences were noted for a particular test, a power analysis indicating the number of specimens needed to find significance would be helpful.

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**Date reviewed:** 2013-03-11 14:35

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| [ ] Grade C (Good) | [ ] Grade C: a great deal of language polishing | [ ] No records | |
| [ ] Grade D (Fair) | | BPG Search: | [ ]Rejection |
| [ ] Grade E (Poor) | [ ] Grade D: rejected | [ ] Existed | [ Y] Minor revision |
| | | [ ] No records | [ ] Major revision |

**COMMENTS TO AUTHORS**

Appreciating authors for conducting such an important study. However I have some minor observation before considering this for final publication 1. Title of this paper can be more specific in line with research question and hypothesis. 2. In abstract section authors made a headline "Summary of Background Data Methods:" I think methods and background should be in different heading or section. 3. Background information and rationale have been written precisely however little elaboration can be made. 4. Study procedure has been written clearly however, name of the study design can be mentioned. 5. Authors have mentioned about 't' test however mean difference including 95% confidence level and p values were not mentioned. 6. Authors have not mentioned about ethical issues.

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**Reviewer code:** 02444749
**Science editor:** Huang, Xin-Zhen
**Date sent for review:** 2013-03-03 17:34
**Date reviewed:** 2013-03-12 11:11

| CLASSIFICATION | LANGUAGE EVALUATION | RECOMMENDATION | CONCLUSION |
|---|---|---|---|
| [ ] Grade A (Excellent) | [ ] Grade A: Priority Publishing | Google Search: | [ Y] Accept |
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| [ ] Grade D (Fair) | | BPG Search: | [ ]Rejection |
| [ ] Grade E (Poor) | [ ] Grade D: rejected | [ ] Existed | [ ] Minor revision |
| | | [ ] No records | [ ] Major revision |

**COMMENTS TO AUTHORS**
This article described about the biomechanical integrity after sternotomy. The results is very instructive and contain new knowledge that are assessed as "acceptable as is" in the Journal. My question for the authors how many non-union can you decrease by this method in clinics?

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**Reviewer code:** 00501337
**Science editor:** Huang, Xin-Zhen
**Date sent for review:** 2013-03-03 17:34
**Date reviewed:** 2013-03-16 21:50

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**COMMENTS TO AUTHORS**

The present manuscript is investigating the biomechanical properties of a straight median sternotomy versus an interlocking sternotomy. 10 sternocostal joints from sheep were used in each group. Fatigue testing was performed using a material testing machine. In the results, the authors found superior results for the interlocking sternotomy in all directions. The authors concluded that the interlocking osteotomy provided superior biomechanical characteristiscs compared to the straight median osteotomy. The present manuscript is interesting and should be concsiered for publication after a revision. However, the set up and performed testing has to be explained in detail as it is unclear if the present set up a adequate for biomechanical testing of sternotomy fixation. Moreover, it is unclear if the measured differences of the results are significant. This is, however, the most important part of the results as this might change the whole conclusion. Introduction Adequate Methods Page 6: This is confusing. The material testing machine is able to test elonation under cyclic displacement in one plane. The authors described three testing directions. Which direction was tested? Were the specimens divided for different testings or did the authors perform the the testings subsequently? This has to be clarified. Why did the authors use 400N? Please explain? Why was one specimen tested for 180 cycles? Results Page 7: this means 8 specimens were tested for each group. Table 1 the range of the difference is XX. This has to be revised. Differences are shown in the table. However, pvalues are missing. Were the measured differences statistically significant? Discussion The discussion should start with the principal finding of the present study. References Good. Abstract Missing

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**Reviewer code:** 02444747
**Science editor:** Huang, Xin-Zhen
**Date sent for review:** 2013-03-03 17:34
**Date reviewed:** 2013-03-17 10:47

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| [ ] Grade D (Fair) | | BPG Search: | [ ]Rejection |
| [ ] Grade E (Poor) | [ ] Grade D: rejected | [ ] Existed | [ ] Minor revision |
| | | [ ] No records | [ Y] Major revision |

**COMMENTS TO AUTHORS**
I enjoyed reading the manuscript. The authors showed that the median interlocking sternotomy is biomechanically superior to the straight median sternotomy. My concern is about Results section which seems incomplete. There are many XXs in the table 1. Please indicate whether the difference is statistically significant or not. Explanation of the surface area is necessary. How are the results of the fatigue testing?