Reviewer's report

Title: Less than full circumferential fusion of a tibial nonunion is sufficient to achieve mechanically valid fusion - Proof of concept using a finite element modeling approach

Version: 2 Date: 28 July 2014

Reviewer: Ai-Xi Yu

Reviewer's report:

1. Is the question posed by the authors well defined?
   - Yes.
2. Are the methods appropriate and well described?
   - Partially. All data in the current study were from a tibia model treated with zinc spray. Why not replace the model with a tibial fracture patient? Or, was the model reliable enough to mimic the true situation? If so, please provide the reference.
3. Are the data sound?
   - Yes.
4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
   - Yes.
5. Are the discussion and conclusions well balanced and adequately supported by the data?
   - Yes.
6. Are limitations of the work clearly stated?
   - Yes, the authors stated some limitations. However, another limitation should also be mentioned. Namely, the current study is only a pilot research of model and clinical trial on patients is needed to confirm the conclusion.
7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
   - Yes.
8. Do the title and abstract accurately convey what has been found?
   - Yes.
9. Is the writing acceptable?
   - Needs some language corrections before being published.

Major Compulsory Revisions
Comment 1: All data in the current study were from a tibia model treated with
zinc spray. Why not replace the model with a tibial fracture patient? Or, was the model reliable enough to mimic the true situation? If so, please provide the reference.

Comment 2: Why not further confirm the conclusion in some patients? The current study is only a pilot research of model and clinical trial on patients is needed to confirm the conclusion.

Minor Essential Revisions
- Comment 3: Abstract. “…nonunion therapy remains a domain of open surgery”. What did the authors mean “a domain of open surgery”.
- Comment 4: Background, first paragraph. “These aim have basically…”. Please replace “aim” with “aims”.
- Comment 5: Background, second paragraph. “…non differences were found”. Please replace “non” with “no”.
- Comment 6: Background, third paragraph. “…complex fracture patterns, 9 and further…”. Please omit the number “9”.
- Comment 7: Background, fourth paragraph. The sentence is too long and difficult to understand. Please rephrase it.
- Comment 8: Results, fourth paragraph. “…imation of the level 1 image. The following numerical simulations are…”. Please omit a space before the word “The”.

Discretionary Revisions
- Comment 9: Please replace “nonunion therapy” with “treatment of nonunion” throughout the text.
- Comment 10: Methods, eighth paragraph. “…worst case’...”. Please confirm the punctuation is right. Please also confirm the usage throughout the text.
- Comment 11: Discussion, third paragraph. “…the screw purchase...”. Please confirm the tense is right.
- Comment 12: Conclusions. It would be better if the conclusion is concise.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Needs some language corrections before being published

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

Declaration of competing interests:

I declare that I have no competing interests.