Reviewer’s report

Title: Bone preserving level of osteotomy in short-stem total hip arthroplasty does not influence stress shielding dimensions - a comparing finite elements analysis

Version: 0 Date: 12 May 2017

Reviewer: Thilo Floerkemeier

Reviewer’s report:

P 4, line 26: „While cementless procedures have no impact on the bone remodelling process, short stems are made for this purpose."

I disagree with the authors. Each implantation of a cementless implant affects the bone remodelling process. Otherwise the authors should present adequate literature.

P 7, line 34: „Only in ROI 3 and 4 virtual implantation of the trochanter sparing type stems resulted in a stress-shielding phenomen.” Stress-shielding means that bone adapts to the load. Either by increasing bone or by resorbing. Thus, this has to be rewritten and described in detail. (Same line 44 page 7)

Results: Within the graphics „standard" is mentioned. Within M&M the authors need to mention what this means.

In the results the authors mentioned: „In summary the results demonstrate that implantation of a short-stem prosthesis reduced the stress shielding effect compared to implantation of standard stems." (as well as 8 line 5) This is in my opinion in contrast to the title. According to the title is seems that the short stem and standard stem reveals similar stress shielding, which is not the case. Thus, the title should be changed.

Page 8, Line 1: „In the trochanteric region, only the collum-type stem showed a biomechanical behaviour to the native femur." Which figure shows this fact?

One major disadvantage of the study is that they accumulate differs stems together depending on the resection. I think that this is not possible. Although for example the METHA and Nanos have similar resection heights the anchorage is different. The Nanos has a bigger distal part and is thus more a short stem with more diaphyseal anchorage than the METHA. Therefore, I propose to illustrate all tested stems on their own.

In the discussion existing DXA studies on stems used (like METHA, Nanos, and so on) should be discussed.

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.

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