Author’s response to reviews

Title: Knee arthrodesis versus above-the-knee amputation after septic failure of revision total knee arthroplasty: comparison of functional outcome and complication rates.

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REVIEWER #1:

Comments:

Please remove: These patients can reach a better quality of life after an amputation with proper orthotics in contrast to a modular knee arthrodesis, from the conclusion in the abstract as not fully supported. The prior sentence indicates this point.

• We agree with the reviewer and removed the sentence from the “Conclusion” section of the “Abstract”.

Please have: Therefore the central aims of our study was to analyse the clinical course, complications, functionality and quality of life of AKA and MKA after septic failure of TKA. We hypothesize that neither AKA nor MKA after septic failure of TKA is superior in terms of functional outcome and complication rates and that the treatment decision process should be judged individually according to the patients` overall condition and the local bone and soft-tissue status.” as a separate paragraph.

• We thank the reviewer for the suggestion and changed it accordingly. The aim and hypothesis of the study is now listed in a separate paragraph at the end of the “Introduction” (line: 77 – 81).
Please define primary AIM and secondary AIMS. This will allow a post hoc power calculation to be performed according to primary aim.

- This is an important comment. We added the following to the “Methods” section: “The functional outcome, assessed with the LEFS was defined the primary aim. The complication rate, as well as the patients’ physical (PCS) and emotional quality of life (MCS) were defined secondary aims.”

I suspect the trend towards significance observed in the LEFS and PCS for the AKA group is due to the study being under powered. This is okay, and supports the paper - a post hoc power calculation should be presented.

- We appreciate that the reviewer is supporting our results. We added a sentence to the end of the “Discussion” section (subsection: “Limitations”) to highlight this important fact: “The high drop out rate is explained by the advanced age of a part of patients at inclusion and is consequently accounting for a limited number of patients available for follow-up examination. At follow-up, the mean LEFS was 37 for AKA patients and 28 for MKA patients, but statistical analysis could not show any significant difference. The missing significance may be explained by the limited power of the study. Nevertheless, the current data provide basic information for a proper sample size calculation for a multicentre study. A multicentre study is needed for more reliable outcome data and the indications for AKA or MKA after septic failure of revision arthroplasty are rare and drop out rates in this cohort are high.”

As far as I am familiar with post hoc power analysis, this analysis is possible with more than two analysed groups. I think you meant a sample size calculation which is needed to estimate the needed number of patients to see any statistical differences between in focus of our primary aim. I calculated the sample size for LEFS with the given SD of 26, an alpha power of 0.80 and a confidence interval of 0.05 to see a difference between the groups of 25% i.e. 8 points. Than we would need approximately 320 patients in our study. Nevertheless, the post hoc power analysis are subject of discussion according to Hoenig and Levine et al. who recommended that post-hoc power analyses should no longer be performed in case of non-significant results to predict an effect in a proper sample size [1, 2]. On the other hand, the results of our study are suitable as a pilot study for following investigations on this subject and calculate proper sample sizes with the knowledge of our results. We added this in the discussion part in the section limitations.

In addition it should be clearly stated that the choice to go forward with an AKA will likely be skewed towards those patients who can tolerate it and have the physical reserve to mobilise. The last sentence of the discussion summarises this point very well.

- To highlight this conclusion, we added a sentence to the first paragraph of the discussion: “Therefore, patients with a proper physical and mental state that will be able to mobilize with proper orthotics may benefit from an AKA.”
Comment:

Aim of the Authors was to report their experience in the treatment of septic failure of total knee arthroplasty performing an accurate comparison between above-knee-amputation (AKA) and modular knee-arthrodesis (MKA). They analysed and compared specific complications, functional outcome and quality of life in 81 (MKA) and 32 (AKA) patients.

The topic is really interesting and actual, and the data reported by the Authors underlines their large experience for the treatment of this challenging infection. I believe that the paper is well executed, absolutely worthy of being published in your journal. The bibliography is complete and well cared for. I have not further objections or comments. I would recommend acceptance as is.

- We thank the reviewer for his efforts and appreciate his comment.

References
