Author’s response to reviews

Title: Influence of the anterior notch in mobile-bearing UKA on patellofemoral radiotracer uptake and clinical outcome

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Author’s response to reviews:

List of changes

Andreas Fottner (Reviewer 1):

• My main concern, the limited sample size of 24 patients was not sufficiently addressed in this revision. I do agree with you that a sample size calculation is difficult to perform for the SPECT-CT analysis due to a lag of data. But I do disagree with you that there is no power analysis of sample size calculation needed at all, since you also performed clinical outcome tests. For these tests there are plenty of studies providing a "minimal-important difference" and therefore a minimal statistical power is needed to draw reliable conclusions. For this reason I still believe that a power analysis is crucial for this study.
Author’s response: The sample size cannot be addressed during manuscript revision. As stated during the previous revision, we could not get ethical approval for more patients undergoing SPECT-CT... (exposure to radiation). When demanding measuring methods are applied (eg. gait analysis, video fluoroscopy, SPECT-CT...) small sample sizes (<20) are very common in the literature. Moreover, in case of measuring methods that also mean high exposure to radiation (SPECT-CT) (or other types of invasiveness) ethical committees only approve low case numbers. Our sample size was 24.

Changes done in the manuscript: none

Shantanu Patil (Reviewer 2):

• Thank you for addressing the questions raised. I recommend this revised article be published.

Lennart Scheys (Reviewer 3):

• The paper has much improved over the previous version, for which I congratulate the authors. Nevertheless, some remaining issues - listed below - should be addressed before I would advise to accept the paper.

• Prior Comments:

Comment No 11:

So if I understand correctly your sample size was empirically chosen. Please mention it as such in the methods section.

Author’s response: I agree

Changes done in the manuscript: An accordant sentence was added to the methods section.
• Furthermore, and more importantly, I still miss a clear indication towards the readers of the confidence you have in your data in view of the small sample size. This should be overcome by reporting confidence intervals for your outcome parameters as those typically take into account the number of samples.

Author’s response: 95%CI Intervalls are now provided

Changes done in the manuscript: For the outcomes parameters KOOS and KUJALA the 95%CI are provided as part of table 1. For the notch size 95% CI are given in the results section.

Lines: 161 and 162; Table 1

• Furthermore, I would strongly advice the authors to include the box plots table 1 as this will be way more informative than all those numbers.

Author’s response: The boxplots for the KOOS and Kujala Scores are now provided as separate figures.

Changes done in the manuscript: Fig. 5 (Kujala Score Boxplots) and Fig. 6 (Koos Subscore Boxplots) were added

• Finally, your correlation analysis suffers from quite a big multiple testing problem as a total of 18x2=36 correlation analyses were performed which should be corrected for.

Author’s response: I agree the problem of multiple comparisons comes to mind.

Changes done in the manuscript: Alpha was changed from 0.05 to 0.01. Accordant changes were made in the statistics section of 'methods' and in Table 2.

Lines: 143 - 144
• Comment No 12:

Although I understand a more gold-standard approach was not readily available in the literature many of the questions I raised still remain and the explanation provided still lacks detail. As a bare minimum, the authors should at least acknowledge that their study suffers from the limitation that it did not include an analysis of the repeatability and reliability of the notch-size measurement.

Author’s response: I agree, the notch size measurements were not based on previous publications.

Changes done in the manuscript: As requested it was added to the 'limitations’ section of discussion that we do not provide an analysis of the repeatability and reliability of the notch-size measurement.

Lines: 250 - 252

• Comment No 17:

Aren't full leg frontal and lateral X-rays part of the standard-of-care post-op evaluations at your institution? If so, this would allow an evaluation of the achieved alignment. If it is the other way around, than the question still remains: to what extent is the variation in notch size related to implant alignment?

Author’s response: Unfortunately, full-length lateral and frontal postop x-rays are not obligatory at my department. Therefore, it is not possible to retrospectively add that radiographic measurements. Consequently the paragraph in the discussion section dealing with notch size as surrogate of implant alignment is of course speculation / theory.

Changes done in the manuscript: none

• Comment No 24:

Your answer provides another argument that post-op alignment should have been included in the analysis. If really not possible, please add it to the limitations and/our suggestions for future research...
Author’s response: s. above

Changes done in the manuscript: Accordant sentences were added to the limitations section.

Lines: 241 - 244

• Further comments:

Abstract:

Background: this section rather explains the goal of the study. I would advise to instead describe the clinical reasons for the study: why is it, from a clinical point of view, interesting to read your study?

Author’s response: I agree.

Changes done in the manuscript: This section of the abstract was revised.

Lines: 8 - 13

• Conclusion: in your last sentence you still seem to imply causation by your choice of wording. I would suggest to replace "even contributed" by "was even associated with".

Author’s response: I agree.

Changes done in the manuscript: done

Line: 264

• Manuscript:

Methods section:

Lines 91-94: this explanation is quite difficult to follow. I suggest to expand Figure 3 with a scheme like the one drawn in response to my comment No 13 as well as more clearly indicating the directions in which the measurements were performed on the figure on the right. To me the green indication seems very easy to miss.
Author’s response: I fully agree

Changes done in the manuscript: The schematic hand drawing from the last revision was now done properly (now as new Fig. 4 R2). Figure 3 and its green indication was revised to red color (Fig. 3 R2)

• Line 129: be more precise. How did you define what the medial facet was?

Author’s response: agreed

Changes done in the manuscript: The description of the SPECT data processing was improved

Lines: 125 – 130 and 131 - 134

• Line 132: the description here should be improved. Please check the literature how this common procedure is typically described.

Author’s response: agreed. I once again checked the manuscripts from the most active study group regarding SPECT-CT in knee surgery (around M. Hirschmann from Basel). They defined 4 or 8 patellar volumes (dependent on the articles and study questions) and assessed the maximum tracer uptake. This was normalized by using a reference value from a different area. It seems to me that our approach was very much alike.


Changes done in the manuscript: The description of the SPECT data processing was improved.

Lines: 125 – 130 and 131 - 134

• Line 133: it is unclear to me as to why you chose to report the maximum tracer uptake instead of, for example, the average? This choice should be properly substantiated in the manuscript.

Author’s response: During conceptualization of the study we also wondered whether we should use the mean or the maximum uptake. We decided to use the (normalized) maximum uptake in a
certain region (VOI) because a) that value it more forgiving with regard to the manually defined VOI and b) because previous research groups also did so:


Changes done in the manuscript: This information was added.
Lines: 125 – 130 and 131 - 134

• Results section:

Line 166: please write "maximal tracer uptake" is this is the variable you've analysed.
Author’s response: I agree that this is more accurate
Changes done in the manuscript: was corrected to 'maximum tracer uptake’ Lines: 164 and 166

• Discussion section: on line 189 you again seem to imply causation by your choice of wording. I would suggest to replace "do not lead to" by "are not associated with”.

Author’s response: ok
Changes done in the manuscript: changed
Lines: 191 - 192

• Same remark on line 195 and line 259.
Author’s response: ok
Changes done in the manuscript: changed