Author’s response to reviews

Title: The effect of medial open wedge high tibial osteotomy on the patellofemoral joint: comparative analysis according to the preexisting cartilage status

Authors:

Hyun-Soo Moon (oshdsesu@gmail.com; oshs87@yuhs.ac)
Chong-Hyuk Choi (CHOI8422@yuhs.ac)
Min Jung (JMIN1103@yuhs.ac)
Sang-Hoon Park (orthomania@gmail.com)
Dae-Young Lee (saegil2015@gmail.com)
Jong-Kwan Shin (jkshin2403@gmail.com)
Sung-Hwan Kim (orthohwan@gmail.com)

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Author’s response to reviews:

[Authors’ response to reviewers’ comments]
We are grateful to have the opportunity to improve this manuscript. Also, thank you for your detailed advice. We performed additional analyses and revised the manuscript based on your recommendations. To aid the editor in evaluating the revised manuscript, all new text or the revised parts based on the editor's comments are highlighted in blue letters in this response letter as well as the revised manuscript.

1. Editor Comments:
This study evaluated the effects of medial open wedge high tibial osteotomy (MOWHTO) on the patellofemoral joint with regard to the objective and subjective aspects, with a special focus on the preexisting cartilage status. Ninety-two cases were divided into 2 groups according to the preexisting cartilage status of the patellofemoral joint. The authors evaluated information on the patients with many factors. As results, MOWHTO contributes to the progression of osteoarthritis of the patellofemoral joint regardless of the preexisting cartilage status, but this was not considered to be directly associated with clinical outcome. In addition, there were no significant differences in radiographic parameters between the two groups.
I understand that the present study is different from previous studies including the study of Tanaka et al. "Deterioration of patellofemoral cartilage status after medial open-wedge high tibial osteotomy" Knee Surg Sports Traumatol Arthrosc. 2019 Apr; 27(4): 1347-1354. It is interesting to investigate the effect of preexisting cartilage lesions to determine the contribution of MOWHTO to the progression of patellofemoral joint osteoarthritis. However, it may be true
that the readership of BMC Musculoskeletal Disorders is also strongly interested in causes or factors (including correction angle, etc.) associated with deterioration of PF cartilage after MOWHTO.

Thank you for your comments. We agreed that additional analyses are required concerning factors that could be related to the criteria dividing two groups, which further possibly affect the deterioration of the cartilage on the patellofemoral joint after MOWHTO. Hence, we conducted an additional assessment on possible related factors that could be retrospectively analyzed at this point (medial proximal tibial angle, joint line convergence angle, posterior tibial slope, and the classification of trochlear dysplasia).

However, in regard to the recommendations suggested by Reviewer 2, we consider that it does not fit the purpose of this study. These are good points, but there are already two hypotheses in this study. If another question is added to the purposes of the present study, it could obscure the main reason why this study was performed. Further, there are already previous studies that addressed corresponding topic (patellofemoral osteoarthritis and related factors). For this reason, the authors did not conduct a further evaluation regarding the corresponding issues but are nevertheless willing to do an investigation if the editor does suggest that it should be performed.

2. Marcel Betsch, M.D. (Reviewer 1): Review:

BMC Musculoskeletal Disorders
Manuscript ID: BMSD-D-19-00896
Manuscript Title:
"The effect of medial open wedge high tibial osteotomy on the patellofemoral joint: comparative analysis according to the preexisting cartilage study"

Thank you very much for allowing me to review the manuscript with the title "The effect of medial open wedge high tibial osteotomy on the patellofemoral joint: comparative analysis according to the preexisting cartilage study".

This is a retrospective study that evaluates the effects of medial open wedge high tibial osteotomy (MOWHTO) on the patellofemoral joint with a special focus on the preexisting cartilage status. A total of 92 patients who underwent 2nd-look arthroscopy of the knee were included in this study. Two groups were formed according to their preexisting patellofemoral cartilage status. Both groups were evaluated regarding their clinical scores, radiographic parameters, and arthroscopic cartilage status of the patellofemoral joint. No clinical differences were found between both groups at the time of follow-up. In both groups the size of cartilage lesions of the patellofemoral joint increased over time, however no differences were found between the groups.

Overall, this is a clinically interesting topic.
In the past there have been studies that have evaluated the clinical and radiographic outcome of the patellofemoral joint following MOWHTO. The authors state that in their study they performed an analysis according to the preexisting cartilage status. It is not clear to the reviewer how the current study differs from the study of Tanaka et al. "Deterioration of patellofemoral cartilage status after medial open-wedge high tibial osteotomy" Knee Surgery, Sports Traumatology, Arthroscopy 2018.
Thank you for your comments. A study reported by Tanaka et al. investigated relevant factors that influence the further deterioration of patellofemoral joint cartilage after MOWHTO. The study by Tanaka et al. is similar to the present study in that they analyzed the cartilage status of patellofemoral joint using the ICRS grading system at separate two-time points (first-look arthroscopy and second-look arthroscopy). However, they did not assess the effect of the pre-existing cartilage status of patellofemoral joint. In this study, we evaluated the effects of MOWHTO on the patellofemoral joint according to their pre-existing cartilage status of the patellofemoral joint and suggested that MOWHTO would contribute to the progression of osteoarthritis on the patellofemoral joint regardless of the presence/severity of preexisting cartilage lesions. Therefore, it revealed that the preexisting cartilage lesions on the patellofemoral joint have little effect on the progression of patellofemoral joint osteoarthritis. The purposes of each study are different, and grouping for patients is also different. To address the difference from the study reported by Tanaka et al., we described it in the discussion section.

In this study the authors did also divide the patients into two groups regarding the preexisting cartilage status. The patellofemoral joint can be affected by multiple causes such as lower limb alignment, hip rotation, muscle status, trochlear dysplasia, just to name a few. In this present manuscript the authors do not include information on such important parameters. This means that we do not know in what way the two groups differ regarding preexisting conditions that also affect the patellofemoral joint. Hence, differences or no differences between the two groups could be the result of difference in these parameters and not because of the MOWHTO.

Two surgeons performed the radiographic evaluation. Why did not also two surgeons perform the intraoperative evaluation of the cartilage defects? In previous studies this has been performed and information about the reliability of these measurements was been given.
The authors state that they have performed a sample size calculation in the limitations of this manuscript, however the actual numbers are missing. This should be included in the methods section of the manuscript.

: Thank you for your comments. However, we already stated a minimum number of patients required for each group (20 patients) determined by the sample size calculation (Line 220, page 10) in the method section.

Comparing this study to previous studies there should be some radiographic measurements added to the analysis such as tibial slope, grading of patellar and trochlear dysplasia, medial proximal tibial angle. These additional parameters can be helpful to distinguish differences between the two groups.

: Thank you for your comments. As mentioned above, we performed additional comparative assessments of the radiographic parameters that could be retrospectively analyzed at this point (medial proximal tibial angle, joint line convergence angle, posterior tibial slope, and the classification of trochlear dysplasia). (Method section [Evaluation], Line 193-196, Page 9) (Result section, line 243-244, page 11) (Table 1, 2, and Additional file 1)

Please also add and discuss the following recent studies in the discussion of your manuscript:

: Thank you for your recommendations. We discussed abovementioned studies in discussion section of manuscript as you recommended. (Discussion section, Line 319-337, Page 14-15)

3. Goki Kamei (Reviewer 2):
1) Previous literatures showed that osteoarthritis of patello-femoral joint(PF OA) progressed as the opening angle increased in open wedge high tibial osteotomy and PF OA did not correlate with the clinical outcomes. Therefore, there is no new concept in this study

: Thank you for your comment. However, the purposes and results of the present study are different from what you concerned. This is the study to investigate the effect of MOWHTO on the patellofemoral joint with regard to objective and subjective aspects according to the preexisting cartilage status. The effect of preexisting cartilage lesions in the patellofemoral joint on the surgical outcomes of MOWHTO has been not studied yet.
We considered we have clearly stated the purpose, background, and the process of drawing conclusions. However, since several papers similar to the current study that investigated the relationship between MOWHTO and the patellofemoral joint have been reported continuously, we further discussed the differences from previous studies and the clinical implications of this
2) I think that you should evaluate the cases that PF OA do not progress to make your study meaningful.
3) And, you should discuss the OA progress in same OA grade and the correlation between OA progress and various factors (example for opening angle, patella height and etc)

: Thank you for your recommendations. These are good points. However, we consider that it does not fit the purpose of this study. If another question is added to the purposes of the present study, it could obscure the main reason why this study was performed. Further, there are already previous studies that addressed corresponding topic. For this reason, the authors did not conduct a further evaluation regarding the corresponding issues but are nevertheless willing to do an evaluation if the editor do suggest that it should be performed.