Author’s response to reviews

Title: Development and Validation of a Prediction Model for Knee Joint Line Orientation after High Tibial Osteotomy

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Author’s response to reviews:

Responses to the Comments of Senior Editor and Reviewers

Dear Editor,

Thank you so much for your kind advice for our manuscript entitled "Development and Validation of a Prediction Model for Knee Joint Line Orientation after High Tibial Osteotomy". We also appreciate the constructive comments from the reviewers. These comments are most valuable for us in preparing a more valuable manuscript. We have revised the manuscript according to the reviewers’ suggestions. The changes within the revised manuscript were highlighted (in blue). Specific responses to reviewers’ comments are described below:

Reviewer #1:
1) Reviewer’s comment #1:
The authors carried out radiographic measurements using 14 parameters. (P5, L14- ) Are these parameters commonly recognized? If so, please cite the references.
Author’s response:

It is an important and valuable suggestion. For the 14 radiographic parameters we have measured, we have added references for these parameters at page 6 of the manuscript and highlighted blue.

2) Reviewer’s comment #2:

Accurate preoperative planning is mandatory in the success of HTO.' (P9, L13) Even if accurate bony correction can be achieved, discrepancy between preoperative planning and postoperative alignment may occur due to change of soft tissue balance. Can alteration of soft tissue balance be preoperatively predicted by radiographic parameters?

Author’s response: We appreciate the reviewer’s important comment.

It is still debated on the factors associated with correction errors in HTO. Kyung et al reported that accurate bony correction does not correlate with changes in mechanical alignment because alignment is also affected by soft tissue laxity. Recently a study by Lee et al reported that joint space tilt angle can preoperatively quantify soft tissue laxity in HTO. Our study also included JSTA in our analysis for this reason. We have added the above comments in the discussion section at page 9 line 9-14, highlighted in blue, of the manuscript.

3) Reviewer’s comment #3:

'One notable fact in our equation is that aimed correction angle is the only factor that can be controlled by the surgeon' (P9, L54-57) How can the correction angle be controlled by surgeon?

Author’s response:

It is an important question, thank you. In our equation, preoperative G-KJLO and preoperative TPI are preoperative anatomic parameters decided before the surgery. However, the amount of correction can be controlled by the surgeon. If the surgeon is planning on a large degree of correction, the postoperative G-KJLO would be larger than when the surgeon is planning on a smaller degree of correction.
4) Reviewer’s comment #4:

The authors described that the aimed mechanical axis was the weight bearing line passing 62.5% of the width of the tibial plateau. (P4, L39-44) However, in the discussion, the authors described 'or consider reducing the amount of correction.' (P10, L42) What amount of correction can be reduced to keep acceptable lower limb alignment? Could the postoperative weight bearing line be achieved just as preoperative planning?

Author’s response:

We appreciate the reviewer’s important comment. This study was a retrospective study in nature. The preferred practice of the senior author is aiming for the weight bearing line passing 62.5% of the width of the tibial plateau. 62.5% is based on the empirical results of Fujisawa et al. Up to date, no clear scientific background of the correct target point is present. Birmingham et al proposed of templating the weight bearing line depending on the articular cartilage status of the lateral compartment. If the cartilage status of lateral compartment is of good quality, weight bearing line is templated towards the Fujisawa point. If the cartilage status of lateral compartment is unsatisfactory, weight bearing line is titrated towards the neutral point. Similarly, our algorithm suggests that in cases where G-KJLO is expected to be more than 5º, the degree of correction should be reduced. The amount of correction, however, should not be reduced as to induce undercorrection of the malalignment. The weight bearing line should be titrated between neutral point and Fujisawa point. We have added the above comments in the discussion section at page 10, line 22 through page 11, line 8, highlighted in blue, of the manuscript.

Reviewer #2:

1) Reviewer’s comment #1:

Line 14 "In this study, 14 radiographic measures, including (1) preoperative and postoperative ankle joint line orientation relative to the ground (G-KJLO), (2) ..." should be Knee joint line

Author’s response:

We appreciate the reviewer’s important comment. We have changed the error in page 5 line 6, highlighted in blue in the manuscript as the review’s comment.
I hope that we have responded to all the comments from the reviewers, and the revised manuscript will meet the editorial requirements. I look forward to your expert advice and comments.

Sincerely yours,

Chong Bum Chang