Peer Review File

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Reviewer A

It contains academical and clinical relevant content and has good potential.
I encourage you to work on the following aspects

Comment 1: 1) page 10 regarding the transverse fracture pattern: your findings meet with the study from Kfuri et al. were a transverse, 6-part patellar fractue model was tested, featuring a distal comminution zone. please discuss the results: anterior plating is the most stable variant concerning every direction of the room. The more fragments are found the more fixation profits from an angle stable anterior plate fixation.

Reply 1: Thank you for the constructive comments. We appreciate the biomechanical study by Kfuri et al. that the 6-part fracture model is a very good multi-fragmentary patella fracture model, and it meets the common fracture characteristics demonstrated in this study. We agree that anterior plating offer biomechanically excellent fixation for multi-fragmentary patella fractures.

Changes in the text: In the Discussion Section, we discussed the advantages of anterior plating in the revised manuscript (Please see Page 11~12, Line 202~221). Besides, the references have been updated (see Page 16~18, Line 283~333).

Comment 2: 2) Discussion: The discussion needs more highlighting of results concerning the observed patterns. please compare to other findings in the literature: parallels? tendencies? please refer to Kfuri et al in your discussion: discuss the role of the observed fracture pattern concerning the biomechanical performance. compare your observed patterns to the results found in this experiment. Please also address the issue of inferior smashing zones: suggestions from the literature to date? any preferred techniques to address these fragments?

Reply 2: Thank you for the valuable comments. Together with your valuable suggestions in comment 1, we added the discussion of the observed fracture patterns and their biomechanical significance. Besides, we expanded the discussion of the smashing zones and introduced the advantages of the anterior plating from a morphologic point of view. In the Discussion Section, we explored the current options to deal with the smashing zone, as well as preferred techniques.

Changes in the text: Several paragraphs in the Discussion Section have been rewritten in the revised manuscript according to your comments. Changes have been highlighted in red.

(see Page 11~13, line 193~240). References also have been updated. (see Page 16~18, Line 283~333)

Reviewer B

Comment 3: General comment: Regarding the content, this is more of an article presenting a method than actually results. It is almost a basic science article. The method used is interesting and promising.

Reply 3: Thank you for your interest in this study as well as insightful comments. The method has also been used to explore the fracture pattern of other fractures, including Hoffa fractures, tibial plateau fractures, and scapular fractures. Three-dimensional demonstration of fracture patterns allows for reflection about possible implications in the clinical management of these fractures. The clinical relevance of the results has been highlighted in the Discussion Section.

Changes in the text: The clinical relevance of the results has been highlighted in the Discussion Section. (Please see Page 11~12, Line 202 ~240).

Comment 4: Regarding the form, the article is globally well written and corresponds to what can be expected. Each step is clear and well explained. There are some flaws which can be fixed with a revision. The English needs to be proofread. Some sentences are difficult to understand because they are too long with many adverbs.

Reply 4: Thank you for your advice on the language. We carefully proofread the manuscript to correct grammatical errors, reduced the use of adverbs, and shortened the sentences. Besides, the references have been updated.

Changes in the text: All changes have been highlighted in red in the whole text.

Comment 5: Abstract: Overall well written and clear. Please separate the first sentence into two separate sentences.

Reply 5: Thank you for your suggestion. The first sentence has been revised and split into 2 sentences.

Changes in the text: we have revised the corresponding sentences in the Abstract part as advised (see page 3, line 31~33).

Comment 6: Introduction: Please rephrase the last sentence of the first part "the anatomical.... "

Reply 6: Thank you for your suggestion.

Changes in the text: we have rewritten the corresponding sentence as advised (see page 5, line 62~64).

Comment 7: Please point out that there are also disadvantages with plates, which are often bulky and can create conflicts with soft tissue, exposing the patient to healing problems and therefore infection.

Reply 7: Thank you for this constructive comment.

Changes in the text: we added the disadvantages of plate fixation of patella fractures (see page 5, line 69~70).

Comment 8: Please limit the number of adverbs used: therefore, however.....

Reply 8: Thank you for your suggestion on adverbs. We have reduced a number of adverbs in the revised manuscript.

Changes in the text: The whole text has been revised and changes are highlighted in red.

Comment 9: Please add a hypothesis before the introduction.

Reply 9: Thank you for your comment. This makes the article better structured.

Changes in the text: we added the hypothesis at the end of the Introduction Section (see Page 5~6, line 79~80).

Comment 10: The last sentence should be moved to your material and methods.

Reply 10: Thank you for your comment. We suppose you suggest we move the last sentence to the “Methods” section. We understand your concern, but according to the “Instruction for Authors” of this journal, a statement should be included at the end of the “Introduction” to indicate which reporting checklist was followed.

Changes in the text: no changes yet, but we have no objection to moving the position of this sentence if appropriate.

Comment 11: Materials and methods: For the inclusion criteria, please define more precisely what AO 34C3 is. This will help readers who are not familiar with the classification to understand.

Reply 11: Thank you for this constructive comment. This improves the readability of the paper.

Changes in the text: we added the description of AO/OTA 34C3. (see Page 6, line 87~88).

Comment 12: The rest is very clear. The 3D mapping method is well explained. The statistical analysis seems coherent.

Reply 12: Thank you for your comment.

Changes in the text: No corresponding changes were made.

Comment 13: Results: OK

Reply 13: Thank you for your comment.

Changes in the text: No corresponding changes were made.

Comment 14: Discussion: The first point of the limitation part needs to be rewritten. The sentence is too long and difficult to understand.

Reply 14: Thank you for pointing out this obscure sentence. We rewrite it as advised, this suggestion does help us to made this paragraph more readable, thank you.

Changes in the text: We rewrite the first point of the limitation as suggested (see page 13, line 241~242). We welcome your further suggestions and comments.

Reviewer C

Comment 15: The review process aims to assess the quality and ensure the article's reliability, completeness, and consistency. It is a way to improve your manuscript. The manuscript is of considerable interest and, in my experience, has no methodological or drafting errors that need to be corrected. Likely, previous experience in this type of analysis and the authors' completion of the STROBE reporting checklist have contributed to the article's lack of errors.

Reply 15: Thank you for your comments.

Changes in the text: No corresponding changes were made.

Comment 16: Overall: The research is both meticulous and thorough. Congratulations to the authors. It provides a different view than the traditional one to understand the fracture pattern of this type of patella fracture and is helpful for the development of treatment systems.

Reply 16: Thank you for your comments.

Changes in the text: No corresponding changes were made.

Comment 17: A native English speaker should check it. Non-native speakers of English tend to overuse the passive voice. Certain grammatical aspects of the writing can be improved.

Reply 17: Thank you for your language suggestion. Due to the revision deadline, we are not able to find a native English speaker to check the manuscript. However, we found an orthopaedic surgeon to carefully revise this manuscript. He published over 20 English papers, including 2 papers in the Journal of Bone & Joint Surgery and 1 in Arthroscopy, in the past decade. In the revised manuscript, the use of passive voice was reduced and quite a few grammatical errors were corrected. Besides, a number of sentences were rewritten. We believe that the text quality has been improved a lot. Should there is any residual concern about language editing, please let us know. We will apply to the editorial office for an extension of the revision deadline. Thank you again for your comments.

Changes in the text: In the revised manuscript, we reduced the use of passive voice, corrected grammatical errors, and rewritten a few sentences. All changes were highlighted in red in the whole text.

Comment 18: Title: adequate and correct.

Reply 18: Thank you for your comment.

Changes in the text: No corresponding changes were made.

Comment 19: Abstract: Correct in extent and description of the study.

Reply 19: Thank you for your comment.

Changes in the text: No corresponding changes were made.

Comment 20: Keywords: OK

Reply 20: Thank you for your comment.

Changes in the text: No corresponding changes were made.

Comment 21: Introduction: The authors describe the topic well, ending the introduction with the study's objective. No objections.

Reply 21: Thank you for your comment.

Changes in the text: No corresponding changes were made.

Comment 22: Methods: The description of the methodology is systematic and adequate. The authors have already used the same mapping system on other fracture patterns and validated it by publication. The statistical analysis is adequate for the variables described. No objections.

Reply 22: Thank you for your comment.

Changes in the text: No corresponding changes were made.

Comment 23: Results: The authors present the results correctly, both in the text and in the tables they have prepared. I have no objections.

Reply 23: Thank you for your comment.

Changes in the text: No corresponding changes were made.

Comment 24: Discussion: The authors adequately develop the rationale for the significance of the findings, the conceptual innovation in mapping fracture patterns, the potential usefulness of their findings, and the study's limitations. Congratulations.

Reply 24: Thank you for your comment.

Changes in the text: The Discussion has been revised according to other reviewers' comments. (Please see Page 11~13, Line 193~246)

Comment 25: Conclusions: OK. Figures and tables: OK. References: OK.

Reply 25: Thank you for your comment. References have been updated.

Changes in the text: We updated the References (Please see Page 16~18, Line 283~333.)