Author’s response to reviews

Title: Surgical Trends in Elderly Patients with Proximal Humeral Fractures in South Korea: A Population-based Study

Authors:

Young-Hoon Jo (darkpac@hanmail.net)

Kwang-Hyun Lee (leegh@hanyang.ac.kr)

Bong-Gun Lee (orthdr@naver.com)

Version: 1 Date: 30 Dec 2018

Author’s response to reviews:

We wish to resubmit the manuscript titled “Surgical Trends in Elderly Patients with Proximal Humeral Fractures in South Korea: A Population-based Study” The manuscript ID is BMSD-D-18-01220.

We thank you and the reviewers for your thoughtful suggestions and insights. The manuscript has benefitted from these insightful suggestions. I look forward to working with you and the reviewers to move this manuscript closer to publication in BMC Musculoskeletal Disorders. The revised sentences are highlighted in yellow in the updated manuscript, and the line numbers of each revision are noted in the corresponding answer below.

Reviewer #1
1. Unfortunately, this study cannot serve as a general recommendation in order to improve the outcome after proximal humeral fractures as there is no further information like revision surgeries, infections or the need for assistance after the operative procedure.
Response: We agree with your comment. Because the HIRA data does not provide information on clinical outcomes, the clinical outcomes between operative procedures were not comparable in this study. Such limitation has been mentioned additionally in lines 224-226 (Discussion section, 224-226, page 8-9).

2. The authors should consider adding a diagram with each operation technique, e.g. x-rays
Response: Thank you for this helpful suggestion. We have added a diagram of each operation technique to your recommendation, as shown in Figure 1 (Background section, 66, page 3).

3. Line 61-63: Please consider rewriting in a clearer manner.
Response: Thank you for pointing this out. We modified the sentences more clearly (Background section, 61-63,
4. Subsequently, patients who underwent conservative treatment for PHFs were identified as those for whom ICD-10 codes (S42.2) codes were entered, but operation codes were not. What about the patients with multiple injuries and patients who died? Are they categorized as conservative treatment?

Response:
Thank you for pointing this out. If the surgical codes of PHFs were not entered for patients with multiple injuries and patients who died, we considered those patients to have undergone conservative treatment. Although it is difficult to say that patients who died received conservative treatment, such cases are rare. Many studies have investigated the number of fractures treated with conservative treatment in a similar way to ours.1,2


5. Please include p value.
Response:
Thank you for this helpful suggestion. We added a p-value according to your recommendation (Results, line 151, page 6)

6. Do the authors think, that this is based on the surgical procedure or the fact that patients with higher age rather get arthroplasty as younger patients? Please clarify.
Response:
Thank you for pointing this out. We did not give any special meaning to the average hospitalization period. Therefore, the existing line 151-152 is deleted because it is judged to be an unnecessary sentence.

7. Figures 1-3 have poor picture quality and should address exact numbers as well.
Response:
Thank you for this helpful suggestion. We modified the pictures and entered the values into the pictures (Figures 2-4).

Reviewer #2
1. The authors explain, why locking plates are used more often when performing ORIF. In the reviewers' point of view, a few sentences about intramedullary nailing should also be added.
Response:
We agree with your comment. The intramedullary nailing can be also a useful tool for PHF fixation. Therefore, we added a few sentences about intramedullary nailing in line 66-69 (Background, 66-69, page 3).

2. The surgical codes should be explained immediately (as done in line 108-110) to avoid confusion.
Response:
Thank you for this helpful suggestion. We briefly explained the operation codes according to your recommendation (Methods, 98-100, page 4).

3. Line 145-146. The authors state that the proportion of RSA increases significantly in Patients older than 80 years. In line 197-204 the authors explain, that until 2017, only patients older than 80 years received insurance coverage for RSA.Assumingly, patients younger than 80 had to pay for the procedure themselves. This poses a massive bias. If the information, that RSA is more frequently used in patients over 80, is given in the results, the insurance bias must be explicitly mentioned in the limitations of the study.

Response:
We agree with your comment. Before October 2017, insurance coverage was a major constraint for surgeons to choose the surgical treatment of patients aged<80 with PHFs in South Korea (Discussion section, 208-209, page 8). Therefore, the insurance coverage served as a bias that could have caused high preference for RSA over HA in only patients over 80 years of age. If there had been no insurance bias, the RSA preference might have been higher than HA even for those under 80 years of age in 2016. Such limitation has been mentioned additionally in lines 226-229 (Discussion section, 226-229, page 9).

4. Line 169-171: The authors state before, that the incident rate of PHF does not increase, because the population of South Korea has increased in the monitored years concurrent to the number of PHF's. If osteoporosis is an important risk factor in PHF, like stated, and the number of cases of PHF is predicted to increase steadily, why didn't the incident rate increase in this study? Please discuss.

Response:
Thank you for pointing this out. In this study, the incidence rate was calculated only for the population over 65 years of age, so it did not increase. This result is similar to previous report. If the incidence rate of PHFs was calculated in all age groups without age-adjusted in this study, it would be expected to increase steadily during the study period as population aging continues. This is mentioned on line 172-174 (Discussion section, lines 172-174, page 7).


5. Line 181-189: Like before, the intramedullary nail is not mentioned. Is it not used in South Korea? If not, why?

Response:
We agree with your comment. In South Korea, many surgeons prefer the locking plate rather than the intramedullary nail, but nailing is also often used. Therefore, we added a few sentences about intramedullary nailing in line 188-190 (Discussion, 188-190, page 7).

6. Discussion: No functional outcome was registered in the data. We learn from this study, that the frequency of surgical treatment increases, but it would be interesting to know, if the functional outcome is getting better simultaneously. In the reviewers' point of view, this is a limitation of the study and should be mentioned as such.

Response:
We agree with your comment. Because the HIRA data does not provide information on clinical outcomes, the clinical outcomes between operative procedures were not comparable in this study. Such limitation has been mentioned additionally in lines 224-226 (Discussion section, 224-226, page 8).
7. Table 3: Please mark statistical significant differences in the table. If all differences are significant, please state this in the description.
Response: Thank you for this helpful suggestion. We added p values in table 3 according to your recommendation (Table 3).

8. Figure 3: Are the patients more than 65 or older than 80 years old? Please state this in the description.
Response: Thank you for pointing this out. The patients in Figure 3 are older than 65 years. Figure 3 is modified to Figure 4. The legend for Figure 4 in lines 378-379 now states that the patients were over 65 years of age.

Again, we greatly appreciate the reviewers’ advice and recommendations for our manuscript.