Author's response to reviews

Title: Radiographic Union Score for Hip Substantially Improves Agreement Between Surgeons and Radiologists

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Author's response to reviews: see over
January 18, 2013

Dear Dr. Aldea,

Thank you for your letter dated 10-Dec-2012 regarding our manuscript titled “Radiographic Union Score for Hip Substantially Improves Agreement Between Surgeons and Radiologists”. Please accept our resubmission for the manuscript. Please find below our responses to each of the referee’s concerns.

Referee 1

Reviewer Comment: The first major observation concerns the type of lateral radiographic view of the hip performed in the study. The term “lateral” could refer to two different radiographic views and therefore, though it may seem obvious, the correct type must be specified.

Response: The images obtained were cross-table lateral images. If a true lateral view was not possible, an oblique view was used. This has been specified in the manuscript.

Reviewer Comment: The attached images are not self-explanatory, also because they are slightly different, even in the same patient. I believe that we are talking about “cross-table lateral view”, but in the attached x-ray images we see an overlap between the neck and the greater trochanter, ie a sign of incorrect projection. If, in the study there were problems in obtaining correct and strictly comparable radiographs this should have been specified considering that the outcome of the study could be affected (see all Page 7, line 3: “and, if applicable, commented on the quality of the radiographs for each case”).

Response: We agree with the reviewer’s concern. The images utilized in this study were obtained from patients included in a multi-centre research initiative, which are representative of images being taken in practice. Due to patient pain and limitation in range of motion, it is not always possible to obtain the ideal image. This has been addressed in the limitations section of the discussion as well as in the methods.

Reviewer Comment: The most important major compulsory issue concerns the evaluation of the results. The underlying problem is that a validated reference standard for the assessment methods of fracture healing does not really exist. Thus, the primary endpoint of a study on this topic should be the reliability and efficacy of the method, leaving as secondary endpoints its repeatability and applicability among various specialists.

Response: This study was conducted with the aim of: 1) evaluating agreement between surgeons and radiologists on the assessment of fracture healing, 2) evaluate the performance of the RUSH checklist,
and 3) compare the findings of the current study to a study previously conducted using the RUSH score. Further trials will need to be conducted in order to fully determine the reliability and efficacy of the method.

**Reviewer Comment:** Also, because an assessment could be highly reproducible, even if wrong. For this reason the fact that in this study there is no agreement among specialists in the evaluation of x-rays with date blinded in time should be treated and discussed in the article in a more comprehensive and detailed manner. If a method does not provide, in a blinded mode, a statistically significant consensus among specialists already familiar with it, you have to question the effectiveness of the method of evaluation, especially if this has not yet been officially validated.

**Response:** The manuscript has been reorganized to clarify that a previous study was conducted in which the reviewers were presented with a single radiograph for each case and were unaware of when it was obtained relative to surgery. The results of the present study then were compared to the results of the previous study. We have clarified this in the text of the manuscript.

**Reviewer Comment:** Which radiographs determined less consensus (the earliest after surgery?) is not described in the article.

**Response:** The reviewer raises an interesting point. This has been examined and added to the manuscript.

**Reviewer Comment:** Whether or not there is a difference between the evaluation of radiologists or orthopedics is not described.

**Response:** All key findings were presented as the agreement between radiologists and surgeons. We have clarified this in the manuscript.

**Reviewer Comment:** There is no correlation with clinical data collected (although it was not among the objectives of the article).

**Response:** The reviewer raises an interesting point; however, this is beyond the scope of the current study. It would definitely be something for a future research initiative and we have added this point to our discussion.

**Reviewer Comment:** The authors state that the consensus achieved on “unblinded” radiographs is significant because it reflects the real clinical practice. However knowing the date of radiographs could certainly also affect the assessment of radiological findings. This is even more likely if you also add the possibility to clinically evaluate the fractured patient. I would not be surprised if the overall impression of fracture healing alone was able to reach an almost perfect consensus if combined with the knowledge of the dates of the radiographs and the clinical evaluation of patients. In fact, in the article the “unblinded” overall impression of healing has ICC values similar to those of “blinded” RUSH method. (Fig. 4)

**Response:** As indicated above, the inclusion of clinical evaluation would definitely be interesting for future research.
Reviewer Comment: In conclusion, I believe that it is essential, before publication, to make some corrections in the abstract, in the results and conclusions. In particular the problems related to the lack of “blinded” agreement should be specified, the statistical evaluation of this aspect expanded and the causes of this problem speculated upon. However, it is advisable to make a more clear statement in the article about the need for further studies on the effectiveness of the RUSH method, comparing it also in blinded mode to other methods of assessment of fracture healing.

Response: We have corrected the wording throughout the manuscript. The need for further research initiatives has also been addressed.

Referee 2
Reviewer Comment: While I think that the authors’ development of a system to better improve the assessment of femoral neck healing has some utility in theory, I wonder how practical it will be to apply this score to everyday practice as it appears to me that it takes more time than allowed in practice. In conclusion, while I am not convinced that many orthopedic surgeons would use this tool on a daily basis to assess healing of a femoral neck fracture, I do think that this is a valid scoring system and should be included in out literature and may indeed have more utility to clinical practice than I predict.

Response: The referee raises a valid concern. We have not implement or evaluated the RUSH score in clinical practice. Instead, we have developed it for us of examination of x-rays during an independent assessment of fracture healing, a process that is commonly used in in clinical trials. Future research should evaluate the feasibility and validity of implementing the RUSH score into clinical practice. We have addressed these concerns in the discussion.

Thank you again for considering this manuscript for publication in BioMed Central. I am hopeful that our responses adequately address the referees’ concerns. Please do not hesitate to contact us if you have any questions or concerns. I we look forward to further communication with you regarding this manuscript.

Sincerely,

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