Author's response to reviews

Title: Indications for computed tomography (CT-) diagnostics in proximal humeral fractures: a comparative study of plain radiography and computed tomography

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Version: 4 Date: 11 February 2009

Author's response to reviews: see over
Dear Doctor Edmunds,

thank you very much for your review of our paper and the chance to re-submit an improved manuscript version. We addressed all issues carefully. In particular, we hope to have improved the flow of the language in important sections of the discussion and conclusion.

In the following sections, we present a point by point answer to the comments.

1. According to the reviewer Dr. Lunsjö, the abbreviations 2D, 3D and AP should be presented in full text the first time they are used.

We presented the abbreviations 2D, 3D and AP in full text when used the first time (introduction).

2. In the results section, we discarded the irregularity of alpha and $\rho$ by solely using $\rho$. In addition, we used X-ray with an capital X throughout the whole manuscript.

3. Then, reviewer 2 stated: "In the discussion, the first half of the second paragraph "Our study showed...until; ...digital image acquisition and processing." makes the reader confused. It is to difficult to follow, please simplify."

To address this point, we changed the manuscript to: „Our study showed a significantly better technical image quality of digital radiographs compared to analogous radiographs. In addition, 3 D CT reconstructions presented on films were better than 3 D CT reconstructions viewed on workstation. Furthermore, the digital conventional image quality was equal to the quality of the 3 D CT on workstation. Therefore, the quality standard, of the digital conventional radiography possibly was of such a high level that it reached the quality of a technically superior method such as 3 D CT. Those results may be related to a center-specific technical quality standard and the technical availability of modern
diagnostic equipment and the expertise in digital image acquisition and processing."

4. Then, reviewer 2 stated: "The last paragraph before the conclusion; Take out Hertel because if his 5 basic questions are not explained, it does not add any to this manuscript."

We addressed this point by deleting the appropriate section and agree that this point did not add to the content of the manuscript.

5. Reviewer 2 also stated: "Conclusion; the first sentence is unnecessary and unscientific. Settle with the 2 last sentences and stay focused on the message of your report."

To address this point, we changed the final conclusion to "If image quality impairs fracture visualization or if osseous overlap prevents the visualization of the fractured structures, conventional radiography is not sufficient. In such a situation, we believe that a CT should be performed."

6. Reviewer 2 wanted an improvement of the legends of Figures 1 and 3. He stated: "The "baseline" of fig 1 could be conventional x-ray, 2 D and 3 D instead of 1,2 and 3, respectively. That would simplify the legend to the figure and enhance the understanding. The same regarding fig 3. Legend to fig 4; Assessment of relevant structures of the proximal humerus according to Neer (2-part...). This is easier to understand."

Therefore, we changed the baseline and changed the legend accordingly to "The mean quality scores for the three methods (Conventional X-ray; 2 D CT, 3 D CT) and the two methods of presentations (x = analogue/ films, + = digital/ workstation) are shown with their 95% confidence intervals." for Figure 1. For Figure 3, we changed the baseline to "Assessment of relevant structures of the
shoulder joint and the proximal humerus. The mean quality scores for the three methods and the two centers are shown with their 95% confidence intervals."

We sincerely hope to have addressed each point of the reviewer carefully and would like to re-submit our improved manuscript for consideration for publication in the journal BMC Musculoskeletal Disorders.

Sincerely,

Christian Bahrs, MD