Comment on Bakker et al.: change of Böhler's angle during conservatively-treated displaced intra-articular calcaneal fractures

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Dear Editor,

We have read the article titled “The fate of Böhler's angle in conservatively-treated displaced intra-articular calcaneal fractures” by Bakker et al. [1] with great interest and their work should be praised.

In this article, the authors firstly focused on the change of Böhler's angle during conservative treatment. The conclusion, which proved the existing decrease of Böhler's angle in conservatively-treated patients through a retrospective analysis of 38 patients, was thought provoking. However, we have several questions together with personal opinions regarding this study.

1. All consecutive patients with unilateral or bilateral displaced intra-articular calcaneal fractures (DIACF) treated conservatively between 2004 and 2011 were included in this study. It is known that many factors will affect the fracture healing. Therefore, we would like to know whether the recruited patients have similar characteristics.
2. In the study, the authors found that a statistically significantly higher decrease of Böhler's angle was detected in high energy trauma (HET) compared with low energy trauma (LET). What are the detailed measurement criteria to sort the energy of trauma as HET and LET?
3. With regard to gender, although the difference was not significant ($p=0.569$), the female patients had a greater decrease of Böhler's angle than the male patients. It is generally believed that males tend to have worse prog-

nosis because of their heavy work load. So what is the probable cause for such an opposite outcome, or was the difference just due to the small a sample size?

4. There are many conservative methods for DIACF treatment and different management strategies may result in varied clinical outcomes. Therefore, we would like to know whether there were other conservatively therapeutic measures apart from ten to 12 weeks of non weight-bearing mobilisation in this study.
5. We wonder whether the recruitment of bilateral fractures affects the outcomes.
6. The sample size was limited, which may have an effect on the conclusion. The average follow-up time was 29.2 weeks, whether there are angle changes after longer follow-up time remains unclear. Though a randomised controlled trial [2] comparing operative with nonoperative treatment of DIACF with 15-year follow-up indicated that the Böhler's angle for conservative treatment decreased from post-injury of $13.8^\circ \pm 11.2^\circ$ to long-term follow-up of $10.4^\circ \pm 9.4^\circ$, it was based on nine (post-injury) or 11 (long-term follow-up) patients. Moreover, special attention should be paid to work load, as different work loads may lead to different outcomes [3].

We agree with the authors that the predictive value of Böhler's angle remains controversial and patient compliance during conservative treatment seems very important.

This study provided evidence that conservative DIACF treatment had disadvantages. Therefore, from another perspective, operation is recommended for most DIACF patients.

Thanks to all authors for their invaluable work.
With our sincere regards!

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