

Reply to comment on Bakker et al.: Change of Böhler's angle during conservatively-treated displaced intra-articular calcaneal fractures

Dear Editor,

We thank Jiang et al. for their interest in our manuscript. Hereby we would like to reply to their commentary on Bakker et al.: Change of Böhler's angle during conservatively-treated displaced intra-articular calcaneal fractures <sup>1</sup>.

1. With respect to the patient characteristics we looked at age and gender. Data on smoking habits and diabetes were not available to us for analysis. In the literature the time patients remain non-weight bearing ranges between six and twelve weeks. It is our protocol to mobilize these patients non-weight bearing for twelve weeks, which we expect is enough for fracture healing even in patients who smoke or have diabetes.

2. In the current study a HET (High Energy Trauma) was defined as by the Advanced Trauma Life Support Criteria <sup>2</sup>:

- a. *a fall from a height of more than 3 meters*
- b. *car accident with speed above 50 km/h (restrained victim)*
- c. *ejection from a car*
- d. *vehicle rollover on collision*
- e. *deformation of vehicle by more than 50 cm*
- f. *pedestrian victim versus vehicle at speed above 20 km/h*
- g. *bicycle/motorcycle versus vehicle at speed above 30 km/h*

All other trauma was considered to be of a low energy type.

3. As stated correctly in the letter by Jiang et al., the analysis of differences in Böhler's angle between male (n=30) and female patients (n=8), revealed no statistical differences. Neither the univariate nor the multivariable analysis showed a statistically significant difference. This might of course be due to the low number of female participants, but other factors such as osteoporosis cannot be ruled out.

4. All patients were treated with early range of motion exercises and twelve weeks non-weight bearing.

5. We cannot correct for patients noncompliance, but one might speculate that patients suffering from bilateral calcaneal fractures may be more compliant with the

non-weight bearing regime being wheelchair-bound. On the other hand one might argue that, for the same reason, patients with bilateral calcaneal fracture tend to bear weight more early to avoid a wheelchair. As per protocol the bilateral fractures were also kept non-weight bearing for twelve weeks.

6. The average follow-up was indeed about a half year. This is because after this period people were released from outpatient follow-up. Quite a large proportion of patients, especially those in whom conservative treatment is preferred, are subsequently lost to follow-up. In surgically treated patients with longer follow-up a decrease in Böhler's angle is seen even after one year<sup>3-4</sup>. We would like to encourage others to look at conservatively treated patients with a longer follow-up and to evaluate patients with a minimally displaced fracture with an initial angle of more than 15 degrees, as these were not available for our current study. Secondly, it would be interesting to see whether or not this secondary decrease has an effect on outcome.

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## References

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