



## Letter to the Editor

Reply to the letter by L.A. Hoogervorst, R. W.A. Spek and M. P.J. van den Bekerom



We appreciate the opportunity to respond to the letter to the editor written by Hoogervorst et al. In our article, we discuss the outcomes of surgically fixed greater tuberosity fractures via a systematic review [1] and conclude that, overall, surgical treatment leads to satisfactory functional outcomes.

One of the arguments presented by Hoogervorst et al. is that our article misleads readers to believe that all greater tuberosity fractures need to be treated surgically. We respectfully disagree with this interpretation. Our article focused on papers reporting on surgical treatment, and in fact, the most common indication for surgery was at least 5 mm of displacement. Thus, those greater tuberosity fractures that were nondisplaced or minimally displaced were likely treated non-operatively and thus excluded from papers that comprised our review.

In the systematic review conducted by Hoogervorst et al., the large majority of fractures were minimally displaced (< 5 mm), and this group of fractures is dramatically different from the ones that we report on in our study. The authors point out that they conducted a subgroup analysis on the fractures that had greater than 5 mm displacement. However, this group was only 4% of the study patients. Furthermore, the direction of displacement may play a role in outcomes. A study by Verdano et al. [2] suggests that conservative treatment of fractures displaced in the postero-superior direction may lead to poorer outcomes compared to fractures without displacement or displaced in other directions.

We agree that the optimal cutoff for surgical treatment of greater tuberosity fractures is debatable and likely needs to take into account the degree and direction of displacement along with the patient's age and functional demands. Further research in the form of randomized controlled trials will help physicians develop evidence based algorithms for the treatment of isolated greater tuberosity fractures.

## Disclosure of interest

The authors declare that they have no competing interest.

## References

- [1] Huntley SR. Outcomes of surgical fixation of greater tuberosity fractures: a systematic review. *Orthop Traumatol Surg Res* 2020;106(6):1119–26.
- [2] Verdano MA. Isolated fractures of the greater tuberosity in proximal humerus: does the direction of displacement influence functional outcome? An analysis of displacement in greater tuberosity fractures. *Acta Biomed* 2014;84(3):219–28.

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