Reviewer's report

Title: Permissive weight bearing in trauma patients with fracture of the lower extremities: prospective multicenter comparative cohort study

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Reviewer: Benedikt Braun

Reviewer's report:

Thank you for the opportunity to review this article. Overall, I think it is an interesting study testing valid hypothesis. I believe that this study will lead to results that can potentially change our aftercare regimes drastically. However, the study suffers from a slightly unbalanced tone. Overall the text should be corrected by a native speaker to correct some language and grammatical issues.

Issues that arose during the review:

1) I might consider calling it permissive full weight-bearing, rather than permissive weight bearing

2) Slightly unbiased tone: At times it is implied, that 12 weeks of complete non weight-bearing after all intraarticular fractures of the lower extremity is in line with the AO Principles of Fracture management (see page 6 Lines 14-17: "According to the AO-protocol, postoperative management of (peri)- or intra-articular fractures of the lower extremities consists of non-weight bearing for 6-12 weeks followed by partial weight bearing with a 25"). However this is only partially true. While the AO Principles do recommend this for fractures around the knee, it is not recommended in acetabular fractures, as studies have shown that forces across the hip joint are higher during non weight-bearing. Here they recommend partial weight bearing. Furthermore several studies have already shown, that patient compliance to weight-bearing recommendations either partial- or permissive full weight-bearing is low. This includes research from our own group confirming low compliance rates already shown by several short term measurements from other research groups. This has led to some clinics adopting more weight-bearing friendly aftercare regimes with equally good results. The fact that these regimes are already established in quite some clinics (including the authors own institution judging from the background section) and are also highly present in the current literature is not represented in the current article. I would rework this part in the background and discussion section in a more balanced way, to not only reflect current recommendations that might, or might not be employed in some hospitals, but also the current research and what is already known on weight-bearing compliance.
3) Not randomizing the study: I understand the authors concerns about randomization, as they do not want patients with different treatment philosophies on the same ward to prevent bias. However I fear that not randomizing, but assigning treatment protocols to different centers introduces a lot more bias to the study. Especially since one study center is already used to and convinced of permissive full weight-bearing. This introduces observer bias. I would at least address this issue in a thorough limitations section, as it has not been mentioned anywhere in the manuscript up to now.

4) More specific study information: While the article is very specific on the outcome measures the included fracture entities remain rather vague, i.e. all peri- or intraarticular fractures that would require non weight-bearing. As this can have different meanings to different clinicians and researchers I would highly recommend providing more specific inclusion criteria based on the AO/OTA classification system to truly make it comparable to other research projects. Type of fracture (although not specified) is already part of the collected demographic variables. I would highly recommend specifying which fracture classification is used and then also provide it as a specific inclusion criterion.

5) Follow up: I understand that the authors are concerned that the results might be equal between treatment groups at a 1 year follow up mark. However there is no way of knowing that and I feel that this would also be an important result, as this is a common follow up for some of the fracture entities studied and might even be too short a follow up for some cases; i.e. acetabulum fractures, with arthritis as the most common complication that usually manifests within a 2 year follow up. This should also be discussed.

6) Insole compliance measurement need to be described in more detail: What insole is used? How is the measurement set up (i.e. sampling frequency)? When and how long is the patient measured? This is very important, as compliance is different at different settings.

7) Teaching non weight-bearing: It needs to be specified how the non weight-bearing is taught. There are highly significant differences in the way non or partial weight-bearing is taught that also have significant implications for the ensuing compliance.

Some more minor issues should be corrected after the manuscript is changed according to the suggestions above.
Overall the article presents a promising study concept that certainly has the potential to change our treatment regimes. The article is certainly of interest to the readers of the journal. I feel however that it would benefit from a more balanced tone and if a more specific study protocol is included.

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