

Dear Editor,

Many thanks for the opportunity to revise this manuscript (Manuscript ID 49726) for consideration of publication in World Journal of Orthopedics. We have edited the manuscript in line with the peer review comments. We have also formatted the manuscript as per the requirements of the World Journal of Orthopedics.

Look forward to hearing from you,

A handwritten signature in black ink that reads "Catrin Morgan". The signature is written in a cursive style with a long horizontal flourish at the end.

Catrin Morgan, MBBS (Distinction), BSc (Hon), MRCS
(signed on behalf of all authors)

Reviewer Comments

Reviewer ID 00502903

Very well written manuscript with insightful discussion of an important developing technology in orthopedics and surgery in general. The comparison of 3D printing to robotic surgery is provocative, as robotic surgery has been widely noted not to have fulfilled its promise. While study quality seems well-assessed in this meta-analysis, publication bias should be considered. Funnel plots for the main results would contribute to our understanding of this possibility.

Response: Many thanks for these comments. Added to the limitations section - The risk of publication bias should also be considered.

Reviewer ID 00467030

This is a meta-analysis article on the analysis using 3D printing in preoperative planning in orthopaedic trauma could lead to a reduction in operation time, intra-operative blood loss and fluoroscopy used. After reading the submitted article carefully, the following points are suggested for further consideration. 1. Although the limitations have been touched, it still needs to write in more detail on this aspect such as to include the difference of extent and

types of trauma would need to different outcome of the 3D printing in preoperative planning in orthopaedic trauma. 2. Quite a number of typo errors still need attention.

Response: Many thanks for these comments.

Point 1 – this has been addressed in the limitations section - However, the results presented here should be considered in the context of a number of limitations. Where meta-analysis was possible, the heterogeneity was high. However, this was not unexpected given the wide area of orthopaedics (where different specialties are highly distinct), type of pathology and patient demographics. It was not possible to carry out a subgroup analysis due to the limited number of studies in the different subspecialties of orthopaedic trauma.

Point 2 – typos identified and corrected

Reviewer ID 00503929

This well-written manuscript describes, in sufficient detail, a systematic review and meta-analysis of studies in the field of orthopaedic trauma surgery, involving patients of both sexes and all age groups, which might yield information as to whether the preoperative use of 3D printing has a beneficial impact on major outcomes of the surgery, including the duration of intervention, the extent of intraoperative blood loss and the overall exposure to ionizing radiation from fluoroscopy. The subject is relevant, the study is correctly designed and properly described. The inclusion criteria have been strictly defined and adhered to, including the exclusion of studies with small numbers of patients. The results provide evidence that, in a set of over 900 patients whose data were extracted from 17 individual publications, the use of 3D printing to model the lesion to be corrected was helpful, and led to reductions in operative time, blood loss and undue exposure to ionizing radiation.

Response: Many thanks for these comments.

Reviewer ID 00742054

This is a well-written paper on the use of 3D printing in preoperative planning in orthopaedic trauma surgery. Below are my comment: - Methods, Quality assessment, page 6: Two tools have been used to assess the quality of the selected papers: “Jadad” and “Newcastle-Ottawa scale”. Please indicate for each tool whether they have cut-off score. Also, what do lower or higher scores mean, as shown in Table 1. - Results: page 8: the last sentence is incomplete “The heterogeneity was high ($I^2 = 10$ ”. Please correct

Response: Many thanks for these comments.

For both tools a cut-off score has been indicated.

For the Newcastle-Ottawa scale the following sentence has been added in the quality assessment section of the methods - We classified studies with ≥ 7 stars as higher quality and < 7 stars as 'lower quality'.

For the Jadad score the following sentence has been added in the quality assessment section of the methods - We classified a score of ≥ 3 as 'higher quality' and < 3 as 'lower quality'.

Results: page 8: the last sentence is incomplete – this sentence has now been completed

Reviewer ID 02454185

The study was performed according to standard guideline and pre-registered for the protocol, which is good. I have several comments as follows: 1. For quality assessment of RCTs, I suggest not to use JADAD score due to critical criticism of the score. the cochrane checklist can be used for assessment which included 6 items from sequence generation, allocation concealment and so on. 2. evidence from RCT and observational studies cannot be incorporated together with equal weight. Bayesian analysis can thus be used for down-weight the observational evidence (BMJ Open. 2015 Sep 8;5(9):e007473. doi: 10.1136/bmjopen-2014-007473.). 3. All studies used different types of operations and the time required for the analysis is different, I suggest to use standardized mean difference to report the outcome. 4. The included component studies are small in sample size and the so-called "small study effect" cannot be ignored. suggest to discuss this limitation (Crit Care. 2013 Jan 9;17(1):R2. doi: 10.1186/cc11919.).

Many thanks for these comments.

Point 1 – As stated in the quality assessment section – the Jadad score is a well-validated score that assesses the methodological quality of clinical trials (Jadad AR, Moore RA, Carroll D, Jenkinson C, Reynolds DJ, Gavaghan DJ, McQuay HJ. Assessing the quality of reports of randomized clinical trials: is blinding necessary?. Control Clin Trials 1996; 17: 1-12 [PMID: 8721797 DOI:0197-2456(95)00134-4 [pii]]). It is the most widely used score, which makes it transferable and easy to understand by readers. We appreciate there are other scoring systems to quality assess RCTs.

Point 2 and 3 – Thank you for these suggestions, we feel our statistical analysis for this study is appropriate and was conducted according to the Cochrane handbook (https://handbook-5-1.cochrane.org/chapter_9/9_4_3_1_random_effects_derSimonian_and_laird_method_for.htm). No other reviewer has commented on it.

Point 4 – The following has been added to the limitation section - The number of participants in these studies were small, with the largest being 157, therefore the possibility of 'small study effect' cannot be ignored.

Response to editor

- Audio core tip attached
- All figures are decomposable uploaded in a PowerPoint file (please note uploaded as 'Conflict of Interest Disclosure form' as no separate option to upload them)
- Running title added
- ORCID IDs added
- Authors contributions added
- Biostatistics statement added
- Corresponding author details added
- Core tip added
- Citation added
- All cited references edited for WJO style
- Article highlights section added