

Peer Review File

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Review Comments

Reviewer A

Comment 1: This paper is a literature review describing a revision THA method with massive acetabular defect. Revision THA with massive acetabular defect is the most difficult surgery of revision THA. Preoperative evaluation and planning are of utmost importance in the selection of a surgical procedure for revision THA with a massive acetabular defect. This is because it depends on the long-term outcome of surgery. The authors describe the advantages, disadvantages, and performance of each method.

Comment 2: The flow chart of treatment policy by Figure 1 is not easy to understand. It would be better to have a table showing which situation each method is suitable for.

Reply 2: We have modified our text as advised. The flow diagram from figure 1 has been converted to Table 6. Page 9, Line 143.

Reviewer B

Thank you very much for this review, which I read with interest. However, prior to publication several points have to be addressed:

Comment 1: Key Content and Findings:

Pre-operative Evaluation. It is important to consider different definitions of PJI to rule out this diagnosis (e.g. MSIS, EBJIS, etc.) Please explain in more detail than just summarizing different serum markers etc.

Reply 1: We have modified our text as advised. See page 7 lines 90-94. We have also created Table 2 summarizing the EBJIS criteria. See Page 8&9, Line 129 to 146.

Comment 2: Four classification systems have been used for acetabular bone loss: This is not up-to-date and the authors need to mention more recent classification systems:

1. Wirtz DC, Jaenisch M, Osterhaus TA, Gathen M, Wimmer M, Randau TM, Schildberg FA, Rössler PP. Acetabular defects in revision hip arthroplasty: a therapy-

oriented classification. Arch Orthop Trauma Surg. 2020 Jun;140(6):815-825. doi: 10.1007/s00402-020-03379-6. Epub 2020 Feb 25. PMID: 32100108; PMCID: PMC7244606.

Reply 2: We have modified our text and included this study as advised see Page 9 lines 145-148 and Classification Table 7.

2. Walter SG, Thomas TS, Kenndoff D, Thomas W. Mid-term follow-up after all-size acetabular revision and proposal for a stability classification system. Hip Int. 2020 Jul;30(4):431-437. doi: 10.1177/1120700019839698. Epub 2019 Apr 4. PMID: 30945560.

Reply 2: We have modified our text as advised and included this study see Page 9, Lines 148-151 and Classification Table 8

„The risk of 217 allograft resorption can be reduced by soaking the graft in bisphosphonates or using Mesenchymal Stem 13 218 Cells (MSCs)“

This is citing an experimental study in sheep. The authors need to note this fact as this is not an establish method in clinical routine.

Reply 2: We have modified our text and removed this statement from the section “Bone Impaction Grafting with Cemented Cup”. See Page 12, beginning Line 225.

Comment 3: The authors report on treatment of severe acetabular defects that are treated with CTAC. However, a significant part of recent literature from European centers with monoflanged custom made acetabular components and superior biomechanical propertiers has been neglected by their review. However, I believe this to be an important part of the discussion:

1. Walter SG, Randau TM, Gravius N, Gravius S, Fröschen FS. Monoflanged Custom-Made Acetabular Components Promote Biomechanical Restoration of Severe Acetabular Bone Defects by Metallic Defect Reconstruction. J Arthroplasty. 2020 Mar;35(3):831-835. doi: 10.1016/j.arth.2019.10.040. Epub 2019 Oct 28. PMID: 31735489.

Reply 3: Thank you for this comment and suggesting this technique. The authors do agree that this is an important aspect of acetabular revisions for massive bone loss. As such, we have written an additional section dedicated to monoflanged custom made acetabular components. We have modified our text and included this study as well. See Page 19, Lines 393-400.

2. Frörschen FS, Randau TM, Hischebeth GTR, Gravius N, Gravius S, Walter SG. Mid-term results after revision total hip arthroplasty with custom-made acetabular implants in patients with Paprosky III acetabular bone loss. Arch Orthop Trauma Surg. 2020 Feb;140(2):263-273. doi: 10.1007/s00402-019-03318-0. Epub 2019 Dec 9. PMID: 31820093.

Reply 3: We have modified our text and included this study See Page 19, Lines 401-406.

3. von Hertzberg-Boelch SP, Wagenbrenner M, Arnholdt J, Frenzel S, Holzapfel BM, Rudert M. Custom Made Monoflange Acetabular Components for the Treatment of Paprosky Type III Defects. J Pers Med. 2021 Apr 8;11(4):283. doi: 10.3390/jpm11040283. PMID: 33917821; PMCID: PMC8068245.

Please discuss these studies and subsequent studies within your review.

Reply 3: We have modified our text and included this study See Page 19, Lines 407-421.

Comment 4: The authors describe surgical techniques. The review would benefit from adequate literature citing those techniques e.g.:

1. Frörschen FS, Randau TM, Walter SG, Dally F, Wirtz DC, Gravius S. „Custom-made acetabular components“ (CMAC) beim zweizeitigen Wechsel und bei höhergradigen periazetabulären Knochendefekten [Use of custom-made acetabular components (CMAC) as part of a two-stage procedure in patients with severe periacetabular bone loss]. Oper Orthop Traumatol. 2022 Oct;34(5):361-371. German. doi: 10.1007/s00064-022-00766-7. Epub 2022 Apr 1. PMID: 35362782.

Reply 4: We have modified our text and included this study See Page 20, Lines 422-430

2. Holzapfel BM, Thaler M, Rudert M. Revision arthroplasty via the direct anterior approach. Oper Orthop Traumatol. 2022 Jun;34(3):175-176. English. doi: 10.1007/s00064-022-00773-8. Epub 2022 Jun 14. PMID: 35699771.

3. Etc.

Although your study intends to be a narrative review, there are only 37 citations and as outlined above important studies in this field have not been mentioned and discussed.

Reply 4: With the addition of the above classification systems and additional studies as mentioned above, we have made this narrative review much more comprehensive. We also added European studies on Monoflanged CMAC techniques as outlined on Page 21, lines 455-463. We truly appreciate your comments, which have helped improve the quality of this review.