Format for ANSWERING REVIEWERS

July, 6th 2014

Dear Editor,

Please find enclosed the edited manuscript in Word format (file name: 10801-edited.docx).

Title: Overweight and obesity in hip and knee arthroplasty: Evaluation of 6078 cases

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The manuscript has been improved according to the suggestions of reviewers:
1 Format has been updated

2 Revision has been made according to the suggestions of the reviewer

(1) This retrospective study, conducted at a single medical center with high volume of total joint arthroplasty, showed some interesting findings. Although low evidence, it does add new information to the field. The study was well conducted with detailed data analysis. The conclusion is validated. I do have a few minor concerns: On page 4, the authors hypothesized "that obese patient were treated with later stage of OA and more conservative implants like cemented total hip arthroplasties (THA) and constrained total knee arthroplasties (TKA)". The word "conservative" is confusing and misleading, similarly on page 7, the authors stated:"super-obese patients were treated much more conservatively than overweight or normal weight patients", again, the word: "conservative" is inappropriate. I recommend the authors to edit these sentences to make it more meaningful and easy to understand.

Author: The authors changed the sentence on page 4 to „...and more established implants like...“ and the sentence on page 7 to „were treated much more cautiously...“

Studies have shown that patients with morbid obesity do have increased risk for peri-operative complications, however, this study did show similar findings. This could be because patient population treated at this medical center were relatively healthier. Unfortunately, the authors did not provide detailed information regarding comorbidities in their study subjects. I recommend authors to add this piece of information.

Author: The authors added a table with information regarding comorbidities to the manuscript.

The manuscript needs some help from English editor to polish the language.

Author: The manuscript was corrected by a native speaker.

(2) English is not my native language, still I feel free to say that the manuscript requires thorough English editing (grammar and syntax throughout the text need to be improved).

Author: The manuscript was corrected by a native speaker.

The series is really large, both for THA and TKA, however, the study has certain inherent limitations (and these should be addressed by the authors) – it is retrospective (although, clearly, the database was built systematically and prospectively) and it is cross-sectional. Hence, by its design it cannot be conclusive, but only indicative. For example, the last paragraph of Introduction states: "*The aim of this study was to evaluate the influence of the different stages of obesity on the need for endoprosthetic joint replacement in the hip and knee joints in a monocentric setting with a high caseload.*" _A retrospective analysis of cross-sectional data cannot achieve this goal. The word "influence" implies a causal relationship between variables, a presumed "cause" (in this case, obesity, i.e., its "dose") and a presumed consequence (in this case, a need for total joint replacement). A causal relationship could only be implied in a prospective cohort setting: for example, if authors had prospectively followed-up a group of variably (non)overweight subjects over certain period of time and had recorded the incidence of a need for THA/TKA or time till a need for THA/TKA – then, in an appropriate analysis, they could have detected an "independent effect of obesity (and its 'dose')" on the need for THA/TKA. A cross-sectional setting or a case-control setting can only indicate associations between obesity and the need for THA/TKA (which could be indicative of a potential causal relationship). But, to detect such an association, these types of analyses require that also "non-cases" (subjects without a need for THA/TKA, i.e, without severe OA) are included.
Hence, the present analysis cannot achieve the declared aim and the cited sentence from the Introduction should be deleted.
The present sample and its analysis could, however, achieve another goal – an answer could be provided to the following question: "Is there an association between obesity (various levels, or 'dose') and peri-operative characteristics of the procedure in patients who underwent THA/TKA?" (by "characteristics" one could perceive – age at surgery, functional status, intra/postoperative complications, choice of implants etc., just as depicted). However, what needs to be detected is an "independent association".

Author: The authors deleted the cited sentence from the introduction and added the sentence „The aim of this study was to evaluate if there is an association between the various levels of obesity and peri-operative characteristics of the procedure in patients who underwent THA and TKA."

The entire analysis in the present manuscript is univariate – Kruskal-Wallis test is a non-parametric version of a one-way analysis of variance. In this case, patients were categorized across levels of BMI and Kruskal-Wallis was used to test the hypothesis that any two of the subgroups are "statistically different", separately in respect to age (at THA-TKA) and functional status immediately before surgery. A univariate association was observed, more precisely, a "linear trend" was observed –age and functional status at THA/TKA progressively decreased across the increasing levels of BMI. However, the detected association is only univariate and not "independent" – the analysis does not "separate" the association between increasing BMI and the outcomes from possible confounding effects. Hence, to answer the question posted ad 2), this univariate analysis needs to be complemented by a multivariate analysis. Since both age and a measure of functional status are continuous variables the appropriate analysis would be multiple regression. Each of the two outcomes (age, functional status) would need to be analyzed in a separate model (and this should be done separately for THA and TKA) in a "gradual" manner.
The first model would need to evaluate whether there is an independent association between the level of obesity (independent variable) and age at THA/TKA (dependent variable). Following effects would need to be included in the model: BMI (as a continuous variable) and then, in an alternative analysis, as a categorical variable with 4 levels; sex; whether OA was primary or secondary (and, eventually, types of underlying conditions or their "groups") and any other potential confounder (but, I believe that no other info is available on the embraced patients). In the next step, the same analysis would be implemented for "functional status" as a dependent variable. Age, which was a dependent variable in

the first-step analysis, could be also tested as a independent variable in this second step analysis.

Author: The authors performed the required multivariate analysis and added table 9-12 to the manuscript.

Data on "preferred prosthesis type" are currently only displayed as proportions. To make any inference about the potential association between BMI/Obesity and the used prosthesis type, prosthesis types could be collapsed into 3-4 levels (or maybe 2-3), based on their common properties. Then the association would be tested in a logistic regression in which dependent variable (type of prosthesis) is categorical with 2-3 (or 3-4) levels.

Author: The authors collapsed the prosthesis types and performed a logistic regression.

Complications should be presented as counts (as they are) but also as percentages. They are too few for any meaningful analysis. But, if an analysis would be preferred, then it should be through logistic regression.

Author: The authors presented the complications as counts but also as percentages.

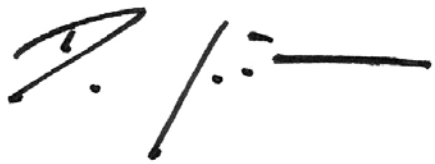
Clearly, even such multivariate analysis would be limited: a) by a limited availability of information on potential confounding factors; b) by a cross-sectional nature of the sample.
Both of these limitations should be acknowledged and addressed by the authors

Author: The authors added following sentences tot he manuscript: „There are limitations of this study. The multivariate analysis is limited by a limited availability of information on potential confounding factors and by a cross-sectional nature of the sample."

3 References and typesetting were corrected

Thank you again for publishing our manuscript in the *World Journal of Orthopedics*.

Sincerely yours,



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