Reviewer's report

Title: Cementless short-stem total hip arthroplasty in the elderly patient. Is it a safe option? A prospective multicentre observational study

Version: 0 Date: 18 Feb 2019

Reviewer: H. D. Veldman

Reviewer's report:

An interesting study comparing the clinical and radiological results of short stem total hip arthroplasty (THA) between elderly (>75 years) and middle-aged (<65 years) subjects. Although I am overall positive about this well-written work, I have a few comments/questions for the authors:

* Firstly, I would suggest to use terms like the 'middle-aged' (i.e. <65yrs) and 'elderly' (i.e. >75 years) subjects (or synonyms) instead of group A and B. This will improve the readability of the article.

* Since the follow-up time of the elderly and middle-aged subjects are quite short (mean: 43 and 52 months respectively) and the accompanied standard deviations are relatively high (17.9 and 21.3 months respectively), I was wondering whether the authors could also provide the range of follow-up time for both groups.

* As a reader I am wondering whether the comparison the authors make is fair. The authors namely compare the results after short stem THA between elderly and middle-aged subjects, but explain the higher number of postoperative fractures by 'the higher risk of accidental falls' in elderly and the lower Harris Hip Score by the fact that elderly patients 'usually have more comorbidities that affect normal gait and are generally less active than younger patients'. I understand that these explanations also play an important role, but is the comparison in their study fair in that case? It might be more relevant to compare short stems with cementless or cemented conventional stems in per specific age group.

* The number of postoperative periprosthetic fractures reported in this study in the elderly group is 5 and in the middle-aged group is 1. Percentagewise, the incidence of postoperative periprosthetic fractures therefore is 9-times higher in the elderly group, even with the elderly
group having a shorter follow-up time than the middle-aged group. In my opinion, this suggests that the worsened bone quality in elderly subjects indeed results in more implant related complications. Based on this result, is it than even worth considering these type of short stem implants in the elderly subpopulation?

* This study indicates that old age alone not necessarily determines a bad outcome after short stem THA. By careful selection of elderly patients with bone morphotypes eligible for short stem THA, results comparable to that of middle-aged patients might be obtained. Unfortunately, the authors do not describe the used eligibility criteria for short stem THA. Especially in the elderly group, selection of eligible cases for short stem THA based on bone morphology is expected. Could the authors provide extra information on which cases were considered eligible for short stem THA (based on what criteria)?

* Additionally, measurements describing the femoral canal morphology and the bone quality such as the cortical index or canal flare index could provide valuable extra information on the femora in which the stems were implanted. It would be interesting to assess whether differences between groups (A vs B) exist, which is expected.

* Finally, sub-analyses of the morphology of the proximal femur of the elderly patients with good clinical and radiological results could help identifying future cases of elderly patients potentially eligible for short stem THA.

Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

No

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

No
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I am able to assess the statistics

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?
2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?
3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?
4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?
5. Do you have any other financial competing interests?
6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests.

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal.