**Reviewer’s report**

**Title:** Modular stem in total hip arthroplasty for patients with trochanter valgus deformity: surgical technique and case series

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**Reviewer:** Dejin Yang

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The authors described the surgical technique and results of using a modular stem system for THA patients with valgus deformities at the inter-trochanteric or sub-trochanteric area. It is an interesting and well-organized paper. Over all, I suggest the editorial office to publish this paper after a proper revision.

My comments are listed.

1. The technique described by authors is commonly used for this specific group of patients. Nowadays, an angular osteotomy on the proximal femur is not suggested in hip preservation surgeries for the consideration of added difficulties for potential future THAs. But this specific deformity is still occasionally seen in this region in conversion THAs for DDH with previous surgeries, which accounts for a significant challenge.

When introducing the technique as a successful solution for this kind of patients, it is necessary to emphasize the technical difficulties to remind surgeons who are still performing angular osteotomies on proximal femurs even in a salvage surgery for hip preservation.

Exactly as mentioned in the results, the intra-operative fracture rate (2/12) is not as low as the rate for a normal patients group. It is not appropriate to conclude it as a simple surgery in the conclusion of the paper, even though we can see the authors did a great job. And this difficulty should be further discussed in the discussion part.

2. S-ROM is a modular stem system with a porous sleeve (with a triangle spout) or a cone (without a spout). The sleeve can be locked with the stem with any version, as described in its surgical technique note ("The S-ROM sleeve can be placed in 360 degrees of version"). The word "reverse" is actually not accurate here in the title. I suggest the authors to highlight the specific deformity (trochanter valgus deformity) and the modularity of the stem in the title, such as "Modular stem in total hip arthroplasty for patients with trochanter valgus deformity: surgical technique and case series".
3. S-ROM system provides an option with a sleeve as well as a cone for the proximal fixation and further bone integration. Another solution for those cases described by the authors is using a cone. With a cone, it has the advantages including easier bone preparation, less bone loss in the trochanteric area and less stress focusing at the tip of the sleeve; but it has potential disadvantages including less anti-rotation stability especially for the cases needing subtrochanteric osteotomy. This should be mentioned.

4. In case of using a sleeve with nearly 180 deg version, it's not possible to do an instructed calcar reaming. Besides the method described by the authors, it is also reasonable to use a BUR for bone preparation for the spout placed towards the great trochanter, which I believe could provide more accuracy and cause less bone loss.

5. Page 5, lines 32-34: "Up to now, no other study has described this special sleeve-implanting method and analyzed its clinical outcome systematically." This sentence should be moved to the instruction or deleted.

(BTW, the line numbers are so confusing, and I tried my best to make it accurate.)

6. Page 6, line 2: "Because there was no instrument to managing sleeve sloop in the greater trochanter side, the surgeon handled the sloop manually." Is it "sloop"? The prominent part of the sleeve is often called "spout" and a "reamer" is often used to prepare the calcar. Make is clear here. And as I mention above, a bur may help in this step.

7. Page 6, line 23: "The patients were followed up at 4 and 12months after surgery." Why was this follow up protocol? It is specific for this group of patients or not?

8. Page 6, line 39-50: the last paragraph before the statistical analysis statement. The details of measurement should be moved to the figure legends for a friendly reading flow and better comprehension of the measurement with the help from illustrations.
9. In the last sentence of the method, the classification or grading of ICC is not necessarily declared. And the second last paragraph in the results should be moved here at the end of the methods, as a concise statement of the ICC measurement and the ICC value.

10. Page 7, line 36-41: the statement about G/L. It is not a RESULTS part except the first sentence. It is a part of discussion. What is more, I don't think it is appropriate to take it as "reverse sleeve", it is just a sleeve with nearly 180 deg version or more accurately a sleeve towards the great trochanter rather than sitting on the calcar.

11. Page 8, line 17: "The long-term clinical outcome was significantly inferior to common THA". This is probably not due to subtrochanteric osteotomy but the severity of the disease or deformity or technique difficulties. Subtrochanteric osteotomy is still necessary in certain cases with a need of careful technique. Even for some valgus deformities, to reduce the position of GT to facilitate the offset of the muscle, or to make the insertion of a stem possible in case of an severe angular deformity stopping any stem to pass, a subtrochanteric osteotomy is still indicated. This should be clarified and added to the discussion.

12. Page 8:"Secondly, additional fixation and special prosthesis were needed to achieve satisfying initial stability." This is also not appropriate. S-ROM is still a good solution for cases with subtrochanteric osteotomy.

13. Overall, I suggest authors to delete the 2nd and 3rd paragraph of the discussion, or make it concise, as they are not directly related to the results or just common sense.

14. Page 8, line 42: "arbitrarily"? How about "freely"? In the same sentence, "usually" or "seldom"?

15. Once again, in the discussion of the technique, a cone provided as an alternative should be mentioned. And in the conclusion, obviously it is not a simple technique. And G/L seems not important to mention in conclusion, as the sleeve rotating freely is a well-known design. But in contrast, a suggestion of technique caution including burs or other certain tools should be standing by for bone preparation, or a cone should be considered especially when an osteotomy is not planned (anti-rotation stability would be weaken by the osteotomy).

**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.

Yes

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

Yes

**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.

Not relevant to this manuscript

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