Author's response to reviews

Title: Changes of gluteus medius muscle in the adult patients with unilateral developmental dysplasia of the hip

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Author's response to reviews: see over
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Dear Ms. Abigail Quiniquini,

Thank you very much for your letter and advice. We have revised the paper, and would like to re-submit it for your consideration. We have addressed the comments raised by the reviewers. We hope that the revision is acceptable, and I look forward to hearing from you soon.

With best wishes,

Yours sincerely,

Ruiyu Liu

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We would like to express our sincere thanks to the reviewers for the constructive and positive comments.

Replies to Prof. Marie Gdalevitch:

Major compulsory revisions
1. Please provide the data that demonstrates "degree of contracture in gluteus medius muscle is not in concordance with the degree of hip subluxation" in a table format and include this in the results section before bringing it up in the discussion.

Response:
We acknowledge the reviewers point. In our patient group, the subluxation degree ranged from 55-98% (not including subluxation degrees less than 55%) therefore, it is not proper to draw this conclusion as stated in the original manuscript. Therefore, we have deleted this phrase in our revised manuscript.

2. It appears that your study is only confirming findings we already know about the abductors and their abnormalities in DDH. Although their are perhaps no CT studies to demonstrate this, there are anatomical dissections that have described these studies before. Can you elaborate on how your findings are new and contribute to helping us understand the abnormalities of the gluteus medius muscles (please elaborate in Introduction as well as Discussion). Perhaps this study will allow us to compare to post-operative MRI or CT of THA in DDH? We need to find a greater significance, other than confirming findings we already know.

Response:
We have revised the introduction and discussion to focus on and emphasize the new information we present for DDH.

3. Can you elaborate on how this finding will help develop better rehabilitation protocol or prevent dislocations. current rehabilitation protocols are already focused on abductor strength, particularly for patients with DDH.

Response:
The gluteus medius muscle in patients with DDH show a reduction in length and decreased strength. Therefore we think this clearly shows that patients need more time to adapt gait and in rehabilitation.

Minor Essential Revisions
1. Please explain why you used a CT and not an MRI scan for assessing the gluteus medius muscle, when other papers were based on MRI

This study made use of data from our previous study [a] which used CT to study the acetabular bone stock in the patients with DDH. However, not only does making use of this existing data save in conducting further patient studies, these data have the advantage of being directly comparable to muscle structure in other recent studies [b,c,d].

a. Rui yu liu ,Kun zheng wang ,Chun sheng wang :Evaluation of Medial Acetabular Wall


2. Please explain why you focused exclusively on gluteus medius and ignored maximus and minimus, in the introduction.

We have added the maximus and minimus description in the revised version of the manuscript (in the introduction).

3. Please elaborate in discussion how this information can be used by total hip surgeons in a constructive manner for better reconstruction.

We have made the requested elaboration.

Discretionary Revisions
1. Consider whether further studies should be done on assessing postoperative MRI or CT for patients with THA to assess changes in gluteus medius muscles.
2. Consider assessing all abductors in the same manner to describe their abnormalities.
3. Consider repeating study with MRI analysis.

Response:
We will assess postoperative CT for patients with THA to assess changes in gluteus medius muscles and all abductors in the same manner to describe their abnormalities in our following studies, including the repetition of the study with MRI analysis.
Replies to Replies to Prof. Chantal Janelle

**Major compulsory revisions:**
The specific classes of the Crowe classification (used in the article) are not mentioned.
i.e.: on page 4, last paragraph.

*Response:*
We have described the specific classes of the Crowe classification in the revised manuscript.

**Minor revisions;**
terminology used in tables: "(-) means reducing than healthy side" should read :reduction compared to healthy side.

*Response:*
We have made the requested correction in the revised manuscript.