Author's response to reviews

Title: Bilateral apical vertebral derotation technique by vertebral column manipulation compared with vertebral coplanar alignment technique in the correction of Lenke type 1 idiopathic scoliosis

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Author's response to reviews: see over
Dear Mr Reynaldo Aldea Jr, Dr Gabriel Piza Vallespir and Dr Toru Maruyama:

Thank you for your letter and for the reviewers’ comments concerning our manuscript entitled “Bilateral apical vertebral derotation technique by vertebral column manipulation compared with vertebral coplanar alignment technique in the correction of Lenke type 1 idiopathic scoliosis” (MS: 7495677548330458). Those comments are all valuable and very helpful for revising and improving our paper, as well as the important guiding significance to our researches. We have studied comments carefully and have made correction which we hope meet with approval. We used TRACKS (Ctrl+Shift+E) and underlined the changes in the revised manuscript which we have made. The main corrections in the paper and the responds to the reviewer’s comments are as flowing:

Reply to the reviewers’ comments

Reviewer: Gabriel Piza Vallespir

- Major Compulsory Revisions

Abstract (Methods, Paragraph 1): Retrospective case-control study. This definition is in contrast with the statements in the Methods (paragraph 1). Patients selected and enrolled during a period of time were included by admittance order in one of the two groups of study and followed for 18-22 months. I think this should be considered a prospective clinical assay.

Reply:
We accept the reviewer comment that the study should be a prospective clinical assay. In the revised version of the manuscript, the study type has been redefined as a prospective clinical assay. (Page 2, line 12-13).

- Minor Essential Revisions

Methods (paragraph 3): the surgical technique of VCM described by the authors does not match exactly with the original technique (explained in the paper in Discussion (paragraph 2)), because there is not a real quadrilateral frame as only three screws are used to rotate the apex. This difference should be commented.

Methods (paragraph 4): In the original VCA technique pedicle screws were placed at every level also in the concave side. Once the VCA correction is done over the convex side, the concave rod has to be inserted and locked. This rod has to hold the correction while the Coplanar System is released. It is uncertain if the ability of this rod to keep the correction (specially the rotation) would be the same with one half of the screws. This possibility should be commented.

Reply:
The reviewer has made two very good points here. In the Discussion section of this revision, we have added the contents as “Moreover, we did not place pedicle screws at every level in the fixation-fusion segment in both VCM and VCA groups. So there was the difference between our surgical technique of VCM and the original technique, and in VCA group some pedicle screws also had to be removed after
VCA. However, by this way the satisfactory correction effect of IS with less cost could be offered to our patients. Whether the correction effect of our method of placing screws is equal to the original technique in VCM and VCA, need to be further study by biomechanical analysis and clinical assay.” in order to explain the possible difference. (Page 18, line 7-17).

We agree with this view that better corrective effect could be obtained by pedicle screws placed at every level for IS, but because of financial reasons in most IS patients in western China, this method usually could not be implemented. Moreover, in both groups of our study, the same method of placing the pedicle screw was used.

Methods (Paragraph 3): The sentence “After assembly, ventral and medially directed spinal implant force combined with clockwise rotation force was applied using the vertical and convex derotator handles” is unclear. It is only understandable if the VCM technique is already known.

Reply:
This is a constructive suggestion by the reviewer. In the Methods section of this revision, we have rewritten these contents as “After assembly, with ventral and medially-directed spinal implant forces performed using the vertical and convex derotator handles, a periapical derotational maneuver was assessed to quantify the degree of derotational corrective forces to be applied.”, which will help readers to better understand this technique. (Page 8, line 3-8).

Results (paragraph 5): flexibility of the major curves, according to table 1 (demographic data) is 37.2 and 38.8% for groups A and B respectively, so they are >30%.

Reply:
As the reviewer has said, in our study the patient’s flexibility of the major curves was >30%. However, in this section we want to explain the reason that the coronal correction rates in our study was higher than the average level reported. This result may be caused by the absence of large values of preoperative Cobb angle (>75°) and the absence of small values for flexibility (<30%). We are sorry that we failed to make us clearly, and we have rewritten these contents in the revision. (Page 15, line 5-6).

Results (paragraph 8): “Another advantage is that VCM quadrilateral frame Could reduce the possibility that the lateral screw may need to be removed because of its proximity to the aorta after the correction by direct vertebral rotation technique [25].” I think lateral screw is unclear; it probably refers to concave screw.

Reply:
Corrected accordingly. (Page 17, line 15).

Table 3: the “Thoracic kyphosis angle of flatback” is an unclear concept. It is difficult to understand what does it refer to.

Reply:
The reviewer has made a very good point here. We have redefined it as “Thoracic kyphosis angle in flat back patients” in Table 3 of this revision, which will help readers to better understand this concept. (Page 28, line 13 - Page 29, line 1).

- Discretionary Revisions
Methods (paragraph 4): “For the patient with hyperkyphosis, the bandage was wound (the space was 20 mm to 30 mm) between the tops of the tube to reconstruct the normal kyphosis.” It should say, “a bandage was wound.”

Reply:
Corrected accordingly. (Page 9, line 1).

Methods (paragraph 6): According to the Spinal Deformity Study Group (Radiographic Measurement Manual, O’brian MF et al. 2005) lumbar lordosis should be measured from T12 upper endplate of to S1 upper endplate.

Reply:
We are appreciated for the reviewer’s comment. But in our study, we had measured lumbar lordosis by the way of from L1 upper endplate to S1 upper endplate for all patients.

Reference 14: This is a mistake not attributable to the authors. Due to an unfortunate misunderstanding with Spine Journal, the name of all the authors of this paper was erroneously referenced. In Spain middle name is seldom used. After the first name, we use two surnames, being the first the main one. So, the right way to reference the first four authors of the paper should have been Piza G, Burgos J, Sanpera I and Hevia E.

Reply:
Corrected accordingly. (Page 23, line 4-8).

Reviewer: Toru Maruyama

Discretionary Revisions

Please clarify how small the pedicles are contra-indication for VCM or VCA. How do the authors treat these curves?

Reply:
The reviewer has made a very good point here. In the Discussion section of this revision, we have added the contents as “If the pedicle diameter of the apical vertebra was too small to place screw anchors adequately, VCM technique would not be used for these IS patients. Otherwise, there would be the possibility of the pedicle burst during correction, because of the concentration of correction force in the apical vertebra area by VCM.”, which will help readers to better understand the exclusion criteria. (Page 14, line 13-17).
In our study, the smallest diameter of Legacy screw was 5.5mm for the apical vertebra in VCM group. For IS patients with the pedicle of the apical vertebra was too small to place screw anchors adequately, the conventional derotation technique would be used for correction and no screw would be placed in the apical vertebra.

Editorial Requirements:

Consent statement:
Please state in the Methods section whether written informed consent for participation in the study was obtained from participants or, where participants are children, a parent or guardian.
*Kindly provide patient consent to publish images

Reply:
This is a constructive suggestion by the editor. Though we also mentioned in the Methods section, we have rewritten these contents in accordance with editorial requirements in the Methods section of the revision. (Page 6, line 11-12).

We would like to express our great appreciation to you and reviewers for comments on our paper.
Looking forward to hearing from you.
Thank you and best regards.
Yours sincerely,
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