Author’s response to reviews

Title: Radiographic characteristics in congenital scoliosis associated with split cord malformation: a retrospective study of 266 surgical cases

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Author’s response to reviews:

Dear Editor,

Thank you very much for the comprehensive review of our manuscript entitled: “Radiographic characteristics in congenital scoliosis associated with split cord malformation: a retrospective study of 266 surgical cases” number BMSD-D-16-01143.

We sincerely appreciate the reviewers’ comments and feel encouraged by their professional questions and concerns. Below we provide a point-by-point response to the comments and highlight the revised parts of the manuscript.

Reviewer 1

(1) Question: Materials and Methods Line 9 - How many patients were excluded?
Response: In our series, 21 patients with previous spinal surgery, spinal fractures were excluded. The related information has been added in the revised text. Thank you for your careful review.
(2) Question: Results Line 25-26 - Please include p values for female to male comparison and age comparison between type I and type II groups

Response: No significant differences were detected between two groups in gender (P= 0.633) or age (P= 0.715). The related information has been added in the revised text.

(3) Question: Results Line 40 - ".. the main curve was higher" is misleading as line 44 indicates p=0.434

Response: Following your advice, the misleading description has been deleted. The average Cobb angle of the main curve was 71.5° (range 14°–165°) in Type I group and 68.9° (range 30°–158°) in Type II group. There were no significant differences between two groups (P=0.434). The misleading description has been deleted.

(4) Question: Results Line 17 (on the following page) - Please reference "volcano-shape deformity".

Response: In Pang’s series[10], they demonstrated the hypertrophic lamina and bulbous spinous processes at the level of the midline septum were common findings among patients with SCM. Occasionally, two or three adjacent laminae were fused into a massive ganal, which we described as the “volcano-shape” deformity (as shown in Figure 3).

(5) Question: Conclusions - Please list all of the significant differences between type I and type II SCM that your study documented.

Response: The length of the split segment in Type I SCM was significantly shorter than that in Type II SCM. Compared with Type II SCM, patients with Type I SCM presented with higher incidence of kyphotic deformity, more extensive and complicated vertebral anomalies, and more complex rib anomalies. The related information has been added in the revised conclusions. Thank you for your professional review.
According to your suggestion, descriptors with arrows has been added in the revised figure and legends. Images of an eight-year-old male patient diagnosed with congenital scoliosis and the type I split cord malformation. Three-dimension CT showed hypertrophic lamina and bulbous spinous processes in the middle thoracic region. These exuberant neural arches can be described as the “volcano-shape” deformity (with arrows in the figure).

Reviewer 2

(1) Question: There are discrepancies between the study question and the protocol. In the study question its stated that the aim is to report about abnormalities in congenital scoliosis. Then in the methods there is subgrouping with comparisons among between congenital scoliosis and hemicords. This point should be clarified, giving more details in the study question. It's also necessary to define group 1 and group 2, adding more details.

Response: Thank you for your careful review. The purpose of this study is to identify the vertebral, rib and intraspinal anomalies in surgical patients with congenital scoliosis and coexisting split cord malformation. According to Pang’s classification [7,8], all patients were divided into two groups: type I group is defined as two hemicords, each within a separate dural tube separated by a bony or cartilaginous medial spur, while type II group is defined as two hemicords within a single dural tube separated by a nonrigid fibrous septum. Following your suggestion, more descriptions have already been added in the revised Abstract and Text.

(2) Question: The paragraph describing the included patients should be moved to the results. Only the inclusion criteria should be reported in the methods.

Response: According to your advice, the paragraph describing the included patients has been deleted.
Moreover, it would be important to report the total number of patients record assessed to find the 266 included subjects.

Response: In our series, 281 consecutive patients of congenital scoliosis associated with SCM undergoing spinal correction surgery between May 2000 and December 2015 were retrospectively reviewed. Among these patients, 266 fulfilled the following inclusion criteria: (1) definite diagnosis of congenital scoliosis with SCM; (2) patients with complete medical records and radiological data. Other 21 Patients with previous spinal surgery, spinal fractures were excluded. The related information has been added in the revised methods. Thank you for your professional comments.

In the Radiographical mearument paragraph, two subjects are described. Also this part should be moved to the results.

Response: This is a misunderstanding. “A patient with a simple rib anomaly included a localized fusion of two or three ribs or a small chest wall defect that was due to a deviation of one or two ribs or an absence of a rib. A patient with complex rib anomalies included multiple extensive rib fusions, usually without a set pattern, combined with an adjacent large chest wall defect that was because of an absence or deviation of ribs.” They are details on classification of rib anomalies described by Tsirikos and McMaster[13]. Thank you for this careful review.

The discussion is quite long. I suggest to work on it and be more focused on the comparison of the present findings with previous literature.

Response: According to your suggestion, we revised the discussion part and focused on the comparison of the present findings with previous literature. We hope this revision could be satisfying.

It's helpful in the introduction report data about the prevalence of congenital scoliosis, which is quite rare with respect of idiopathic, and not frequent as stated by the authors.

Response: Congenial scoliosis is a kind of rare spinal deformity. Large population studies utilizing screening low-dose radiography of the spine suggested a congenital scoliosis prevalence
of 0.5% to 0.11%. According to your suggestion, the related information has been added in the revised introduction. Thank you for this professional comment.

Many thanks to you and two reviewers for the time and efforts spent on this paper. I sincerely hope this revised manuscript will be accepted for publication.