

RESPONSE LETTER

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Title: Hyoid-complex elevation and stimulation technique restores swallowing function in patients with lateral medullary syndrome: Two case reports

Column: Case Report

Authors: Yuer Jiang, Qianqian Lyu, Feng Lin, Xueting You, Zhongli Jiang

Dear Editor,

We sincerely thank you and the reviewers for the valuable feedback to improve the quality of our manuscript. The manuscript has been revised accordingly and the format has been updated in the edited manuscript. The reviewer comments are laid out below in *italicized font* and specific concerns have been numbered. Our point-by-point responses are given in normal font and all the modifications to the manuscript are indicated in **red text**. If there are any other modifications we could make, we would like very much to modify them and we really appreciate your help.

Reviewer #1 (code: 00742421)

Specific comments to authors:

Need to improve discussion

Response:

Thank you for your suggestion. We have revised the discussion extensively. The explanation for every step of the operation was added into discussion, including more specific details and functions. Also, we improved the comparison between HEST and conventional therapy, which highlighted the distinct advantage of the novel technique.

In addition, the expression was modified for better language and clarity. The detailed corrections of discussion are listed below.

Page 10, Line 22: (specific functions) “The former technique was used to **loosen the UES and elevate the hyoid-complex, meanwhile** the latter technique was used for myoelectric biofeedback training.”

Page 11, Line 6: (specific details) “**The plump balloon distracted the UES and lifted up when the sustaining resistance generated.**”

Page 11, Line 12: (specific details and functions) “**The threshold value of the electrical stimulation was set in advance depending on the intensity to evoke the macroscopic contraction of mylohyoid muscles, which could be revealed by the movement of prominentia laryngea. In other words, ETS patterns were delivered to help accomplish the complete swallowing at the moment of every beginning. Hence, when the inflated balloon encountered resistance, the patients were instructed to swallow with effort, and ETS stimulation was simultaneously administered.**”

Page 11, Line 19: (specific functions) “A complete swallowing exercise was completed when the balloon could be pulled out with ease, **which means the UES was loosen up and the hyoid-complex was elevated.**”

Page 12, Line 8: (expression modification) “**Lateral medullary infarction impairs the sequence of swallowing events.**”

Page 12, Line 16: (detailed functions) “**To be specific, ETS stimulation and the balloon lifting work together to upraise the hyoid bone with pedunculus and epiglottidean complex tissues, while the active swallowing along with the balloon dilation help loosen the upper esophageal sphincter.**”

Page 12, Line 20: (detailed comparison) “**In comparison with isolated muscle strength exercises such as Mendelson maneuver, Masako maneuver and electrical stimulation, HEST can improve the strength of suprahyoid muscles and lift the hyoid bone as well.**”

What is more, HEST solves the tricky problem of UES opening, which would result in leaking or aspiration from residue.”

Reviewer #2 (code: 00058448)

Specific comments to authors:

This is an interesting report regarding the use of hyoid-complex elevation and stimulation technique to restore swallowing function. It is well written. The following is my comment: #1. Can the authors provide short-term or long-term outcome of these two patients in addition to discharge outcome at Table 1.

Response:

Thank you for your nice comment. We have added the follow-up information into Table 1 and each case presentation. The detailed additions are listed below.

	Case 1	Case 2
Chief complaint	Aphagosis for 20 days accompanying salivation and emaciation	dysphagia for 24 days
MRI examination	left lateral medullary infarction	right lateral medullary infarction
Admission evaluation	FOIS: level 1 MWST: grade 1 sEMG: imperfect swallowing motion and delayed pharyngeal transit time VFSS: leakage or aspiration, pharyngeal residue, incomplete epiglottic closure and UES dysfunction FEES: epiglottis insufficiency	FOIS: level 1 MWST: grade 4 sEMG: imperfect swallowing waves especially when swallowing at the left side VFSS: leakage or aspiration, pharyngeal residue, decreased laryngeal elevation and impaired opening of UES
Start times of HEST	The 2 nd week (After 2 weeks, the patient was able to resume oral feeding.)	The 1 st day (After 3 days, the patient was able to resume normal oral feeding.)

Discharge evaluation	FOIS: level 7 MWST: grade 5 sEMG: normal	FOIS: level 7 MWST: grade 5 sEMG: normal
Follow-up	FOIS: level 7 oral feeding (Each meal could be finished within 30 minutes.)	FOIS: level 7 oral feeding (Each meal could be finished within 30 minutes.)

Case 1 was admitted on February 7, 2019. Page 8, Line 13: “The long-term outcome was investigated 12 months later over the telephone because the present address of the patient was quite far away from the hospital. The only possible evaluation was FOIS which maintained level 7 and the nutrition way maintained oral feeding. The time required for each meal was limited in 30 minutes.”

Case 2 was admitted on May 7, 2019. Page 10, Line 8: “The follow-up was investigated 9 months later over the telephone because the patient felt free to eat kinds of foods and believed there was no need for him to hospital. The FOIS of the patient maintained level 7 as well. The nutrition way remained the same with each meal finished within 30 minutes.”

To conclude, the two patients both achieved and kept a noteworthy improvement in swallowing function for at least several months by the use of HEST (hyoid-complex elevation and stimulation technique), which did enhance the quality of their life.