The Influence of Open-door Laminoplasty with Preservation of the Unilateral Musculo-ligament Complex to the Volume of Cervical Paraspinal Muscles on the Early Post-operative Stage

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Object: There is no report about the paraspinal cervical muscle changes after the expansive open door laminoplasty in the literature. This paper is to evaluate the influence effect of open door laminoplasty with preservation of the unilateral musculo-ligament complex on the early stage of post-operative paraspinal muscle volume of cervical spine.

Method: 60 patients who experienced open-door laminoplasty with preservation of the unilateral (right side) paraspinal musculo-ligament complex due to cervical spondylotic myelopathy were reviewed retrospectively. There were 41 males and 19 females with mean age of 58.0 (range, 34-78) years old. The average followed up was 4.3 months. An MRI scan was performed before the operation and at final follow-up. The bilateral posterior muscle area at cross-section plane at each intervertebral level of C2/3, C3/4, C4/5, C5/6 and C6/7 were measured, respectively, on MRI scan using Photoshop software and summed the five ipsilateral area values as the muscle volume. The data were analyzed using SPSS 16.0.

Result:
(1) There was no significant side-related difference of muscle area at each level (P>0.05) before operation. The muscle areas on the right side are significantly larger than the left side at the levels of C3/4, C4/5, C5/6 (P< 0.05) but not at C2-3 and C6-7 (P>0.05) at final follow-up.
(2) There was some muscle areas decrease on the left side and increase on the right side at levels of C2/3, C3/4, C4/5, C5/6 after the operation.
(3) There was no significant difference for the sum of five muscle area (levels of C2/3, C3/4, C4/5, C5/6,C6/7) between the left and right side before operation. But the sums at the right side was significant larger than those at left side (P< 0.05) at final follow-up.

Conclusion: Open-door laminoplasty with preservation of the unilateral paraspianl musculo-ligament complex is less invasive to the posterior cervical muscles and maintain the muscle volume to some degree on the early stage after the operative.