

무정위형 뇌성마비 환자의 경추 추력 요법 시행에 따른 합병증

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Complication of the Cervical Thrust Technique in a Patient with Athetoid Cerebral Palsy

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Manual therapy has been widely practiced in almost all countries worldwide. With its potential complications, there are contraindications for thrust technique. A 56-year-old woman diagnosed with athetoid cerebral palsy visited a local clinic due to a tingling sensation in right hand that lasted for a year and aggravated to both upper extremities. The patient underwent three sessions of cervical manual therapy including thrust technique. No evaluation was performed. The patient immediately felt weakness in all extremities after performing cervical thrust technique. Magnetic resonance imaging showed atlantoaxial instability and cervical myelopathy. Approximately one-third of adults with cerebral palsy reported chronic musculoskeletal pain and they often experience neck pain. Particularly in athetoid cerebral palsy, malalignment or instability of the cervical spine is prevalent and often results in myelopathy. Therefore, musculoskeletal evaluation is necessary to identify cervical instability in case of cervical thrust technique, and it should be performed by relevant medical professionals. (*Clinical Pain* 2022;21:38-40)

Key Words: Manipulation, Spinal, Spinal cord disease, Cerebral palsy

INTRODUCTION

Manual therapy has been widely practiced in almost all countries worldwide and is largely divided into thrust and non-thrust techniques. In the thrust technique, the provider recognizes motion restriction and engages the barrier, and a low-amplitude and high-velocity force is applied to vertebral segments for a very short time [1]. A cervical thrust technique improves cervical kinesthesia sense, pain-related disability, and cervical range of motion in participants with chronic mechanical neck pain [2]. Meanwhile, potential complications and contraindications are associated with the thrust technique. We report the case of patient with athetoid cerebral palsy who developed cervical myelopathy after undergoing thrust technique without proper musculoskeletal evaluation.

CASE REPORT

A 56-year-old woman diagnosed with athetoid cerebral palsy and left-sided torticollis visited a local clinic due to neck pain and right-hand tingling sensation that lasted for a year and aggravated to both upper extremities. The symptoms of athetoid cerebral palsy were mild, and the patient did not show any muscle weakness or problems with gait or activities of daily living. The physician in a local clinic recommended cervical manual therapy after a few physical examinations, and the patient underwent three sessions of cervical manual therapy, including the thrust technique within a month. However, no radiological evaluation was performed before the manual therapy, such as a simple X-ray, computed tomography, or magnetic resonance imaging (MRI) of the spine to rule out myelopathy. In the third session, the patient immediately felt weakness in all extremities after performing the cervical thrust technique and was, therefore, transferred to a tertiary hospital. On the initial physical examination, the patient showed both upper and lower extremities weakness with Medical Research Council (MRC) grades 3 and 4, respectively. On the box and block test, the patient transferred 34 (normal range

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74.7 $\pm$ 8.9) and 33 (normal range 73.6 $\pm$ 7.8) cubes with her right and left hands, respectively, for 1 min representing impaired fine motor function [3]. The patient showed restrictions in activities of daily living and scored 70 on the Spinal Cord Independence Measure-3. Touch and proprioceptive senses also decreased in all extremities. The patient could not stand or walk independently. Upper motor neuron signs such as Hoffman's sign and increased deep tendon reflex were observed. An electrophysiologic study showed no response for left median nerve somatosensory evoked potential (SEP) and prolonged right median nerve and both tibial nerve SEPs, suggesting myelopathy. Spine MRI showed atlantoaxial instability, dens erosion, pannus formation, and compressive myelopathy at the C1/2 joint level (Fig. 1). The patient underwent decompressive laminectomy of the C1 vertebra and posterior spinal fusion of

C1-C2 operation to release spinal cord compression (Fig. 2). After a month, her neurologic deterioration gradually recovered to the previous level, except for numbness in both hands. The patient's muscle strength in both upper and lower extremities improved to MRC grade 4, and she was able to walk and climb stairs independently.

DISCUSSION

Manual therapy is a treatment method that improves of body functions using hands for functional disorders, such as segmental and somatic dysfunctions. Among its various techniques, the thrust technique, often known as manipulation, is performed by applying a high-velocity, low-amplitude thrust. However, the thrust technique is associated with the following contraindications: joint instability, verte-



Fig. 1. Preoperative images of the cervical spine. (A) Lateral view of cervical spine X-ray, (B) Anteroposterior view of cervical spine X-ray, (C) Sagittal view of cervical spine T2-weighted magnetic resonance image (MRI), (D) Axial view of cervical spine T2-weighted MRI. Preoperative cervical spine MRI shows atlantoaxial instability, the herniated cervical disc in C5/C6, erosion of dens (arrowhead), pannus formation in the C1/C2 joint (white arrow), and compressive myelopathy in the C1/C2 joint (empty arrow).

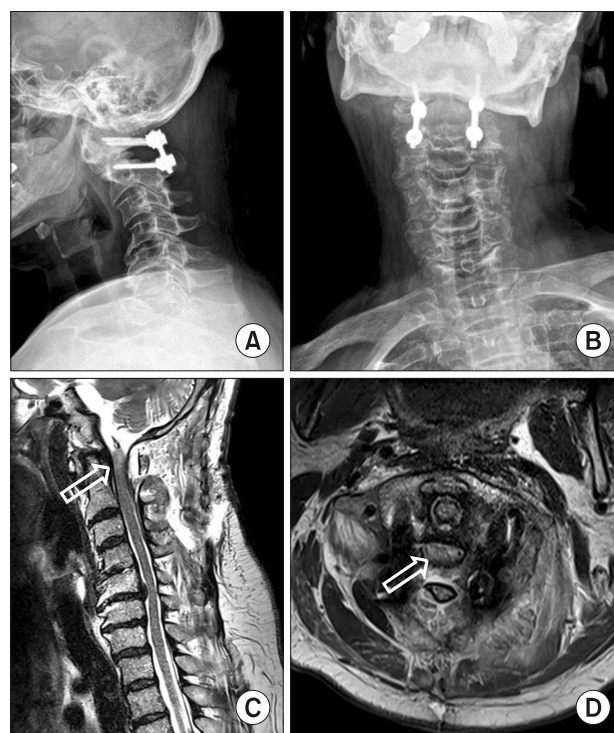


Fig. 2. Postoperative images of the cervical spine. (A) Lateral view of cervical spine X-ray, (B) Anteroposterior view of cervical spine X-ray, (C) Sagittal view of cervical spine T2-weighted magnetic resonance image (MRI), (D) Axial view of cervical spine T2-weighted MRI. Decompressive laminectomy of C1 vertebra and posterior spinal fusion of C1-C2 operation relieved the spinal cord compression. However, compressive myelopathy is still observed (empty arrow).

bral malignancy, infection or inflammation, myelopathy, radiculopathy, and rheumatoid disease because it can cause vertebrobasilar artery dissection, spinal cord injury, and radiculopathy [4]. A previous 5-year retrospective study in a single-group practice demonstrated that 11 patients with spinal cord injury after thrust technique were reported, which was estimated to be 1 in 8,500 cases [5].

In this case, the cervical thrust technique was performed in a patient with athetoid cerebral palsy without any radiological evaluation, which eventually caused and exacerbated cervical myelopathy. To the best of our knowledge, no such cases have been reported previously. Many patients with cerebral palsy suffer from chronic neck pain. [6,7]. Hypertonic muscles do not relax during an activity, resulting in spasticity, which leads to contracture and torsional deformity of long bones and joint instability. This, in turn, can lead to the development of early osteoarthritic changes [8]. The majority of patients complain of reduced range of motion in 1 or more joints [6].

When establishing a treatment plan for neck pain in patients with cerebral palsy, physicians should keep in mind that cervical spine malalignment or instability can commonly cause cervical myelopathy, especially in athetoid cerebral palsy [7]. Based on the MRI results, the patient presumably had joint instability, dens erosion, and pannus formation due to athetoid cerebral palsy before the manual therapy. In other words, cervical manual therapy was contraindicated for this patient, particularly cervical thrust. If the physician had paid sufficient attention to the possibility of cervical instability, severe complications could have been avoided by radiological evaluation, such as cervical MRI before performing manual therapy.

The physician in local clinic who performed the manual thrust technique on the patient was not a specialist in pain management. However, as can be seen from the above case, various factors should be considered when performing manual therapy, and specialized knowledge is required. Manual therapy without specialized knowledge should be avoided as it can harm the patient. As previously reported, the judgment of requiring manual therapy and the selection

of the treatment site and technique must be made by doctors with expertise [9]. Not only thrust techniques but also non-thrust techniques should be performed under their direction and supervision.

In conclusion, appropriate evaluation and confirmation should precede manual therapy, especially the cervical thrust technique. In particular, patients with athetoid cerebral palsy should be more carefully considered because it is often accompanied by joint instability, one of the contraindications of the thrust technique.

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