

## A Case of Cervical Radiculopathy Related to a Cervical Manual Therapy Course

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### ABSTRACT

*Neck pain is a common problem associated with considerable comorbidities, disability and cost to society. Spinal manual therapy is commonly used to treat this condition, and some countries recommend it as a treatment option in their clinical guidelines, since it is generally believed to be a safe and effective method for physicians to use to relieve neck pain. However, the non-invasive and frequently medication-free manipulation manoeuvres can potentially lead to severe adverse effects. This study presents a case of cervical radiculopathy related to cervical manual therapy applied during a training course.*

**Keywords:** Cervical radiculopathy, manipulation trainings, manual therapy.

### INTRODUCTION

Mechanical neck pain is a common condition that affects an estimated 70% of the population at some point in their lives. It has self-reported incidence rates ranging from 15.5 to 213 per 1000 person years and 12-month prevalence rates of approximately 30%–50%. Spinal manual therapy is a term commonly utilized to describe a frequently used conservative treatment option for mechanical neck pain (1–3). This intervention entails a range of manual manoeuvres that stretch, mobilize or manipulate the spine, paravertebral tissues and other joints in order to relieve spinal pain and improve locomotor function (4).

Although spinal manipulation is very popular among physicians and other assistant health staff, it can lead to a variety of neuromuscular complications, including radiculopathy (4) which can occur during treatment.

In this report, we present the case of a patient who was suffering from cervical radiculopathy related to cervical manual therapy that was applied during a training course.

### CASE REPORT

A 36-year-old woman was admitted to Department of Physical Medicine and Rehabilitation, Adana, Turkey with a six-month history of periscapular numbness.

The patient, a physiatrist by trade, had participated in a manual therapy training course 6 months before her admission. During training, she complained of mechanical neck pain, and the trainer of the course had applied cervical manipulation manoeuvres to alleviate her pain. Although she had transient relief immediately after the cervical manipulation, her mechanical neck pain resumed 5 hours after this manipulation. Over the next 2 days, she began to feel radicular pain and numbness radiating down her left arm, without motor deficit. She described her numbness as tingling and prickly at the suprascapular and infrascapular regions. She had no pain with physical activity and sleeping, and there was no previous history of cervical disease or injury before the manipulation at the training course. On her physical examination, her cervical flexion was limited and painful, and the manual muscle strength of her left shoulder abductor and flexors was 4/5 on the Lovett scale. In addition, when examining the sensations in her upper extremities, the left suprascapular and infrascapular regions were paresthetic. All of the patient's other examination findings were normal. Subsequently, electroneuromyography was performed, and the motor and sensorial nerve conduction studies yielded normal results. In the needle electromyographic examination, there was one polyphasic unit and decreased recruitment

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in the motor unit action potentials (MUAPs) in the deltoid muscle. Moreover, when the supraspinatus muscle was sampled, two polyphasic units of the MUAPs were noted. The electromyography revealed normal results for the biceps, triceps, abductor pollicis brevis, and abductor digiti minimi muscles. In addition, the patient's cervical magnetic resonance imaging (MRI) was normal and showed no minimal degenerative changes. At this point, the clinical and electroneuromyographic findings were consistent with left C5 radiculopathy due to the traction effect of cervical manipulation. After these evaluations, she was prescribed a home exercise programme composed of progressive muscle strengthening of the left upper extremity and periscapular region as well as the paracervical muscle. At the patient's follow-up appointment, the mechanical neck pain continued in the same region with the same characteristics, and while the frequency of her radicular pain had decreased, the severity and other features of this pain remained consistent.

## DISCUSSION

Spinal manipulations are frequently employed by physicians to relieve acute pain and muscular imbalance and are increasingly being used to treat a growing number of indications. They are characterized by a high-velocity, low-amplitude thrust that cannot be resisted by the patient (2, 5).

However, trials that have investigated manipulation for neck pain have shown conflicting results, with some patients responding well and others receiving little benefit. Spinal manipulation, particularly when combined with exercise, appears to produce marginally better pain relief compared with other interventions, but systematic reviews and a randomized controlled trial showed that exercises, both with and without spinal manipulation, provide similar outcomes for neck pain (1–3). Bronfort *et al* (6) found that in both the short and long term, manipulation was more effective than medication for patients with acute and subacute neck pain, but they also determined that a few instructional sessions to teach the patients proper home exercises along with appropriate advice can also result in similar improvement at most time points. In our case, the cervical spinal manipulation only provided transient relief, with the long-term follow-up identifying a continuation of the patient's mechanical neck pain.

Although manual therapy is usually considered to be safe and effective, there has been occasional discussion concerning potential harmful consequences following spinal manipulation in the upper neck region. In fact,

there are reports that involve multiple patients who have experienced serious complications after this type of treatment. For example, Struwer *et al* (2) estimated that the risk of adverse reactions was 1:40 000 manipulations for mild complications and between 1:400 000 and 1:1 000 000 for serious complications. However, they also acknowledged that determining the true risk of injury due to spinal manipulation is difficult. In addition, Gouveia *et al* (7) reviewed this type of intervention and found that 33%–60% of patients reported that adverse reactions, including neurological complications, were common after their treatment session. Furthermore, Ernst (8) noted that adverse reactions associated with spinal manipulation were often located in the cervical region.

Most adverse events are characterized by benign and transitory local discomfort and radiating pain along with stiff and sore muscles (2, 5, 9). However, several trials have reported serious, primarily neurological adverse reactions such as stroke, myelopathy, radiculopathy, subdural and epidural haematomas, herniated discs, diaphragmatic palsy, pathological fractures of the vertebrae or ribs, vertebrobasilar artery dissections, and dural tears as well as the presence of intracranial hypotension syndrome, postural headaches, tinnitus and nausea, massive hemothorax, and cauda equina syndrome (2, 4, 8–13). For this reason, before considering spinal manual therapy, a careful evaluation of the patient's safety profile is of vital importance (2).

In our case, the trainer who applied the manipulation did not perform a careful neuromuscular system evaluation of the patient, and manipulation without this examination can lead to an increased risk of radiculopathy. Nowadays, manual therapy training courses are commonly organized throughout the world with the aim of teaching basic interventional principles and applications to physiatrists and other assistant health staff such as physiotherapists. In these courses, trainees are frequently used as patients by the trainers to apply manual therapy. However, the experience and accuracy of the trainers' techniques can vary, and this lack of experience along with inaccurate evaluations and applications can increase the risk for complications. Similarly, these courses may not be suitable for a thorough evaluation of the patient since inspection and palpation of the whole of body are crucial for the manipulation.

In our case, the trainer examined her cervical region without looking at the thoracic area or shoulder. Furthermore, numerous absolute and relative contraindications for spinal manipulations have been proposed,

including acute fracture, dislocation, ligamentous rupture, instability, tumours, infection, acute myelopathy, cauda equina syndrome, spondylolisthesis, recent surgery, acute soft tissue injury, osteoporosis, ankylosing spondylitis, rheumatoid arthritis, vascular disease, vertebral artery abnormalities, connective tissue disease, anticoagulant therapy, and bleeding dyscrasia (4). Inadequate questioning of the patient can also precipitate serious adverse events. For example, at our patient's evaluation, the trainer did not ask any questions to assess whether there were any contraindications for this kind of treatment.

Based on this case, physiatrists and trainers should obtain information regarding the patient's medical history, perform a careful neuromuscular system evaluation and be aware of the potential adverse effects of manipulative treatment. Additionally, before initiating the manipulation, physiatrists should evaluate the patient via appropriate imaging methods (eg, MRI and X-rays) when warranted. This treatment should also be explained clearly and completely to the patient before beginning the intervention, and physicians should inform them not only of the benefits of cervical spinal manipulation but of the potential dangers and possible harmful side effects as well. Furthermore, the patients and trainees should be aware of the trainer's experience level before agreeing to undergo any manipulation.

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