



Research Article

Utilizing a Multi-Modal Approach of Spinal Manipulation and McKenzie Method of Mechanical Diagnosis and Therapy (MDT) Cervical Protocol in the Treatment of Cervical Radiculopathy in a 31-Year-Old Female

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Abstract

Neck pain is a leading cause of disability in the United States. Neck pain with radiculopathy is commonly seen in the Chiropractic office. Patients presenting with these symptoms may not benefit from immediate high velocity adjustments. Approaches like The McKenzie Method of Mechanical Diagnosis and Therapy provides a useful alternative.

Introduction

Neck pain is a leading cause of musculoskeletal pain disorders in the United States with 14.3% of persons reporting neck pain or problems [1]. In 2016, among the 154 conditions, low back and neck pain had the highest amount of health care spending with an estimated \$134.5 billion in spending [2]. Chiropractors treating the general population can expect to see about 23% of their patients presenting with a chief complaint of neck pain [3]. The most common causes for neck pain treated by chiropractors are back pain, neck pain, and

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headaches [4]. Cervical Radiculopathy (CR) is a term used to describe neck pain with radiating pain in the arm with motor, reflex, and/or sensory changes provoked by neck posture and/or movement. The clinical diagnosis relies mainly on the outcome of history taking and a physical examination in which those changes can be found. The differential diagnosis of CR can include many musculoskeletal or neurological conditions that may mimic the signs and symptoms of CR. [5]. Patients presenting with CR most frequently complain of neck pain, paresthesia, and radicular pain [6]. Conservative treatments consist of immobilization, anti-inflammatory medications, physical therapy, cervical traction, and epidural steroid injections. Cervical radiculopathy typically is self-limiting with 75%-90% of patients achieving symptomatic improvement with nonoperative care [7]. While research on the effectiveness of manual therapy for cervical radiculopathy is scarce, there is low level evidence to show that a multi-modal approach utilizing cervical joint mobilization and specific (motor control) exercises can be more effective at short term follow up (<4 weeks) than either manual therapy or exercise alone or wait and see on pain and activity limitations [5,8]. The McKenzie Method of Mechanical Diagnosis and Therapy (MDT) is a system of diagnosis and patient management and an evidence-based assessment and management protocol that applies to acute, subacute, and chronic conditions of the spine and extremities [9].

Methods

A 31-year-old female patient presented to a student chiropractic clinic with neck pain. This patient with no apparent history of cervical disc herniations reported that four days ago, she was placed in a headlock while practicing Brazilian Jui-Jitsu and her head was forced into extreme extension. She described the next ten minutes as some of the most intense pain of her life and she could not move her entire body. That sensation eventually subsided over the next several hours. She did not seek care immediately after that incident. The next 3 days, her cervical range of motion was limited with what she described as a “severe pain that feels like a horseshoe-like band in the middle of her back”. Notable patient intake form information demonstrated that the patient’s mother had Rheumatoid Arthritis (RA), but the patient recently had blood work ordered by her endocrinologist came back negative for RA factor. Because of the mechanism of injury during the history, a cervical x-ray series was taken that included a lateral, APOM, A-P, flexion, and extension films. There was no fracture evident, no evidence of intersegmental instability, and minimal C4-C5, C6-C7 disc degeneration with mild left C4-C5 uncinate joint osteoarthritis. Upon the physical exam, the patient appeared saddened, frustrated, and in pain. All vitals appeared normal except for a higher respiratory rate (18/minute) that could potentially be due to the level of pain at the time vitals were taken. Deep-tendon reflexes were 2+ and symmetrical. Muscle and sensory testing were unremarkable The patient completed outcome assessment surveys. Her Neck Bournemouth score was 78.5% indicating a severe condition. The patient’s initial yellow flag screening questionnaire indicated a high risk of chronic pain and disability. Upon range of motion examination, the patient demonstrated a moderate to severe reduction of cervical extension

that caused the “band-like” pain in the middle of the back, shown to be consistent with the referral pattern of a cervical disc disruption of an unknown type [10]. Cervical protraction, flexion, extension, lateral bending bilaterally and rotation bilaterally were moderately decreased with what was described as “locked-up” muscles around the neck by the patient. When cervical retraction was performed, there was a bilateral, shooting pain going down the back of both of her arms. With this motion, she stated that this was the first time she had experienced that symptom. Orthopedic exams revealed a positive maximal foraminal compression test bilaterally for pin-point pain in the lower cervical spine, but no radicular symptoms. Cervical distraction was positive for a relief in symptoms. Spurling’s Test was positive for local pain in the lower cervical spine [11].

Upon the completion of the history and physical exam, the patient was diagnosed with M53.1 Cervicobrachial syndrome. A true disc lesion could not be confirmed without MRI (magnetic resonance imaging). At this time, it was determined that patient would not be an ideal candidate for high velocity low amplitude adjusting, so McKenzie retractions were selected as a starting point. The initial procedure was to have the patient perform cervical retraction with self-overpressure ten times to patient tolerance. After ten repetitions, the patient was asked if her pain was better, the same, or worse. The patient stated that the pain was about the same. There was no immediate change in radicular symptoms when accompanied with cervical retraction. Range of motion was reassessed immediately after, and the patient demonstrated a slight increase in cervical extension and rotation bilaterally. Directional preference, as defined by the McKenzie Method of Mechanical Diagnosis and Therapy, describes the clinical phenomenon where a specific direction of repeated movement and/or sustained position results in a clinically relevant improvement in symptoms. This improvement is usually accompanied by an improvement in function, mechanics, or both. Its presence and relevance are determined over two to three visits [12]. Utilizing the principles of directional preference as defined by the McKenzie Method of Mechanical Diagnosis and Therapy, there was a clinically relevant improvement in functional symptoms such as increased cervical range of motion and a decrease in pain symptoms. Because of these findings the patient was instructed to do ten to fifteen cervical retractions with slight overpressure to patient tolerance every one to two hours for the remainder of the day and the next day. This was to be completed only if there was no progression in symptoms or pain. If there was any progression in pain or symptoms, she was to cease the retractions and seek medical care to rule in/out a more serious pathology. The patient was instructed to return two days after the initial appointment and to be evaluated every two to three days after that, if necessary.

When she returned to the office for her follow up appointment two days later, the patient reported that all radicular symptoms associated with cervical retraction were gone. Range of motion was reassessed, and the patient demonstrated an increase in cervical extension and bilateral rotation compared to the first appointment, exhibiting only a mild decrease in cervical range of motion overall. The patient was provided manual therapy utilizing Active Release Techniques on the suboccipital muscles bilaterally to reduce muscular hypertonicity commonly associated with cervical pain and to increase her range of motion during retractions. She was instructed to continue to do the retraction exercises with the same rep scheme, even though symptoms had resided. The second and third week of care consisted of a slightly more aggressive form of manual therapy twice a week with an increase in pressure on the suboccipital muscles involved.

The patient also presented with an increase in cervical range of motion in weeks two and three, and no radicular symptoms. During the second visit of week three, the patient’s cervical spine (C6-C7) was adjusted using the diversified technique from a supine position, with an increase in cervical range of motion in the C6-C7 region after the chiropractic adjustment was delivered. The patient responded well to the spinal manipulation and continued to show an improvement in overall symptoms. After the first month of treatment the patient’s Neck Bournemouth score was 14%, down from her initial score of 78.5%. A two-month follow-up revealed no cervical radiculopathy and an increase in cervical protraction, flexion, extension, and lateral bending bilaterally with no pain. The two-month Neck Bournemouth score was 10%. This patient responded well to care and did not require any further imaging or interventions from other providers.

Discussion

Usage of MDT as a method of care has been successful in treatment of neck pain in the short term [13]. Wainner and colleagues identified a clinical prediction rule (CPR) for the presence of cervical radiculopathy [14]. In this case, the patient presented with three of four positive orthopedic or physical exam findings associated with cervical radiculopathy (symptom reduction with cervical distraction, symptom reduction with Spurling’s Test, and decreased cervical rotation range of motion). There are three types of presentations defined by MDT. Derangement Syndrome is a clinical presentation which demonstrates directional preference in response to loading strategies and is typically associated with movement loss. A common feature in the spine is centralization. In the spine, Dysfunction Syndrome is a clinical presentation where symptoms are produced consistently and only at a limited end-range of a movement. Postural Syndrome is a clinical presentation where symptoms are produced only from prolonged static holding [12]. The patient’s presentation demonstrated Derangement Syndrome. The goal for initial treatment was to initiate centralization, which is the phenomenon by which distal pain originating from the spine is progressively abolished in a distal to proximal direction [12]. Studies have shown between 67% to 85% of centralizers displayed the directional preference for spinal extension [12]. These exercises might promote cervical root decompression and reduce radicular pain in patients with C7 radiculopathy, according to a research report in the *Journal of Orthopaedic & Sports Physical Therapy* [15].

Patients presenting with high levels of pain and disability as well as yellow flags may need forgo high velocity low amplitude adjusting for a period until their symptoms subside. An alternative for these patients experiencing radicular symptoms, high levels of pain, and psychosocial factors is the McKenzie Method. The retraction exercises provide patient directed treatment that can be done to tolerance. The availability to complete the exercises at home adds an additional benefit and sense of empowerment to the patient. Patients of this type may benefit the most from an approach that utilizes less invasive to more invasive progression of treatment.

Conclusion

Utilizing a multi-modal approach with cervical spine manipulation and specific (motor control) exercises can be highly effective in treating cervical radiculopathies and similar presentations. In this case, the approach utilized was to start with the least invasive form of treatment (MDT and ART) and progress on a visit-by-visit basis to incorporate a cervical spine adjustment in combination with progression of motor

control exercises. As the patient progressed through the care plan with a decrease in radicular symptoms through MDT, cervical spine adjustments were performed and resulted in an increase in cervical range of motion and a decrease in the patient's pain symptoms. In the chiropractic setting, there are circumstances where spinal manipulation is not an immediate option, even if proven to be effective in the short-term in patients with cervical radiculopathy if combined with exercise [5,8]. There is clearly a need for more studies on a multi-modal approach including spinal manipulation, exercise, and other forms of manual therapy care to improve patient outcomes in the short and long-term.

Clinical Relevance:

- Consider MDT for patients presenting with cervical radiculopathy before adjusting.
- Not all patients with radicular symptoms may require MRI confirmation and may benefit from a short course of conservative treatment first.
- Psychosocial factors for patients pain and disability need to be taken into account when selecting treatment modalities.

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