Massage Therapists' Association of British Columbia

Clinical Case Report Competition

Okanagan Valley College of Massage Therapy

Spring 2009

First Place Winner

Erin Perrault

The effectiveness of muscle energy and massage therapy for the management of symptoms related to chronic cervical dystonia

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MTABC 2009

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1st Place — Erin Perrault

The Effectiveness of Muscle Energy and Massage Therapy for the Management of Symptoms Related to Chronic Cervical Dystonia

by Erin Perrault, 3rd year student at Okanagan Valley College of Massage Therapy

ABSTRACT

Objective: To assess the effectiveness of Muscle Energy and Massage Therapy for management of symptoms related to chronic cervical dystonia.

Methods: A therapeutic massage treatment program was designed and implemented to address postural imbalances and head tremors associated with chronic cervical dystonia. The subject received one-hour treatments once a week for eight weeks. A full baseline assessment was taken of the subject on the initial and final treatment. The treatment protocol focused on muscle energy, myofascial release, neuromuscular facilitation, trigger point release, light frictions and traditional Swedish massage techniques. Specific homecare exercises were also given to the subject. Treatment progress was assessed following the Cyriax Model, which included a detailed questionnaire, full postural scan, palpation and special tests. A visual analogue scale was used to measure the subject's head tremors at the beginning and end of each treatment session. Muscle strength testing was performed on the initial and final assessment and active and passive range of motion of the cervical spine was assessed before and after each treatment. The assessment also included the Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS).

Results: The subjects head tremors markedly reduced from the initial assessment at 8/10 to the final assessment 0/10. All ranges of motion increased except right rotation, which was full at the initial assessment. An unexpected outcome was the subject's ability to hold cervical rotation to the left for at least four second before the involuntary muscle contraction snapped it to the right. Muscle strength testing showed improvement and

head tremor activity during muscle contraction decreased remarkably from initial to final assessment. The Toronto Western Torticollis Rating Scale (TWSTRS) revealed that the severity scale which measures cervical alignment, the use of sensory tricks and the duration of the spasm decreased from 18/35 to 8/35 and the disability scale that rates the impact of dystonia on activities of daily living decreased from 14/30 to 6/30.

Conclusion: The results obtained in this study provides support for the effectiveness of Muscle Energy and Massage Therapy in conjunction with homecare exercises to manage symptoms related to chronic cervical dystonia. The results with this subject were significant enough to warrant further study.

Key words: Dystonia, Spasmodic torticollis, Torticollis, Massage therapy, Manual therapy, Treatment, Physical therapy,

INTRODUCTION

It is a challenge when a massage therapist approaches treatment of chronic cervical dystonia as there is very limited research evidence and few guidelines by which to develop a treatment protocol. Cervical dystonia is a neurological syndrome dominated by involuntary sustained muscle contractions frequently causing twisting and repetitive movements of the cervical spine. The abnormal postures are often exacerbated when the person performs active voluntary movements (Goodman, Boissonnault, and Fuller, 2003). The movements associated with cervical dystonia, which are involuntary and sometimes painful, may affect a single muscle or a group of muscles.

Cervical dystonia is also commonly referred to as "spasmodic torticollis" (Ramdharry, 2006). Cervical dystonia is characterized by abnormal rotation, lateral flexion, flexion and or extension of the neck occurring in various combinations that can include rotation (torticollis); lateral tilting (laterocollis); flexion (anterocollis); and extension (retrocollis) (Ramdharry, 2006). Another, characteristic finding of cervical Dystonia is the *geste antagonistique* also known as "sensory trick". The patient will pull on their chin or touch the top of their head to temporarily overcome involuntary muscle activity and abnormal head posture (Velmickovic Miodrag, 2001). Cervical dystonia can present with pain, can be disruptive to functional activity, and can lead to osteoarthritis and hypertrophy of the Sternocleidomastoid muscle if remission does not occur (Goodman, Boissonnault, and Fuller, 2003). Dystonia usually is pervasive throughout the day whenever the affected body part is used. In more severe cases, the dystonia appears at rest as well. Cervical dystonia can also present with annoying and debilitating head tremors. Patients with cervical dystonia frequently experience difficulties with social embarrassment, stress and other psychological problems (Grundle et al, 2001). The condition is chronic in nature and has been shown to have a negative impact on the quality of life, which is comparable to individuals with multiple sclerosis, Parkinson's disease and stroke (Camfield et al, 2002).

Dystonia is classified into two categories. The first is primary (idiopathic or focal) and the other is secondary which occurs as a result of injury or brain illness (Goodman,

Boissonnault, and Fuller, 2003). Cervical dystonia is the most common form of focal dystonia accounting for two thirds of all diagnosed cases.

An estimated 1.1 in 100,000 persons per year develop dystonia, with a female/male ratio 1.6:1. The average age of onset for focal dystonia is usually between 30 to 50 years of age. Predisposing factors can include acute head trauma (Goodman, Boissonnault, and Fuller, 2003), and there is some suggestion of familial links (Berardelli et al, 1998).

Descending pathways involving reciprocal inhibition of the motor neurons have been identified as possible sites of pathenogenesis in focal dystonia. Nerve conduction velocity studies have shown that there is a failure of neural activities preparing for movement. Defective retrieval of specific motor programs in response to sensory stimuli results in contraction of both the agonist and the antagonist muscles around the joint (Goodman, Boissonnault, and Fuller, 2003). Most studies have implicated the basal ganglia in particular the lentiform nucleus (combination of globus pallidus and putamen), as being the region most affected (Berardelli et al, 1998).The lentiform nucleus is located just lateral to the thalamus. The major function of the basal ganglia is to help initiate and terminate movements of the body. The basal ganglion also suppresses unwanted movements and regulates muscle tone. The basal ganglia influence many other aspects of cortical function including sensory, limbic, cognitive and linguistic functions (Tortora and Derrickson, 2009).

Treatment remains symptomatic and includes primarily drug therapy, surgery and occasionally physical and occupational therapy. (Goodman, Boissonnault, and Fuller, 2003). Anticholinergics have been the most widely used oral medications to decrease acetylcholine (an excitatory neurotransmitter that helps regulate dopamine in the brain and in the body acetylcholine released at free nerve endings causes muscle contraction) and correct a cholinergic imbalance in the basal ganglia (Tortora and Derrickson, 2009). Botulinum toxin type A (botox) injected intramuscularly has emerged as the most common, safest and effective symptomatic treatment of cervical focal dystonia (Y. Balash and N. Giladi, 2004). These injections are effective in improving postural deviations and pain in about 80% of people with cervical dystonia. Injected directly into the actively contracting muscle (most commonly the Sternocleidomastoid) blocks the neuromuscular junction by acting presynaptically to reduce and release acetylcholine, producing a chemical denervation. Muscle weakness and atrophy can result from this treatment. Response to the injection occurs in 3-7 days and lasts for about 3-4 months. Dysphasia is the most serious side effect of this treatment. Lowering the dosage can decrease the severity of this side effect. A major drawback of this treatment is the need to continue treatment injections every 3-4 months, indefinitely. Surgery is usually reserved for patients for whom other forms of treatment are no longer effective. Current procedures include muscle denervation and, more recently, deep brain stimulation. A drawback to surgical intervention is that it may lose its effectiveness over time providing only temporary symptomatic relief (Goodman, Boissonnault, and Fuller, 2003).

An extensive literature review revealed limited documentation on the use of massage therapy approaches and treatment protocol for cervical dystonia. The majority of

literature focused primarily on pharmacological and surgical interventions. Although some authors mentioned the use of physiotherapy and chiropractic for management of cervical dystonia there were very few studies looking at other manual types of treatment for chronic cervical dystonia.

The objective of this case study is to provide insight into the effectiveness of muscle energy and massage therapy as non-invasive management of symptoms related with chronic cervical dystonia.

CASE HISTORY

The subject is a 47-year-old female. She is self-employed part time and her job is physically demanding. She first noticed an abnormal neck rotation in June 1998 and by August of 1998 it was distinctively pronounced. Initially, only mild discomfort accompanied this patient's abnormal head presentation. In January of 1999 she developed a severe head tremor. She managed to maintain a fairly neutral head position by using a commonly described "sensory trick" of hand-to-chin position to interrupt involuntary muscle activity (Beth E Crowner, 2007). Finally, in November of 2000 she was diagnosed with idiopathic cervical dystonia. She has been receiving local botulinum toxin A (botox) injections into the left sternocleidomastoid and splenius capitus muscle every three to four months for the past nine years. She describes her condition as manageable. One of her main complaints is head tremors especially in stressful and unfamiliar situations such as social events or driving in a vehicle with other people. The tremors seem to build as the day progresses and are the worst when she puts here head on the pillow when she goes to sleep or when she rests her head against a hard surface. She has been receiving general relaxation massage therapy for the past two years, which has been helpful for general stress management. She also started taking yoga four months ago to help maintain a low stress level. There are no known causes for the subject's dystonia. Some possible links could be from a fall she sustained in 1989 where she hit her head and was knocked unconscious for a few seconds. There is also a family history of Parkinson's disease. Additionally, the subject has had type-one diabetes since she was six years old.

ASSESSMENT

Assessment followed the Cyriax Model, which included a detailed questionnaire, observation including a full postural scan, palpation and special tests. A visual analogue scale was used to measure the subject's head tremors at the beginning and at the end of each massage treatment.

To rule out any cervical disc, ligament, facet joint or space occupying lesion involvement the following special tests were used: Spurling's, valsalva's, vertebral artery, alar and transverse ligament stress tests were performed at the initial assessment and all were negative.

Muscle strength testing was performed at the initial and final assessment. Muscles that were tested were the sternocleidomastoid, upper trapezius, levator scapulae and the posterior lateral flexors in the cervical spine.

Active and passive range of motion was routinely performed in the cervical spine before and after each treatment and active and passive range of motion of the shoulder girdle was assessed on the initial and on the final treatment.

The assessment also included a commonly used outcome measure, the Toronto Western Spasmodic Torticollis rating scale (TWSTRS). The scale includes assessment of the abnormal position of the head, neck and shoulders, the effectiveness of sensory cues, the length of time that the subject can keep the head in the midline as well as subjective information regarding daily living activities. This assessment tool was used during both the initial assessment and the final treatment.

TREATMENT PLAN

The subject received one-hour treatments once a week for eight weeks. Specific treatment techniques used were: muscle energy, fascial release, neuromuscular facilitation, trigger point release, light frictions and traditional Swedish massage techniques.

Each session was slightly different depending on presenting symptoms. However, a basic treatment protocol was followed. The treatment always began in a supine position with muscle energy of the cervical spine. Muscle energy was used as the main form of treatment because it is a gentle non-invasive manual therapy used to help normalize spinal and extremity joint problems. The objective of muscle energy is to remove or lessen the motion barrier restriction thus restoring joint range. Muscle energy reduces muscle spasm, restores proper joint mechanics, normalizes proper circulatory and neurological functioning and helps promote postural alignment (Fred L Mitchell Jr., 2005). Treatment protocol for muscle energy is to move the affected body part towards the motion barrier restriction; ease back slightly and engage in all three planes; request an isometric contraction for three to six seconds; have the subject completely relax and pause; move the body part to the new motion barrier; repeat sequence three to six times and re-evaluate. Muscle energy was used at the beginning of each session to release cervical restrictions and to ease head tremors.

After the muscle energy treatment was completed the client repositioned to a prone position and fascial release techniques were performed on restricted tissue especially the erector spinae and upper and lower trapezius muscles. NMT, muscle stripping and trigger point release was used on muscles that were hypertonic, had adhesions and active trigger points. Muscles most affected were the upper and lower trapezius, levator scapulae, and splenius capitus and cervicis and semispinalis capitis. Posterior treatment finished with kneadings and flushing strokes to the areas that had been addressed.

The client was then repositioned into a supine position where light frictions to the origin of sternocleidomastoid were performed bi-laterally. Trigger points were released in the SCM and kneading and flushing was done to the anterior, lateral and posterior neck. The treatment finished with long axis traction to the sub occipitals and a cranial still point.

Homecare consisted of diaphragmatic breathing especially at bedtime to help reduce night head tremors: five deep abdominal breathes in for five-six counts and out for five-six counts, three-six times and increasing as the weeks progressed. Standing wall head re-posturing exercises were given: two times per day, held for fifteen-thirty seconds. Rhythmic stabilization for the cervical spine: held five-seven seconds, three times each position, two-three times per day. Contract-relax technique for the cervical spine: left side only, hold five-seven seconds, four positions, three times per day. The last exercise given was an active eye stabilization technique to increase left cervical rotation: once per day. All the homecare exercises were introduced as the eight weeks progressed.

OUTCOMES

Progress was monitored through a number of assessment tools. The head tremor charted on the visual analogue revealed markedly reduced symptoms from the initial assessment to the commencement of the case study. Week five showed an increase in head tremor activity post massage treatment possibly due to the intensity of the muscle energy treatment during that week's session. (Figure 1)

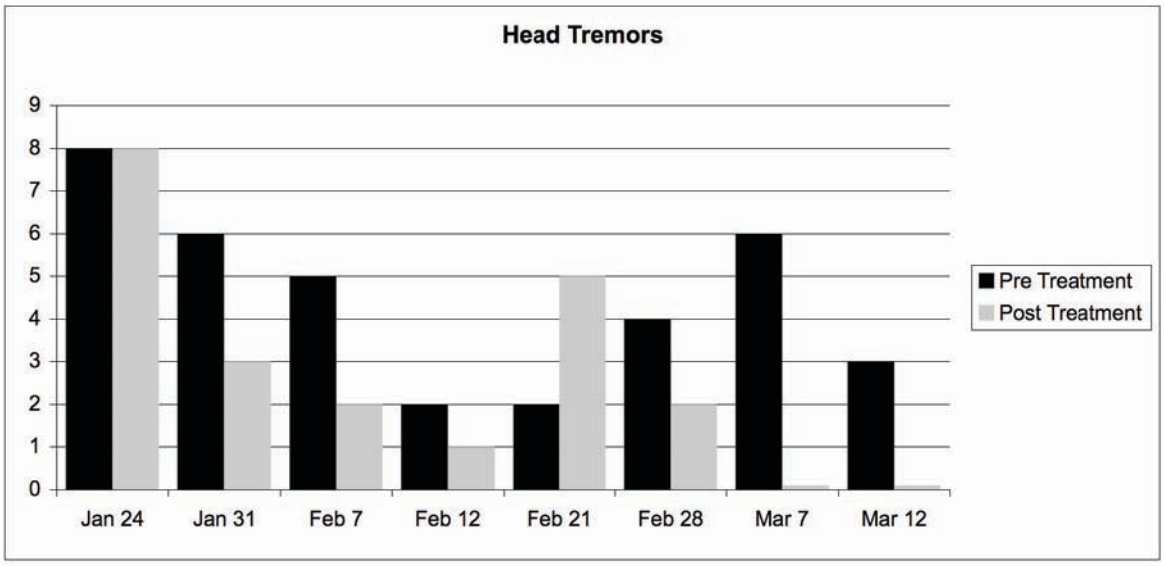

Figure 1. Progression of subject's head tremors pre-treatment and post-treatment

Active range of motion of the cervical spine was measured before and after each treatment session. All ranges of motion increased from initial assessment to final assessment except right rotation, which had full range to begin with. An unexpected outcome with range of motion testing was the subject's ability to hold cervical rotation to the left for at least four seconds before the involuntary muscle contraction snapped it to the right. Each session the subject also gained more pure range of motion in extension and lateral flexion to the left. (See Figure 2)

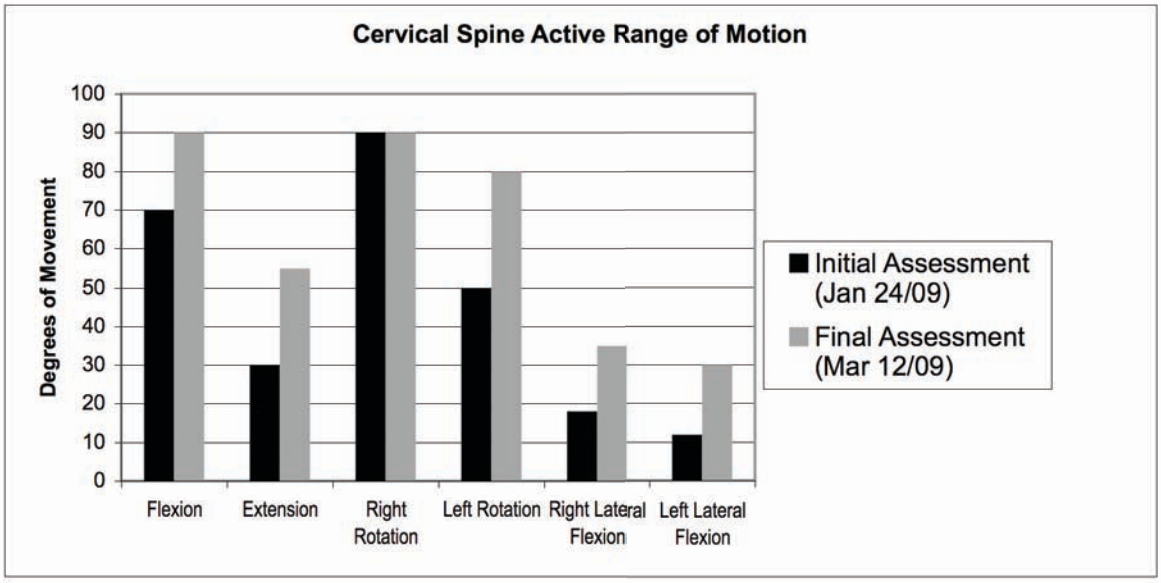

Figure 2. Progression of Subject's active range of motion of the cervical spine from initial assessment to final assessment

Muscle strength testing was measured at the initial and final assessment. Slight improvement in muscle strength was made in all muscles however; a notable outcome was that the head tremors when performing the muscle tests decreased remarkably from the initial assessment to the final assessment. (See Figure 3)

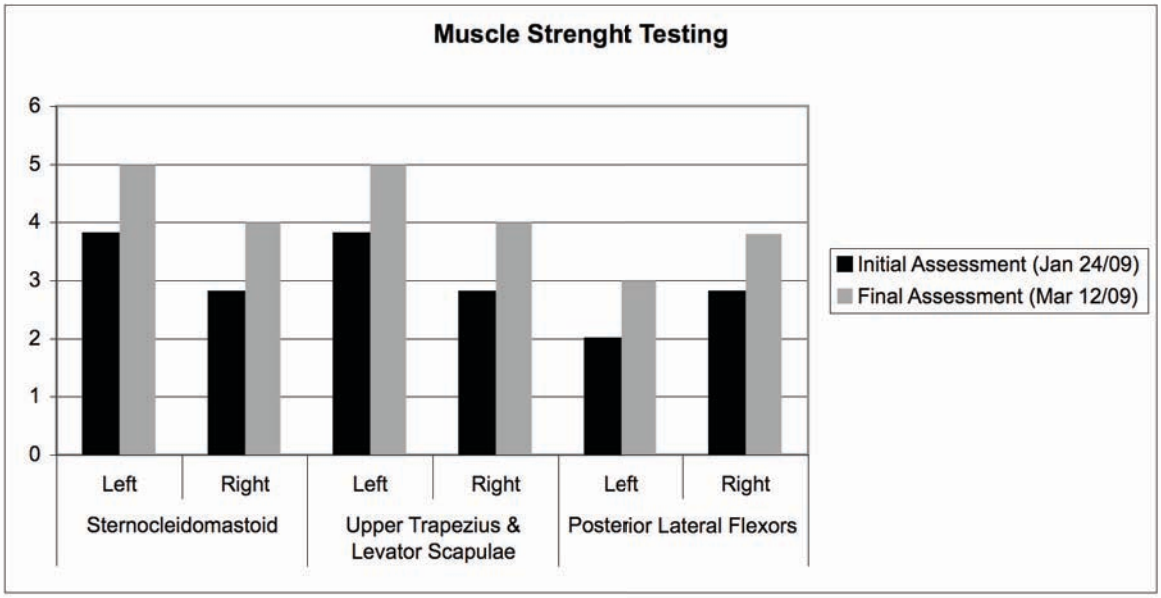

Figure 3. A comparison of muscle strength from the initial assessment to the final assessment

The subject's progress was also monitored using the Toronto Western Spasmodic Torticollis rating scale (TWSTRS). The two sections that were used for this case study were the severity scale (rating alignment, sensory tricks, and duration of spasm, out of a score of 35) and the disability scale (rating the impact of cervical dystonia on activities of daily living, out of 30.) (Figure 4)

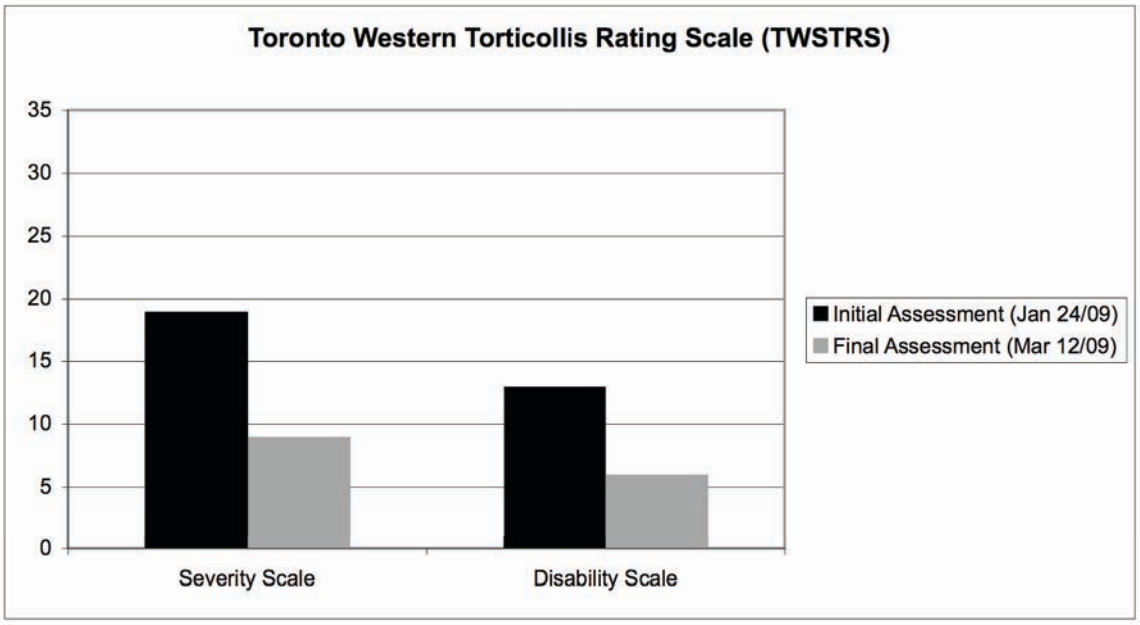

Figure 4. Changes in Toronto Western Torticollis Rating Scale (TWSTRS) score

Homecare exercises were given to strengthen muscles (especially the right sternocleidomastoid and scalene) to assist in maintaining midline head position. Visual tracking exercises were given to increase left cervical rotation. And breathing and postural exercises were given to help promote relaxation and as tools to use in stressful situations that exacerbate head tremor and dystonic head position. The subject was very compliant in doing suggested homecare. The subject struggled with the visual tracking exercise finding it particularly straining on the eyes however, when the subject performed the exercise she gained left cervical rotation and the head tremors did abate slightly.

CONCLUSION

The current treatment for cervical dystonia is predominantly pharmacological and surgical intervention. Specific treatment protocol cannot be generalized or created from a single case study; however, insight can be gained into other forms of treatment for this chronic condition. This case report demonstrates improvement of symptoms related to the subject's chronic cervical dystonia. The outcomes were more than expected. One of the major symptomatic complaints was the head tremor activity that intensified when the subject was under stress in unfamiliar settings and at rest. Table one demonstrated a significant decrease in head tremor activity after the first few treatment sessions and a significant decrease by the commencement of the study. One benefit not specifically measured was the intensity of night head tremors, which decreased slightly as the

treatments progressed. The use of muscle energy at the beginning of the session quieted the head tremors so that the other treatment techniques could reduce fascial restrictions, adhesions and trigger points resulting from the dystonic head position. All these techniques helped restore proper function and biomechanics and improved tissue health to the affected structures involved. Overall range of motion and muscle strength increased and the ability of the subject to hold the head in a midline position for more than 30 seconds with out utilizing sensory tricks was remarkable. Upon initial assessment, the subject reported a long history of botulinum toxin A (botox) injections, which helped manage the subject's chronic condition. It appears that with the addition of massage therapy that the subject has been able to manage symptoms related to chronic cervical dystonia with out receiving botulinum injections for over six months. This is the longest period of time that the subject has gone without botulinum injections for the past nine years.

The results obtained from this study show that muscle energy and massage therapy in conjunction with specific homecare exercises may be effective in managing symptoms related to chronic cervical dystonia. The results with this patient were significant enough to warrant further study.

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