

Massage Therapy for Cervical Degenerative Disc Disease: Alleviating a Pain in the Neck?

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Background: A 66-year-old female client with cervical degenerative disc disease at lateral left facet joint C6/C7 was experiencing symptoms of chronic neck pain accompanied by limited cervical range of motion, as well as radicular left shoulder and arm pain. The objective of this case report was to describe the effect of therapeutic massage on the client's symptoms and impairments of cervical DDD.

Methods: Therapeutic massage interventions included soft-tissue manipulation using petrissage and neuromuscular techniques, fascial work, facilitated stretching, joint play, hydrotherapy, education on self-stretching, and positive guidance about condition management. Assessment included pain-free cervical ROM and a subjective verbal pain scale.

Results: After several treatment sessions, client's symptoms had decreased and cervical ROM had improved moderately. There was also a decrease in reported pain and an increase in functional daily activities. Client showed a greater understanding of the physiologic barriers which degenerative changes may present.

Conclusions: This client responded favorably to massage therapy as a treatment intervention for cervical DDD symptoms.

KEYWORDS: cervical degeneration, cervical radiculopathy, chronic neck pain, massage therapy

INTRODUCTION

Cervical Degenerative Disc Disease (DDD) is a major contributor to neck pain. Depending on the severity of the degeneration and the amount of compression on cervical nerves, neck pain can interfere with daily activities. Typically, the degree of pain and alterations a person must learn to cope with are what motivates a search into complementary and alternative health care as treatment options. Treatments can come in many forms including chiropractic, massage therapy, acupuncture, physiotherapy or similar modalities. Specifically in the case of cervical DDD, research into the benefits of massage therapy as a

treatment option is meager. This case study describes one client's experience of the possible benefits of such a treatment.

Overview of Cervical Degenerative Disc Disease

Cervical disc degeneration is an acknowledged part of aging⁽¹⁾. However, cervical DDD becomes problematic when symptoms begin to interfere with activities of daily living. While discussions surrounding chronic low-back pain (CLBP) are seen widely throughout academia, similar symptoms in the neck are not as commonly discussed⁽²⁾. Chronic neck pain may be more persistent and has been shown as a major cause of employment sick days⁽²⁾.

Cervical disc height may diminish with age as the collagen is transitioning from type I to types II and V, thus reducing space for spinal nerves⁽¹⁾. Many aspects of occupation and recreation, as well as faulty posture, impact the manner in which the cervical spine ages⁽³⁾. If during daily activities repetitive loaded rotation or sustained extension occurs, it becomes susceptible to wear and tear elements of degeneration. In the case of DDD, wear and tear are further exacerbated by posterior osteophyte development along affected facet joints⁽⁴⁾. Paradoxically, this is often the foremost contributor to pain in clients. Cervical nerve roots may develop inflammation as a result of narrowed intervertebral foraminal space, causing troublesome symptoms of radiculopathy in the shoulder and arm^(3,5).

Symptoms of Cervical Degenerative Disc Disease

Symptoms typically observed with this condition include neck pain, loss of cervical ROM, decreased strength of postural muscles, cervical muscle fatigue, radicular symptoms, and general stiffness⁽⁶⁾. These can occur in any combination and may fluctuate over time. It is estimated that over 50% of adults experience some degree of neck pain every year⁽⁷⁾, and more than 60%–80% of older adults experience neck pain due to degenerative changes⁽³⁾.

Although the entire cervical spine can be effected by DDD, the most common symptomatic sites are found in lower cervical vertebrae C6 & C7⁽⁸⁾. Radiculopathy may affect deep tendon reflexes and strength of biceps and triceps due to reduced neural activity of the compressed nerve root. It may also produce radial forearm dermatomal paresthesia for similar reasons. In some instances, arm pain can be the most problematic symptom⁽⁵⁾. Clients with symptomatic DDD typically exhibit forward head posture with chin protrusion. Cervical compression tests including Spurlings, may increase radicular symptoms, and cervical distraction tests may provide relief. Most significantly, cervical ROM may show signs of altered function. The common cervical capsular pattern affects all motions except forward flexion⁽⁹⁾. Specifically, pain is decreased rotating away from the side of impingement, pain is increased rotating towards the side of impingement, lateral flexion is diminished, and there is pain with minimal extension. In theory, increased pain with extension is due to exaggerated nerve root compression in this position⁽¹⁰⁾. Depending on the daily activities of the client in question, movement towards any end-range may correlate with pain. Inflammation in and surrounding the disc and facet joint may also contribute to pain.

There is a common misconception that the bony changes associated with DDD are always accompanied by pain⁽⁹⁾. Some authors argue that the degree of degenerative changes does not necessarily correlate with a client's level of pain^(6,11). Madson et al.⁽⁷⁾ attest severe neck pain can be found in client cases without degenerative changes, and degenerative changes do not always cause pain in every case. Hertling and Kessler⁽⁹⁾ call this a paradox in DDD. One would expect a change in form to create a change in function. Manifestations of radicular symptoms in this pathology seem to originate in the degree of nerve root sensitivity. With a healthy, nonaggravated nerve root, the bony changes of DDD seem to be asymptomatic⁽¹²⁾. However, if the nerve root's blood supply is compromised, it has been found that sensitivity increases⁽⁹⁾. Oxygen availability influences nerve root health; therefore, hypoxia may also further increase sensitivity⁽¹²⁾. How, then, do involved nerves become hypoxic? Most often it results from trauma (violent or repetitive), and faulty posture may play a major role. In any case, treatment then needs to be primarily focused on improvement of blood flow in the area⁽⁹⁾, which may be aided by improvement to postural impairments.

Treatment of Cervical Degenerative Disc Disease

The most effective evidence-based treatment for cervical DDD presently eludes scholarly research. There are sources suggesting the need for further research; particularly for randomized clinical trials^(5,7).

This is specifically the case for complementary and alternative medicine (CAM). Massage therapy, chiropractic, physical therapy, self-care, and the use of analgesic medication are among the most common conservative management strategies; whereas, in some cases, surgery is required. However, since there are no currently published treatment guidelines⁽¹²⁾, the question then becomes: Where does treatment start?

Indisputably, many clients suffering from cervical DDD are motivated to seek out CAM⁽¹³⁾; chiropractic care is a common treatment choice⁽¹⁴⁾. Efficacy studies, testing impingement site manipulation and mobilization, suggest that regardless of the grade of joint play applied, it is surrounding soft tissue which benefits the most from this treatment⁽¹⁵⁾. The goal of chiropractic care in the efficacy studies was to recreate room between bony structures to allow proper circulation and nutrition of spinal nerves. This modality seems to decrease pain and disability, and to increase ROM⁽⁷⁾.

Traction of the cervical spine is another conservative treatment modality for DDD. There are numerous forms of traction, applied with various amounts of force. By creating space in the spine for compressed nerves, symptoms should decrease. Some studies suggest traction benefits are physiological and include the release of restricted muscle and fascia, increased circulation to the area, neural decompression and stimulation, reduction of pressure on the discs nucleus pulposus, and increased intervertebral foraminal space^(9,16,17). Another study suggests the benefits of cervical traction are more psychological⁽¹⁷⁾. Evidence is lacking for the efficacy of this modality and, due to poor methodological quality of trials, systemic reviews are inconclusive⁽¹⁷⁾.

Exercise has also been studied as treatment for cervical DDD⁽¹⁸⁾. This has similar results in CLBP. Postural awareness, in combination with some other modality like massage therapy, physiotherapy or chiropractic, has been found to be more effective than individual treatments^(5,8,11,18-20).

Massage Therapy

Though there remains no standardized treatment for DDD, it has been recognized that both physical therapy and massage therapy do provide relief for some patients⁽³⁾. Some applicable techniques of therapeutic massage include joint play, and soft-tissue and fascial release, in addition to direction regarding exercise and self-care. Self-care may include applicable stretching and relaxation techniques for each individual DDD case, based on client's symptoms and most aggravated sites. Thomson et al.⁽²¹⁾ emphasize the importance of relaxation education about pain management, because symptomatic clients suffer tension specifically in the neck and shoulder girdle. Lowe⁽²²⁾ suggests massage therapy can ease the elevated muscle resting tension that

cervical pathologies may create. One study suggests that massage therapy as a treatment option showed to be more effective at decreasing disability than exercise⁽¹⁴⁾. Another study affirms the use of massage therapy as a safe treatment option for chronic neck pain sufferers, also suggesting that more research should be done⁽²³⁾. The purpose of this case report is to explore the value of massage therapy in the treatment of cervical DDD for a symptomatic, elderly female client.

METHODS

Profile of Client

A 66-year-old recently retired female client presented with chronic neck pain and had an MRI-confirmed diagnosis for cervical DDD. Most DDD changes were found at level C6/C7 with advanced changes (osteophyte development on facet joint) occurring on the left side. The client’s symptoms were chronic neck pain, accompanied by radicular left upper limb pain, which suggests other cervical level involvement. These were causing her limited painful cervical ROM and pain with heavy lifting. Client complained of muscle pain and fatigue in the left side of her neck traveling into her shoulder. She found that these symptoms were interfering with her activities of daily living (ADLs).

The client reported having difficulty carrying a purse on her left shoulder. She described her pain as insidious in onset, achy and deep. On a subjective pain scale where 0 is no pain at all and 10 is the worst pain imaginable, the client rated her pain at best 5/10 and at worst 7/10. Upon intake, the client felt her pain was worsening. Although she had been taking Celebrex for osteoarthritis in lower limbs, the onset of neck symptoms prompted the addition of over-the-counter NSAIDS to her self-management. Client reported ongoing chiropractic care every six weeks for over two decades, wherein treatments remained constant and provided some relief. Heat, cold, and rest have been used effectively as home care for pain management. The client’s goals were to reduce pain in her left shoulder and neck. She also wished to carry a purse without pain.

Assessment results showed a general guarding of neck movement. The client had a positive cervical compression test which reproduced familiar pain down the left side of her neck. A summary of the client’s initial ROM testing can be found in Table 1.

Treatment Plan

One-hour treatments for this client occurred bi-weekly over the course of five sessions. Sessions were divided into approximately 45 minutes of therapy and 15 minutes of discussion.

TABLE 1. Initial Range of Motion Testing Results

<i>Glenohumeral ROM Testing Results</i>	<i>Cervical ROM Testing Results</i>
- pain with left passive extension at end range	- limited cervical active extension at 25°
- all other motions right and left (active, passive and isometrically resisted within normal limits)	- limited cervical passive extension at 40°
	- limited and painful cervical active left lateral flexion at 20°
	- limited cervical active right lateral flexion at 20°

Pretreatment Assessment

Each session began with an assessment of the client’s progress. Two markers of progress were used: pain-free cervical ROM (assessed visually⁽²⁴⁾ pre- and post-treatment each session), and a subjective verbal pain scale⁽²⁵⁾ (assessed at client intake and following the five-session treatment plan). Typically in treatment of chronic pain, the ultimate goal should be to improve the level of function⁽²⁶⁾. However, in this case, bony blocks in the cervical spine may have been impeding end-range cervical motion, and the client’s primary concern was to have pain relieved; as such, it seemed that subjectively measuring her pain level was a responsible way to assess progress. Cervical ROM was assessed actively and passively, and resisted isometric tests were performed. Client was asked to rate her level of pain from 0–10. Before beginning on-table treatments, results from the last session were evaluated. The client was asked how long previous treatment results lasted in days, if there was a change in the need of NSAIDS for pain, any restrictions in activity level noticed between treatment sessions, and if self-stretching protocol was adhered to. (Self-stretching protocol listed below in post-treatment assessment.)

Treatment

On-table treatments began with ten minutes of work to upper back and shoulders done with the client in prone position. Work here included fascial techniques⁽²⁶⁾ intended to reduce adhesions in shoulder girdle muscles. The goals were to improve ROM in the glenohumeral joint and to increase proprioception responses in the shoulder and arm affected by radiculopathy. Treatment progressed into sweeping longitudinal strokes and neuromuscular techniques⁽²⁶⁾ on the same area to enhance relaxation and promote fluid movement throughout upper back and shoulders. Because muscles have developed waste products, which are chemical irritants to the surrounding tissues (including close proximity fascia), facilitating fluid

movement is an important aspect of treatment⁽¹⁷⁾. These waste products are a result of the adhesions developed between the cervical vertebra and around the nerve root resulting from the DDD itself⁽²¹⁾. Massage therapy in sweeping longitudinal strokes following along lymphatic watersheds can help promote a drainage of these waste products⁽²²⁾.

Following this, bilateral long axis oscillating leg traction was done for one minute each. Treatments continued with the client in supine with a warm towel at the neck intended for relaxation. Bilateral long axis-sustained leg traction was done for an additional one minute each. Upper limbs were treated for ten minutes total with both fascial techniques, to lengthen connective tissue and neuromuscular techniques, to stimulate relaxation. The intended outcome, in keeping with the gate theory of pain, was to locally stimulate large fiber cutaneous afferent neurons so as to override the sensation of pain^(19,26).

The final twenty minutes of on-table treatment concentrated on the client's neck. Sustained low-grade cervical traction allowed the discs to separate, in an attempt to increase circulation of nutrients and oxygen to nerve roots in the neck^(9,16,20). The disc itself receives nutrients through circulation of fluids. With chronic pain, movement and muscle guarding tend to decrease the fluid circulation to the area most affected. Therefore by imposing movement through traction, nutrition is aided to the degenerative altered areas⁽²¹⁾. Both sides of the neck and along the clavicles then received fascial techniques. This was to facilitate lengthening of shortened structures along the anterior neck triangle to encourage proper head posture. Neuromuscular techniques were applied to the area to aid relaxation and fluid movement and reduce muscle resting tension. Reducing resting tension in the cervical muscles allowed for greater ROM in related cervical facet joints.

In later treatments, positional low-grade cervical traction was conducted. The head was placed in slight flexion (5°–10°) and slight right rotation (5°–10°), then gentle traction was applied. The intention of this was to create an optimal position for the most compressed nerve root⁽⁹⁾ which, in this case, was away from the left C6/C7 osteophytic facet joint. Further joint play was done on each individual cervical vertebrae (lateral/lateral glides and anterior/posterior glides) to bring nutrients to the joint and joint capsule, and to decrease pain⁽²⁷⁾. In the remaining minutes of treatment, suboccipital muscles were released bilaterally using specific compression. Facilitated stretching further relaxed the muscles of the neck. A final high-grade neck traction was conducted until tissues were comfortably stretched (in accordance with basic instruction)⁽²⁷⁾.

Post-treatment Assessment

Each session ended with a post-treatment discussion, which included review of self-stretching

techniques for the lateral neck flexors and the suboccipital muscles. Suboccipital muscles are relevant in neck tension where forward head posture is a factor⁽¹¹⁾. Forward head posture was assessed with a basic postural analysis. Cervical ROM was tested post-treatment to assess for changes in pain-free range. Reassurance was given that, with proper management, the client's painful condition could improve. One study indicates that this guidance has a positive impact on patient outcome⁽¹¹⁾. As has been noted, in cases where the nerve root is nonaggravated, the bony changes of DDD can be asymptomatic⁽¹²⁾. Therefore by continuing to promote space between the discs and nutrient flow to the nerve roots through movement, the pain level of DDD should improve. Providing the client with this sense of hope can increase their adherence to postural improvement and treatment options.

RESULTS

Pretreatment Assessment – Change Over Course of Care

Biweekly, over the course of five sessions, the client's pretreatment pain free active ROM experienced a gradual increase. The client's pain free pretreatment passive ROM also showed a gradual increase. Her pretreatment isometric resisted ROM experienced no change over the five sessions. Results are shown in Table 2. Client's initial verbal pain rating was given as 5/10 at rest and 7/10 at flare.

Post-treatment Assessment Change Over Course of Care

The client displayed a gradual increase in pain-free cervical ROM. The most significant increases were seen in lateral rotations and extension. These results are listed in Table 2. Client showed a gradual decrease in both resting pain and flare-up pain levels over the course of treatments. By the end of her treatment sessions, the client rated her pain as 2/10 at rest and 5/10 at flare. Her level of pain decreased over the course of five sessions, and the client reported discontinued use of NSAIDSs. Weather was always reported as a factor in the client's comfort level between treatments. The client reported an increased ability to function with reduced pain in her ADLs. She had suggested an optimistic outlook pertaining to her condition and throughout five sessions adhered to her stretching regime.

DISCUSSION

Cervical DDD is particularly problematic when irritated nerve roots cause persistent adverse symptoms and, as a result, many patients seek alternative care.

TABLE 2. Marker of Progress Comparison of Pre- and Post-treatment Cervical Range of Motion Testing

	Session 1		Session 2		Session 3		Session 4		Session 5	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Active										
Flexion	WNL	WNL	WNL	§	WNL	WNL	WNL	WNL	WNL	WNL
Extension	25	30	35	§	20	25	25	30	30	35
Left Lateral Rotation	40	40	40	§	30	30	30	35	60	60
Right Lateral Rotation	40	40	40	§	30 ^a	30	30	35	60	60
Left Lateral Flexion	20*	30	25	§	15	15	10	15	10	20
Right Lateral Flexion	20	30	25	§	20	20	15	15	15	20
Passive										
Flexion	WNL	WNL	WNL	§	WNL	WNL	WNL	WNL	WNL	WNL
Extension	40	WNL	40	§	WNL	WNL	WNL	WNL	WNL	WNL
Left Lateral Rotation	45	WNL	WNL	§	WNL	WNL	WNL	WNL	WNL	WNL
Right Lateral Rotation	45	WNL	WNL	§	WNL	WNL	WNL	WNL	WNL	WNL
Left Lateral Flexion	30	WNL	30	§	WNL	WNL	20	WNL	30	30
Right Lateral Flexion	30	WNL	30	§	WNL ^a	WNL	25	WNL	30	30
Isometrically Resisted	WNL	WNL	WNL	§	WNL	WNL	WNL	WNL	WNL	WNL

^a = painful; WNL = within normal limits; § = not done due to time constraints. All values recorded in degrees.

Because of the variety of available treatment options, patients will often have difficulty deciding which is the right choice for their personal circumstance. Carrette and Fehlings⁽¹²⁾ suggest treatment goals should aim to reduce pain, improve neurological health, and teach awareness about maintenance and prevention, all of which massage therapy has historically shown to do for CLBP⁽¹⁹⁾. Therefore, it follows that similar effects could be achieved in the cervical region.

Certainly, in this case, the client experienced a decrease in her level of pain throughout treatment sessions of massage therapy. Cervical traction appears productive in promoting nerve root health. This client's pain-free ROM increased in all ranges. Even her lateral flexion, which showed a decrease in degrees, was done completely pain-free at the end of five sessions. Her overall pain rating decreased from a resting 5/10 down to a 2/10 and her need for NSAIDs decreased. It seems that massage for this client reduced elevated resting tension and promoted general relaxation.

One study suggests that ongoing preventative nonsurgical care for DDD can stop or reverse symptoms⁽⁴⁾. Strong recommendations were given to this client to obtain and use a home cervical traction unit to maintain space between spinal discs. She was provided with a written stretching plan, detailing and illustrating lateral cervical stretches and suboccipital stretches. A discussion was had with the client reviewing the importance of postural awareness, with the aim of preventing future irritation of nerve roots. Massage therapy has not, as yet, been effectively

studied in randomized controlled trials as a treatment protocol for this condition⁽⁵⁾. Walton⁽²⁸⁾ would suggest that the discipline is waiting for conclusive evidence establishing the role of massage therapy in the treatment of cervical DDD.

CONCLUSION

Though this case report does successfully establish a modest positive treatment outcome for this particular client, without comparison data, it has obvious limitations. Another issue inherent in this case study involves the measurement of cervical ROM, which was done visually each treatment; Vizniak⁽²⁵⁾ would suggest conducting this measurement using an inclinometer or goniometer. In future studies, it would be interesting to know which massage technique(s) created the changes in the symptoms for the client, (neuromuscular, fascial, or cervical traction), although determining this may be challenging. The breathing patterns of the client should have been investigated more thoroughly for the purposes of this case study. Upper-chest breathing would lead to shortened accessory breathing muscles⁽²⁶⁾ and could lead to an increase in improper posture, which could aggravate the clients condition. Educating the client in diaphragmatic breathing should be emphasized in future studies.

Without the foundation of previous research on the efficacy of massage therapy as a treatment protocol for cervical DDD, creating a comprehensive treatment

plan is a dynamic process. It must be based on sound, dynamic communication between client and therapist. A thorough understanding of the individual's condition should back the treatment. Fundamental questions should revolve around the effectiveness of treatments for each individual client and whether goals have been measurably achieved. It does appear in this case that massage therapy had positive effects on symptomatic cervical DDD. This case study informs future research on the subject.

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CONFLICT OF INTEREST NOTIFICATION

The authors declare there are no conflicts of interest.

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