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CLINICAL VIGNETTE

Non-Operative Patient-Centered Integrative Approach to Cervical Radiculopathy

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Case

A 35-year-old male with chronic neck pain was referred to East-West Medicine (EWM) for neck pain with right-sided radiculopathy. He had an episode of similar right-sided cervical radicular pain in 2010-2011 that was self-limited and improved with conservative care over a few weeks.

In the fall, he developed neck pain with right-sided radiculopathy. This was more severe than his prior episode, without known inciting event or trauma. The right-sided neck pain ranged from 7-9/10 on VAS (visual analog scale) associated with radiating paresthesias down his arm to his fingers and significant restriction in cervical range of motion (ROM). The pain worsened with lateral rotation of the neck and abduction/forward flexion of his right shoulder.

He presented to his primary care provider three weeks after symptom onset and evaluated with cervical x-rays, moderate C4-C7 foraminal narrowing and he was treated with high dose of NSAIDs, gabapentin, methylprednisolone dose pack and referred to physical therapy. Cervical MRI one month later showed C3-C5 right-sided disc osteophytes with severe right foraminal stenosis as well as C6-C7 right-sided disc protrusion causing severe right foraminal narrowing, and likely C7 nerve impingement. He was evaluated by physical medicine and rehab (PMNR) and after completing several weeks of physical therapy and high doses of gabapentin 900mg TID, 600mg ibuprofen TID, cyclobenzaprine 10mg TID, without significant relief. A C6-T1 cervical epidural steroid injection (ESI) provided less than 25% improvement. Given continued pain, he had a repeat cervical ESI (C7-T1, with catheter advancement to C6-C7) 3 weeks later with less than 50% improvement in the baseline pain.

Due to the lack of effective symptom management, he was evaluated by neurosurgery who recommended surgical intervention if he fails to improve. His symptoms persisted and three months after onset with the goal of improving symptoms and avoiding surgery. At the time of CEWM presentation, he continued to have significant right-sided radicular neck pain with lateral movement of the neck or abduction/forward flexion of the right shoulder.

On physical exam he had significant cervical and shoulder muscle spasm, with multiple active myofascial trigger points.

An integrative approach was taken to assess other contributing factors. He worked at a legal office with over 60 hours/week of computer work with poor ergonomics. He slept about 5 hours per night, with significant work-related stress. He did not have proper stress management techniques, and no longer exercised due to the pain. At the end of the first visit, trigger point injections (TPIs) were provided for the myofascial strain component of the right neck/shoulder, and acupuncture therapy provided for both cervical radiculopathy as well as chronic stress. Lifestyle modifications and self-care routines were discussed. Specifically, improving ergonomics at work, stretching, improved sleep hygiene with the goal of 8 hours per night, and magnesium citrate powder to assist with sleep were recommended. His diet was highly processed and pro-inflammatory. He was educated on an anti-inflammatory diet, along with initiation of alpha lipoic acid. Finally, he was encouraged to continue with physical therapy twice per week, which had provided mild benefit for cervical ROM.

He was seen back the following week with repeat TPIs and acupuncture performed. Further discussion centered on improved stress management and educated on how stress can hasten cervical myofascial spasm. Restorative practices including deep breathing, acupressure, and a mind body exercise called Qi gong were introduced. He was instructed to use a transcutaneous electrical nerve stimulation (TENS) unit several times a week for pain management as well as utilizing the TENS over specific acupuncture points targeting his radiculopathy from a Traditional Chinese Medicine (TCM) perspective.

By the third visit, he reported about 25% improvement in right cervical radicular pain. Due to the work constraints, he could not continue weekly treatments at the EWM office; thus, resources were provided for him to continue weekly acupuncture with a community acupuncturist. He continued to be seen every three weeks in the office for TPIs and supplemental acupuncture. During this time, he improved his work ergonomics, continued weekly physical therapy, use of the TENS unit, magnesium supplementation, changed his diet, and increased his sleep to an average of 8 hours nightly. He had embraced decreasing work stress with the incorporation of Qi gong, meditation, deep breathing and decreasing his workload in the office with significant improvement in his mood.

At the sixth visit (3/2021), he had resolution of the right-sided cervical radiculopathy, and full ROM of his right shoulder without eliciting radicular pain or right upper extremity paresthesias. He had about a 75-80% improvement in his baseline cervical neck pain and was no longer routinely taking any of his prior medications routinely. Given the significant improvement, his care was transitioned to a maintenance regimen. Visits were spread to monthly; he completed PT, and decreased community acupuncture to twice monthly, while continuing the self-care and stress management strategies. Currently, he is eighteen months from the initial onset of symptoms and while he has small flares of cervical neck pain they are easily managed and treated without re-occurrence of his cervical radicular symptoms.

Discussion

Most cases of cervical radiculopathy arise from degenerative compressive etiologies. Cervical spondylosis and disc herniation are the two predominant mechanisms and the focus of this discussion.¹ Cervical radiculopathy from spondylosis is caused by mechanical compression and inflammation of cervical nerve roots, most commonly C5-C7.^{2,3} Cervical radiculopathy is often described as neck pain accompanied with radiating pain and neurological symptoms such as numbness, muscle weakness and diminished reflexes in one or both upper extremities.⁴ Exam findings include diminished deep tendon reflexes and positive provocative spurling test, shoulder abduction test, and upper limb tension test to confirm diagnosis.² Imaging is not initially required unless trauma, persistent symptoms greater than 4 weeks, or red-flag symptoms for infection, malignancy or abscess are present.² Plain radiographs of the cervical neck are useful for ruling out instability, but are non-specific with 65% of asymptomatic patients having cervical degenerative disc disease regardless of radiculopathy symptoms.² MRI is indicated in patients with complex radiculopathy defined by: high suspicion for myelopathy, any red flag symptoms, progressive neurological findings, or failure to improve after 4-6 weeks of conservative treatment.^{2,5} While there is insufficient evidence to support routine use of electro diagnostic testing, electromyography does have clinical utility when differentiating between peripheral or upper extremity neuropathy.³

Various treatment algorithms have been created for cervical radiculopathy. For non-complex cervical radiculopathy a large majority will improve with time in conjunctions with conservative options.⁴ Non-operative treatments include immobilization, physical therapy, traction, acupuncture, medications and cervical steroidal injections. High quality studies are lacking, given the wide variety and stylistic differences in conservative therapies. Despite low quality of evidence from Cochrane reviews, a multitude of randomized control trials (RCTs) support twice weekly physical therapy for symptom management in cervical radiculopathy.^{6,7} Similarly, numerous RCT involving traction, brief immobilization with cervical orthosis, acupuncture, myofascial massage, and oral analgesics have reduced pain and improved outcomes.^{2,3}

Patients with cervical radiculopathy most commonly experience pain with reduced cervical range of motion along with cervical muscle spasm on exam. The cervical myofascial strain/spasm can lead to further compression of the cervical nerve root leading to increased symptoms, pain and possible delayed recovery.⁸ Cervical radiculopathy potentiates an increase in active myofascial cervical trigger points, with ample studies showing trigger point injections to be one of the most effective treatments to inactive trigger points and provide relief from myofascial symptoms.^{9,10}

Stimulation of acupuncture points release neurotransmitters such as serotonin, oxytocin, and endorphins in the CNS as well as provide improved stress regulation, pain management and localized muscle relaxation.^{11,12} More recent research, supports frequent acupuncture modifying pain and inflammation by promoting endogenous opioids while reducing pro-inflammatory cytokines such as tumor necrosis factor, interleukins and prostaglandins.¹² Large Cochrane studies show limited evidence for acupuncture in cervical radiculopathy. The main limitations rise are the size of RCTs, varying style of acupuncture, and reporting. Many smaller RCTs have shown the efficacy of acupuncture on cervical radiculopathy, possible assistance with regression of herniation, and acupuncture is currently supported by the evidence-based treatment guidelines from the Council of Acupuncture and Oriental Medicine^{8,13,14} for cervical radiculopathy.

Cervical Steroidal Injections (CSI) have wide been used for refractory radiculopathy usually over 4 to 6 weeks with the goal to reduce inflammation at the nerve root, block C fiber activity at the dorsal root ganglion and reduce nociceptive input from somatic nerves.⁴ Similar to aforementioned therapies high quality evidence in support of CSI for cervical radiculopathy is sparse. A 2007 Cochrane review found low quality evidence to support the use of CSI with chronic cervical radiculopathy.¹⁵ However, more recent systemic reviews and RCTs show benefit in pain and function for up to one year for patients with cervical radiculopathy who had not improved with more conservative therapies and medications.¹⁶ CSI should be considered for non-complicated refractory cases of cervical radiculopathy, but given the higher risk of complications other complementary and alternative medical should first be considered.

This clinical case of a patient suffering from acute right-sided cervical radiculopathy with persistent symptoms despite initial conservative medication and therapeutic interventions. While retrospective case series estimate about 80% of non-complex cases of cervical radiculopathy will improve within 4-6 weeks of conservative treatment, the dilemma arises when symptom control is not easily achieved.² The optimal surgical timing for recalcitrant cases without red flag symptoms or progressive neurodegenerative symptoms such as atrophy and myelopathy are lacking.^{2,17}

For our patient, we used a multi-modal person-centered Integrative East-West Medicine approach for symptom management and treatment. Many integrative therapies were

utilized simultaneously. The patient was encouraged to continue supported complementary and alternative therapies including physical therapy and massage. Trigger point injections were utilized for concomitant cervical spasm and active trigger points, which after a few treatments provided improved cervical range of motion and decreased pain. Specific acupuncture points were utilized to assist with pain and inflammation.

More important, was to broaden the approach from just a pain and acupuncture clinic to approach the patient holistically. A patient centered integrative history was employed with a comprehensive history and physical examining: past medical history, previous injuries, diet, psychological/emotional stressors, exercise routine, sleep, medications, supplements, and work ergonomics. This data was synthesized to address the variety of contributing factors in the context of the whole person. Acute stress can cause increased muscle tension through the up regulation of the sympathetic nervous system with the usual release of the tension when the stressor passes.¹⁸ Chronic prolonged stressors also played a role. Extraneous work hours, a hostile work environment, lack of adequate sleep, and poor resilience for mitigating stressors lead to constant myofascial tension leading to muscle spasm/strain and the development of active trigger points.¹⁹ Focus was placed on stress mitigation with improvement in his sleep, work hours, and the incorporation of restorative practices such as Qi gong, acupressure, and meditation to combat stress and its effect on myofascial tension. From a TCM perspective focus was placed on the importance of 7-8 hours of sleep nightly, which allows the body to potentiate intrinsic healing mechanisms and replete deficiencies that lead to symptoms.

The initial identified over 60 hours of computer work weekly with poor ergonomics. Current literature reports poor ergonomics and sedentary computer-intensive jobs have a higher incidence of neck pain.²⁰ Sustained poor ergonomics can lead to forward head posture, which can increase incidence of cervical degenerative disease and spondylosis. RCTs have shown correction of forward head posture decreases dermatomal somatosensory evoked potentials from C6 and C7 nerve roots and improve pain and nerve root function in lower cervical radiculopathy.²¹ A thorough evaluation of workstation was discussed, with guidance on improved ergonomics, posture, routine stretching, and acupressure massage to assist with the cervical myofascial component of the radiculopathy.

Lastly, focus was placed on his diet that was shifted from a highly pro-inflammatory processed diet to an anti-inflammatory diet high in antioxidants, omega fatty acids, ginger and turmeric. Magnesium has been well documented to assist with insomnia, muscle cramps/tension, and anxiety with research reporting that hypomagnesemia increases pro-inflammatory cytokines and propensity toward oxidative stress.²²⁻²⁴ Magnesium was added to assist with poor sleep and cervical strain, which was effective in our patient. Alpha lipoic acid (ALA) a potent antioxidant was also recommended as recent studies have shown ALA can reduce pain, paresthesias and numbness in patients with compressive radiculopathy.²⁵

Prior directed treatments and medications had failed to provide substantial relief for our patient. Given the recalcitrant nature of his cervical radiculopathy for over 4-6 weeks, MRI findings, and significant pain a surgical intervention could have been offered. However, by employing a more holistic patient-centered integrative model additional contributing factors were detected and treated allowing for the de-escalation of all analgesic medications and resolution of his cervical radicular and myofascial pain within three-months.

Conclusion

Population based studies identify 80 to 90% of adults over 50 have disk degeneration on MRI.^{26,27} A 2015 review of the global burden of low back and neck pain estimated more than a third of a billion people worldwide had mechanical neck pain of at least 3 months duration.²⁷ While cervical radiculopathy has estimated annual U.S. incidence of approximately 83 per 100,000 people, the incidence is expected to rise as the population ages, along with increasing sedentary computer intensive desk jobs with significant global health implications.¹⁷ Finding non-surgical or opiate-based regimens for non-complex cervical radiculopathy is imperative. This case illustrates complementary alternative therapies, along with a comprehensive patient centered integrative approach, can be a successful to treat and improve the quality of life of a patient suffering from cervical radiculopathy.

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