



Chiropractic spinal manipulative treatment of migraine headache of 40-year duration using Gonstead method: a case study

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Abstract

Objective: The purpose of this article is to present a case study of chiropractic spinal manipulative treatment (CSMT) using the Gonstead method for a patient with migraines.

Clinical Features: The patient was a 52-year-old married woman with a long-term history of chronic migraines, which included nausea, vomiting, and photophobia. The patient had endometriosis, but did not relate the migraines to her menstrual cycles. She also reported not using medication for her migraines due to previous drug-related issues. The average frequency of episodes before treatment was 1 per month, and her migraines often included an aura. The pain was moderate, was located on the right side, was pulsating, and lasted for approximately 15 hours. The numeric pain scale for an average episode was 8 out of a possible 10. The aura involved nausea, photophobia, and visual disturbances including black dots in the visual field lasting for approximately 10 minutes.

Intervention and Outcome: The patient reported all episodes being eliminated following CSMT. At 6-month follow-up, the patient had not had a single migraine episode in this period. The patient was certain that there had been no other lifestyle changes that could have contributed to her improvement.

Conclusion: This case adds to previous research suggesting that some migraine patients may respond favorably to CSMT. The case also provides information on the Gonstead method. A case study does not represent significant scientific evidence in context with other studies conducted; this study suggests that a trial of CSMT using the Gonstead methods could be considered for chronic, nonresponsive migraines.

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Introduction

Migraine is a common, burdensome, and disabling disorder that increases throughout childhood and early adult life until approximately the age of 40 years, after which it declines.¹ In 2005, The American Migraine Prevalence and Prevention center calculated that as much as 35 million of the US population had migraine.¹ Previous studies show that 6% of men and 18% of all women experience migraine.^{1,2} Migraine has a higher prevalence in Europe and Central/South America, with North America having the highest prevalence and Africa and Asia showing the lowest prevalence.^{1,3} Lipton et al² found the prevalence of migraine to be related to socioeconomic status, showing that those with a high income and education had a lower number of people with migraine.^{1,2} In 2005, Lipton and Bigal⁴ found the annual cost for society to be \$25 billion in lost productivity each year in the United States.

According to The Headache Classification Committee of the International Headache Society (IHS), *migraine* is defined as headache in a unilateral location, with a pulsating quality and moderate to severe intensity that is aggravated by routine physical activity. The patient must also experience nausea and/or vomiting, photophobia, and/or phonophobia.⁵ The migraine also cannot be attributed to another disorder listed in groups 5 to 11 of their classification system.⁵ Migraine can be further divided into migraine with aura and migraine without aura.⁵ The IHS defines *aura* as a complex of neurological symptoms occurring before or with the migraine attack.⁵ The symptoms of an aura vary greatly; common symptoms can be alternation in vision, sensation, and speech.⁵ Other symptoms can be unilateral hyperesthesia and/or numbness.⁶

Several studies have assessed chiropractic spinal manipulative therapy (CSMT) as a therapy for migraine.⁶⁻¹⁴ The evidence includes 3 systematic reviews,^{7,15,16,17} 2 randomized controlled trials,^{6,9} a controlled trial,¹⁰ and 3 case studies.^{8,11-13} These studies suggest CSMT to be effective in treating migraineurs.

Ninety-one percent of chiropractors report using the diversified technique.¹⁸ The Gonstead method is the second most commonly named system technique used by chiropractors (59%).¹⁸ Both the Gonstead method and the diversified technique focus on high-velocity, low-amplitude (HVLA) thrust; however, there are some points of difference. Both the diversified technique and the Gonstead method focus on manual chiropractic adjustments. Unlike the diversified styles, Gonstead releases from the adjustment slowly.¹⁹ Both diversified

and Gonstead evaluation procedures include history taking, visual inspection, physical examination, and static and motion palpation. Gonstead evaluation typically includes static and dynamic (stress) radiography and instrumentation (primarily thermography), with the last 2 distinguishing itself from the diversified technique. Gonstead practitioners apply short lever forces in an attempt to correct the vertebra posterior to anterior, as they believe the posterior component of spinal misalignment to be the most important part.¹⁹ The correction is directed through the parallel of the disk plane. The least important of spinal misalignments according to Gonstead tradition is rotation. Gonstead technique focuses on minimizing the rotational component in adjustments as well as minimizing the intersegmental pretension before the adjustment.

Although there is evidence supporting CSMT for migraineurs, there is limited research using the Gonstead method. One previous case report has indicated a reduction in headache and migraine in patients with temporomandibular disorder and atlas fixations following CSMT using the Gonstead methods.²⁰ The limited numbers of high-quality studies that include large sample size and control groups as in randomized controlled trials stress the importance of continuing to do research on the effect of CSMT in patients with migraine. The purpose of this case study is to discuss a chronic, nonresponsive patient with migraine headache receiving CSMT using the Gonstead methods.

Case report

A 52-year-old, 65-kg white woman who had never previously received CSMT had a 40-year history of chronic migraine with aura. She reported the migraine to be present from her teenage years, with a slight decrease in frequency in the 10 years before seeking chiropractic care. The patient did not recall any specific episode, incidence, or trauma that resulted in her migraines. However, the patient recalled a fall from a small brick wall, as well as fracturing her right wrist in her teenage years. The patient reported that she had not undergone any operations. The patient reported a family history of migraine, which included her mother experiencing migraine with aura.

For the 2 years before seeking chiropractic care, the patient's headaches occurred approximately once a month. The pain was moderate, was on the right side, was pulsating, and lasted for approximately 15 hours. The numeric pain scale score for an average episode

was 8 out of a possible 10. Her migraines had a higher intensity, frequency, and duration in her 20s compared with menopause, which started in her early 50s. The patient described her visual disturbance aura to include black dots in the visual field lasting for approximately 10 minutes. The aura was, however, more intensive during her 20s compared with that during her 50s. She believed that she had learned to cope with the migraine better as she grew older, which had resulted in the decreased intensity and duration. The patient also experienced nausea and photophobia. She reported no other disorders that could be related to her migraine attacks. She had endometriosis and took nonsteroidal anti-inflammatory drugs prior when she was menstruating to relieve pain. However, she had never been able to link the menstruation pain to her migraine headaches, which normally came on during emotional and physical stressful situations, or to increased sound or flashing lights. The patient denied any food triggers. To relieve the migraine, the patient had to seek a quiet dark room, vomit if necessary, and also avoid strong odors. The patient was a dramatic adviser by occupation and performed varied types of work activities. Because of family history of drug abuse, the patient rejected medication use for her migraines as a treatment option; and she did not take natural supplements. The patient also reported not receiving any other forms of physical treatment, except for being monitored by her general practitioner.

Physical examination demonstrated reduced cervical range of motion (ROM), especially right cervical rotation. Results of the cervical Spurling compression test and slump tests for neural tension were both negative for pain.²¹ Results of motor function testing (C2-T1) and deep tendon reflex testing (C5-C7) were normal and symmetrical. Dermatome testing (C2-T1) showed normal and symmetrical sensibility. Result of cranial nerve testing of III, IV, and VI was also normal and symmetrical. Spinal palpation revealed segmental joint dysfunctions with decreased ROM at multiple levels in the cervical vertebrae (C2, C6), thoracic vertebrae (T2, T4), and lumbosacral junction (L5, right sacroiliac joint) with minimal (minimal-moderate marked classification) tenderness on the spinous process of cervical vertebrae C2 and C6 and lumbar vertebra L5. Further physical examination revealed her neck muscles to be tender and hypertonic, especially the levator scapula, trapezius, and suboccipitals muscles bilaterally. Her blood pressure was normal (129/84). No other vital signs were tested. Based on the IHS classification, the patient was diagnosed with migraine with aura (migraine with aura, category 1.2).

Radiographic examination was performed to evaluate her posture, joint and disk integrity, and vertebral position and to rule out any pathology. Full-spine radiographs (anterior-posterior and lateral film) were taken in the standing, weight-bearing position to fully substantiate the examination findings. The radiograph showed marked reduction in the cervical lordosis. There was a minor discogenic spondylosis (minor-moderate marked classification) at the intersegmental disk space of C6-C7 and minor discogenic spondylosis at lumbosacral disk space at level L5-S1. No other abnormalities were detected.

Chiropractic treatment was conducted 11 times over a 9-week period where she experienced a gradual progressive relief in her migraine headaches, which resolved after 9 weeks. Treatment included CSMT and a specific-contact HVLA adjustment applied using the Gonstead method.²² The initial 5 treatments concentrated on the thoracic vertebra subluxations (T2 and T4) with an improvement in ROM and decreased tenderness along the levator scapula bilaterally. The patient had no migraines during the first 3 weeks. Further treatment focused on improving joint functions in cervical vertebra C6 and lumbar vertebra L5 using HVLA adjustments. Further improvement in ROM and reduced tenderness along the levator scapulae were noted during the next 3 weeks. She did however experience premonitory symptoms 5 weeks into the treatment that lasted for approximately 10 minutes, including nausea, blurred vision, and photophobia.

The next 3 weeks focused treatment on improving joint functions at C2 and the right sacroiliac joint using HVLA adjustments. The patient noticed a marked improvement in cervical ROM and reduced tenderness along the suboccipitals muscles 5 hours after the first C2 adjustment. She also felt very tired that night. The following 2 weeks continued with a further improvement in cervical, thoracic, and lumbosacral ROM and marked reduction in cervical muscle tenderness; and the muscle hypertonicity had reduced. The patient recorded the frequency, intensity (numeric pain scale), duration, and time before she could return to normal activities for every migraine episode from when she started the treatment. By the final treatment, the patient reported a significant improvement in ROM, reduced muscle tenderness, and a feeling of general well-being and muscle relaxation; the subjective outcomes by the patient were confirmed by motion palpation. At 6-month follow-up, she still had not experienced another migraine attack. Motion palpation revealed normal spinal ROM, and her muscles

tonus had improved. The patient gave consent for the publication of this case report.

Discussion

Migraine is reported to involve nociceptive responses from the upper cervical spine and upper limb muscles, leading to a hyperactive state of the trigeminal pathway.^{23,24} Previous theories have focused on vascular causes and extracranial vasodilation being responsible in causing the migraine attacks.^{25,26} Now migraine can no longer be considered a vascular or a neurovascular disorder, but instead should be thought of as a disease mediated by the central nervous system.²⁶ Current theories on migraine argue that the trigeminal nerve that innervates the meninges affects pain-sensitive vascular structures in the dura mater, base of skull, and scalp that are involved in the migraine attack.^{23,27} It is thought to be a complex of nociceptive responses involving the upper cervical spine and upper limb muscles, leading to a hypersensitivity state of the trigeminal pathway that conveys the sensory information for the face and much of the head.^{23,24} These nerves pass through the trigeminal ganglion and synapses on second-order neurons in the trigeminocervical complex.²⁸

Other successful case studies on migraine have also demonstrated upper cervical complex adjustments to be beneficial in the reduction of migraine attacks.^{8,29} However, there is limited evidence supporting a specific chiropractic treatment. Although there is evidence suggesting involvement of the trigeminal complex in the upper cervical spine, the patient did not receive upper cervical spine CSMT initially because of a more severe spinal segmental dysfunction in the cervicothoracic areas, which had to be resolved. Some theories suggest that CSMT has a beneficial effect on the dorsal horn by stimulating mechanoreceptors and inhibiting nociceptors through the ascending spinothalamic tract.^{30,31} Possible mechanisms might be that the zygapophysial joints, intervertebral disk, and muscles all contain mechanoreceptors.³² An experimental study by Pickar and Wheeler³³ demonstrated that mechanoreceptors could be activated by spinal manipulation. Although the pathogenesis of migraine is complex and still developing, there seems to be adequate evidence to further investigate and hypothesize if the neurological pain pathway³⁴ and its close links between mechanoreceptors and nociceptors might be why CSMT has shown to be effective in patients who experience migraine headaches. Thus, the research is still devel-

oping and is far from clear; but further research will continue to improve our understanding.

Limitations

Case studies should not be generalized; however, they are important in developing clinical knowledge and generating inductive hypotheses.³⁵ Limitations of this report are that it is a case study, there was a limited follow-up period, and no pretreatment data were collected. The patient's improvement may have occurred through psychological factors, menopause, stress changes, etc. It is possible that the improvement was not due to CSMT and independent of the other factors. Research has recommended further studies on other chiropractic techniques in assessing the effect of CSMT on people with migraine.⁶

Conclusion

This case study shows that a patient with migraine headaches might respond to CSMT using the Gonstead method.

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