Cranial and Fascial Distortion Techniques Used as Complementary Treatments to Alleviate Migraine Headache: A Case Report

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Abstract

Migraine headaches are a common condition, affecting 37 million people in the United States according to the National Headache Foundation.[1] Traditional treatments for patients with migraines include pharmacotherapy, physical therapy and acupuncture. In this case, a 27-year-old female patient who reported experiencing chronic migraine for 3 years had not responded to standard pharmacotherapy that consisted of escitalopram, amitriptyline, topiramate, and sumatriptan. Magnetic resonance imaging and a neurology workup revealed no abnormalities or potential etiologies.

After receiving treatment based on osteopathic cranial manipulative medicine (OCMM) and the fascial distortion model (FDM), the patient reported immediate pain relief, as well as decreased frequency and severity of headaches.

The complementary application of OCMM and FDM is a new concept. The fascial tensegrity change brought about through FDM improves the chances of success with cranial treatments and vice versa. Combining these 2 approaches can be an effective treatment option for patients with chronic headache, which can have a profound impact on quality of life.

Introduction

Globally, 47% of adults have active headache disorders.[2] Headaches can have a huge effect on an individual's life, preventing participation in work, family activities, and activities of daily living. Treatment approaches for patients with headache include medications, physical therapy, manipulation, and acupuncture.

The National Headache Foundation defines migraine headache as a unilateral headache that lasts 4 to 72 hours that is accompanied by at least one of the following symptoms: nausea, vomiting, photophobia, and phonophobia.[1] Patients whose headaches have no identifiable cause may not respond to pharmacotherapy or other traditional treatments. Osteopathic palpatory diagnosis may reveal soft tissue abnormalities that contribute to or even cause migraine headaches. Osteopathic manipulative treatment may provide relief for these patients.

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Background

The fascial distortion model (FDM) is an osteopathic treatment model developed by Stephen P. Typaldos, DO, in the 1990s. Using body language, mechanism of injury, and subjective and objective findings, FDM can be beneficial in diagnosing and treating patients for virtually any musculoskeletal, neurological, or medical condition.[3] The fascial distortions, or dysfunctions, found in the patient in this case were continuum distortions (CDs), trigger bands, and herniated trigger points (HTPs).

A CD occurs in the calcium-driven transition zone between fascia and bone. The transition zone loses its ability to respond to external forces, essentially resulting in a steplike dysfunction until there is no movement in either transitional direction, causing a CD between the fascia and bone.[3] These distortions usually develop during a sudden change in motion, such as occurs with trauma. Treating patients for CDs involves applying direct pressure into that transition zone until a palpable release is felt.

A trigger band results when a disrupted linear band of fascia realigns abnormally, creating twists or kinks along the line of disruption.[3] Treating patients for trigger bands involves applying

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direct pressure along the band of tissue to release the twists, kinks, or—as is more common in chronic trigger bands—adhesions.

An HTP occurs when underlying tissue such as fascia or subcutaneous fat herniates through an adjacent fascial plane and becomes trapped.[3] Treatment involves applying direct pressure on the herniated tissue until it releases back into the proper fascial layer.

Case Presentation

A 27-year-old woman reported experiencing daily migraine headaches with phonophobia and photophobia for 3 years following an 8-year period of intermittent headaches. According to the patient, pain ranged from 4 to 10 on a 10-point verbal numerical rating scale. At its worst, the pain prevented the patient from going to work and performing basic activities of daily living.

During the patient's initial visit, she described her pain as nonradiating and her pain level as 7 out of 10. The pain was limited to the bilateral occipital region. The patient had previously consulted a neurologist, and she had been treated with escitalopram, amitriptyline, topiramate, and sumatriptan with no relief. A magnetic resonance imaging scan 1 year prior to the patient's initial visit revealed no abnormalities.

The patient's history included a fall at age 8 while tumbling in gymnastics in which the patient hit the back of her head on the mat, a backward fall at age 18 with resulting concussion, and an automobile accident at age 19 with whiplash injury. Other medical history was significant for ovarian cysts and Raynaud phenomenon.

Initial cranial palpation revealed a flatter-than-normal occiput, leading to a diagnosis of a compressed occiput with a cranial rhythmic impulse (CRI) of 5 with very low amplitude. The remainder of the osteopathic structural examination during the first visit revealed somatic dysfunctions in the cervical spine, thoracic spine, ribs, and sacrum. Multiple CDs were found on the occiput, with trigger bands bilaterally from the occiput to the sagittal suture.

After the patient underwent occipital decompression and compression of the fourth ventricle, her CRI remained at 5, but its amplitude increased appreciably. High-velocity, low-amplitude (HVLA) and muscle energy techniques were used on the remainder of the patient's dysfunctions. Reevaluation of the cranium revealed moderate improvement in CRI, which was now at 6.

The patient's occipital CDs were then treated based on FDM, which yielded immediate tissue-texture change in the cranium. The occiput and parietal bones immediately mobilized around the lambdoid suture. Treating the patient's trigger bands bilaterally resulted in further changes. When the cranium was reevaluated, the occiput felt full instead of flat, the CRI had risen to 9 with even greater amplitude, and the cranial rhythm was not dysfunctional. The patient reported that the pressure she normally felt around the occiput was reduced, and she scored her pain as 1 out of 10.

At the patient's first follow-up visit 2 weeks later, she reported that her headaches had decreased significantly. She had 9 consecutive days without headache. On the 10th day, she developed a relatively mild headache that she scored as 4 out of 10 and that persisted until her first follow-up appointment.

An osteopathic structural examination revealed dysfunctions in the cranial, cervical, and thoracic spine that were similar to those found during the previous visit, and the patient was treated using osteopathic cranial manipulative medicine (OCMM), HVLA, and FDM. Immediately after the patient's osteopathic treatment at the second visit, her dysfunctions were less severe, with approximately 50% less asymmetry than prior to treatment. CDs again were found in the patient's head, though they were smaller and in different locations than those found during the initial visit. The presence of fascial dysfunctions compromised the tensegrity in the musculoskeletal system, allowing some somatic dysfunction to persist.

At the third visit 3 weeks after the second, the patient reported that her headaches moved to the right side of her head with mild pressure in the medial right orbit instead of posteriorly at the occiput. The intensity of the headaches had abated to 3 to 5 out of 10, and they were occurring every 2 to 3 days. Osteopathic findings included an extended, sidebent right cranium with restriction in the right temporal bone and a CRI of 7. Small CDs were detected along the right temporal region.

Treatment included indirect cranial manipulation, temporal lift, and treatment of the CDs using FDM. The patient was also treated for a lacrimal HTP on the medial right orbit. After being treated, the patient again reported experiencing complete pain relief.

In another 2 weeks, the patient reported at her fourth visit that her headaches were occurring only once per week and that her pain intensity was 3 or 4 out of 10. Pain still occurred in the right temporal and right orbital regions. The patient also reported having tension in her neck during the past 2 weeks that she had not had before.

An osteopathic examination revealed that the patient's cranium was sidebent to the right and her CRI was now 8. Palpation of the right shoulder revealed tissue tension that had not been detected previously. When her temporal CD was palpated, the patient said,

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"I feel it in my shoulder." Palpating the right shoulder revealed a supraclavicular HTP and 2 trigger bands running between the acromioclavicular joint and mastoid process (also called shoulder-mastoid trigger bands). Treatment again consisted of OCMM, FDM, and HVLA. Post-treatment evaluation again revealed a freely moving cranium, and the patient reported her headache had resolved.

Discussion

During development, the bony structures of the cranium are created by dermal ossification of connective tissue. This process allows the dura mater to develop a strong, anchored connection to the inside of the cranial bones.[4] Sutures develop with surfaces that are beveled, serrated, grooved, or a combination thereof, and fasciae run between and among all of these surfaces. Therefore, the dura is continuous with the extracranial fascia.[5]

While the dural membranes regulate the involuntary articular motion of the cranial bones, any change in tissue tension on or around these bones will affect the dura. Any such change affects 2 components of the primary respiratory mechanism (PRM): the mobility of intracranial and intraspinal membranes, including the dura, and the articular mobility of the cranial bones.[5] In such a situation, FDM and OCMM become synergistic.

The fasciae constitute a continuous tensional network that covers and connects every part of the body. Tensegrity can be used to describe how fasciae support the body. Tensegrity structures distribute tension across all structural members to create support and stability. For example, while bones can be considered to be compression struts that are supported by muscles, tendons, and ligaments, the fasciae can be considered as bearing the tension of such structures.[6] Fasciae run very intricately throughout the body, and therefore, they will affect much deeper structures both locally and distally when tension is added or changed. When applied to the cranium, this model of tensegrity helps to explain the benefits of both FDM and OCMM.

Although tissue changes were detected after OCMM was initially applied in the current case, restrictions were found in the cranial sutures upon reexamination that OCMM did not overcome. When FDM treatments were performed, significant tissue-texture change occurred immediately. Reexamination demonstrated that the cranial dysfunction resolved, the CRI improved, and the patient's headache resolved.

The tensegrity principle can effectively explain these results. Distortions create tension in which the fasciae cannot move freely. This tension spreads into surrounding fasciae, bone, and dura, making it difficult for OCMM to fully correct the dysfunctions found in the PRM. Once FDM corrects these distortions and releases the fascial tensions, OCMM can normalize the PRM.

Conclusion

In 3 months, the combined use of OCMM and FDM resolved 3 years of chronic headaches for the patient in this case. The fascial tensegrity change produced by FDM improves the results of cranial treatments and vice versa. When these two modalities are used togethery, they can provide patients with acute and chronic headache with an effective treatment option that can have a profound impact on quality of life.

Further studies to investigate FDM and its use with cranial techniques and other forms of osteopathic manipulative treatment would be beneficial to determining whether FDM has broader application as a complementary osteopathic approach to improve treatment outcomes.

References

1. Migraine. American Headache Foundation website. 2007. http://www.headaches.org/2007/10/25/migraine/. Published October 25, 2007. Accessed December 8, 2015.

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Severe nausea and vomiting in pregnancy (NVP)
Markelz KA, Blumer JU. Osteopathic manipulative treatment for patient with severe nausea and vomiting in pregnancy: a case study. *AAOJ*. 2015;25(1)13-18,24.

Special communication
AAO Board of Trustees. AAO position paper: recommended knowledge base for entering ACGME residencies with osteopathic recognition. *AAOJ*. 2015;25(2):6-9.

Esteves JE, embodied clinical decision-making in osteopathic manipulative medicine. *AAOJ*. 2015;25(2):13-16.

Goldman SI. Rising to new challenges: problems and proposed solutions for osteopathic program directors. *AAOJ*. 2015:25(3);7-10.

Shannon SC. Implementing the single accreditation system for graduate medical education: seeking osteopathic recognition. *AAOJ*. 2015;25(2):10-11.

Suboccipital decompression
Nishida Y, Sopchak MM, Jackson MR, Andersonning TR, Leikert EP, Goldman SI, Jarski RW. Effect of select osteopathic manipulative treatment techniques on patients with acute rhinosinusitis. *AAOJ*. 2015;25(3)12-20.

Supraorbital nerve release
Nishida Y, Sopchak MM, Jackson MR, Andersonning TR, Leikert EP, Goldman SI, Jarski RW. Effect of select osteopathic manipulative treatment techniques on patients with acute rhinosinusitis. *AAOJ*. 2015;25(3)12-20.

Thomas L. Northup Lecture
O'Connell JA. Thomas L. Northup Lecture: Are we ready to lead? ACGME merger: an opportunity to fulfill osteopathy's mission. *AAOJ*. 2015;25(1):7-11.

Thoracic inlet myofascial release
Nishida Y, Sopchak MM, Jackson MR, Andersonning TR, Leikert EP, Goldman SI, Jarski RW. Effect of select osteopathic manipulative treatment techniques on patients with acute rhinosinusitis. *AAOJ*. 2015;25(3)12-20.

Tolerance
Kaufman BE. View from the pyramids: tolerance in mind and medicine. *AAOJ*. 2015:25(3);5.

Trigger bands
Ribar JS, Capistrant TA. Cranial and fascial distortion techniques used as complementary treatments to alleviate migraine headache. *AAOJ*. 2015;25(3):22-26,30. ■

OMT and rhinosinusitis (continued from page 20)

8. Rosenfeld RM, Andes D, Bhattacharyya N, et al. Clinical practice guideline: adult sinusitis. *Otolaryngol Head Neck Surg.* 2007;137(3 Suppl):S1-31. http://oto.sagepub.com/content/137/3_suppl/S1.full. Accessed December 22, 2015.
9. Hwang PH, Patel ZM. Acute sinusitis and rhinosinusitis in adults: clinical manifestations and diagnosis. UpToDate website. http://www.uptodate.com/contents/acute-sinusitis-and-rhinosinusitis-in-adults-clinical-manifestations-and-diagnosis. Updated May 26, 2015. Accessed December 28, 2015.
10. Low DE, Desrosiers M, McSherry J, et al. A practical guide for the diagnosis and treatment of acute sinusitis. *CMAJ.* 1997;156(6 suppl):S1-S14. http://www.cmaj.ca/content/suppl/2012/03/19/156.6.1-s.DC1/sinusitus.pdf. Accessed September 9, 2015.
11. Browne JP, Hopkins C, Slack R, Cano SJ. The Sino-Nasal Outcome Test (SNOT): Can we make it more clinically meaningful? *Otolaryngol Head Neck Surg.* 2007;136(5):736-741. http://oto.sagepub.com/content/136/5/736.full. Accessed September 9, 2015.
12. Van Buskirk RL. *The Still Technique Manual: Applications of a Rediscovered Technique of Andrew Taylor Still, MD.* 2nd ed. Indianapolis, IN: American Academy of Osteopathy; 2006.
13. Greenman PE. *Principles of Manual Medicine.* 3rd ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2003.
14. Eisenberg DM, Davis RB, Ettner SL, et al. Trends in alternative medicine use in the United States, 1990–1997: results of a follow-up national survey. *J Am Med Assoc.* 1998;280(18):1569–1575. http://jama.jamanetwork.com/article.aspx?articleid=188148. Accessed September 9, 2015.
15. Kessler RC, Davis RB, Foster DF, et al. Long-term trends in the use of complementary and alternative-medical therapies in the United States. *Ann Intern Med.* 2001;135(4):262–268. http://annals.org/article.aspx?articleid=714691. September 9, 2015.
16. Moyer CS. Weighing alternative remedies. *American Medical News* website. http://www.amednews.com/article/20120220/profession/302209935/4/. Published February 20, 2012. Accessed September 9, 2015. ■

OCMM and FDM alleviate migraine (continued from page 25)

2. Jensen R, Stovner L. Epidemiology and comorbidity of headache. *Lancet Neurol.* 2008(7):354-361. http://dx.doi.org/10.1016/S1474-4422(08)70062-0. Accessed December 8, 2015.
3. Typaldos S. *FDM: Clinical and Theoretical Application of the Fascial Distortion Model Within the Practice of Medicine and Surgery.* 4th ed. Bangor, ME: Typaldos Publishing Co; 2002.
4. Liem T, Vogt R. Membranous structures within the cranial bowl and intraspinal space. In: Schleip R, Findley TW, Chaitow L, Huijing PA, eds. *Fascia: The Tensional Network of the Human Body.* New York, NY: Elsevier; 2012.
5. Magoun HI Sr. *Osteopathy in the Cranial Field.* Boise, ID: Northwest Printing Inc; 1966.
6. Ingber D. The architecture of life. *Sci Am.* 1998;278(1):48-57. ■