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# Management of Mild Traumatic Brain Injury Symptoms in a 31-Year-Old Woman Using Cervical Manipulation and Acupuncture: A Case Report



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## Abstract

**Objective:** The objective was to describe chiropractic and acupuncture care of a patient with acute mild traumatic brain injury (mTBI) symptoms.

**Clinical Features:** A 31-year-old woman had acute neck pain, headache, dizziness, nausea, tinnitus, difficulty concentrating, and fatigue following a fall. She was diagnosed at an urgent care facility with mTBI immediately following the fall. Pharmaceutical intervention had been ineffective for her symptoms.

**Intervention and Outcome:** The patient was treated with chiropractic adjustments characterized as high velocity, low amplitude thrusts directed to the cervical spine and local acupuncture points in the cervical and cranial regions. The patient received care for a total of 8 visits over 2.5 weeks with resolution of concussive symptoms.

**Conclusion:** This patient with mTBI responded favorably to a conservative treatment protocol with the combination of chiropractic and acupuncture care.

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## Introduction

Mild traumatic brain injury (mTBI) has gained media attention over the effects of repetitive head injuries on brain development and health in both athletes and trauma patients. Approximately 75% of the 1.7 million brain

injuries in the United States are classified as concussions or mTBI annually.<sup>1</sup> This figure reflects the sharp increase in mTBIs incidence from 521.0 reported injuries per 100,000 people to 823.7 per 100,00 from 2001 to 2010.<sup>2</sup> The mechanism of injury is largely attributed to local head trauma from biomechanical forces.<sup>3</sup> Currently, there is a large focus on a young, athletic population with injuries from contact sports, although the majority of mTBIs occur after traumatic falls and motor vehicle crashes.<sup>4</sup> As a result of the trauma, current evidence

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suggests that there is a rapid hyperglycolysis in the neural tissue followed by a prolonged period of hypoglycolysis, altered permeability of the blood brain barrier, increased inflammation, and a rise in interleukin levels.<sup>5</sup> Symptoms arising from these cellular events include nausea, dizziness, headache, tinnitus, acute pain, and cognitive deficits.<sup>6</sup> Symptoms typically resolve over weeks to months, although 36% of patients diagnosed with mTBI continue to report persisting symptoms for 6 months or longer.<sup>7</sup> In addition, the Centers for Disease Control and Prevention reported that as many as 15% of patients with diagnosed mTBI experience persistent, disabling problems associated with concussive symptoms.<sup>8</sup>

Consistently, the literature reports rest as the most common treatment method for mTBI symptoms.<sup>5,9–13</sup> Symptom education and material on future prevention are also commonly given as postconcussive treatment especially in an athletic population where return to play is a major focus.<sup>6,13</sup> Although rest and education have been found to reduce some mTBI symptoms, these can be insufficient as a treatment strategy in an adult, working population where symptoms often can be triggered by occupational duties and can greatly impact daily activities. Pharmaceutical treatment options, such as DDAVP, have demonstrated little positive effect on symptoms.<sup>5,13,14</sup> Self-management with over-the-counter options like nonsteroidal anti-inflammatory drugs has also been shown to be ineffective in symptom reduction despite the inflammatory cascade that occurs during mTBI.<sup>5</sup>

Chiropractic management of mTBI has a prominent focus on an athletic population within the literature. Multiple reviews outline the high incidence of mTBI and indicated that chiropractors as first-contact providers should have awareness of symptoms, educational materials for patients, and stress rest before a return to play or activities.<sup>1,15,16</sup> In addition, manual adjustments both with and without soft tissue therapies have been shown to be effective in the treatment of some mTBI symptoms including somatic pain related to mTBI, whiplash, headache, migraine, loss of motion in the cervical spine, and additional sequelae from trauma.<sup>17–20</sup>

In Traditional Chinese Medicine (TCM), it is theorized that external trauma such as in mTBI often causes a TCM condition known as *blood stasis* which causes pain and dysfunction in the injured area and can be alleviated with TCM treatments such as acupuncture. Acupuncture has been found to have longer-lasting therapeutic effect for acute headache after trauma when compared with pharmaceutical options.<sup>21–25</sup> Local needling produces analgesic effects in areas of injury

by locally increasing the blood supply through the release of vasodilatory neuropeptides and thereby increasing local oxygen and cytokines along with reducing inflammation.<sup>26,27</sup> Acupuncture also has been indicated as having a positive therapeutic effect on other mTBI-related symptoms such as headaches, neck pain, and nausea.<sup>28–31</sup>

Because of the prevalent nature of mTBI injuries, there is need for additional treatment protocols to be available for injuries sustained by adults in nonathletic situations. The purpose of this case report is to describe the management of an adult patient with mTBI injury through the use of manual cervical chiropractic manipulation, soft tissue therapy, and acupuncture.

## Case Report

A 31-year-old woman presented to the chiropractic clinic for treatment of acute mTBI symptoms after a traumatic fall 3 weeks prior. She reported that she slipped on ice and landed prone, striking her face on the ground. She lost consciousness for a period of 3–4 minutes. The patient presented to urgent care with symptoms of acute neck pain, frontal and occipital headaches, nausea, dizziness, tinnitus, fatigue, and cognitive "fogginess." She was diagnosed with mTBI and prescribed Flexeril and Vicodin. Medical intervention temporarily alleviated her symptoms, but she found the relief to be short lived.

The patient described her physical and cognitive symptoms as unchanged from her initial presentation to urgent care. She reported constant dull neck pain with intermittent episodes of sharp pain into her arms bilaterally and upper back associated with movement. The symptoms made it difficult to sleep, perform her occupational duties, and participate in physical activity. She noted her neck pain to be 9/10 on a verbal Numeric Pain Scale (NPS) and headache pain to be 9/10 NPS upon initial evaluation.

On examination, the patient had a loss of active cervical rotation 5°–10° bilaterally and was noted to have static rotational changes to her occiput. Her neurologic examination was nonfocal, and she had no evidence of cranial trauma. Vitals were within normal limits. Plain radiographs of the cervical spine demonstrated a loss of cervical lordosis and a mild right lateral convexity of C4–C7, with minimal signs of vertebral body elongation inferiorly on C4, C5, and C6. Result of Romberg test was negative on orthopedic examination. Local pain and tension were noted during cervical

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