

# Treating the Sequelae of Postoperative Meningioma and Traumatic Brain Injury: A Case of Implementation of Craniosacral Therapy in Integrative Inpatient Care

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## Abstract

**Background:** Craniosacral therapy (CST) is a commonly used but under-researched therapeutic approach. This case study explores the implementation of CST in the integrative inpatient treatment of sequelae of postoperative meningioma and traumatic brain injury.

**Case:** A 50-year-old woman was admitted for 2 weeks of integrative inpatient treatment following meningioma resection and traumatic brain injury. In addition to the integrative treatment approach, which included conventional as well as complementary and alternative medicine, she received five sessions of CST for refractory headaches, vertigo, and cervicobrachial syndrome during this time. At discharge, the reported intensity of her headaches on a 10-cm visual analogue scale decreased from 6–9 cm to 2–4 cm and her level of vertigo decreased from 6–10 cm to 2 cm. Her cervical mobility and muscle tension, sleep quality, and general well-being also improved. The attending physicians saw CST as having contributed greatly to this improvement alongside use of phytotherapy and hyperthermia.

**Conclusion:** Implementation of CST in integrative inpatient care could benefit patients with headache and vertigo from intracranial injuries.

## Introduction

**T**RAUMATIC BRAIN INJURY has wide-ranging somatic and neuropsychological sequelae. Post-traumatic headaches are frequent, and they present like tension headaches or migraine. In up to a third of cases, such headaches last for more than a year.<sup>1</sup> Patients also report persistent vertigo, with severe effects on their psychosocial functioning.<sup>2</sup> Treatment recommendations are primarily limited to drug administration; even for chronic conditions medication is the usual recourse.<sup>3</sup>

Craniosacral therapy (CST) may provide an additional treatment option. CST involves a systematic assessment and manipulation between the cranium and sacrum, using gentle manual techniques to release fascial restrictions in the cranial sutures, cerebral and spinal membranes, and related connective tissues. Such manipulation seeks to balance sensory, motor, cognitive, and emotional aspects of patients' central and autonomic nervous systems.<sup>4</sup> Preliminary evidence supports the craniosacral concept and links CST to reduced pain, sleep disturbance, and anxiety, as well as improved quality of life.<sup>5</sup> This initial report describes CST

as part of an integrative inpatient treatment of the sequelae of repeated intracranial injuries.

## Case

### *Data collection*

Before collection of medical data, the patient provided written informed consent. On hospital admission and discharge, a research assistant recorded, transcribed, and analyzed results of visual analogue scale (VAS) assessments and semi-structured face-to-face interviews. Six months after discharge, a follow-up interview was conducted by phone.

### *Case history*

A 50-year-old woman had been diagnosed with a left parietal meningioma in 2009. The lesion was resected but she continued to experience persistent headaches and vertigo. A further relapse in 2011 was treated with CyberKnife® (Accuray, Inc., Sunnyvale, CA) radiotherapy. Three months later, magnetic resonance imaging showed a

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smaller, encapsulated meningioma, with perifocal edema and irritated meninges. The patient's symptoms were exacerbated by a traumatic brain injury, from a cycling accident, in 2011; this injury had increasing effects on her social and occupational functioning. In 2012, she was admitted to the hospital with daily headaches, vertigo, and chronic neck pain (Table 1). Upon admission, she described her headaches as diffuse, unilateral or bilateral, and often radiating down into her neck. She rated her average intensity at 6 cm on a 10-cm VAS, with frequent peaks up to 9 cm. During episodes of severe pain, she infrequently self-medicated with ibuprofen. She reported no aura, nausea, or vomiting, but her daily vertigo made her stagger. She rated this symptom at 6 cm on the VAS, with rare peaks of 9–10 cm. She also reported cervicobrachialgia, with an intensity of 4–7 cm on the VAS, causing temporary numbness in both hands. She was prescribed intermittent flupirtine maleate for these symptoms.

#### Physical examination and diagnosis

On admission, the attending physician found the patient to have normal nutritional status but increased functional disability due to the described symptoms. Her vital signs, electrocardiogram, and laboratory data all proved unremarkable, as did abdominal ultrasonography, despite tenderness in the upper right abdomen. Musculoskeletal examination showed increased tension in her cervical musculature bilaterally but no pelvic obliquity. No abnormality was seen on the neurologic examination.

A craniosacral assessment using manual palpation techniques, performed by a licensed massage therapist with advanced Upledger CST qualification, found the following restrictions: meningeal adhesions/adherence; restrictions between several cranial bones as well as between occipital bone and atlas; cervical muscle turgor/tension, with heat emission and increased trapezius tone; thoracic restrictions; connective tissue adhesions (viscera and fascial sheath) and tenderness in the stomach region; restrictions of the sacrum, left iliac crest, and pelvic diaphragm; and restrictions in the left ankle range, with inversion of the left foot and tenderness of the left instep.

#### Integrative treatment

The 2-week inpatient treatment approach at the Department of Internal and Integrative Medicine, Kliniken Essen-Mitte, academic teaching hospital of the University of Duisburg-Essen, Germany, combines methods of conventional with complementary and alternative medical ap-

proaches. An individual treatment, devised for the patient described here, included auricular acupuncture, cupping massage, hydrotherapy (cold affusions), thermotherapy (hot and cold cataplasms), exercise, nutritional therapy, and phytotherapy with *Bryophyllum* species and *Avena sativa*. Relaxation, stress reduction, mindfulness, and cognitive restructuring training were also provided.

Given her history of brain injuries due to the surgery and bicycle accident, a therapeutic attempt with CST was made. The five 1-hour CST sessions focused on gentle fascial palpation techniques at the cranium, including frontal and parietal lift, medial compression of the parietal bones, release of the sagittal suture and atlanto-occipital joint, and compression-decompression of the temporal bones, sphenobasilar, and temporomandibular joints. The hyoid bone and thoracic inlet and respiratory and pelvic diaphragms were also treated, releasing the transverse connective tissues. Other CST techniques used included dural tube traction and lumbosacral/sacroiliac decompression for sacral mobilization, along with fascial unwinding of the upper and lower limbs with still point induction.<sup>4</sup>

#### Course

On admission, the patient described “diffuse headache symptoms, with dizziness and a pain that sort of runs round the outside of my head. I get a feeling of pulling in my head, as if I’ve got a net around it that tightens....The dizziness feels like it’s pressing. Some days, it’s all got so bad, that I haven’t known how to get up the stairs.”

On discharge, she attributed much of her symptom relief to CST, noting “everything that’s cut my body’s tension has helped, but the essential thing has been craniosacral therapy.” She went on to describe CST as being “like a journey through my body and its various little building sites” noting that “the therapist took the individual sites and connected them, which I could really feel, from my neck up, as well as down in my abdomen and left foot. At first the pain increased, then it went through my whole body, and then went out. It was as if a child’s toy, with a lot of joints and threads, was being pulled and twisted until it was lined up right. ...Meanwhile, I had tears in my eyes and replaying pictures from the past were offered to me. It didn’t feel good, at the time, but afterwards I felt like I was freed from a burden. I’ve realized that something released, also physically; something in me opened. It made click, click, click, click, click, as if barriers were being unlocked. It was suddenly very bright and clear in my head. After the last craniosacral therapy, I didn’t have any pain at all. I’ve since noticed I’ve still got a sore spot under my shoulder blade, but you can’t compare it to before. You can’t compare it.”

In numbers, the patient cited her headache intensity at 2–4 cm on the VAS and her vertigo level at 2 cm. CST follow-up assessment revealed improved flexibility of the cranial bones and the atlanto-occipital joint, which had led to improved cervical rotation. Her neck muscles and abdomen were less tense and her hands no longer felt numb. Her posture had normalized through the release of sacrum and thoracic restrictions, freeing up her breathing. Her sensitivity to noise had fallen considerably and her sleep pattern improved. She voiced amazement at being able to “sleep so peacefully without taking all my usual drugs.” When asked

TABLE 1. PATIENT'S DIAGNOSES WITH INTERNATIONAL CLASSIFICATION OF DISEASES, 10TH REVISION, CODES

Code	Diagnosis
G44.2 R42	Chronic tension-type headache Dizziness and giddiness/vertigo NOS, S/P intracranial injury 2011
D32.9	S/P resection of a left parietal meningioma NOS 2009, relapse 2011
M53.1	Cervicobrachial syndrome

NOS, not otherwise specified; S/P, status post.

about her general functioning/well-being, she cited a 60% improvement. Six months later, the observed effects persisted. She reported no severe adverse events. Just after the first and second CST sessions, she stated temporarily increased headache intensity and tiredness.

### Discussion

This report describes a patient with refractory headache, vertigo, and cervicobrachial syndrome after meningioma resection and intracranial injury who received 2 weeks of integrative inpatient treatment, including CST. On discharge, her reported headache intensity decreased from 6–9 to 2–4 cm on the VAS and her vertigo symptoms from 6–10 to 2 cm. The mobility and muscle tension in her neck, numbness in her hands, sleep quality, and general well-being were all improved.

The patient's attending physicians saw CST as having contributed greatly to this improvement, alongside use of phytotherapy and hyperthermia. Research suggests that adding CST to current treatments for tension headaches and vertigo is both reasonable and feasible.<sup>6,7</sup> Fascial restrictions and misalignments appear to play a decisive role in development and persistence of headache and vertigo, with similar pathophysiologic mechanisms conceived for chronic back pain.<sup>8</sup> Mechanical stress from surgery or traumatic brain injury, inflammatory, atrophic, and fibrotic processes appear linked to connective tissue remodeling, with resulting neuroplastic changes and abnormal pain processing. Symptom modification through myofascial manipulation seems entirely plausible, given connective tissue's broad nociceptive and mechanosensory innervation. In CST<sup>4</sup> and massage therapy research,<sup>9</sup> touch is also known to trigger emotional release processes, which in turn can promote somatic symptom relief.

Although CST seems to achieve only gentle manipulations of fascia and connective tissue, adverse effects have been observed, with an incidence rate of 5% in patients with traumatic brain injuries.<sup>10</sup> Nevertheless, implementation of CST in integrative inpatient care could be a gain for patients with headache and vertigo as a consequence of intracranial injuries. Further studies with randomized controlled designs are needed to examine the effectiveness and safety of CST for secondary symptoms from postoperative meningioma and traumatic brain injury.

### Author Disclosure Statement

No competing financial interests exist.

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