

RESOLUTION OF OPIOID MEDICATION USE FROM CHIROPRACTIC MANAGEMENT OF NONUNION HIP FRACTURE, POST-SURGICAL PELVIC FUSION AND SEVERE TBI: A CASE REPORT

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ABSTRACT

Objective: To discuss the chiropractic management of a 21-year-old female with constant pain from a non-union fracture in the right hip with post-surgical pelvic fusion and severe traumatic brain injury (TBI). She was initially treated with physiotherapy which improved vestibular functionality and mobility after surgery for three to four months then discharged. This case report aims to contribute to the existing literature about the role of chiropractic care and how it may support patients in decreasing opioid usage for pain relief while recovering from a severe TBI. With the evolving opioid crisis, chiropractors can provide assistance to support the health system by managing patients with musculoskeletal complaints who are using painkiller medication such as opioids.

Clinical Features: The patient sustained the injury when she fell from a single floor to the ground and landed on her right leg, causing her right hip to fracture and break through the right ischium, also sustaining a severe TBI. She sought chiropractic care 7 months after physiotherapy and 1 year after the incident took place. Seeking improvement in pain in her right hip, lower back and TBI symptoms.

Intervention and Outcome: High-velocity low-amplitude (HVLA) chiropractic adjustments were delivered using Diversified technique, alongside mobilizations, soft-tissue therapy and exercise rehabilitation at a frequency of twice a week for 3 weeks, once a week for 6 weeks and once a fortnight for 4 weeks, followed by maintenance once per month. She received rehabilitation exercises/stretches including cardiovascular, vestibular and nutritional advice about 2 weeks into treatment, targeting her severe TBI. After the reduction of the severe TBI symptoms, she underwent rehabilitation for the

chief complaint of her right hip. Improvement was seen after every chiropractic visit; she progressed from using morphine for the past year to no painkillers at all in 4 weeks of chiropractic care.

Conclusion: This case study demonstrates the elimination of opioid medication while improving severe TBI symptoms, nonunion fracture pain and post-surgical intervention using chiropractic management. Further research is required to investigate the effects of chiropractic treatment on opioid use in pain management. (*J Contemporary Chiropr* 2022;5:76-81)

Key Indexing Words: Chiropractic Manipulation; Analgesics; Opioids; Traumatic Brain Injury; Post-Surgical Syndrome; Fracture; Rehabilitation

INTRODUCTION

Opioids originate from the opium poppy (*Papaver somniferum*), where its first known use was around 400 BC. (1) These substances act on opioid receptors in the body to help with pain management and other medical issues. (1,2) It is an effective analgesic used for both acute and chronic pain. (1) This includes emergencies where anesthetic and sedatives are needed, such as cardiac issues, trauma, orthopedic pain, burns, and postoperative pain. (2)

The opioid crisis has emerged as one of the greatest health challenges facing our health systems worldwide. (3) New Zealand ranks 15th of the 30 developed countries for the use of prescription opioids from 2012-2014. (3) With New Zealand ranked low within developed countries, some wonder whether New Zealand would not be in an opioid epidemic situation. (3,4) Other developed countries, such as the United States of America, United Kingdom, Canada, European countries and Australia are also struggling with the opioid crisis. (3-5)

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Traumatic brain injuries (TBI) are also a significant health issue, due to complications that can develop into chronic issues if not managed correctly. (6) It is common to sustain other injuries alongside a TBI, such as the cervical spine and other regions depending on the injury mechanism. (6) Opioids are commonly used as analgesics for people who have sustained a TBI, especially with other injuries that cause pain. (7) Prescription of common opioid pain medication for TBI patients is difficult due to side effects that can worsen the TBI symptoms. (2,7) Many opioids have side effects that alter the functionality of the body. This is important as this could have complications to recovery. (1,2,7)

Surgery for pelvic and hip fractures is common practice. It is done regularly in the elderly, who have a high fall risk, and people who sustain it in car accidents or sporting injuries. (8) The surgery depends on the severity of the injury. It can range from bolts and plates placed around the hip for stability up to a full hip replacement. (8) Opioids are commonly prescribed for post-surgical pain relief to aid with the recovery and it is generally safe to do so (9). The dosage medication is slowly decreased over time depending on pain levels to help soft tissue healing and rehabilitation and to return to activities of daily living (ADL) (3).

CASE REPORT

Clinic Features

A 21-year-old woman fell from a single floor and landed on her right leg, causing her right femur to fracture through her right ischium. She also hit her head and caused whiplash to her neck as she hit the ground.

She was admitted to hospital immediately for emergency care for a few weeks due to the severe TBI which was seen to carry a risk of brain hemorrhage. After clearing any red flags, via brain scan, x-ray and MRI scans, she had surgery to reconstruct her right ischium, with plates and bolts placed in the pelvis. She also had repositioning of the dislodged right hip. Once the surgery was complete, she was given morphine to help manage her pain levels from surgery. Post surgery, she had been managed by an orthopedic specialist, who then referred her for rehabilitation of her right hip and the severe TBI with a physiotherapist for 4 months, after which she was discharged. She improved her vestibular function under physiotherapy care and improved her activity of daily living (ADL) approximately 40%. However, she was still having issues with her pain management, TBI symptoms, balance and carrying out certain ADLs.

She sought chiropractic care just under a year after the incident took place for improvement in pain in her right hip, low back and TBI symptoms, including headache. At that time she was under no other allied health

practitioner's care and was last treated 6 months ago. Her chief complaint was her inability to manage the right hip pain and low back pain since this was affecting her ADLs. She struggled to stand and walk for 10 minutes without pain and had concentration issues with her work and tertiary studies due to her severe TBI. There was an intermittent sharp pain in her right hip, with movement and constant dull ache present in the lower back and neck. Her visual analog scale (VAS) ranged from 7-8. We performed a concussion exam, neurological exam, orthopaedic exam and chiropractic exam. The current pain management plan was managed by her general practitioner (GP). She was on a slow release of morphine taken twice daily, morning and night. Her GP instructed to keep taking this until her pain levels decreased; then, a new prescription of pain medication would be given.

A SCAT5 form was used to evaluate her severe TBI, along with other tests related to TBI. (10). This examines the patient's background, symptomatology, cognitive screening (including orientation, immediate memory, concentration) and neurological screening. (7)

A chiropractic examination was performed, where a spinal exam found joint dysfunction at the following regions:

Table 1. SCAT 5 Results

Date	14/09/21	05/10/21
Symptom number (of 22)	22	19
Symptom severity score (of 132)	71	28
Orientation (of 5)	5	5
Immediate memory (of 15)	14	15
Concentration (of 5)	3	5
Neuro exam (of 5)	Abnormal 3	Normal 5
Balance errors (of 30)	11	11
Delayed recall	4	4
% Feeling normal	65%	75%

Occiput, C1, C5, T1-2, T4, T7, T9, T12, L4-5, L Sacrum, R SI. Significant muscles which were all contributing to the joint dysfunction included the suboccipitals, levator scapulae, sternoclavicular muscles, scalenes, diaphragm,

erectors spinae, quadratus lumborum, gluteus max/med, piriformis, iliopsoas.

Intervention and Outcome

The treatment provided for the patient was both for her right hip, low back and severe TBI injury. She was adjusted using Diversified technique and mobilization, in combination with soft-tissue therapy that involved myofascial release. The main spinal segments that were adjusted or mobilized were the occiput, C1, C5, T1-2, T4, T7, T9, T12, L5, L Sacrum, R SI. Mobilizations were done where adjustments were contraindicated due to surgical artifacts or other findings that needed modification, such as the right ischium fusion in the pelvis. Soft tissue therapy treatment was done to the subicular occipitals, levator scapulae, scalanes, gluteus med/max and iliopsoas muscles.

We provided TBI rehabilitation initially due the symptoms affecting the rehabilitation for her chief complaint of hip pain and low back from post surgery for the first 2 weeks. This included:

- Cardiovascular rehabilitation by assessing heart rate with her symptomatology similar to the buffalo treadmill test and prescribing exercise to work within a suitable heart rate to improve cardiovascular fitness. (11)
- Vestibular rehabilitation with eye and balance exercises. (11)
- Nutritional advice by supplementing/increasing Omega-3 fatty acids (EPA, DHA and ALA), magnesium, Vitamin D and Vitamin E (12,13), increased hydration and advised her to decrease her calorie intake to help lose weight passively, as this was gained in the past year from being immobile and would help unload pressure in the lower back/right hip region. (13,14)

The patient improved throughout care for her chronic TBI symptoms as seen in Table 1 using the SCAT5 form as a guide alongside other concussion assessments. (10)

Following this, we prescribed exercises/stretching 2 weeks into treatment targeting her lower back, hips and upper body to help ensure strengthening and activation to help support her posture and pain management. This progressed from walking, to jogging and finally running toward the end of care. This was possible due to the improvement to her chronic TBI symptoms.

The frequency of treatment was twice a week for 3 weeks, once a week for 6 weeks and once a fortnight for 4 weeks. followed by maintenance treatment once per month. She reported improvement after every chiropractic treatment; she decreased her dosage from taking morphine for a

year after the incident to no painkillers in four weeks of chiropractic care, safely with GP overview. She went from 2 weeks of morphine, then to codeine only once daily for 2 weeks. Once that was complete, she was not on any pain medication and did not require tramadol since it is not suitable for TBI patients. (7) She experienced some withdrawal symptoms for about a week when going off these pain medications, but was managed in part by our chiropractic treatment. (1,2) Her hip flexion ROM improved from 50 to 95 degrees with no pain or block end feels. She reported feeling a lot more like her usual self, improving both mental and physical aspects, after ceasing her use of the opioid medication.

DISCUSSION

In 2018, The World Federation of Chiropractic (WFC) recognized that the opioid epidemic is a major issue for chiropractors, and that they should be acting proactively in support of their patients. (15) Many health professionals have seen an increase in opioid use over the years in patients. (16,17) However, recent discoveries with opioid usage and its potential effects has seen a slight decline over the years but remains prevalent. (17) Shobbrook *et al* examined the current educational gaps for chiropractors in pain management, and the current direction of the opioid crisis in Australia. (16) It has been proposed that chiropractors need to take charge and upskill in learning about pain management to help with the current crisis and help their patients promote well being and better health outcomes. (16) To combat this, Parkin-Smith *et al* have provided strategies for participation and delivery for the individual practitioner, professional and organisational level. (18)

In New Zealand, opioid prescription is extensively monitored ever since the crisis overseas. (3) The World Health Organization (WHO) has listed opioids in 2 categories, strong and weak, which New Zealand has adapted. (19) Morphine is a strong opioid. Its use has increased since 2011 in all age groups in New Zealand, while other strong opioids have remained in similar use. (19) As people age in New Zealand the weak opioids intake increases as people do become dependent on them for varying medical use. (19) Chiropractic treatment has been known to be effective pain management for patients with acute and chronic pain. (20,21) In saying this, the effectiveness and cost-effectiveness for patients is beneficial as this decreases time off work, decreases insurance payouts and helps patients go about their lives. (20,21) Having chiropractic treatment initially before pain medication could be a way to support our health care worldwide.

There are several studies investigating the effect of chiropractic care on opioid use. (22) Corcoran *et al* conducted a systematic review/meta-analysis in 2020

and found patients under chiropractic care had 64% less likely chance of receiving an opioid prescription than people who didn't receive chiropractic care. (22) Other studies have found similar outcomes. (23,24) Studies have shown there is a reduction in patients with opioid usage while under chiropractic care. (24-26). Herman found 59% reduction in opioid usage after chiropractic care in the military health system. Lisi *et al* shows nearly one-third of veterans had lower prescription rates after their initial chiropractic visit for opioid usage. The studies conducted have been mostly in the military setting due to the extensive usage for military personnel in the past (24,25). This shows promising evidence that there is potential for chiropractors to support patients while helping reduce opioid usage.

Chiropractic educational institutions have started to teach management of concussion with options to pursue postgraduate studies for practitioners to further their knowledge base. (27) In the case seen here, the patient decreased opioid medication to nothing in 4 weeks, which was possible only due to the decrease in chronic TBI symptoms. This is ideal since morphine is addictive and has a high abuse potential. (2) Skipping tramadol was preferable for her TBI recovery progression as she went from morphine to codeine, with the GP reluctant to prescribe tramadol due its side effects for TBI patients. (7) Side effects include headache, emotional changes (nervousness, anxiety etc), tiredness, uncontrollable shaking, heartburn or indigestion, dry mouth, and muscle tightness/swelling among others. (28) Mahmood *et al* discovered patients who received tramadol had an increased rate of tracheostomy of 12.4% and patients who received no tramadol had no cases of tracheostomy. They also found patients would develop agitation and have a longer stay at the hospital. (7) Our patient did experience withdrawal symptoms. These symptoms depend on the frequency and duration of the opioid usage, with the longer the duration the worse the symptoms. This is referred to as "abstinence syndrome." (2) Chiropractic management has supported her transition from morphine to codeine, which was managed with manipulative therapy, soft tissue therapy and exercise prescription. All of this was accomplished in collaboration with her GP.

Recent research into chiropractic and the effects of spinal manipulation have found changes in the central nervous system (CNS). (29,30) Changes in these regions can have positive outcomes for patients who are in need of pain management. (29,30) There is a growing body of chiropractic research on the prefrontal cortex changes after spinal manipulation that might influence pain processing. (30,31) There is limited evidence showing chiropractic changes to other structures in the brain that may be affected by opioids, and this warrants further research to see if there are any changes.

Limitations

One limitation may arise from the rehabilitation progress conducted by the physiotherapist after the patient's surgery. This could have aided in the recovery with the chiropractic management even though it was 7 months since she saw the physiotherapist. The patient presented with significant symptoms for both hip and TBI-related injuries which the chiropractor treated. However, the chiropractors management of the patient could be easier due to the acute pain gone but this could be seen as a disadvantage due to the chronicity of the region with the underlying issues.

CONCLUSION

A woman with TBI was able to reduce her use of opioids after a course of chiropractic care, in collaboration with her GP. Her chiropractic treatment consisted of manipulation/mobilizations, soft tissue therapy and exercise/concussion rehabilitation. Current research is limited on the mechanism of how chiropractic treatment can help with reducing opioid medication.

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Declarations

Ethical Approval and Consent to participate

Not applicable

Consent for Publication

The patient and their parents gave consent for publication.

Competing Interest

The author reported no competing interests

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Authors' contributions

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