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Chiropractic Management of Musculoskeletal Symptoms in a 14-Year-Old Hockey Player With Postconcussion Symptoms: A Case Report

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Abstract

Objective: The purpose of this study is to describe the chiropractic management of a student athlete with postconcussion syndrome.

Clinical Features: A 14-year-old male hockey player presented to a chiropractic clinic with postconcussion symptoms 13 days after his initial injury. He experienced an occipital headache with a pain rating of 8/10, upset stomach, blurry vision, nausea, dizziness, balance problems, a “foggy feeling,” difficulty with concentration, difficulty with memory, fatigue, confusion, drowsiness, and irritability. Prior to seeing the doctor of chiropractic, the patient was monitored by a medical doctor, and the care he had been receiving was in accordance with current concussion guidelines. At the time of presentation to the chiropractic clinic, he had failed to progress toward return to play, and his computerized neurocognitive testing scores had not improved.

Intervention and Outcome: Chiropractic manipulative therapy, myofascial release, instrument-assisted soft tissue technique, and therapeutic exercises were provided over 5 treatments spanning a 20-day period. The patient followed up each treatment with ImPACT testing. At the conclusion of the treatments, the patient’s computerized neurocognitive testing scores had improved, and the patient was returned to play.

Conclusion: This case demonstrates the improvement of postconcussion syndrome in a 14-year-old male hockey player under chiropractic management.

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Introduction

Concussion is a subset of a traumatic brain injury (TBI) and is often classified as a mild traumatic brain injury (mTBI). Concussion is a brain injury resulting

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from a low-velocity force in which the brain is shaken, resulting in clinical symptoms which are not necessarily related to a pathological injury. It is a complex pathophysiological process leading to a wide array of symptoms.¹ It is the common result of a direct blow to the head in contact sports; however, it can be a consequence of collisions and falls. It can also be the result of a whiplash-type injury without a direct blow to the head.² With the growing concern of TBIs in athletics, the balance between athletes maintaining a competitive edge in a sport and participant safety has become gray. The balancing between this has been left up to coaches, doctors, players, team trainers, and even parents. The role of the health care provider is the rapid assessment of the injured athlete and the guidance toward a safe return to play.

At present, there are very few case reports describing the chiropractic management of a patient with concussion and return to play. Therefore, the purpose of this case report is to describe the chiropractic management of a student athlete with postconcussion syndrome (PCS).

Case Report

A 14-year-old adolescent boy presented 13 days after sustaining a concussion while competing in a hockey game. He was skating along the boards with the puck, passed the puck to his teammate, and then lifted his head. At that moment, he saw his opponent skating toward him who then checked him into the boards. The opponent hit the left side of the athlete's body, with the athlete's right side of his body hitting the boards. He was knocked to the ground but able to get up. He continued to play for 2 more shifts, which usually last about 30-90 seconds, before becoming nauseous. At that time, he sat down for the rest of the game. He reports that he was told by numerous teammates that he was acting out of character. He was brought into the local emergency department, and at that time, he did not know what position he played and the date of his birthday, and he was struggling with name recognition. A computed tomography scan of his neck and head was ordered but found to be negative for pathology. Over the course of the next 2 weeks, the patient was monitored by a medical doctor and was seen by a physical therapist. The care he had been receiving was in accordance to current concussion guidelines. During this time, he failed to progress along the return-to-play protocol because of ongoing symptoms of PCS. His computerized neurocognitive (ImPACT Applications, Pittsburgh, PA) testing scores had remained poor.

The patient presented to a chiropractic clinic. Subjective findings on the date of initial examination included a constant occipital headache with a numeric pain rating of 8 of 10, upset stomach, blurry vision with concentration, difficulty remembering names, nausea, dizziness, balance problems, feeling in a "fog," difficulty with concentration, difficulty with memory, fatigue, confusion, drowsiness, and irritability. The patient did not report neck pain. He denied any upper or lower extremity radicular symptoms.

Cognitively, the patient was alert and oriented to the month, day of the week, year, and time; however, he did not know the date of the month. He scored a 9 of 15 on immediate memory testing and a 2 of 5 on his concentration testing. His delayed memory assessment was a 3 of 5. Romberg's test result was positive with his eyes open and eyes closed. The patient was unable to hop on 1 foot because it would cause dizziness and nausea. In a 20-second time period for balance testing in a double leg stance, he had 1 error; in single leg stance, he had 4 errors; and he had 4 errors in a tandem stance. Finger to nose test was abnormal with the patient tending to touch his finger to his upper lip. Results of diadochokinesia testing and heel-to-shin testing were normal. Musculoskeletal palpation revealed taut and tender muscle fibers in the left suboccipitals, left levator scapulae, left serratus posterior, right lumbosacral paraspinals, right quadratus lumborum, and right piriformis. He had mild reductions in cervical flexion, extension, and bilateral rotation and mild to moderate reduction in right lateral flexion. Left lateral flexion was normal. There was tenderness to palpation at C2, T2, and L2. He had a high left shoulder, high right ilium, bilateral rounded shoulders, and anterior head carriage. Neurologically, he had 4 of 5 strength testing for bilateral levels at C5, C6, C7, C8, T1, L4, L5, and S1. His reflexes were normal, and dermatomal sensory testing was not performed because he denied any radicular symptoms. Orthopedically, the patient had positive results in foraminal compression test and shoulder depression tests, reproducing midcervical spine pain without radicular pain. Soto Hall's test caused pain in the cervical-thoracic junction. Valsalva's test result was negative.

The patient was diagnosed with PCS in which his concussion was sustained 13 days prior to the initial examination. At this time, the patient and mother gave consent for him to go through a trial of chiropractic care.

Multimodal manual therapy interventions were used, which included spinal manipulative therapy, myofascial release, and instrument-assisted soft tissue mobilization in the form of Graston Technique. The patient followed up with care 3 days later. At this visit, he reported

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