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Cranial Treatment and Spinal Manipulation for a Patient With Low Back Pain: A Case Study

Wayne Powell II DC [a] and Simone F.C. Knaap DC, MAppSc [b,*]

[a] *Private Practice Dordrecht, The Netherlands*
[b] *Private Practice, Borger, The Netherlands*

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Abstract

Objective: The purpose of this case study is to present chiropractic management of a patient with chronic low back pain by focusing on the craniomandibular system.

Clinical Features: A 37-year-old man consulted a chiropractor for pain in the lumbosacral area with radiation down the anterolateral side of the upper left leg. The symptoms started after a fall the previous year. Examination showed a post-traumatic chronic L4-L5 facet dysfunction and left sacro-iliac joint dysfunction. Chiropractic spinal manipulation to the lumbar spine and pelvis gave only temporary relief from the pain.

Intervention and Outcome: A year later a bone scintigraphy was conducted, in which a lesion was found over the right sphenoid area. Cranial treatment of this area was added to the chiropractic treatment plan. After this treatment, the patient reported that he was pain free and could return to normal activities of daily living.

Conclusion: The clinical progress of this case suggests that for some patients, adding craniosacral therapy may be helpful in patients with low back symptoms.

Introduction

Chronic low back pain is a common problem and its prevalence has increased to around 10% in the last decade.[1,2] In about 10% of patients, the primary pain generator is not found in the spine or directly related area.[3]

Craniomandibular disorders may affect 10% to 40% of the general population within their lifetime and associations to other disorders, such as postural disorders, lumbosacral pain, cervical spine disorders and general musculoskeletal symptoms have been found.[4–7] Fink et al found that simulated dysfunction of the craniomandibular system caused functional abnormalities in the sacro-iliac joint.[8] Fischer et al also found a strong correlation of craniomandibular dysfunction in patients with complex regional pain syndrome restricting hip motion.[7] Their theory is that the central nervous system allows information (including nociceptive information) to be communicated between the temporomandibular joint and the rest of

* Corresponding author at: Simone FC Knaap, DC, MAppSc, Eeserstraat 14, 9531 CM Borger, NL. Tel.: +31 599 323020.
E-mail address: simone@chiropractieborger.nl (S. F. C. Knaap).

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the body, since the afferent inputs from the periphery converges on the neurons of the spinal or trigeminal dorsal horns. Evidence suggests that input at brainstem level may play a role in trigeminal motor function, therefore this may explain the influence of the craniomandibular system on the body. [7]

Few case reports describe the treatment of a patient with low back pain receiving benefit from craniosacral therapy. The purpose of this study was to present a case describing treatment of the sphenoid area as part of the craniomandibular system for a patient not responding to traditional spinal manipulation for low back pain.

Case Report

A thirty-seven year old professional soldier presented with low back pain (LBP) in the lumbosacral region. The pain presented bilaterally, but mostly on the left side. The low back pain radiated down the anterolateral side of the upper left leg when walking for long periods of time.

The symptoms started directly after an accident a year before consultation. The patient fell from a height of around 3 m landing on his back and head. He was rendered unconscious for a short time directly after the incident, dislocated a finger and he experienced neck pain with pain both in the mid-back and low back regions. For the first 5 days after the fall he used a neck brace. A radiological examination was conducted immediately following the incident and again a year later with no evidence of any fracture. The low back pain was aggravated by sitting, standing, lying down, walking, bending over and cycling. The low back pain improved with periodic posture changes and some light exercising such as short walks and cycling. Coughing and sneezing had no influence over the symptoms. Medical history was unremarkable apart from extraction of teeth in 1997, which involved getting removable partial dentures and a bridge.

During the first visit's physical examination, visual inspection of the posture revealed a lower right rim of the ilium compared to the left side, lower right shoulder and bilateral pes planus. Active range of motion of the lumbar spine was restricted in extension, and restricted with pain in both forward flexion and right lateral flexion. Straight Leg Raise gave pain in the low back on the left at 50° and tension in the medial right hamstrings at 70°. Kemp's test was positive on the left. The reflexes of S1, L5 (both prone) and L4 (patient supine) were performed and were asymmetrical: on the right side they were hyperreflexic (+3), on the left hyporeflexic (+1). Dermatomes in the legs were tested by pin prick and soft touch (cotton wool) and were found normal.

Palpation of the spine was performed, both static and motion palpation. Motion palpation was performed with the patient seated. Static palpation was performed with the patient standing, sitting and prone. There was restricted movement at T3-T8 bilaterally, at L4-5-S1 on the right and L5-S1 on the left in right rotation (and lateroflexion). There was hypertonicity of the m. erector spinae in the lumbar region and the left gluteal musculature around the left sacro-iliac (SI) joint. The SI-joint dysfunction was further confirmed by a positive left Yeoman's test. Further orthopaedic and neurological examination was without abnormalities.

The initial working diagnosis was post-traumatic chronic L4-L5 facet dysfunction and left SI dysfunction associated with hypertonicity of the left gluteal and erector spinae musculature.

The patient was treated with Cox flexion (flexion movement of the lumbar spine while holding the spinous process of L5) with lateral flexion and distraction techniques. During treatment other high velocity-low amplitude chiropractic adjusting techniques were also used in the pelvis and the lumbar spine. Trigger point therapy was used on the left gluteal musculature. No further chiropractic adjusting technique was used elsewhere. Throughout the treatment the symptoms slowly resolved. From the 7th visit the patient came in every three weeks, after which he would be pain-free for 2 weeks. Then the pain would gradually return to its previous state. To increase the stability of the low back, the patient was given abdominal strengthening exercises, lumbar flexion/extension exercises, quadruped arm/leg raise and squat exercises. He also received physiotherapeutic treatments, in which he did similar exercises but under guidance. This worsened his LBP at first, but after adaptation of the exercises the symptoms did not improve either. The patient stopped with the exercises because of lack of improvement.

Since the complaint did not resolve in the year after the incident, the (military) medical service conducted a bone scintigraphy to exclude serious pathology caused by the incident, since this happened during work time. A focal lesion was discovered over the right sphenoid and sphenoid sinus (Figure 1). These lesions are areas with an increased accumulation of radioactive material, indicating a metabolically active process. Sinus pathology can be a reason for this focal lesion, but the patient did not suffer from sinus problems, leaving no

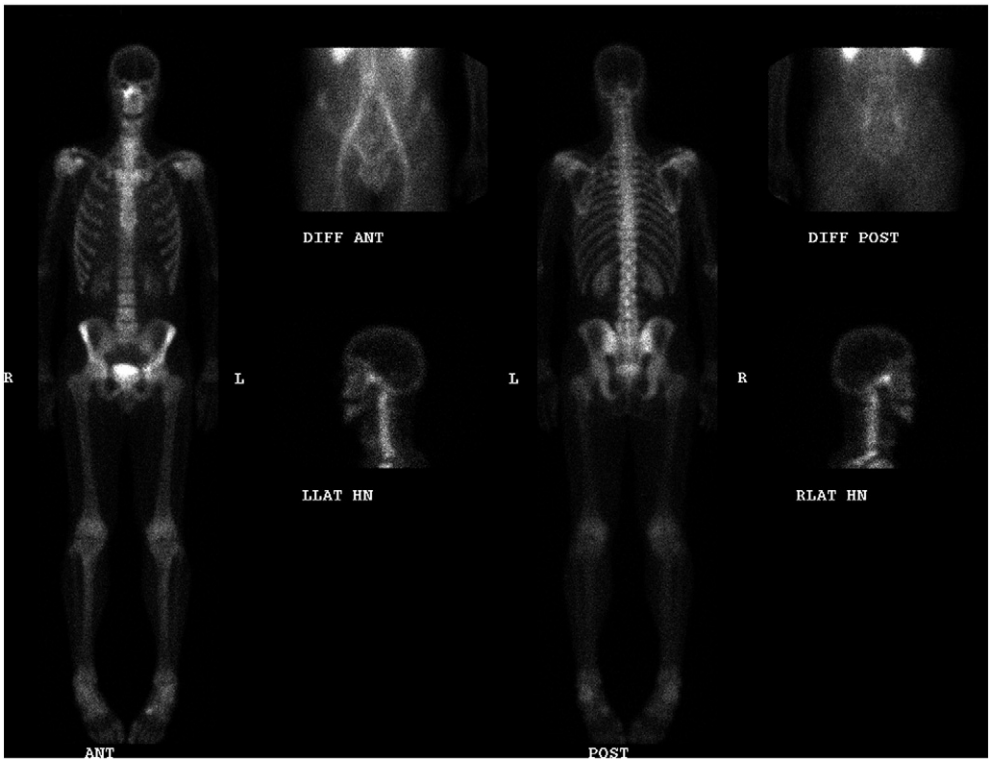

Figure 1. Full body bone scan with details of head. The focal lesion is visible over de right sphenoid bone and sphenoid sinus.

apparent reason for the lesion. The chiropractor treated the sphenoid area with lumbosacral adjustments as previously mentioned. The sphenoid bone was treated once using the Sacro-Occipital Technique (SOT) sphenoid lifting technique (which involves applying anterior pressure on the sphenoid during inspiration).

Before this treatment he was limited in his activities of daily living (ADL). Driving back and forth to work (an hour by car) and standing still for 15 minutes worsened his symptoms. After the sphenoid treatment, the patient had no restrictions in his ADL anymore. Since that time he had only one re-occurrence of his low back pain, but after a similar treatment including the sphenoid lifting technique, he was symptom-free again. The scintigraphy was not repeated. The patient gave consent to have personal health information published without divulging personal identifiers.

Discussion

The source of LBP is often elusive, but concomitant pain at other sites in the musculoskeletal system is common.[9] Wiesinger et al[10] found an association of spinal pain with signs and symptoms of musculoskeletal disorders in the jaw-face region. In the follow-up study they found there is a strong co-morbidity between the two.[11] Baldini et al[12] summarized in their overview there is a connection between craniomandibular and craniocervical dysfunction and posture. In this case, there was a major improvement in low back pain after performing cranial techniques (specifically sphenoidal focused treatments). The sphenoid bone is not directly part of the temporomandibular apparatus, but it is an attachment point for the m. temporalis and the m. pterygoideus lateralis.[13] The temporomandibular apparatus plays a role in postural control.[14] The exact mechanism is unclear. One possibility is that it passes through the fascial system, since this passively distributes tension in body muscles.[6] Because the jaw relationship is important for feeding to survive, the muscles and joints will accommodate occlusion and will compensate body posture to allow this to happen.[15] Sakaguchi et al[16] found that the reverse was also possible: changing body posture affects mandibular function and Sanders et al[17] found that a history of LBP increases the risk of temporomandibular disorders.

D'Attilio et al[18] found that the rats in their study did not experience difficulties feeding with an experimental malocclusion. However, it produced a scoliosis in the spine, which supports an anatomical and a neurophysiological interrelationship between the temporomandibular

apparatus and the spinal column.[16] In this patient no scoliosis was found, however, there were some postural abnormalities noted.

Smith[19] mentions a case study in which chronic low back pain was relieved after orthodontic work was done to reduce stress on the craniosacral system by repositioning the teeth (which shows a similar correlation of craniosacral dysfunction being a cause of LBP and is also what this patient experienced). In this case, the patient had teeth extracted, but had no complaints associated with this. The craniomandibular dysfunction causing LBP occurred only after the traumatic fall. Fisher et al[7] mention the influence of the cortical regions in the processing of information coming from the spinal and trigeminal dorsal horns with integrated input at brainstem level. They suggest this concept may be supported by the work of Miyahara et al[20] who have shown the effect of voluntary teeth clenching on the soleus H reflex, which is also modulated by the cerebral cortex. A concussion may well have had a negative impact on the central nervous system causing processing disturbances in the ascending and descending neural pathways and thereby causing pain. The abnormal muscle stretch reflex findings in this patient may also suggest central nervous system involvement.

D'Attillio et al[18] suggest that the neuromuscular system adapts by moving the center of gravity over the sacral base keeping a horizontal vestibular and visual frame of reference. It may be that this neurophysiological interrelationship has influenced the tonus of the left gluteal and erector spine musculature causing improvement in the low back condition of this patient. Bergamini et al[21] found that neuromuscularly balancing the occlusion reduced the mean voltage of several paired postural muscles, namely m. sternocleidomastoid, m. erector spinae and m. soleus, using surface EMG. Since the sphenoid articulates with almost every bone in the cranium, imbalance in the muscles attaching to the sphenoid can theoretically create an imbalance in the whole cranial system.[15] This may have been the case in this patient since he had a unilateral, left-sided hypertonicity of the m. erector spinae. This may have been a sign of postural imbalance caused by an (cranial) imbalance in the temporomandibular apparatus. This might also explain why the low back pain did not respond to the treatments focused only on the sacroiliac area and thoracolumbar spine.

Limitations

Even though the improvement was striking, there is not sufficient evidence through a post-treatment examination to conclude a correlation between the cranial treatment and the improvement of the low back pain. Since the patient had no temporomandibular symptoms, the correlation in this study may not be correct. The literature on this subject is scarce and anecdotal. The osteopathic and chiropractic literature on craniosacral therapy usually focuses on the cranial sutural treatment. It may be possible that the suggested treatment of the sphenoid bone was treatment of the m. temporalis leading to the above-mentioned changes.

Conclusion

The clinical progress of this case suggests that for some patients, the addition of craniosacral therapy may be helpful in patients with low back symptoms.

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