
CASE STUDY

Resolution of Bell's Palsy in a 68-Year-Old Man Following Correction of Upper Cervical Subluxation: A Case Report & Review

Shane Preece D.C.¹ & Joel Alcantara D.C.²

ABSTRACT

Objective: To describe the positive health outcomes following upper cervical chiropractic care in a patient with Bell's Palsy.

Clinical Features: A 68-year-old male presented for consultation and care with drooping with paralysis of the left side of his face for two weeks duration. The droopiness and paralysis had affected his quality of life such that he was unable to close his eyelid, suffered from dry eye on the affected side and had difficulty eating, drinking and speaking. Previous medical care included prescription steroids and eye drops that were ineffective.

Intervention and Outcome: The patient was cared for with chiropractic care utilizing the NUCCA technique. The patient attended a total of four visits with adjustments given on the 2nd-4th visits. On the 3rd visit (2nd set of adjustments), the patient's face was 80-90% improved. After four visits, the patient's facial paralysis resolved.

Conclusion: This case report provides supporting evidence that patient's presenting with symptoms consistent with Bell's Palsy may benefit from chiropractic care a la NUCCA technique. We encourage continued documentation of chiropractic care of similar patients to inform practice and research.

Key Words: *NUCCA, Bell's palsy, facial paralysis, vertebral subluxation, upper cervical subluxation, adjustment*

Introduction

Named after the Scottish anatomist, Sir Charles Bell, Bell's Palsy is the most common acute mononeuropathy associated with facial nerve weakness or paralysis¹ and accounts for > 50% of all cases of facial paralysis.² Affected individuals span across the age spectrum and both sexes, with an incidence ranging from 11.5 to 53.3 per 100,000 person years in different populations.³⁻⁷

The facial paralysis associated with Bell's Palsy may cause significant temporary oral incompetence and an inability to close the eyelid, leading to potential eye injury. Long-term poor outcomes do occur and can be devastating to the patient such as facial asymmetry and muscular contractures, lagophthalmos and keratitis. Given that no known cause for Bell's Palsy has been identified medically, a number of

-
1. Private Practice of Chiropractic, St. George, UT
 2. Research Director, International Chiropractic Pediatric Association, Media, PA

treatment options (medically) for its sufferers include steroids and antivirals, alone or in combination and surgical decompression⁸⁻⁹ as well as complementary and alternative therapies such as acupuncture and chiropractic.¹⁰⁻¹¹ Specific to the chiropractic care of individuals with Bell's Palsy, there is a dearth of documentation in the scientific literature in this type of care. To address this deficit and following the principles of evidence-informed practice, we describe the chiropractic care of a patient with Bell's Palsy.

History

The patient was a 68-year-old male presenting for consultation and possible care with drooping and paralysis of his left face. According to the patient, his facial paralysis occurred 2 weeks prior. Interestingly, the patient reports that he does not experience any pain with the paralysis. The droopiness and paralysis were such that the patient indicated that it has affected his quality of life such that he is unable to close his left eyelid, he suffers from dry eye on the left and has difficulty eating, drinking and speaking. When asked to rate the functionality of his left face with respect to facial expressions, the patient provided a rating of 0/10 (0=no functionality; 10=fully functional). The patient denied any improvement or worsening of his symptoms. The patient received medical care in the way of prescription steroids and eye drops but were ineffective. The problem at clinical presentation was such that he wore an eye patch at night to prevent his left eye from drying out. Notable past history findings included the patient being hospitalized about 5-6 months prior due to a motor vehicle collision in which the patient suffered a "broken back" and a concussion. The patient was medically cared for with a back brace for 3 months to allow the fracture to heal.

Examination

The physical examination revealed the following. On observation, the patient looked agitated due to his clinical presentation. Standing balance on bilateral scales revealed unequal weight-bearing with the left side greater by 7 lbs. Postural examination revealed the patient's left hip as rotated mildly anterior, his left shoulder slightly elevated by 1 inch compared to the right side. His neck was visibly deviated to the right with his Head deviating to the left. Leg length analysis revealed a short leg on the right side by $\frac{1}{2}$ " interpreted as body imbalance, pelvic distortion and compensatory adaption to a subluxation. With the patient on the table in the prone position, the patient was asked to turn his head from side to side while observing for the patient's leg length; a left cervical syndrome indicated based on the observations.

On digital palpation, the following muscles were found to be hypertonic and tender to palpation: the left sub-occipital muscles, the trapezius muscles (bilaterally) and the left lumbar paraspinal muscles (throughout). Active range of motion analysis revealed decreased/restricted bilateral Rotation and left lateral flexion. Given the patient's presenting complaint, the attending chiropractor decided to perform cranial nerve testing (i.e., cranial nerves 1-X11). Given the patient's left sided facial paralysis, CN VII testing was especially noted. The patient was asked to lift his eyebrows and forehead and

did not "wrinkle." The patient denied diplopia or dizziness and did not exhibit ataxia of gait. He denied experiencing nausea, numbness, nystagmus, and dysphagia.

The patient admitted having trouble speaking but this was attributed to the left side of his lip not working properly. Heart Rate Variability and surface electromyogram (SEMG) testing was performed and revealed the following: The patient's heart rate variability scored 90%. Despite this high score, the HRV graph showed the irregularities in the heart rate as well as an unbalanced autonomic index. SEMEG was in 62% with asymmetry favoring the right side of the spine (see Figures 1 and 2).

Chiropractic analysis utilized NUCCA Technique. Radiographic examination was taken as per NUCCA protocol (see Figure 3). The patient was determined to have an atlas right laterality by $\frac{1}{2}$ " (note: the patient demonstrated a left head tilt of approximately $\frac{1}{2}^{\circ}$) and a right anterior rotation of the atlas by $7\frac{3}{4}^{\circ}$. In addition, it was determined that the patient has lower angle left 5° (i.e., right angular rotation of $2\frac{3}{4}^{\circ}$). Based on NUCCA nomenclature, the patient was a NUCCA Type I (High: 1"; Anterior: $7\frac{3}{4}$ "; Torque: Inferior; Head Piece Placement- 1 on B with Flat Skull; Plane Line of Atlas- $+2\frac{1}{16}$ "; Condylar Circle/ Axial Circle- $+3$ "; Atlas in relation to the bottom of the left earlobe $+1\frac{1}{4}$ "; Axis Rotation: R 3'; Thoracic Lateral Curve: L 7', T2-T9; Lumbar Lateral Curve: R 11', T9-L3).

Intervention

Based on the history and physical examination findings, the patient consented to a course of care. The patient received chiropractic care utilizing the NUCCA technique with adjustments to the upper cervical spine that consisted of 24 visits including 3 full evaluations. A typical adjustment involved the patient in a side posture position on their left side with their left shoulder on a side posture NUCCA table. The patient's head position was placed where the center of gravity of the skull was such that only part of patient's head was touching the head piece. The rest of the patient's body was placed in neutral position side posture with knees bent for stability. The chiropractor measured an Atlas High 1" and Posterior $7\frac{3}{4}$ ". This point is considered the settle back point in NUCCA. The chiropractor used a straight on NUCCA stance/position perpendicular to the line of drive (LOD). The LOD was created with the chiropractor lining up his episternal notch directly over the settle back point. With proper position this creates an LOD of 21.8° in the inferior posterior direction. The chiropractic contact point was his pisiform on the patient's atlas with the wrist stabilized. Approximately 10-12 "tricep pulls" were performed till the chiropractor deemed the atlas was repositioned properly. The patient's comparative radiographic analysis are provided in Figure 4. Comparative HRV and EMG analysis are provided in Figures 5 and 6, respectively.

Outcomes

On the 2nd visit, the patient received his initial adjustment. On the 3rd visit (2nd set of adjustments), the patient's face was 80-90% improved in mobility. Following 4 visits, the patient's facial paralysis

resolved. In terms of outcomes, the patient's head and neck have visibly improved, his shoulders are level and his left-sided short leg was less than ¼" with no cervical syndrome.

Discussion

Based on the published literature specific to chiropractic, authors have addressed the epidemiology, pathophysiology and treatment options (both allopathic and CAM) for Bell's Palsy. These aspects have also been addressed in the case reported. In the interest of brevity, we wish to address the diagnosis of the disorder for the practicing chiropractor. As can be surmised shortly, a patient presenting with hemifacial paralysis and concomitant speech difficulties may be mistakenly attributed to a stroke. Towards efforts at the diagnostic characteristics of Bell's we acknowledge the efforts of Baugh et al.¹²⁻¹³ and Tiemstra and Khatkhat.¹⁴

On clinical presentation, the patient will demonstrate the often-described facial weakness or paralysis of all facial muscles on the affected side. The patient's forehead will unfurrow with drooping of the corner of the patient's mouth. Their facial creases and nasolabial fold will also disappear. When asked to close their eyelids, the patient will demonstrate Bell's phenomenon where the eyes roll upward and they will have difficulty closing their eyes with the lower lid sagging. The patient will complain of dry eyes and in other instances, the patient may complain of excessive tearing due to their inability to close their eyelids. Food and liquids will pool on the affected side with spilling at the corner of the mouth.

In terms of the differential diagnosis, classic Bell's Palsy is idiopathic and its diagnosis is mostly one exclusion of other causes of hemifacial weakness/paralysis. Mononeuropathy affecting the facial nerve can have many etiologies. These include structural lesions due to traumatic injury to the facial nerve. An example in infants may be birth trauma due to the use of forceps. Typically, a temporal association is observed with the traumatic event and the symptoms of Bell's Palsy. Structural lesion to the nerve can also occur due to nerve compression due to neoplasms in the ears or the parotid glands. Inflammatory lesion due to an autoimmune process or infection can occur. For example, Guillain-Barre' and Herpes simplex have been implicated, respectively. The pathophysiology could also be due to congenital anomaly (i.e., Mobius syndrome), endocrine (i.e., diabetes) and inherited (i.e., syphilis infection). In terms of a neurovascular pathophysiology, stroke can cause ischemia affecting the facial nerve.

The natural history of Bell's Palsy is said to be favorable. Eight-five percent will demonstrate partial recovery within three weeks of onset without treatment.¹ Sixteen percent of sufferers are said to suffer moderate to severe sequelae. Prognosis is dependent on the age of the patient, time until first sign of symptoms and the degree of paresis. Patient with >90% degeneration of the facial nerve (based on nerve conduction testing) have a poor prognosis for recovery.¹⁵

Chiropractic Care

Our writing focused on the clinical presentation and differential diagnosis of Bell's Palsy in the context of

chiropractic care. Alcantara et al.¹¹ described the chiropractic care of a 49-year-old woman with a medical diagnosis of Bell's Palsy. The patient was cared with Gonstead Technique with excellent outcomes. In addition, the authors discussed the epidemiology, etiology, diagnosis, care, and prognosis of the disorder. As a further context to our discussion, we performed a systematic review of the literature on Bell's Palsy and chiropractic care after the publication of Alcantara et al. We utilized PubMed (2003-2017), Index to Chiropractic Literature (2013-2017) and MANTIS (2013-2017). We utilized the search terms "Bell's Palsy", "facial paralysis", cranial nerve VII dysfunction" in Boolean combination with chiropractic. Inclusion criteria for our narrative review were: (a) articles written in the English language and (b) chiropractic care (i.e., spinal adjustments and/or adjunctive therapies). We found 4 articles consisting of 3 case reports^{16-17, 19} and one case series¹⁸ (See Table 1). To the best of our knowledge, this is the first reporting in the scientific literature on the chiropractic care of a patient with Bell's Palsy utilizing NUCCA.

We are of the opinion that the etiology in the case presented was traumatic in nature given the patient's history of involvement in a motor vehicle collision. We echo the sentiment of Cotton on the possible role of chiropractic adjustments – specifically to the upper cervical spine. According to Cotton, the upper cervical adjustment may change the tension from the arachnoid and dura mater relieving a possible entrapment neuropathy of the facial nerve. The cranial nerve exits the stylomastoid foramen with entrapment resulting from tension of the trapezius muscles that originates, in part, from the external occipital protuberance and the inner third of the superior curved line of the occipital bone. The sternocleidomastoid muscles with attachments to the mastoid process and the outer half of the superior line of the occipital bone can also contribute to this entrapment neuropathy. Chiropractic adjustments of the upper cervical and other functional segments of the cervical spine may reduce the tension within these muscles.

Based on the ontology (i.e., it's a material world) and epistemology (i.e., objectivity is the key to knowledge) of a post-positivist perspective, we acknowledge the lack of generalizability of the case presented due to a number of confounders. These include the effects of placebo, the natural history (see discussion above), subjective validation, and expectations for clinical resolution on the part of the parent in the case reported. However, we should also acknowledge that the publication of this case report is epistemologically in harmony with our clinical experiences which oftentimes forms a basis for our generalization in clinical practice. We make recommendations to our patients based on our clinical experience (i.e., success and failures in patient care) and as such is congruent with the constructivist paradigm (i.e., experience creates our reality) and evidence-informed clinical care.

Conclusion

This case report provides supporting evidence that patient's presenting with symptoms consistent with Bell's Palsy may benefit from chiropractic care a la NUCCA technique. We encourage continued documentation of chiropractic care of similar patients to inform practice and research.

References

1. Peitersen E. Bell's palsy: the spontaneous course of 2,500 peripheral facial nerve palsies of different etiologies. *Acta Otolaryngol Suppl.* 2002;(549):4-30.
2. Schirm JI, Mulkens PS. Bell's palsy and herpes simplex virus. *APMIS.* 1997;105(11):815-23.
3. Brandenburg NA, Annegers JF. Incidence and risk factors for Bell's palsy in Laredo, Texas: 1974-1982. *Neuroepidemiology.* 1993;12:313-325.
4. Katusic SK, Beard CM, Wiederholt WC, Bergstralh EJ, Kurland LT. Incidence, clinical features, and prognosis in Bell's palsy, Rochester, Minnesota, 1968-1982. *Ann Neurol.* 1986;20:622-627.
5. Monini S, Lazzarino AI, Iacolucci C, Buffoni A, Barbara M. Epidemiology of Bell's palsy in an Italian Health District: incidence and case-control study. *Acta Otorhinolaryngol Ital.* 2010;30:198.
6. Rowlands S, Hooper R, Hughes R, Burney P. The epidemiology and treatment of Bell's palsy in the UK. *Eur J Neurol.* 2002;9:63-67.
7. Tsai HS, Chang LY, Lu CY, et al. Epidemiology and treatment of Bell's palsy in children in northern Taiwan. *J Microbiol Immunol Infect.* 2009;42:351-356.
8. Nemet AY, Vinker S2. Considerations and complications after Bells' palsy. *J Clin Neurosci.* 2015;22(12):1949-53.
9. Vakharia K, Vakharia K. Bell's Palsy. *Facial Plast Surg Clin North Am.* 2016;24(1):1-10.
10. Dimitrova A, Murchison C, Oken B. Acupuncture for the Treatment of Peripheral Neuropathy: A Systematic Review and Meta-Analysis. *J Altern Complement Med.* 2017;23(3):164-179.
11. Alcantara J, Plaugher G, Van Wyngarden DL. Chiropractic care of a patient with vertebral subluxation and Bell's palsy. *J Manipulative Physiol Ther.* 2003;26(4):253.
12. Baugh RF, Basura GJ, Ishii LE, Schwartz SR, Drumheller CM, Burkholder R, Deckard NA, Dawson C, Driscoll C, Gillespie MB, Gurgel RK, Halperin J, Khalid AN, Kumar KA, Micco A, Munsell D, Rosenbaum S, Vaughan W. Clinical practice guideline: Bell's palsy. *Otolaryngol Head Neck Surg.* 2013;149(3 Suppl):S1-27.
13. Baugh RF, Basura GJ, Ishii LE, Schwartz SR, Drumheller CM, Burkholder R, Deckard NA, Dawson C, Driscoll C, Gillespie MB, Gurgel RK, Halperin J, Khalid AN, Kumar KA, Micco A, Munsell D, Rosenbaum S, Vaughan W. Clinical practice guideline: Bell's Palsy executive summary. *Otolaryngol Head Neck Surg.* 2013;149(5):656-63.
14. Tiemstra JD1, Khatkhate N. Bell's palsy: diagnosis and management. *Am Fam Physician.* 2007;76(7):997-1002.
15. Jabor MA, Gianoli G. Management of Bell's palsy. *J La State Med Soc.* 1996;148(7):279-83.
16. Cotton BA. Chiropractic care of a 47-year-old woman with chronic Bell's palsy: a case study. *Journal of Chiropractic Medicine* 2011;10:288-293.
17. Rubis LM. Chiropractic management of Bell palsy with low level laser and manipulation: a case report. *Journal of Chiropractic Medicine* 2013;12:288-291.
18. Ng CSY, Chu MHE. Treatment of Bell's Palsy Using Monochromatic Infrared Energy: A Report of 2 Cases. *Journal of Chiropractic Medicine* 2014;13:96-103.
19. Nguyen A, Rose K, Hwang S. Integrated Chiropractic and Acupuncture Treatment for a Patient with Persistent Symptoms of Bell's Palsy: A Case Report. *Topics in Integrative Health Care* 2013; 4(3): 1-7.

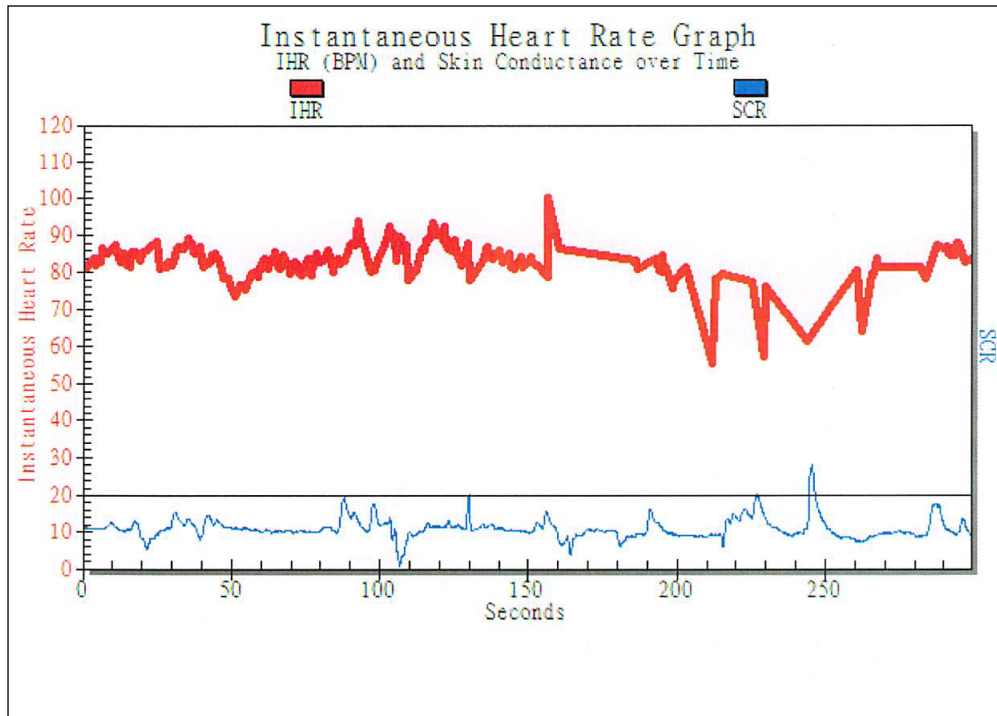


Figure 1. Pre-treatment heart rate variability examination of the patient.

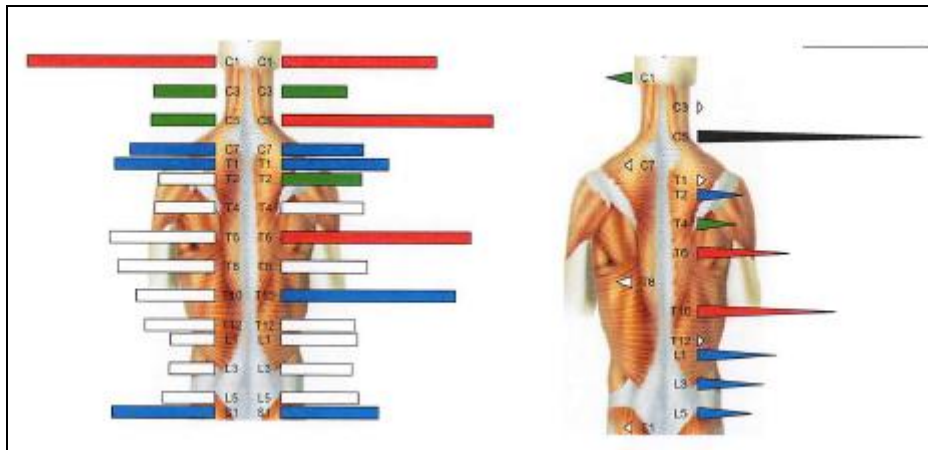


Figure 2. Pre-treatment surface EMG examination findings of the patient presented.

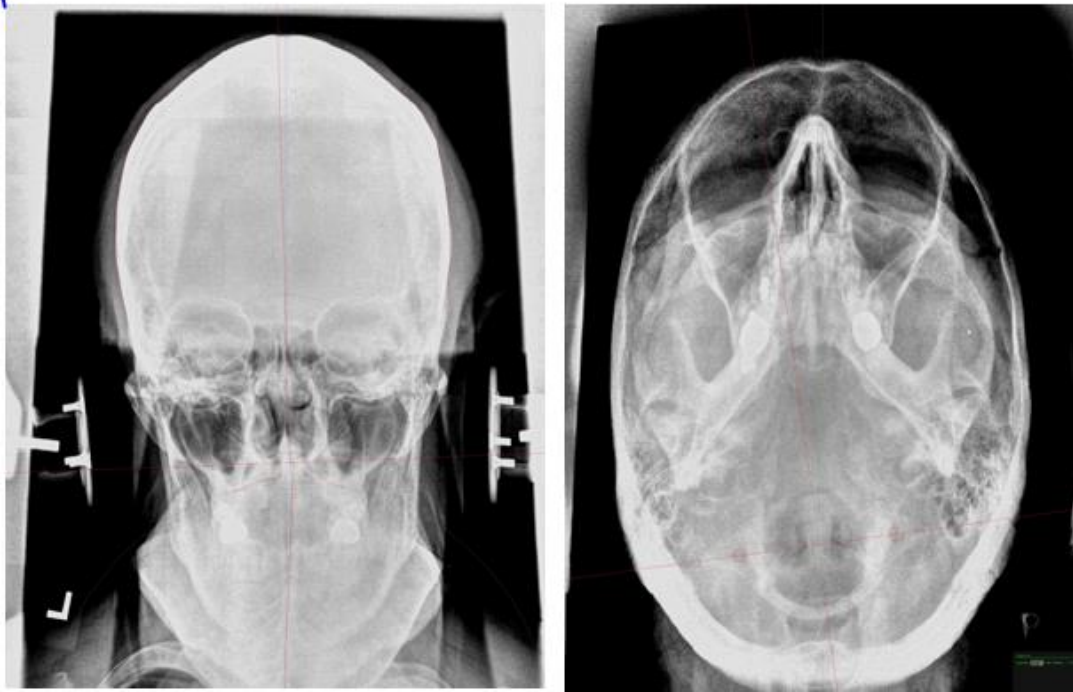


Figure 3. Pre-treatment nasium (left) and vertex (right) NUCCA radiographic analysis



Figure 4. Comparative nasium (left) and vertex (right) NUCCA radiographic analysis.

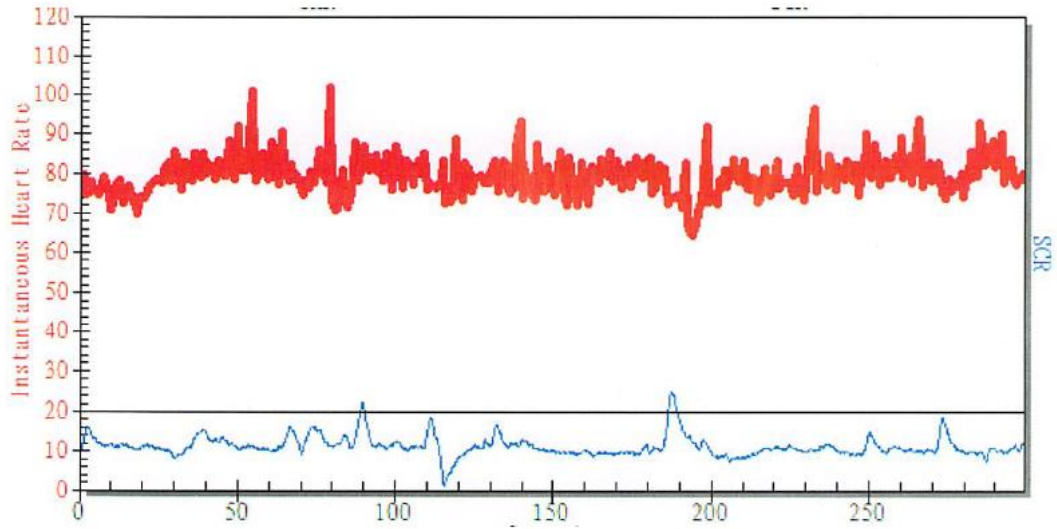


Figure 5. Comparative heart rate variability examination of the patient.

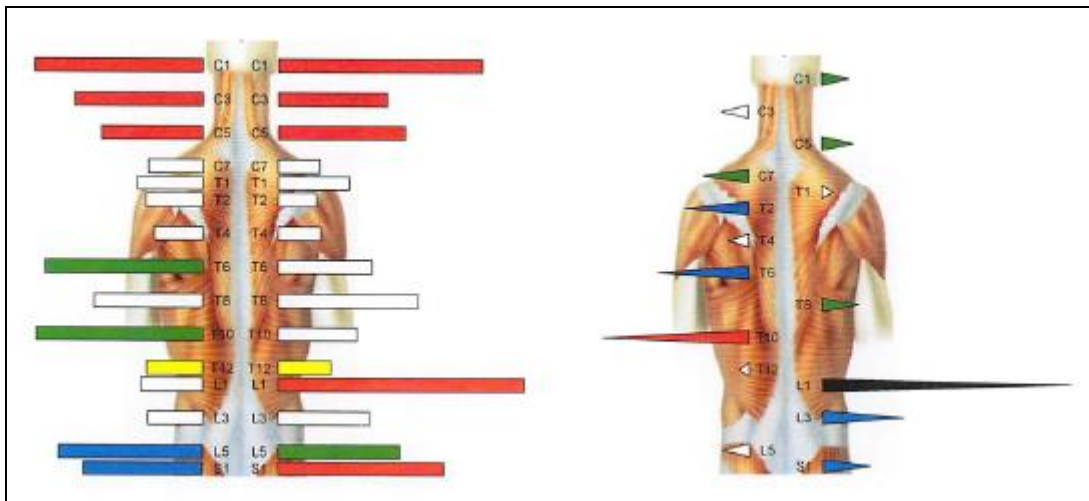


Figure 6. Comparative surface EMG examination findings of the patient presented.

Table 1. Review of the literature on the chiropractic care of patients with Bell's Palsy.

Reference	Age and gender	Clinical notes
Cotton ¹⁶	47-year-old male	Medical care consisted of prescribed a gabapentin (Neurontin, Pfizer, New York City, NY) and an eye lubricant, and recommended drinking cold water and using azithromycin (Z-Pak, Pfizer). However, a neurologist determined the patient's condition was permanent and no further medical care was deemed beneficial. The patient received chiropractic care characterized as high-velocity, low-amplitude technique (i.e., Diversified technique) directed to the C ₁ , C ₇ , T ₂ and T ₆ spinal levels. The patient received care for a total period of 16 months with described improvement in the patient's facial symptoms.
Rubis ¹⁷	A 40-year-old male	The patient was cared for with Diversified Technique with adjustments to the cervical spine (i.e., C ₁ and C ₇ vertebral bodies) followed by low level laser along the course of cranial nerve VII including its branches. The patient was cared for similarly on the 2 nd visit. On the 3 rd and 4 th visit, the patient received exclusively spinal adjustments with reported resolution of facial symptoms by the patient.
Ng and Chu ¹⁸	A 32-year-old male and a 46-year-old female	The male had a one-day onset and the woman was diagnosed with Bell's palsy 2 years prior. Both patients received care with monochromatic infrared lights with the male attending a total of 19 visits while the female attended 45 visits.
Nguyen et al. ¹⁹	A 53-year-old male	The patient received combinatory care consisting of 11 chiropractic and 7 acupuncture visits over a three-month period resulting in resolution of Bell's Palsy. The chiropractic care were adjustments to the upper cervical spine (i.e., Diversified Technique).