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Chiropractic management of Bell palsy with low level laser and manipulation: a case report

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Abstract

Objective: The purpose of this case report is to describe chiropractic management including the use of cold laser and chiropractic manipulation in the treatment of a patient with Bell palsy.

Clinical features: A 40-year-old male patient had a 10-day history of facial paralysis on his left side, including the inability to close his left eye, which also had tearing and a burning sensation. The patient had trouble lifting his left lip and complained of drooling while brushing his teeth. There was no previous history of similar symptoms or a recent infection. Prior treatment had included oral steroids.

Intervention and outcome: The patient was treated with low-level laser therapy and chiropractic manipulation 2 times in 4 days. The laser was applied along the course of the facial nerve for 30 seconds at each point and for 1 minute at the stylomastoid foramen. The laser used was a GaAs class 4 laser with a wavelength of 910 nm. The patient perceived a 70% to 80% improvement of facial movement after the first treatment. After the second treatment, the patient reported full control of his facial movements.

Conclusion: A patient with acute facial paralysis appeared to have complete resolution of his symptoms following the application of low-level laser therapy and chiropractic manipulation.

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Introduction

Bell palsy (idiopathic unilateral facial nerve paralysis) is a condition that has an incidence of 20 to 30 people out of 100,000 per year.¹ These are the three main treatments found cited in the literature. Steroid

treatment, steroids and antiviral medications,¹ and electrical stimulation.² Other anecdotal literature includes the use of osteopathic manipulation,³ acupuncture,⁴ and chiropractic manipulation.^{5,6} Low-level laser therapy (LLLT) has been shown to be effective at nerve regeneration and improving nerve function^{7,8} including the facial nerve.^{9,10} Bell palsy is typically self-limiting. It is reported that there is a high rate of spontaneous recovery especially for people who can still partly move their facial muscles in 1 to 2 months¹¹ During this time, the patient has to consider

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complications that include the risk of eye injuries. It is hypothesized that LLLT and chiropractic care may help speed this recovery with minimal adverse effects. The purpose of this case report is to describe the management of a patient with Bell palsy using LLLT and chiropractic manipulation.

Case report

A 40-year-old man had presented to the office with a chief concern of left-sided facial paralysis for 10 days. He gave consent to have his personal health information published without divulging personal identifiers. The patient reported no history of skin problems or any recent infection. There was no history of recent trauma. The initial symptoms were the burning of his left eye and an inability to close or blink his left eye. He noted trouble with his mouth, biting his bottom lip while eating, and drooling while brushing his teeth, but no change in taste. The day after his symptoms began, the patient presented to his primary care medical physician, who diagnosed him with Bell palsy of possible viral etiology and was given a prognosis that it would be self-limiting in 1 to 6 months. The physician prescribed oral steroids and referred him to a neurologist. The neurologist ordered a brain magnetic resonance imaging that was performed 5 days later; the report of his brain magnetic resonance imaging showed no abnormalities. Ten days after symptoms began, the patient presented to my office.

Upon examination, the patient was unable to close his eye, showing minimal movement and an inability to raise his eyebrow; and his lip was drooping on the left side, coinciding with a House-Brackmann score of V.¹² The patient's cranial nerves II, III, IV, V, VI, VIII, IX, X, and XII were intact bilaterally. Swallowing was a little difficult because of the inability to close the mouth on the left side. Sensation over the face was intact with light touch; however, the patient did report a "tight" sensation on the left side. Cervical spine ranges of motion were measured with a single bubble inclinometer in which the patient had 40° in lateral flexion bilaterally with no pain and 40° of extension with no pain. On palpation, the patient had tenderness at C1 with a decrease in left to right lateral flexion. The C7 spinous process was rotated to the left and had a decrease in left-right lateral flexion.

The patient was treated with diversified, supine, rotary manipulation at C1 on the left side and C7 on the right side. After manipulation, 910-nm GaAs class 4

low-level laser was used along the course of cranial nerve VII including its branches for a total of 17 minutes. The laser was set to 100% power, having a peak pulse power of up to 100,000 mW with a frequency of 20 kHz and adding a total of 47.6×10 J of energy. These settings were used according to the manufacturer recommendations for the reduction of inflammation. The laser was placed for 1 minute near the mastoid at the stylomastoid foramen and then for 30 seconds at each spot along all 5 branches of the facial nerve. These spots included the following: along the course of the temporal branch across the forehead, the zygomatic branch across the zygomatic arch, the buccal branch through the middle of the cheek on the buccal muscle, and the mandibular branch along the patient's chin. The patient reported the sensation of warmth on his face toward the midline during the course of treatment. After the first treatment, there was a noticeable increase in wrinkling over the left forehead, showing improvement in the contraction of the corrugator supercilii muscle. The second treatment was performed 4 days later consisting of a diversified rotary manipulation to C2 as well as another round of LLLT to the facial nerve as previously reported. The patient subjectively reported that he had regained approximately 70% to 80% of his facial movement. He was able to smile, was no longer drooling while brushing his teeth, and had the ability and control to wink. The patient was able to close his eye, but still reported a tight sensation and slight weakness. During the second treatment, the patient reported more warmth on his face than what he experienced during the first treatment. The patient returned for a third visit 1 week later with the ability to smile fully and lift his brow as well as close his eyes. The patient was also able to puff his cheeks out and had no sensation of tightness in his face. During the third visit, treatment with cold laser was terminated; and the patient received an adjustment to the cervical spine at C2. On the third visit, the patient presented with a headache that radiated up the back of the cervical spine to the top of the head after straining working out in the gym. He was found to have an increase in muscle tone and tenderness of the right suboccipitals with referral to the top of the head and the C2 spinous process rotated to the right. Two days later, the patient returned for a follow-up without a headache; but C2 was adjusted because of a slight restriction in right rotation. The patient reported no complaint of facial weakness or sensation of tightness. His progress can be tracked in [Table 1](#). The patient was scheduled for another follow-up visit, but did not return for the final follow-up visit. When contacted 4 years later over

Table 1 Outcomes following each treatment

Visit number	Treatment	Outcome
1	Manipulation and LLLT	Initial visit
2	Manipulation and LLLT	70%-80% improvement. Smiling, winking, still has tight sensation
3	Manipulation	Full facial control and no sensation of tightness, headache
4	Manipulation	Full facial control, no tightness, no headache

LLLT, low-level laser therapy.

the phone and asked about his facial movement, he reported no relapse in symptoms and no synkinesis.

Discussion

The condition of Bell palsy can be self-limiting, although usually in a longer duration than this case that had a perceived 70% to 80% improvement 14 days from the onset of symptoms. The patient in this report was treated with steroids, which have been shown to shorten the duration of symptoms with recovery in 3 to 9 months.¹³ However, there is evidence that a combination therapy of steroids and LLLT may be even more effective at decreasing the duration. Research showed a comparison of groups: one that received laser therapy and corticosteroids, and one that received only laser therapy. In the combo group, success was achieved within 14 to 31 sessions, 3 to 10 weeks. Meanwhile, the laser therapy alone received 21 to 66 sessions, 5 to 12 weeks.⁶ The research explains two possible mechanisms found that explain how LLLT can function in reducing inflammation and starting cell repair. Low-level laser therapy may function to reduce inflammatory cytokines such as interleukin-1 and tumor necrosis factor- α by inhibiting them.¹⁴ Also, with the mitochondria being the initial site of light action, there is signaling begun from the LLLT, with cytochrome *c* oxidase being the responsible mechanism.¹⁵ The signaling allows for an increase in adenosine triphosphate production. Adenosine triphosphate has been shown to act as a neurotransmitter directly involved in brain function, sensory reception, and the neuron system control of muscles and organs, explaining the versatility of LLLT effects.¹⁵ A few previous case reports have shown improvement in Bell palsy patients with the use of chiropractic manipulation. For example, a 49-year-old woman was treated with high-velocity, low-amplitude

manipulation and reported symptomatic relief in the cervical and facial regions after 1 week of treatment.⁵ However, improvement in facial motion such as closing the eye and smiling was reported much later, after 20 visits.⁵ Another case reported use of manipulation with interferential muscle stimulation and showed an increase in facial movement after 6 visits.⁶ In this case, chiropractic manipulation to the cervical spine was also performed to increase range of motion and decrease edema or any possible entrapment of the facial nerve. The entrapment could have occurred at different points along the anatomical pathway including local entrapment due to tension of the sternocleidomastoid muscle or the trapezius muscle.⁶ Chiropractic manipulation may help to reduce this tension by restoring proper biomechanical function.⁶ Edema and subsequent nerve entrapment of the facial nerve secondary to infection remain as an accepted theory for Bell palsy.^{16,17} Cold laser combined with chiropractic manipulation has been shown to be better at reducing pain and increasing range of motion than either treatment alone.¹⁸ I think LLLT and manipulation helped this patient because of decreasing inflammation of the facial nerve by stimulation of the mitochondria that allowed for an increase in adenosine triphosphate production or by its inhibition of inflammatory cytokines.^{15,14} Additional research should be done that includes using patients without prior treatment. A comparative study could be done with one group receiving LLLT and another receiving infrared. The research shows that the sooner the intervention is done, prior to 3 days after onset, the more effective the treatment.¹³

Limitations

As this was only one case, extrapolation should not be made for the use of LLLT for treatment of Bell palsy. Although this condition is self-limiting, the high rate of spontaneous recovery is in the time frame of 1 to 2 months especially in those who have partial facial movement.¹¹ It is also possible that this patient may have been misdiagnosed. The patient had presented with facial weakness on the entire side of the face and had no recent history of infection or trauma prior to the episode.

Conclusion

For this patient, early intervention with LLLT and chiropractic manipulation appeared to improve facial paralysis in 4 visits with no reported adverse effects.

Low-level laser therapy may have helped reduce the inflammation of the facial nerve in conjunction with the oral steroids prescribed by his physician. Chiropractic management using LLLT and chiropractic manipulations may be a method of treatment to consider for patients with Bell palsy.

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