

DROP FOOT: A CASE FOR ENHANCED PATIENT OUTCOMES WHEN COMBINING CHIROPRACTIC AND PHYSICAL THERAPY INTERVENTIONS

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ABSTRACT

Objective: To discuss the management of acute unilateral peroneal neuralgia using integrated chiropractic and physical therapy interventions.

Clinical Features: A 61-year-old male sought care at a hospital-based chiropractic clinic for acute unilateral foot drop and paresthesia over the dorsum of his right foot, following sitting with the lateral lower right leg resting along the gunnel of a canoe for extended periods of time.

Intervention and Outcome: Treatment consisted of multimodal chiropractic care and physical therapy intervention, including extremity manipulative therapy, instrument-assisted soft-tissue mobilization (IASTM), manual myofascial release, compression flossing, therapeutic exercises and a home exercise program. Treatment lasted for 8 weeks and consisted of 11 chiropractic treatments and 5 physical therapy sessions. At time of discharge, patient reported complete resolution of ankle dorsiflexion and near-maximal improvement in sensation over the dorsum of his right foot. His Lower Extremity Functional Scale (LEFS) score improved from 62/80 to 77/80. At a follow-up 2 months post-discharge, he reported complete resolution of symptoms.

Conclusion: Conservative management for peroneal neuralgia causing foot drop is not well documented within the current literature. This case provides a case for the combined use of chiropractic care and physical therapy for peroneal neuralgia treatment and suggests the need for further research in this area. (J Contemporary Chiropr 2019;2:1-3)

Key Indexing Terms: Peroneal Neuralgia; Chiropractic; Physical Therapy

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INTRODUCTION

Foot drop is a common and distressing condition where one loses control of ankle dorsiflexion. Often, common peroneal nerve (CPN) dysfunction results in paralysis of ankle dorsiflexion muscles to include; the tibialis anterior, the toe dorsiflexors, the extensor digitorum reavis, and the extensor hallicus longus (2). This dysfunction alters the patient's gait, giving him or her a "steppage gait," which leads to increased hip and knee flexion, often resulting in increased falls and further injury (1-2). Paresis of foot eversion and sensory impairment on the dorsum of the foot and lateral leg is also common but is often a less noticeable cause of dysfunction (2).

Anatomical review (2-5) of the CPN gives insight into the dysfunction one may face after sustaining an injury to this site. In the posterior thigh, the sciatic nerve divides into 2 parts at the proximal popliteal fossa: the CPN laterally, and the posterior tibial nerve medially. The CPN proceeds laterally where it passes posterior to the fibular neck. At this point the CPN traverses under a fibrous edge at the origin of the peroneus longus and then proceeds distally, dividing into the superficial and deep peroneal branches. The superficial peroneal nerve gives off branches to the peroneus longus and brevis, which are primary ankle evertors, and then distally supplies sensation to the lower anterolateral leg and the dorsum of the foot. The deep peroneal nerve courses anteriorly supplying motor function to the tibialis anterior, extensor hallucis longus and extensor digitorum brevis, ankle and toe dorsiflexors, and lastly the peroneus tertius. It supplies a small area of sensation to the dorsal surface of the web space between the 1st and 2nd digits of the foot.

The CPN is the most frequently injured nerve in the lower extremity (6) and the most frequent cause is a common peroneal neuropathy at the neck of the fibula; however, other causes include anterior horn cell disease, muscular dystrophy, polio, Charcot-Marie-Tooth disease, amyotrophic lateral sclerosis, multiple sclerosis, stroke, lumbar plexopathies, L5 radiculopathy, and

partial sciatic neuropathy (1,7). External compression, stretch/contusion with fracture/dislocation, laceration, entrapment, compression, iatrogenic, and gunshot wounds are often mechanisms of CPN injuries (8).

Treatment of foot drop includes nonsurgical interventions such as bracing, splinting, physical therapy and nerve stimulation. Surgical treatment options also exist (9-11). There is little evidence to support the use of chiropractic intervention in the treatment of foot drop. The purpose of this case report is to discuss the management of acute unilateral peroneal neuralgia that involved multimodal chiropractic care and physical therapy interventions. The clinical outcomes are reported along with a description of the treatment mechanism.

CASE REPORT

A 61-year-old male patient sought care at a hospital-based chiropractic clinic with a complaint of right-sided foot drop. His symptoms began 9 days prior to his visit, following 3 days of sitting in his canoe with the right lateral aspect of his leg resting against the gunnel of the canoe. He explained that he had been sitting in this position for 3 hours at a time, over the course of 3 days and at the end of the third day, when he attempted walking up a large hill, he noticed that his right foot was unable to properly dorsiflex during his gait cycle. The patient arrived at his home 60 minutes later and took his boots off, where he found that he had decreased sensation on the top of his right foot and complete loss of dorsiflexion. He sought the care of his medical doctor, where he was not provided treatment and was told to monitor any changes over the next 10 days. By the 9th day, he had not noticed improvement and therefore visited the chiropractic office.

He stood 67 inches tall and weighed 235 pounds. Upper and lower extremity reflexes were intact (+2/2 bilaterally). Lower extremity strength testing was symmetric bilaterally at 5/5, with the exception of right ankle dorsiflexion, which measured 2/5. Furthermore, he was unable to distinguish between sharp and dull sensation along the dorsum of the right foot and indicated his foot felt numb subjectively. Upon observation, his gait clearly demonstrated right-sided foot drop. On palpation, there was a muscular trigger point in the proximal 1/3 of the anterior tibialis along with myofascial restrictions throughout the anterior tibialis and peroneus longus and brevis.

Over the next 3 weeks, he was treated in the chiropractic clinic twice per week. The treatment consisted of an active warm-up which consisted of wrapping functional and kinetic treatment with rehab (FAKTR) compression floss bands from distal to proximal over the right ankle and lower leg, followed by active ankle range of motion (ROM) (2x10 of ankle dorsiflexion, plantar flexion, inversion and eversion). Next, instrument-assisted soft-tissue mobilization was performed over the anterior lateral

leg using Graston™ instruments, followed by manual myofascial release where the doctor placed a contact digit on the restricted musculature (anterior tibialis and peroneal muscles) while the patient actively lengthened the targeted muscle. The fibular head was then mobilized from anterior to posterior. Lastly, kinesiology tape was applied over the anterior-lateral aspect of the right lower leg.

After 3 weeks of multimodal chiropractic intervention, he was referred to physical therapy (PT) for co-management. The initial PT evaluation revealed that ankle dorsiflexion had improved to 4/5. Sensory testing improved to where he could feel normal to light touch; however, the patient continued to indicate numbness on the top of his right foot.

Over the next five weeks, he was treated once per week in the chiropractic clinic and 1 time per week in physical therapy. The chiropractic treatment remained the same and the physical therapy sessions focused on exercises to improve strength in dorsiflexion and active ankle ROM. Exercises performed at each physical therapy session included ankle ABC's, ankle circles, dorsiflexion holds, calf stretches, 4-way ankle motions with yellow TheraBand™, towel scrunches with toes, marble pick-up with toes, and windshield wipers with foot. Russian electrical stimulation over the anterior tibialis and peroneal muscles was also performed for 15 minutes per PT session.

After 8 weeks of care, which included a total of 11 chiropractic treatments and 5 physical therapy sessions, he was discharged from treatment. At the time of discharge, his right ankle dorsiflexion strength fully returned to 5/5 and his gait returned to normal. He was able to distinguish between sharp and dull sensation along the dorsum of the foot; however, he did state that his foot still felt "slightly numb." His LEFS improved from 62/80 at the initial visit to 77/80 at the time of discharge. The patient consented to having this case described in the literature.

DISCUSSION

To date, there is limited evidence regarding the effectiveness of conservative treatment for compression injuries resulting in CPN injuries or peroneal nerve entrapments resulting in foot drop. However, this case assesses the outcomes of conservative management in 1 patient with a CPN injury resulting in foot drop. Our findings demonstrated that after 11 chiropractic treatments and 5 physical therapy sessions over the course of 8 weeks, our patient regained full strength of the ankle dorsiflexors and regained ability to distinguish between sharp and dull sensation. The patient in this case may have improved because of the natural course of the disorder or other factors that were not measured or that we were unaware of. However, because this is a single case report, it is inappropriate to generalize the results from this patient to other patients with a peroneal nerve entrapment, nor is it understood what factors were precisely responsible for the outcomes

obtained. In this case, multimodal chiropractic care and physical therapy was utilized. It is possible only one of the interventions alone may have been just as beneficial as all of the combined interventions. While peroneal neuralgia does follow a recurrent and continual natural course, we hypothesize that the multimodal chiropractic treatment and physical therapy was at least partially responsible for the improvement the patient obtained. Further observation and experimental research with large sample sizes are needed to determine what the effects of multimodal chiropractic care and physical therapy has on patients with peroneal nerve entrapments. This case report is notable to healthcare providers, especially doctors of chiropractic and physical therapists due to the lack of experimental research on effective conservative treatment of peroneal neuralgia.

Interprofessional care has been shown to be beneficial in the management of many health conditions. The quality of healthcare and extent of patient outcomes are often improved when there are multiple providers on the patient's healthcare team (12,13). Our patient initially presented to his primary care physician, who told him to monitor his condition for any changes; there was no treatment provided, no recommendations for palliative care and minimal discussion related to his condition. Still seeking answers, the patient came to the chiropractic office on a self referral, where a complete and comprehensive physical exam was performed and a treatment program was implemented. As the treatment progressed and limitations in the current treatment plan were identified, our patient was sent to physical therapy for co-management of his condition. With a combination of the chiropractic and physical therapy teams, he was able to obtain favorable outcomes and notable improvement in his condition in a relatively short period of time. This collaborative approach and the favorable treatment outcomes when using a combination of conservative care modalities and teams of providers demonstrate the vitality of collaboration among healthcare providers

CONCLUSION

Conservative management for peroneal neuralgia causing foot drop is not well documented within the current literature. In fact, to the best of our knowledge, this is the first case report documented utilizing this mode of intervention. Thus, this case provides preliminary evidence for the combined use of chiropractic care and physical therapy for peroneal neuralgia and suggests the need for further research in this area.

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