CASE REPORT

Subsiding of Dependent Oedema Following Chiropractic Adjustment for Discogenic Sciatica

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Background: Subsiding of dependent oedema with chiropractic treatment for sciatica has not been described in the literature.

Case presentation: A 40-year-old woman presented with unbearable sciatic nerve pain which restricted her in doing daily activities. She also had bilateral leg swelling for some time and no apparent physical causes could be found after being reviewed by a cardiologist. The patient subsequently sought chiropractic care to relieve her pain. She unexpectedly experienced a beneficial outcome from spinal adjustment in which both sciatic nerve pain and leg oedema were simultaneously resolved. It is reasonable to say that ease of mobility from pain relief and increased lymphatic return from sympathetic responses can help eliminating leg oedema following spinal adjustment.

Conclusions: The pathophysiology of oedema formation is multifactorial and the therapeutic role of chiropractic remains inconclusive in this case. Further researches are need in this area before the integration of chiropractic into cardiovascular practice.

Keywords: chiropractic adjustment; lymph; oedema; sciatica; sympathetic response
her leg swelling also subsided following commencement of treatment (Figure 2). The second phase treatment was focused on spinal decompression by intermittently stretching and relaxing in a controlled manner, to create a negative intradiscal pressure and promote faster healing. Treatment was scheduled to perform thrice weekly for the next one month. Sciatica symptoms and leg edema disappeared and her blood test came back normal after the treatments. The patient continued with maintenance care on a monthly basis to prevent sciatica return and achieved stable therapeutic effect in the past 8 months.

Discussion
Various pathological conditions including infection, peripheral vascular disease, cardiac disease, renal failure, fluid and electrolyte problems, and hypoproteinaemia
Chu and Wong: Oedema Subsiding Following Chiropractic Adjustment

Peripheral edema (Zhang et al. 2012) can cause dependent oedema, which may sometimes not be related to a specific disease. Prolonged immobility can slow blood stream, in turn causing fluid retention in dependent parts affected by gravity. In chair-bound patients, oedema is in the feet and lower legs. Patients requiring prolonged bed rest develop oedema in the buttocks, genitals and posterior thighs. Venous stasis eventually leads to venous hypertension, dilation of the small veins and dermal capillaries, and inflammatory events in the inner lining of the veins (Spentzouris & Labropoulos 2009). The deoxgenated venous blood stagnated in the cutaneous microcirculation can lead a bluish or purplish tinge to the skin and permit fluid shifting into the interstitial compartment, as illustrated in this patient (Figure 2).

Some medications can induce bothersome oedema. Pregabalin (Lyrica®) is a voltage-gated Ca$^{2+}$ calcium channel antagonist that subtly reduces the synaptic release of several neurotransmitters, and may entail reduction of abnormal neuronal excitability (Lee 2013). The result of antagonism can cause a secondary reduction in vascular smooth muscle contractility thereby leading to vasodilatation and oedema (Gallagher & Apostle 2013). Pregabalin is also shown to modulate different potassium channels including $K_{	ext{lep}}$ channels probably be another mechanism responsible for its analgesic or anticonvulsant effect (Verma, Singh & Singh Jaggi 2014). Elevated serum potassium has also been observed among people taking pregabalin, as seen in this case. Celecoxib (Celebrex®) is a COX-2 inhibitor, which blocks the enzyme for prostaglandin synthesis. Celecoxib is used to treat inflammation and its accompanying pain and fever. Inhibition of COX-2 enzyme in the kidney could also lead to interruption of the renal synthesis of prostaglandins resulting in peripheral oedema, and other renal adverse effects (Harris Jr 2002). Leg oedema is not listed side effect of acetaminophen (Tyleno®), tramadol (Ultram®) or oral bisphosphonate (Frosamax®).

It has been assumed that chiropractic manipulation reflexly mediates autonomic responses in association to the particular segment(s) adjusted (Welch & Boone 2008). The sympathetic nerves originate from the spinal cord in the thoracolumbar region and extend down to the third lumbar segment of the spine. The parasympathetic nerves arise with cranial nerves III, VII, IX and X, as well as from the caudal portion of the spinal cord. The primary function of the lymphatic system is to return the fluid that has leaked from capillaries back to the bloodstream (Ikomi, Kawai & Ohhashi 2012). Peripheral lymphatic function is controlled by the autonomic nervous system, and the sympathetic activity has been shown to increase lymphatic vessel contraction and lymph flow (McHale 1990). When the lymphatic vessels appear overwhelmed during oedema, an increase in pumping efficiency would be expected to restore proper fluid balance (Scallan, Huxley & Korthuis 2010). Chiropractic adjustments have been assumed to affect the autonomic nervous system by helping to down-regulate the sympathetic nervous system and promote parasympathetic activity (Welch & Boone 2008).

Our speculation has centered on the fact that the patient had been immobilized for sciatic nerve pain and sleeping in a semi-upright position over the past two months. Furthermore, she had been taking more than one drug (i.e. pregabalin and celecoxib) which might predispose her to or worsen dependent oedema. Elevated serum potassium once noted was possibly another drug-induced effect in this case. Therapeutic goal of chiropractic adjustment was releasing neural impairment and restoring sensorimotor function. It is reasonable to say that ease of mobility and improved sleep performance from pain relief and increased lymphatic return from sympathetic responses can help eliminating leg oedema following spinal adjustment. The main limitation of this case report is that the cause of leg oedema and mechanism of symptom relief are still uncertain. Our speculation for the therapeutic outcome is based on the inclusion of clinical possibilities. Withdrawal of the potential offenders should be a straightforward approach to confirm drug-induced reaction. Nevertheless, it would be inappropriate to ask a patient of multidisciplinary care to suspend prescription from the primary treating surgeon. Moreover, a single case report is not proof of concept, but the patient’s experience is supportive. Published reports of the successful spinal adjustment for peripheral oedema are not available yet. Further researches to better clarify the role of chiropractic are necessary.

**Conclusion**

The pathophysiology of leg oedema might be attributable to complex factors and remains inconclusive in this case without solid evidence. Despite spinal adjustments do not actually alter peripheral blood circulation, the manipulations reflexly mediate autonomic responses might have helped alleviating oedema via lymphatic return.

**Competing Interests**

The authors have no competing interests to declare.

**References**


