



Veterinary chiropractic

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Introduction

The past decade has witnessed heightened public interest in complementary and alternative veterinary therapies. Veterinary chiropractic, employed by veterinarians and chiropractors alike, is part of this emerging trend toward integration of complementary medicine with the practice of conventional animal health care.

The focus of such nonconventional therapies, often referred to as *holistic medicine*, is the promotion and maintenance of normal, healthy function. Where health is compromised, holistic therapies are concerned with restoring the inborn homeostasis of the body, thereby facilitating the natural capacity to heal itself. Conventional medical philosophy is often more pathology oriented, and although the philosophies of holistic therapies may diverge from this, the 2 approaches can be combined to provide veterinarians with broader solutions to animal health care. Such is the case with chiropractic in the treatment of neuromusculoskeletal dysfunctions.

Spinal manipulation has been practised for centuries in many cultures. There is evidence that spinal manipulation was employed in China as early as 2700 BC. Modern chiropractic technique was developed in the United States during the late 19th century. Though modern chiropractic is commonly considered to be a relatively new treatment available solely to human patients, numerous chiropractic publications dating from the early 20th century report the successful application of chiropractic treatment on animals (1). Though still firmly entrenched in the domain of human medicine, recently, chiropractic has emerged as a viable and effective treatment for animal patients. Currently, veterinary chiropractic is primarily performed on cats, dogs, and horses; however, any species with a vertebral column can benefit.

Chiropractic, derived from the Greek words "cheir" and "praxis" meaning "practice done by hand," is defined as "that science and art which uses the inherent recuperative powers of the body and deals with the relationship between the nervous system, spinal column including its immediate articulations and the role of this relationship in the restoration and maintenance of health"(2). This definition accords with the basic philosophy of chiropractic, which assumes the innate

capacity of the body to heal itself (similar to what the Chinese refer to as "Qi"); the primacy of the nervous system, especially in affecting homeostasis in the body; and the adverse affect of spinal musculoskeletal dysfunction on neurological function. When applied conscientiously, modern chiropractic technique reflects these principles.

In 1996, the American Veterinary Medical Association stated in its revised *Guidelines on Alternative and Complementary Therapies* that "sufficient clinical and anecdotal evidence exists to indicate that veterinary chiropractic can be beneficial. It is recommended that further research be conducted to evaluate efficacy, indications, and limitations. The assurance of education in veterinary chiropractic is central to the ability of the veterinary profession to provide this service" (3). Some provincial veterinary associations have recently developed their own guidelines on complementary and alternative modalities to encourage members to obtain sufficient training and to meet minimum standards of competence prior to the use of such modalities.

In 1989, the American Veterinary Chiropractic Association (AVCA) was established. It consists of several hundred members worldwide, including both veterinarians and chiropractors. Affiliated with the AVCA is the Options for Animals Teaching College, which provides postgraduate certification training to both veterinarians and chiropractors. The basic certification course is a 5-module, 150-hour program. In addition, the College offers a 3-year, 180-hour diplomate program in advanced veterinary chiropractic.

Vertebral subluxation complex

The veterinary and chiropractic professions have significantly different understanding and definitions of a *subluxation*, which has resulted in much confusion and, even, animosity. The traditional veterinary definition of a subluxation as a "partial dislocation, less than a luxation" has a more structural basis. The chiropractic definition of a subluxation as "a disrelationship of a vertebral segment in association with contiguous vertebrae resulting in a disturbance of normal biomechanical and neurological function" has a more functional basis (2). It is the chiropractic vertebral subluxation complex (VSC) that is the focus of chiropractic therapy.

The characteristic of a VSC is a fixation or decreased mobility of 2 adjacent vertebrae. The 2 adjacent vertebrae and their associated structures are called a *motor unit* (see box 1). The fixation of the motor unit can be in a neutral or a nonneutral position, where the motor unit is

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Components of a motor unit

- 2 adjacent vertebrae
- intervertebral disk
- ligaments and muscles
- contents of the intervertebral foramen (spinal nerve, recurrent meningeal nerve, dural extension, cerebrospinal fluid, blood and lymph vessels, and connective tissue)

2

Changes associated with kinesiopathy

- changes in the intervertebral disk
- soft tissue adhesions
- calcium deposits on joint surfaces
- changes in cerebrospinal fluid flow
- altered proprioceptive input

unable to move through its full range of motion. Accompanying fixation are palpable soft tissue changes, muscle imbalance and contracture, and abnormal function of related neural elements. Such neural elements include spinal nerve, as well as nociceptors and mechanoreceptors located in numerous ligaments, joint surfaces, and capsules (4). There are several experimentally validated theories that explain the pathophysiology of subluxation and the effects of spinal adjustive therapy; however, discussion of these theories is beyond the scope of this article (4).

Phases of the VSC pathology

The phases (often concurrent) of the VSC pathology include the following:

- 1) Initiating cause — Trauma is a common initiating cause of vertebral subluxations. Trauma is classified as either *macrotrauma* (major falls, hit by car, birth, abuse) or *microtrauma* (minor slips, postural imbalances, overuse, and repetitive tissue strain). The initial pain and inflammation may resolve, but biomechanical changes may remain. The biomechanical changes are termed *kinesiopathy*.
- 2) Kinesiopathy — Kinesiopathy is detrimentally altered joint motion. The altered joint motion is either decreased (hypomobility) or increased (hypermobility). Hypomobility is usually the initial change to a motor unit resulting from trauma. Hypermobility of neighboring motor units can be the result of compensation for an area of hypomobility, so that the body retains functionality. Kinesiopathy results in structural and neurologic changes (see box 2).
- 3) Neuropathy — Neuropathy is altered nervous function resulting from kinesiopathy. The alterations are caused directly or, more commonly, indirectly. Direct alterations are caused by compression of the spinal nerve. Research completed at the Biomechanical Department of the University of Colorado has shown that direct nerve pressure as light as 50 mmHg (the weight of a dime) may result in as much as a 50% loss of neurotransmission through a nerve. Indirect alterations are the result of edema, changes in blood supply, changes in the flow of cerebrospinal fluid, and meningeal torque or stretch. The spinal nerve at the intervertebral foramen is very susceptible to indirect alterations.

The initial response of a nerve to damage or stress is hyperactivity or *facilitation*. Facilitation results in increased stimulation of the end organ, whether muscle, viscera, or other tissue. Symptoms include hypertonicity, pain or paresthesia, glandu-

lar stimulation (local sweating), increased vasomotor activity (local heat), and abnormal somatoautonomic reflexes affecting the function of internal viscera (heart, gastrointestinal tract).

Chronic and sustained stress on the nerve results in hypoactivity or *inhibition*. Inhibition results in a decreased nerve supply to the end organ. Signs include muscle atrophy, glandular dysfunction, decreased vasomotor activity, sensory anesthesia, and further autonomic nervous dysfunction.

- 4) Dysfunction — At this stage of the subluxation pathology, tissues fail to perform normally and neurological input to end organs is more deranged. There may even be changes in immune response of tissues. *However, at this point, clinical signs may still not be apparent.*
- 5) Clinical signs — Obvious clinical signs finally become apparent as dysfunction progresses. Signs may include lameness, pain, muscle spasm, weakness, proprioceptive changes, and so on.
- 6) Degeneration — This is nearing the point of no return. At this stage, there is destruction of tissue. The potential for healing becomes increasingly limited.
- 7) Compensations — These are biomechanical reactions to subluxations elsewhere in the body. They may manifest as hypermobility. For example, problems in the thoracolumbar vertebrae are often due to spinal subluxations in the cervical or sacral region (4).

It is crucial to remember that obvious clinical signs occur late along the spectrum of subluxation pathology. *Functional* changes in the neuromusculoskeletal system precede pathology and clinical signs. Chiropractic could be called *functional neurology*, because it can address early subluxations where problems are functional, rather than pathological, and tissues are still healthy. Spinal hypomobility at these early stages is subtle, yet palpable. Positive results are still possible, even in very chronic cases that have degeneration present. However, the most efficacious chiropractic work is done sooner rather than later. In the interest of preventive animal health care, every patient is a candidate for chiropractic evaluation.

Chiropractic evaluation

A comprehensive chiropractic evaluation consists of the following:

- 1) Client history — Includes history of trauma, activities, behavioral/habit changes, and performance changes. It is likely that a majority of behavioral and performance issues in horses have a physical basis (pain or stiffness). Concerns in the horse may include

reluctance to go in one direction, refusing jumps, etc. Concerns in the dog may include stiffness in rising and a reluctance to go up stairs.

- 2) Veterinary history and information — Includes general physical examination, neurological examination, and radiographic analysis. A subluxation is not always evident on radiographs, since altered joint motion may not manifest as a gross positional change.
- 3) Postural analysis — Includes kyphosis, lordosis, scoliosis, abnormal tail carriage, and abnormal standing and sitting postures.
- 4) Gait analysis — Includes shortened stride, asymmetry, circumduction, and pacing (an energy-sparing gait in nonpacing animals).
- 5) Muscle and soft tissue palpation
- 6) Spinal temperature
- 7) Short leg analysis (hind legs) — This is an assessment of an anatomical vs. physiological short leg — the former is truly a shorter leg, the latter occurs with sacropelvic subluxations where the pelvis tilts forward causing the leg to appear shorter. A convenient time to assess leg length in dogs is during positioning for standard ventrodorsal hip radiographs.
- 8) Eye level analysis — A subtle difference in eye levels can indicate a chiropractic version of a head tilt, due to upper cervical subluxations or cranial bone asymmetry. Equal eye level can usually be restored with treatment.
- 9) Motion palpation — This is the cornerstone of a chiropractic examination. Motion palpation determines areas of hypo- or hypermobility. It requires knowledge of facet and disk angles and different planes of vertebral motion (lateral, rotational, and dorsoventral). This is a subtle palpatory skill requiring extensive experience.

Chiropractic treatment

Chiropractic therapy has more than 100 techniques. The most common technique is called *diversified* and uses osseous adjustments. An adjustment is a short-lever, high velocity controlled thrust done by hand. An activator, which is a small hand-held instrument, may also be used for the same result. The adjustment is aimed at a hypomobile motor unit to restore joint motion. A thrust is applied at the end of joint play (the end of the passive range of motion) with a low amplitude of force that is sufficient to release fixations. Occasionally, during the adjustment, a popping sound or “audible” is heard. These are more common in humans than in animals. An audible indicates a drop in intra-articular pressure and is not required for a successful adjustment. The adjustment is highly specific in terms of contact points (spinous, mammillary, or transverse processes), direction, force, depth, and timing (5). Adjustments, properly done, are gentle, accepted, and enjoyed by most animals.

There are other techniques that do not use osseous adjustments. These are generally nonforce techniques that manipulate the dura mater beneath the spinal column, cranium and sacrum. Some techniques are also applied to ligaments, extremity (limb) joints, ribs, and jaw.

Modern veterinary chiropractic therapies are human techniques modified for the standing quadruped. A larger quadruped, such as a horse, can still be adjusted successfully. This is because the area of adjustment is a single motor unit and not the whole animal. An increase in force is required but can be easily achieved by hand. A faster thrust reduces the mass needed to achieve the same amount of force. If the adjustment is done properly, it only requires a relatively low force. Although the horse has a large mass, its nervous system is as sensitive and exquisitely responsive to therapies as that of smaller species.

Short-term results can be observed with rough techniques used by lay people and untrained professionals. However, long-term damage to the joints may result from incorrectly applied adjustments. Research has shown that a little force in the wrong direction can damage a joint (6). When properly applied, the techniques are perceived as nonthreatening and gentle by both the animal and the observing owner.

Clinical indications

The majority of indications for chiropractic are neuromusculoskeletal and include the following:

- 1) Idiopathic lameness — Lameness that remains undiagnosed after a conventional work-up can be the result of sacroiliac pain or sciatic/brachial neuralgia caused by subluxations. In horses, a vague lameness, where they just seem “off”, can often originate in the spine. Also, changes in normal spinal biomechanics lead to increased stress and concussive forces on the limbs, making them more susceptible to injury.
- 2) Intervertebral disk disease — Chiropractic treatment is not contraindicated here. Low force techniques that are applied distant to the lesion alleviate excessive dural tension and, thus, are beneficial.
- 3) Neck/back pain — This is not always due to a prolapsed disk. Nociceptors (pain receptors) are present in spinal ligaments, facet joints, joint capsules, and tendinous insertions of muscles. The disk itself is innervated and can be a source of pain, even though its position is normal.
- 4) Wobblers syndrome/cervical vertebral insufficiency — Treatment can slow the progression of the disease.
- 5) Spondylosis — Restoring and supporting the remaining mobility dramatically decreases pain and stiffness.
- 6) Cauda equina syndrome
- 7) Lick granulomas — In the authors’ opinion, these can be a result of paresthesia from lower cervical or sacropelvic subluxations and radiculopathy or referred pain. There can be quick resolution with chiropractic.
- 8) Hip dysplasia — Chiropractic can improve the biomechanics of the sacroiliac and lumbosacral joints. It can also improve neurological input to the muscles supporting the hip. This decreases strain on the coxofemoral joint and, thus, helps alleviate pain and slows disease progression. Early intervention is crucial, since the altered sacropelvic motion is thought to contribute to hip joint pathology.

- 9) Urinary incontinence
- 10) Local sensory/glandular neuropathies — Clinical signs may include localized pruritis, skin changes, tail rubbing, and glandular hypersecretion.
- 11) Postsurgical rehabilitation — Major weight-bearing changes occur after orthopedic surgery leading to compensations and stress in the spine and pelvis.
- 12) Performance issues in athletes — Chiropractic care can facilitate more balanced, efficient movement. Studies on human athletes receiving regular chiropractic adjustments have demonstrated enhanced athletic performance compared with control groups (7). Common behavioral and performance problems in horses include refusing jumps, bucking, resistance to work, inability to travel straight, difficulty with collection, poor impulsion, head-tossing, and being “cold backed.”
- 13) Show/conformation animals — Chiropractic can enhance the natural posture, gait, and topline of these animals.
- 14) History of any significant trauma — Spinal subluxations can be present in the absence of clinical signs. Treating subluxation pathology early is ideal.
- 15) Other — Any organ pathology is potentially associated with spinal subluxations via effects on somatovisceral and viscerosomatic reflexes, and the pervasive influence of the autonomic nervous system. Every cell in the body has a nerve supply originating in the central nervous system (8).

Contraindications

Contraindications for veterinary chiropractic are few, but they include vertebral or pelvic fractures and spinal neoplasia. Although not a contraindication, skill and diligence must be used with animals that have disk prolapses or that have had back surgery.

Case management

The frequency of treatment varies. However, for acute cases, biweekly or weekly treatments may be required. In chronic cases, weekly treatments (from 2 to 4 wk) are common initially, then treatment is tapered off.

Maintenance protocols vary depending on whether the patient is an athlete, geriatric, or pediatric; on the severity of the condition; and on whether concurrent modalities, such as acupuncture, are used. Some animals require monthly maintenance, others are treated only once or twice each year.

Chiropractic is an extremely rewarding modality, because response, in terms of quality of movement and comfort level, is often immediate. Lasting effects are common within 2 or 3 treatments. The concurrent use of other modalities, such as acupuncture, herbs, and chondroprotective nutritional supplements, may lead to more rapid and enduring results.

Conclusion

Veterinary chiropractic does not replace a conventional approach to neuromusculoskeletal conditions; rather, it is complementary, filling a highly unique niche. However, integrating veterinary chiropractic into conventional practice requires somewhat of a paradigm shift. This involves greater understanding of the hierarchy of the nervous system, new ideas on healing and homeostasis, and new methods of evaluating the biomechanics of the body.

Chiropractic is both treatment and prevention. It has much to offer, from improving the quality of life of the geriatric to enhancing the performance of the athlete, and all patients in between. Acquiring expertise in veterinary chiropractic is rewarding and career-transforming.

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Suggestions for further reading

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