

Somatic Dysfunction – a Reflection on the Scope of Osteopathic Practice

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Abstract:

The development of a consensus regarding osteopathic terminology has shadowed the struggle to express the intention, method and scientific understanding of this aspect manual diagnosis and treatment. The term “somatic dysfunction” has come into use in the context of this struggle. As the osteopathic profession simultaneously expanded yet attempts to maintain unity, a review of the history, relevance and future of the definition seems timely. This article reviews these issues, intending to stimulate discussion toward a broader international consensus regarding the biophysiologic implication of the definition of somatic dysfunction.

Key words:

somatic, dysfunction, osteopathy, lesion, musculoskeletal, function, articular, functional, tensegrity, coherence, oscillation, cranial

Introduction:

Despite the claim by Dr. Still that osteopathy is an eternal science (Still, A., 1981) and that it is defined as a study of the Mind of God in Nature (Still, A., 1986), the public and most practitioners require a more specific focus. As our understanding has continued to evolve, the target of treatment has been expressed as the osteopathic lesion and, since 1968, as somatic dysfunction. Whether or not the term and its current definition convey the full scope of osteopathic practice as it continues to mature is the question raised by this review.

Historical inception of the definition:

The term and definition of somatic dysfunction are included in the Glossary

of osteopathic terminology as printed in *Foundations for Osteopathic Medicine*, a primary reference text published under the auspices of the American Osteopathic Association (Ward R., 2003) The Glossary, since its first publication in April 1981 (Ward, R., Sprafka, S.), has been sponsored by the Educational Council on Osteopathic Principles, now under the auspices of the Association of Colleges of Osteopathic Medicine Revisions. Refinement of the glossary is ongoing and international input is accepted from the glossary committee of the World Osteopathic Health Organization.

The current published definition of somatic dysfunction is as follows: somatic dysfunction: Impaired or altered function of related components of the somatic (body framework) system: skeletal, articular and myofascial structures, and their related vascular, lymphatic, and neural elements. Somatic dysfunction is treatable using osteopathic manipulative treatment.

The positional and motion aspects of somatic dysfunction are best described using at least one of three parameters: 1) The position of a body part as determined by palpation and referenced to its adjacent defined structure; 2) the directions in which motion is freer; and 3) the directions in which motion is restricted. See also T.A.R.T. See also S.T.A.R.

The original 1981 definition varies from this only in its final cross-referencing: “See also osteopathic lesion (Osteopathic Lesion Complex)”

Clearly, the definition has a primary bias toward musculoskeletal biomechanics.

Although the earliest definition reflects the review by multiple individuals and organizations involved in osteopathic education, it is essentially the restatement of the 1968 work of the Hospital

Assistance Committee of the Academy of Applied Osteopathy chaired by Ira Rumney, DO. (Rumney I., 1969)

Preemptively, the committee had developed definitions for osteopathic diagnosis and treatment to be included in the Hospital Adaptation of International Classification of Disease, part of an ongoing international effort to recognize and define medical care. Without this initiative, the osteopathic profession would have accepted definitions and diagnosis with associated code numbers imposed from outside the osteopathic community. As insurance companies and a critical public require specific criteria for defining a service, the definition of somatic dysfunction was developed for this purpose. It was an initiate motivated by medical economics.

Problematic - internal consensus building

Osteopathic practitioners recognize the challenge in describing with words the existential experience, including the vast variability in findings and dynamics, which occurs in the encounter with the patient.

Both before and since the term “somatic dysfunction” was adopted by the AAO’s Hospital Assistance Committee, the term has been recognized as a semantic compromise. The debate over best terminology has entwined the elements of personal experience and philosophical paradigms including various approaches to biological science. Despite the apparent sterility of the term, it was not invented at a scientific symposium. True, Irvin Korr (1948) had influenced the debate over terminology by using the phrase “somatic component of the disease process” to help expand the scope of interest and effect of osteopathic diagnosis

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and treatment. Cole (1952) in turn used the term “spinal dysfunction” in reporting the pathologic state induced by trauma in experimental animals. The marriage of the two would appear to have spawned the current term. (Rumney, 1975)

However, the debate over appropriate osteopathic terminology was not new then nor is it new now. One issue is the scope of consideration in the definition related to the balance of anatomy and physiology.

The biomechanical approach to unity of body function was a key concept of Andrew Still’s and often this was expressed by impressing students to look at the summation of function on individual joints. Early on, the articular dysfunction, which impeded healthy physiological function, was termed the osteopathic lesion. As early as 1915, enough variation of interpretation had arisen to motivate several teachers of osteopathic technique to discuss, adapt and recommend the acceptance of a list of 43 defined terms beginning with the following:

“Lesion- A lesion (Latin, *laesus*, from *laedere*, to injure) is any adjustment of structure which in addition to being a condition of disease, with its symptoms and signs, is an intrinsic cause of disease, with its remote effects.” (Forbes H, 1915)

To develop a larger consensus on this topic of terminology, the following year the AOA appointed a committee, headed by M.C. Hardin, to develop a Latin terminology for osteopathy consistent with then current international medical terminology. (Rumney I., 1971) As will be mentioned below, this group never made a report.

In an editorial some years after, McConnell, (1922) attempted to impress the importance of specific treatment of the primary lesion versus general treatment but at the same time including the importance of ligaments and muscle in restricting motion of the bony vertebra. Clearly there was a debate about the focus of attention, or scope, in diagnosis and treatment.

Since the 1916 working committee never arrived at group consensus, in 1932 a committee under the auspices of the Associate Colleges of Osteopathy reworked a revised list of terms with the following definition:

“The osteopathic articular lesion is any alteration in anatomical or physiological relationships of the articular structures resulting in local or remote functional disturbance.” (Pritchard, W. et al 1933)

The focus is more clearly articular, the chain of causation is clear, but the phrase “physiological relationships” lends itself to broader implications. Halliday (1936) reflects that the term alteration makes allowance for those who prefer positional diagnosis (reflecting bony articular consideration) as well as those using a more physiologic approach (reflecting bony, muscle and ligamentous tissue) in motion testing.

Is this inclusive enough? The clinical dimension

The challenge to be precise, tenable, but not prematurely exclusionary is not to be taken lightly. Dr. Still had the same problem. Despite his bold statements describing the body as a machine, he also recognized the limitations of these analogies. He describes the complex nature of the person as Triune, of physical, spiritual, and mental bodies. (1986, p. 16) and explored the arena of vitalism in his chapter on biogen, (Still, 1986 p. 251) and his explorations of nerve force (1986, p. 40). He describes the body as a machine but clarifies: “The human body is a machine run by the unseen force called life.” (p. 184)

At the end of his great “digression” on the topic of Biogen, Still summarizes:

“We have given a few thoughts on this line of life, hoping the osteopath will take up the subject and travel a few miles farther toward the fountain of this great source of knowledge and apply the results to the relief and comfort of the afflicted who come for counsel and advice.” (1986, p. 258)

William Sutherland, student of Still’s, thought there was more. Despite his beginning with the concept of biomechanics in the cranium, he progressed through dynamism of the cerebrospinal fluid, to potency to explain what he observed. Later he described vital force as “liquid light”, only to retrench for pragmatic reasons to defense of his more demonstrable (articular and membranous) descriptions. (Sutherland, 1967, p. 347)

Rollin Becker (1997), Sutherland’s

student, addresses the difficulty in verbally describing the dimensional criteria of his diagnosis by describing the “anatomical-physiological wholeness of the patient’s body”. p. 155

“The anatomical-physiological mechanism and its structure-function carry the total picture for disease and restored health.” p. 155

“I am not talking about the anatomical-physiological units of tissue. I am talking about the kinetics of the energy fields that make up this stress pattern. The anatomical-physiological tissue units are manifesting this kinetic energy and are expressing this dysfunction as tissue changes and symptoms.” p. 162

Robert Fulford, another student of Sutherland’s, in acknowledges his teacher’s reluctance to fully describe the extent of his model, adapted terminology from “energy medicine” to further describe the activity and potential for osteopathic intervention with the human person. His equivalent of somatic dysfunction he called the “energy sink”. (Comeaux 2002)

Nicholas Handoll analyzes the experience of palpation and the potential for further understanding of the scope of osteopathy by introducing the perspective of physics. The general theory of relativity and observations of quantum physics have implications for interpreting touch and the sensation of restriction of motion. This may cause us to reexamine our premises about wellness, patient-practitioner boundaries and actual manner of treatment effectiveness. In this review, dysfunction reflects a suspension of the body’s self-regulatory process, accessible on multiple levels of organization. p. 145

In developing a model called Facilitated Oscillatory Release (FOR), Zachary Comeaux (2003) applies the concept of energy, vibration and oscillation in a practical way. Building on the phenomenon of phase resonance synchronization of neural firing in nerve and muscle function, and the disruption of such in dysfunction, FOR extrapolates this concept to other body tissues as is consistent with coherence models of body organization which will be described below. In this way of looking at coordination of body motion, somatic dysfunction represents a proprioceptive arrhythmia treatable by

entrainment of endogenous oscillators.

The application of vibration or oscillation is not here unique in osteopathy. This type of force has been used in a variety of settings, though it is rarely emphasized. (Comeaux, 2000)

Is this descriptive enough? The scientific conceptualization

Andrew Still proposed that osteopathy be based in science. We have cited above Dr. Still's interest but difficulty in expressing the inter-relationships between biomechanical, visceral, neural, vascular and vital function. His students have tended to focus on subsets of this interaction because of the complexity in describing total human function. For Still, scientific study entailed anatomical dissection.

Halliday, Fryette, Hulette, McConnell and others variously tried to establish a more scientific understanding of anatomico-physiologic relationships. Early scientific work in establishing the physiologic basis for the "osteopathic lesion" turned to animal studies. W. Cole (1952) provides a comprehensive review and summarization of the first 50 years of osteopathic research. Citing the work of Louisa Burns and others who did histological analysis after mechanically induced lesions in animals, Cole emphasizes that the osteopathic lesion is not strictly an articular fixation but involves a complex of tissues associated with the joint. It is a complex inflammatory response, which he labels a syndrome. He emphasizes the primary role of neural coordination of the tissue response to trauma in the osteopathic lesion. Additionally he emphasizes the effect of somatovisceral and viscerosomatic reflexes which rely heavily on the autonomic balance influencing both periarticular muscle tone as well as visceral function.

Although Cole separately mentions the work of Denslow (1948) and Korr (1945) in applying these principles of sympathetically mediated hypersensitivity (spinal facilitation), Korr made further lasting contributions to the next generation's appreciation of the role of neural coordination in somatic dysfunction. The work of Denslow and Korr relies largely on the increased role of instrumentation in measuring effects of strain and of treatment, but largely in

normal subjects.

Beginning from his collaboration with Denslow on the facilitation model, Korr postulated a further factor, dysregulation in the Alpha-gamma efferent-afferent loop, in maintenance of muscle hypertonia, one of the clinically observable findings often associated with somatic dysfunction. In Korr's words, "A new theory is offered to... elaborate modeling of muscle spindle functional theory and it becomes clear why the 'gamma loop' is often viewed as a high-gain servomechanism, and the gamma neurons as the gain-control components of the system." "I propose as a hypothesis that in the lesioned areas the 'gain' has been turned up in the spindles of one or more muscles."

But he qualifies this by adding:

"The hypothesis says only that the 'lesioned' segment behaves as though gamma motor neuron activity (gain) in that segment has been turned up. In presenting this hypothesis, I hope, whether or not it turns out to be valid, that it stimulates testing and inquiry in clinical practice and in the laboratory, leading to new insights, sounder theory, and more efficacious practice." (Korr, 1974)

This hypothesis was later cited as an important aspect of dysfunction by Lawrence Jones and Fred Mitchell, Jr., the authors of major works on strain counterstrain and muscle energy techniques respectively. (Jones, Mitchell) The theory satisfied many in the profession with a tenable scientific explanation of clinical observation and response to treatment; of special interest was the somatic response to visceral conditions as is evidenced by the elaborate explanation and diagrams in an article by Robert Schaefer, Hannah Bailey, and H. George Grainger.^{11,12,13} However, interestingly Mitchell adds as a disclaimer, "At present, with much relevant laboratory research yet to be done, clinical empiricism is the principal basis of MET theory." To many, however, the hypothesis has been treated as if it were factual.

This hypothesis is challenged by the nociceptive model, which is another aspect of the contemporary legacy of the concept of the sympathetically mediated "facilitated segment." A competitive hypothesis for the cause of the segmental facilitation behind dysfunction was sum-

marized by Richard VanBuskirk (1990) proposing that nociceptive rather than the proprioceptive afferent input was the primary cause of retained muscle hypertonia. This trend of thought was also championed by Frank Willard,¹⁷ who cited the work of Anderson and Winterson to refute the gamma loop hypothesis. In Willard's presentation, persistence of alpha-gamma mediated contraction could not occur after cutting the dorsal root of the spinal nerves as is included in these experiments. Willard more recently refutes also the concept of the sympathetically mediated "facilitated segment." As relevant to somatic dysfunction, emphasizing rather the role of central sensitization as a causal factor in the chronic pain associated with somatic dysfunction. This latter modeling incorporates but expands some of the work of Steinmetz, et al (1982, 1985) in extrapolating spinal neural sensitization as observed in animal models as a cause of persistent pain in further refining the facilitation model.

In an entirely different direction, several teams have worked to validate the clinical observation of oscillatory motion in the cranium and its relevance to somatic dysfunction and osteopathic treatment. Measurable relationships between intracranial volume and intravascular pressure changes correspond to reportable phase changes reported as flexion and extension by cranially oriented osteopaths. (Moskalenko et al. 2003) Additionally, osteopathic researchers are evaluating the physiologic laws and phenomena such as the Traube-Hering-Mayer oscillation that support osteopathic diagnosis and treatment. (Nelson et al 2002)

Further biologic modeling

Osteopathic research and practice do not occur in a vacuum and there is the challenge of incorporating thought from the larger scope of physical and biological sciences. Complementing the osteopathic principle of working with the person as an integrated whole are two parallel avenues of biological modeling which to this author have strong relevance to an expanded view of somatic dysfunction. One is the synthesis of Inger (2003) and others cited as the tensegrity model and the other is the coherence model of bio-

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logical communication and organization described separately by Ho (1998) and by Oschman (2003).

Ingber is motivated by a sense of the need for a sophisticated biomedical model based on current research that conserves the physicality of disease in the face of biomolecular models of genetic control. Ingber translates the architectural concept of structural organization among tensional and compressive elements to describe a more sophisticated plan of body organization from the molecular to the level of gross anatomical form. Ingber's model is easily adaptable as an updated approach to osteopathic myofascial work since he presents the structure/function relationship of tissue as a continuum even into the intracellular level. The seamless collagen matrix of the body continues down to the cell membrane and then further as intracellular tubulin microtubules. This matrix provides communication linkage and structural form to the intracellular organization of organelles, nucleus and other intracellular space.

A further functional complement to this structural model is supplied by Ho (1998). Mae-Wen Ho, a biochemist intrigued by quantum physics and quantum optics, emphasizes the role of this network as a conduit for communication. One of her key concepts, citing a spectrum of research, is that the speed of many complex processes and reactions in the body are not consistent with the paradigm which ascribes all body processes to physical continuity of pathways which transduce all events as chemical ones, dependent on energy transfer through intermolecular bonds. (Ho, p. 114) She proposes that the mechanism for many communications is one in which the connective tissue matrix of the body behaves as a crystalline structure in which components act as semiconductors so that electrons and other charged entities may be distributed instantaneously. Rather than discarding molecular microbiology, Ho adds another level onto the interpretation of the relationship between structure and function.

Besides actual energy transfer, coherence may be the vehicle for consciousness, in which case coherence is a measure of the physical, emotional, and mental health of a system; a very osteo-

pathic compatible concept. (Ho, p. 246) In this context, somatic dysfunction is a lack of coherence, or resonance, among resonant activities. This very strongly parallels Still's conceptualization of the complementary function of physical, mental, and spiritual body.

It is easy to extend these thoughts regarding physical yet energetic communication to the level of patient/practitioner interaction. In an approach compatible to Ho's, J. Oschman (2003) does so in the following statement:

"Coherence signals from the hand of a therapist influence wavefronts flowing through out the molecular fabric of their client's body. When emotionally "charged" regions are contacted, there may be a sudden recall of stored memories. The memory trace is released as an energetic pulse and interacts with other waveform present in the body. The memory is erased when various polymers, such as ground substance and microtubules, de polymerize or fall apart." (Oschman 2003 p. 292) The implications for osteopathic palpation and treatment in a subtle mode are apparent. They validate connective tissue work done in the style of Rollin Becker or Robert Fulford.

Despite the fact that many of these latter models seem fancifully irrelevant to many osteopaths who emphasize joint position and cavitation; many others in the profession readily incorporate these thoughts into their work. Here we have a new generation of challenge in maintaining consistency yet inclusiveness in our osteopathic terminology, including a definition, which describes what it is that we treat.

Challenge of Global Diversity

Besides the challenge from this blend of biophysics and energy medicine, osteopathy has to contend internally with the complexities within the profession associated with its progressive global growth. In various settings internationally, osteopathy has been most influenced by a balance of four conceptual streams. Most of early osteopathy beyond America came through the filter of J. M. Littlejohn who, after serving as Dr. Still first dean, returned to Great Britain and established the British School of Osteopathy in 1917. Later influence from the United States in the 1960s to the present follows the scope

of US osteopathic methodology; in some cases osteopathy in the cranial field; this method, with its own interpreted style, has been introduced in some places as basic osteopathy (Chaitow, 2005). A fourth emphasis has been contact with the disciplines of physical medicine and kinesiotherapy within individual countries.

More recently there have been national, regional, and international efforts to coordinate activities identified as osteopathic. On the international stage, now, is the challenge, which faced the profession initially in America and subsequently in each country in which it has taken root. The questions arise: what training does it take to be called an osteopath; what constitutes osteopathic technique, how do we describe what we do? Embedded in this is the age-old challenge of terminology. Inevitably, there will be another round of question, discussion, and compromise in going forward.

It is this author's contention, and that of others, that the current definition of somatic dysfunction reasonably covers the scope of past conceptualizations of osteopathic work. The question arises as to whether it allows for continuing expansion of application of science and experience of the profession as it grows. In time, the definition of somatic dysfunction will be revisited. In this context, the author puts forward the following definition to reflect a compromise between the classic definition and the emerging paradigm of subtle osteopathy:

Somatic dysfunction: def. A dysregulation of the whole body system (body, mind, spirit) usually expressed as a mechanical restriction of the musculoskeletal system (skeletal, arthrodiagonal, and myofascial [connective tissue?] structures), often accompanied by sensitivity (pain) asymmetry, restriction of motion and tissue texture changes, with either causal or accommodative dysregulation of the related vascular, visceral, lymphatic, and neural elements.

It is the intent of the author to stimulate a discussion, as Still suggested, "We have given a few thoughts on this line of life, hoping the osteopath will take up the subject and travel a few miles farther toward the fountain of this great source of knowledge and apply the results to the relief and comfort of the afflicted who

come for counsel and advice.” (Still, 1986, p. 258)

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