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FASCIAL HYPOTHESIS

Fascia and the mechanism of acupuncture

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Summary In light of the recent results consistently produced by meta-analyses of clinical acupuncture studies, acupuncturists have been challenged to re-evaluate the principles of acupuncture practice. This paper reconsiders acupuncture, positing that the fascia is the mechanism of action of acupuncture therapy. Acupuncture is defined behaviorally, and recent research findings related to the form and function of the fascia are applied to explain the mechanism of action of acupuncture therapy. Acupuncture is then viewed from a historical perspective, and fundamental principles of acupuncture therapy are reconsidered in terms of the fascia model. A conception of acupuncture emerges that is linked to a renewed understanding of ancient acupuncture principles and is characterized by a return to diagnosis and treatment rooted in skilled palpation.

Introduction

There is a logical fallacy that is common to the thinking of clinicians of any medical practice. If a clinician applies a treatment strategy that is based upon some explanation of the mechanism of treatment and finds the treatment to be somewhat effective, then the effectiveness of the treatment is assumed to validate the explanation. In the case of acupuncture, its various transformations over centuries may have resulted in explanations and associated principles that belie reality. An examination of the issues surrounding the extensive findings regarding sham acupuncture may provide a unique opportunity for the reconsideration and perhaps the revitalization of this ancient art.

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Key issues

Acupuncture: a placebo?

Recently there have been an extensive number of clinical studies and meta-analyses (Cherkin et al., 2009; Linda et al., 2009; White et al., 2004) that have failed to find significant differences between acupuncture (independent variable) and sham acupuncture (control). In a systematic review of 38 clinical trials by Moffet (2009) sham acupuncture was about as efficacious as 'true' acupuncture. Moffet goes on to suggest that the fundamental principles of acupuncture need to be reconsidered.

In a systematic review by Lao (2008), acupuncture clinical studies were categorized according to the type of control. One group of studies used a type of time-series design, where acupuncture was withheld from some of the

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subjects and applied to others. A second group of studies employed placebo acupuncture as control, where there was neither stimulation nor insertion of needles. The final set of studies employed sham acupuncture, where points were needled or stimulated in some way. The first two groups demonstrated significant differences between acupuncture treatment and control virtually in every study. The sham acupuncture studies however demonstrated no significant differences in all but one study. What is important about these findings is that *both* the acupuncture and sham acupuncture groups demonstrated significant effects in comparison to no treatment or conventional medical approaches. For example, Scharf et al. (2006) found that both the real and sham acupuncture treatment groups showed double the improvement over a conventional medicine treatment group. Similar results were found by Haake et al. (2007).

In addition to the extensive human clinical studies demonstrating the effectiveness of acupuncture for a wide range of conditions, there are numerous animal studies demonstrating physiological and clinical effects (Lao et al., 2003; Liu et al., 1995; Stener-Victorin et al., 2000; Tatewaki et al., 2003; Wu et al., 2001). The effectiveness of acupuncture has been repeatedly demonstrated. The extensive number of animal studies reporting such effects can allow us to minimize the role of placebo as the explanation of its effectiveness. While the placebo effect is a possibility in any form of treatment, it is very unlikely that it is the fundamental mechanism of acupuncture, as some have suggested.

Findings such as these have sparked a debate about both the placebo effect of acupuncture and the application of reductionist research models to non-linear, whole-system phenomena. What is missed, however, is the significance of the findings regarding sham acupuncture. They point to the remarkable power of needle stimulation of the soft tissue. Such findings do indeed necessitate a reconsideration of the fundamental principles and practices of acupuncture treatment.

The problem of defining acupuncture

One of the great difficulties facing the clinical acupuncture researcher is the definition of the independent variable. How is acupuncture to be defined in a valid and reliable way? Unschuld (1986, p. 5) describes the 'efforts to squeeze an enormous array of concepts and schools of thought in traditional Chinese medicine *which are sometimes mutually contradictory, antagonistic or exclusive* into the kind of homogenous, logically coherent system of ideas and practices that is so attractive to the Western mind' [emphasis ours]. Perhaps the problem does not lie exclusively with the Western mind set.

Examination of the historical development of the varied schools and styles of acupuncture, and the evolution of the numerous and sometimes contradictory principles of practice provides some insight regarding the problem of defining acupuncture. While the practice of acupuncture was rooted in evaluation through extensive palpation and clinical observation, it was also molded and modified by religious, philosophical and cultural influences (Birch and Felt, 1999). Acupuncture principles have been influenced by social, economic and political issues and they have been adjusted by misinterpretations, individual theories, fragmentary texts and faulty translations. In addition, Chinese thinkers were immensely practical and capable of absorbing apparently opposing ideas without replacing or negating earlier ones. To understand acupuncture, then, we must accept it as a unique admixture of both fantasy and fact developed over the course of thousands of years. The longevity of the acceptance of many of the theories and practices may be explained by the general effectiveness of patterned needling of the soft tissue. Successful treatment reinforces the belief in the explanations regarding such treatment.

An example of a style of acupuncture that is the product of diverse influences is also perhaps the most popular form of acupuncture practiced today. Traditional Chinese Medicine (TCM) is the name of a particular approach to acupuncture that was invented at the time of the Cultural Revolution (ca. 1949) in the People's Republic of China (PRC). TCM was created as a result of political and economic circumstances and was aimed at both maintaining the cultural legacy of Chinese medicine and providing some form of health care to a huge population with insufficient modern medical facilities. TCM became the only type of acupuncture that was permitted in the PRC, and was therefore the only system that was taught in developing schools of acupuncture. One of the governmental requirements for the development of TCM was that the principles of acupuncture and herbalism be integrated under a central set of principles. Herbalists had greater political influence in the PRC at this time, and the resulting acupuncture practice was one that was grounded upon the principles that had previously been applied to the use of herbal medicines. It was focused on organ function rather than channel disruption and was strongly connected to modern biomedicine. It connected pattern pathology to modern disease diagnosis and textbooks were produced that described treatments for Western-defined diseases. Pirog (1996) refers to this as a 'herbalized' approach to acupuncture. TCM is currently the predominant approach used in the West, and is the most common approach used in acupuncture clinical research.

Understanding the background of TCM is important, because it marks a clear departure from palpation-based, meridian style approaches to acupuncture, allowing for mass education models as opposed to apprenticeship education that emphasizes palpation. Using the TCM paradigm, point selection decisions are based primarily on symptom/sign pattern recognition and a formulary of commonly known point combinations applied to specific patterns. The application of formula points to particular pathologies or dysfunctions may be moderately effective, and as meta-analyses imply, demonstrate little difference from the non-specific stimulation of point patterns used in sham acupuncture control groups found in some clinical studies.

Defining acupuncture: a behavioral approach

The consideration of a model of acupuncture in which the fundamental mechanism of action is the movement and release of fascial constrictions may provide an explanation

of the apparent contradictions and extraordinary effectiveness of acupuncture treatment, and possibly offer a renewed appreciation of this ancient art. The fundamental requirement for the acceptance of any new theory is that it better explains the phenomena under examination. We suggest that the fascia mechanism offers such an explanation regarding the action and efficacy of acupuncture. However in order to support this model, the practice of acupuncture would have to be reconsidered. By examining the observable phenomena common to acupuncture practice, noting what acupuncturists do, rather than what they believe, acupuncture can be defined behaviorally. Such an examination may provide an objective perspective of acupuncture and its often confusing practices and effects.

Acupuncture may be defined in terms of the characteristics that are common to all styles of practice. Acupuncture needles always puncture the skin, the superficial fascia, and occasionally muscle tissue. In doing so, acupuncturists stimulate soft connective tissues whether or not they recognize that they are doing so. Needle stimulation is most often applied along defined channels, and needles are most often inserted into defined points along these channels. Needles are generally stimulated in some fashion and they are generally left in place for some time before removal.

Stecco (2004) defines the parallels between acupuncture channels and fascial planes and between acupuncture points and centers of coordination. Langevin and Yandow (2002) found an 80% correlation between acupuncture points and intermuscular or intramuscular septa, along fascial planes (see Fig. 1a and b). The clue to the mechanism of acupuncture is therefore anatomical. Loci where maximum stimulation of the fascia may occur are the focus of treatment. Although any needle insertion, at virtually any point on the surface of the body provides stimulation of the fascia, acupuncture points and channels have a unique anatomical correlation to fascial anatomy.

Regardless of the inconsistencies in the acupuncture literature concerning needle depth, stimulation, retention or frequency of visits, all fundamental characteristics of acupuncture treatment are consistent with treatment of the fascia. In essence, everything that the acupuncturist *does*, apart and distinct from any explanations regarding what they *believe* they are doing is completely consistent with stimulation of the fascia. All of this might have seemed interesting but without great significance as recently as ten years ago. Indeed, in the past there have been some who have speculated that the fascia is the basis of the multiple and varied effects of acupuncture treatment (Pischinger, 2007; Larson, 1990; Nagahama, 1956). However, it is in recent years with an expansion of research and interest in the fascia, that the real significance of connective tissue stimulation becomes clear.

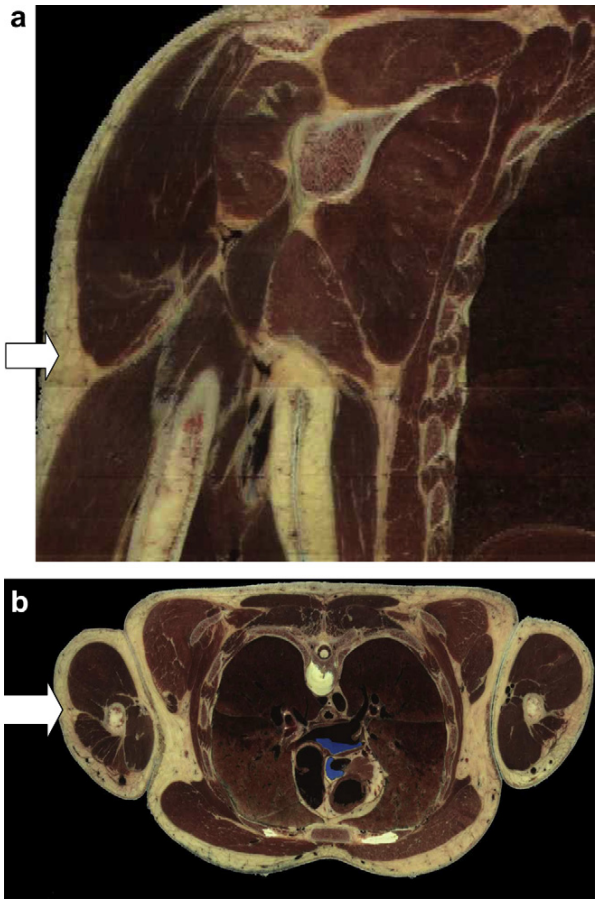

Figure 1 Acupuncture point Lung 3 (arrow) approximated by acupuncture units of measurement. Note relationship to fascial septum. Fig. 1a is a coronal section of the human shoulder. Fig. 1b is an axial section of the human upper torso and arms. Images by permission of the Visible Human Project, National Library of Medicine, United States.

The fascia

Anatomy

Recent research has challenged some fundamental ideas of human anatomy and physiology. It has overturned the concept of the fascia as a static, structural support for the body and has shed light upon a new organ, a continuous sheath of tissue that moves, senses and connects every organ, blood vessel, nerve, lymph vessel, muscle and bone. Fascia has been defined as the soft tissue component of the connective tissue system, forming a whole-body continuous matrix that interpenetrates and surrounds all organs, muscles, bones and nerve fibers (Findley and Schleip, 2007). It can usefully be considered a single organ, a unified whole, the environment for all body systems functioning, connected to every aspect of human physiology (Guimberteau, 2007).

The fascia has also been conceived as a complex communication network that influences and is influenced by every muscle, organ, blood vessel and nerve. Langevin (2006) suggests the fascia to be a metasystem, connecting and influencing all other systems. Incorporating this view would change our core understanding of human physiology.

Chen and Ingber (2007), in studies of fascia cellular structure, describe a cytoskeleton under continuous tension that is capable of transmitting mechanical forces through the system. Forces applied to the cytoskeleton can

produce biochemical changes on the cellular level by mechanochemical transduction. Guimberteau (2003) demonstrates the complex fractal structure of the tissue and how it allows for movement, adaptation, lubrication and repair. Schleip (2008) refers to the fascia as our richest sensory organ, permeated with four types of sensory receptors. The vascular, nervous and lymphatic systems all end in the ground substance, providing nutrients to the ground substance as well as information from the periphery (Paoletti, 1998). It is both interesting and highly significant to note that acupuncture is based upon the conception of a metasystem that links and influences every aspect of human physiology. The fascial system provides the anatomical basis of that metasystem.

Function

The diversity of conditions that respond to acupuncture treatment may be explained by a review of the recently understood functions of the fascia. The involvement of the fascia in dysfunction and disease is pervasive. Paoletti (1998) suggests that to some extent, the fascia will necessarily be involved in every type of human pathology. Some support for this position can be found in research regarding the development of myofibroblasts and disrupted apoptosis, thereby linking the fascia to chronic disease via fibrosis of visceral tissue (Gabbiani, 2003; Hinz, 2006; Tomasek et al., 2002). The exchange of substances across the intercellular ground substance connects the fascia to cellular nutrition and metabolism (Guimberteau, 2007; Paoletti, 1998; Pischinger, 2007). The fascia is responsible for the initial, non-specific immune response of the body to the invasion of pathogens (Pischinger, 2007). It is also involved with hemodynamic processes, particularly venous and lymphatic circulations (Paoletti, 1998).

On a structural level, the fascia allows muscles to function, and is central to physical movement (Stecco, 2004). The fascia protects the body, both from internal stresses and the dissipation of external forces; it provides insulation, lubrication and structural integrity across the entire system (Paoletti, 1998). It is influenced by the external environment, and indeed is the link between the external and internal environments (Pischinger, 2007). This concept parallels fundamental principles in acupuncture which view the human being as part of the environment, rather than isolated from it.

This remarkable and complex metasystem is capable of the transmission of local and distal effects. An example is the transmission along fascial planes of referred pain patterns and impaired movement due to myofascial deformations (Travell and Simons, 1983; Stecco, 2004). Other such examples are the somatovisceral and viscerosomatic reflections that research has demonstrated since the early 20th century (Good, 1950; Gutstein, 1944; Travell and Simons, 1983). Myofascial tissue deformations on the surface of the body have been linked to a variety of visceral and autonomic dysfunctions that are resolved when the myofascial impairment is rectified (Travell and Simons, 1983). Similarly, it has been demonstrated that visceral pathology may be reflected to the surface (Dworken et al., 1952; Melnick, 1957; Mendeloff and Seligman, 1974).

The fascia offers a physiological basis for explaining the clinical phenomena and effects of acupuncture treatment. It offers an explanation for the most fundamental characteristic of acupuncture treatment, the ability to treat numerous, diverse conditions: The fascia is the connection between the surface and the viscera; it provides the means of treating the viscera and countless forms of human pathology and disease through the treatment of the surface; it is an organ that reacts to stimulation, wherever it is applied. It has been shown however that therapeutic effectiveness and efficiency is clearly linked to accurately localizing deformations and dysfunctions of the fascia and using an appropriate strategy to promote its release and restore proper activity (Stecco, 2004; Paoletti, 1998; Larson, 1990). Table 1 summarizes these relationships.

Acupuncture reconsidered

Overview

Acupuncture is a medical art that has withstood centuries of diverse pressures that produced multitudinous branches of practice. The longevity of acupuncture may be demonstrated by three fundamental realities. First, by its nature as a palpation-based form of treatment, it has been subject to intense scrutiny, being shaped by exhaustive clinical observations over millennia. Second, its basis of treatment is a metasystem that has shown itself to be fundamental to human health. Third, its effectiveness has been demonstrated for numerous and varied types of dysfunction through research and clinical experience. A reconsideration of some fundamental acupuncture principles in light of the fascia model is necessary. Such reconsideration is not intended to justify each and every principle of treatment, but to encourage practitioners to reflect upon some fundamental ideas that have guided this safe and effective medical art for centuries, and possibly stimulate new research hypotheses.

Qi

Lying at the conceptual core of Chinese medicine is the idea of *qi*. The notion of *qi* as some sort of energy/substance is a completely modern idea, probably introduced by De Morant and Grinnel (1994) in the early 20th century. It is an idea that certainly helped the dramatic development of acupuncture in the West, but may have diverted both acupuncture practice and research into some less productive directions. Therefore, any effort to engage in a discussion of *qi* must begin by confronting two issues: The issue of language and the issue of preconception. We must recognize that *qi*, like many words in other languages, has no direct translation into English. It is a term that we can only approximate conceptually rather than by direct definition. The second issue involves the existing concept of *qi* in minds of both the practitioner and the public. When a term such as *qi* comes into the common usage it is difficult to break habits of language that imply some understanding of its meaning. Acupuncturists refer to *qi* as commonly as a plumber refers to water, e.g., as something that can be manipulated, 'energy.' The public has a similar

Table 1 Parallels between acupuncture and the fascia.

Areas of comparison	Acupuncture	Fascia
The channel system	A metasystem that links and integrates the human body	A whole-body continuous living matrix; a continuous metasystem that integrates every aspect of the physiology
The channels	Access and affect deeper aspects of the body; are anatomically highly correlated to fascial planes; exist in body lining — ''fat, greasy'' tissue; between bones and sinew	Fascial planes are conduits that have multiple, diverse connections to deeper fascia
The points	Highly correlated to interstices within fascial planes. Needle stimulation of the points effect the physiology	Fascial interstices connect to deeper tissue. Heine cylinders connect surface to viscera and influence cellular metabolism via matrix.
Mechanism of treatment		
Treating physiological dysfunction	Stimulation of acupuncture points used to treat numerous and diverse conditions.	Tensegrity and mechano-transduction models allow for mechanical stimulation of the surface to effect cellular physiology.
Surface treats internal viscera	Channels demonstrate the location of disorders. Treatment of surface points affects the viscera.	Fascia reflects surface constrictions to the viscera and the viscera reflects dysfunction to the surface.
Function		
Immune function	*Wei qi* connected to immune function. Acupuncture used to treat immune issues.	Matrix considered ''first line of defense'' related to immune function.
Blood circulation	Acupuncture related to blood movement — ''where the *qi* goes the blood goes''.	Fascia connected to hemodynamic processes, venous and lymphatic circulation.
Temperature regulation	*Qi* warms the body.	Fascia insulates, maintains temperature.
Protection	*Qi* protects the body.	Fascia protects the body, acts as shock absorber, is connected to immune function.
Digestion/metabolism	*Qi* is the source of harmonious transformation in the body.	Fascia is connected to metabolism, nutrient transfer and organic functioning.
Structure	*Qi* governs retention of substances/organs.	Fascia provides structure at every level.
Movement	*Qi* is the source of movement in the body.	Fascia is connected to all bodily movement from cellular level to gross movement.
Environmental influence	Acupuncture was based on the effects of environmental influences on human health.	Fascia connects the physiology with environmental influences.
Qi	Best understood as proper movement or activity at every level of anatomy and physiology.	Fascia is connected to maintaining optimum activity at every level of anatomy and physiology.

habit of usage, using the term 'energy' without any understanding of what energy may be.

Unschuld (1983) states '…the customary translation of *ch'i* by some Western (and Asian) authors as 'energy' represents a basic misconception that is not supported by Chinese ancient sources.' O'Connor and Bensky (1981) state that '*qi* is an untranslatable word in the Chinese medical lexicon. It signifies a tendency, a movement, something on the order of energy.' And Birch and Felt (1999) point out that 'our… inevitable Western search for the material or energetic basis of *qi* need not look for something that is strong enough to perform work. We can look instead for signals that stop, start or moderate a process… In this regard, the closest parallel to *qi* in Western thought is a generative matrix in which all things interact with all other things through the exchange of information.'

Qi may be best understood within the context of its philosophical roots. *Qi* is a concept fundamental to Taoist cosmology related to the creation of the universe. The cosmology begins with *Wu Qi*, the state of nothingness, the Void, a state a priori to existence, similar to the state before the Big Bang. Existence, *Tai Qi*, represented by the well-known *Yin/Yang* symbol, begins with movement. Movement is a statement of duality; movement can only exist relative to something else. Thus, the beginning of existence, creation, from nothingness to duality, is marked by the introduction of *movement* into the Void.

Wu Qi is quiescence, no movement, no activity. *Tai Qi*, the first principle of existence, symbolizes duality, the balanced relationship between two complementary forces, active and passive. This balanced activity provides insight into the meaning of *qi*. *Qi refers to movement, activity: not just any movement, but the proper movement or activity of any thing*. It is activity that cannot be separated from the thing, as the tides cannot be separated from the oceans. *Qi* is not an amorphous substance separate and distinct from

human anatomy. Rather it is the proper movement and activity of every aspect of human anatomy. In the human being it refers to functional movement at every level of the anatomy and physiology, superficial and deep, systemwide and cellular. The fascia metasystem is the matrix in which all physiologic activities take place. When there are restrictions or deformations within the fascia *movement is impaired therefore function is impaired*. The use of acupuncture is an effort to effectuate proper movement and to restore balanced activity of the fascia. Needles stimulate movement, release deformations and induce reactions in the extraordinary fascia metasystem to correct itself and to restore proper function at every level of the physiology.

If we understand *qi* from the perspective of the proper functioning of the fascia, we do not discover a new acupuncture, but rather a system of treatment based upon careful palpation and observation, a system whose most fundamental principles are in complete accord with fascia mechanism model. Consider the major functions of *qi* as summarized by Kaptchuk (1983): '*Qi* is the source of all movement in the body, protects the body, is connected to harmonious transformation (metabolism), retains the body's substances and organs, and warms the body.' Given our previous discussion of the functions of the fascia, we could literally substitute 'proper activity and function of the fascia' for '*qi*.' Such balanced movement is the basis of health. *Qi* may therefore be considered to be the proper activity of every aspect of bodily functioning. When it functions in harmony, there is health; when it is impaired, there is disease; when it ceases, there is death.

Yin/Yang balance

With the advent of TCM, for the first time in its history, the use of acupuncture was connected to the treatment of Western-defined pathologies. From a historical perspective however, it is more accurate to say that acupuncture has always sought to correct only one condition: imbalance. A model of balance is a reflection of the *Yin/Yang* duality; it seeks to maintain the proper equilibrium between action and rest. This is a perfect expression of fascia therapy. Any fascial deformation can be seen to be an imbalance. In the presence of a fascial deformation, a state of excess, such as a build up of blood, lymph or muscular stress develops, as well as a concomitant and related deficiency elsewhere along the fascial pathway. The fascia model of acupuncture is concerned with alleviating deformations or constrictions of the fascia, regardless of whether they are related to dysfunctions associated with pain, proprioception, movement, or visceral disturbance. Its aim is to restore balanced activity and proper movement within the fascial metasystem, thereby restoring proper function. Because of the wide-ranging effects that a therapy of this type has on overall health, principles and strategies for effecting balance need to be explored and evaluated in order to effectuate a profusion of treatments of this type.

Channels and points

The extraordinary anatomical correlation between acupuncture channels and points to fascial planes and septa (Langevin and Yandow, 2002) and myofascial sequences and centers of coordination (Stecco, 2004) demonstrate the careful observation and palpation by early Chinese medical physicians. The earliest Chinese medical classics, the Su Wen, Ling Shu and Nan Jing all make reference to the location of the channels in 'fatty and greasy' tissue, the 'body lining,' or the 'space between the organs, bones and flesh' (Birch and Felt, 1999; Matsumoto and Birch, 1988). Rather than the simple treatment of local or reflex points on the body surface, the superficial channels, where virtually all acupuncture treatment takes place, represent a complex system of fascial pathways (Figs. 2 and 3). Stimulation along such pathways is capable of inducing fascial movement within both the surface myofascial aspects and the deeper visceral aspects. The channels' coincidence with relatively modern conceptions of fascial planes is a testament to the oldest continually practiced form of medical treatment and the skill of those physicians who were practicing it.

Ni (1996) describes the function of the channels as (1) Integrating the whole body; (2) Involved in the circulation of *qi* and blood; (3) Demonstrating the location of disorders; and (4) Transmitting the needle sensation. All of these functions, given a new understanding of *qi*, may all be ascribed to the fascia. Oschman, in Pischinger (2007), states that 'acupuncture meridians are the main channels of the [connective tissue] matrix' (p. xiii), and refers to acupuncture points as the 'windows on the matrix system' (p. xiv).

The relationship of the points to fascial septa demonstrates fascinating interconnections to deeper anatomical structures as a function of their location (Langevin and Yandow, 2002). Birch and Felt (1999) remind us that the word normally translated as 'point,' really means 'hole' or 'cave.' It alludes to a chamber into something, consistent with the fascial relationships discussed by Langevin and Yandow (2002) and Stecco (2004), and Pischinger's (2007) description of the Heine cylinder. Pirog (1996) states that the original functions of acupuncture points were based upon their anatomical location, rather than some innate quality of the point. Acupuncture points have been known to be anatomically present as loci that affect certain aspects of the body's terrain (Pischinger, 2007). They are similar to trigger points in that they become 'active' in response to fascial deformations. Pirog (1996) states that when treating pain, acupuncture points must be located by palpating for tenderness or tissue change. Toyohari practitioners in Japan use the textbook location of points only as a starting point for feeling the *currently live point*, which is accomplished by palpation. The location of the point may change as the patient's condition changes. This is verified by Pischinger (2007), who describes the palpable characteristics of an active point and notes that '…the non affected — inactive — point is not palpable, while the activated point — regulatorily changed — can be discerned by palpation.'

It is worth recognizing that classical acupuncture points were chosen for use by skilled palpation of the body. The method of proportional measurement for locating points, currently in use today, did not appear until the seventh century (Birch and Felt, 1999). This suggests that acupuncture was practiced for at least eight or nine centuries without

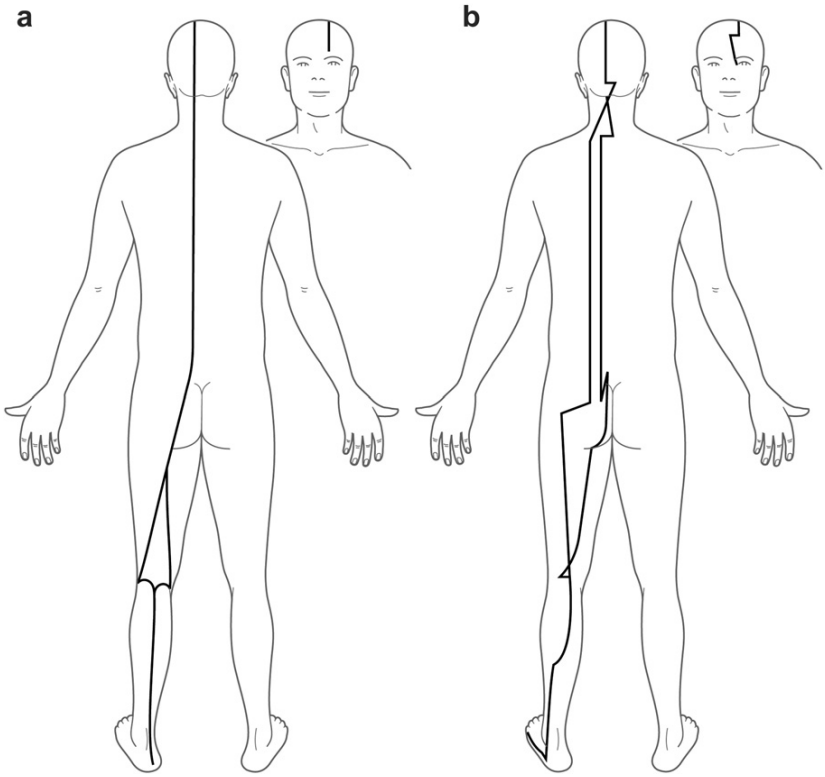

Figure 2 Comparison of fascial plane (a) (based on Myers, 2001) and Bladder channel (b).

precise measurement for points. Points were considered to be 'dynamic structures on the body.' Acupuncturists chose points by how they felt, similar to Toyohari practitioners' 'currently live points,' rather than by simple measurement or approximation (Birch and Felt, 1999).

Rather than a static fixed entity, the point/channel system may well be viewed as a map of potential sites of fascial activity. It allows us to identify, through careful palpation of the natural topology of the body, areas of fascial/visceral dysfunction, and to treat locally and distally along the fascial plane.

A unique aspect of acupuncture as a fascial therapy is the simultaneous use of multiple needles that provide continuous stimulation for a period of time. These patterns of stimulation produce a form of 'microtrauma' that prods the fascia to return to proper activity (Pischinger, 2007). Clinical experience has shown us that it is this unique, three-dimensional prodding of the fascia, coaxing movement through patterns of minor stimulation, that is central to effective treatment.

Deqi (the arrival of *Qi*) and needle stimulation

It is a curiosity that those that believe *qi* to be an energy so subtle that it escapes detection by the most sensitive scientific instruments also find it capable of physically grabbing a steel acupuncture needle. Langevin et al. (2001) relates *deqi* to the wrapping of soft tissue around the needle as it is manipulated. While this may be the case when using a particular needle technique, clinical experience has demonstrated other varied reactions to acupuncture needling. *Deqi* can be understood as the arrival of movement, the indication that the fascia has reacted to stimulation. Depending on how 'active' a particular acupuncture point may be, the *deqi* response may be powerful, where the patient experiences movement similar to myofascial release, spreading away from the location of the needle, usually along a fascial plane. Or it may be a more subtle response experienced by the practitioner who, through the feel of the needle, senses a subtle reaction of the fascia. It may barely occur at all if it is a point related to properly active fascia. These patterned, subtle microtraumas, gently inducing movement of the soft tissue, is unique to acupuncture.

Pischinger (2007) states that needle puncture produces a reaction in the entire intercellular-extracellular matrix. The smallest injury produces the longest lasting effect, at least five days. Thus, microtrauma produced by the acupuncture needle apparently differs from other forms of mechanical stimulation in some way. The rapid release of myofascial trigger points through minimal stimulation of the fascia by an acupuncture needle demonstrates that the simple prodding of the fascia to react can produce a dramatic effect (Travell and Simons 1983). It is in this sense that acupuncture may differ from techniques that affect the fascia through deep tissue compression, stretching or vibration. Acupuncture needling is seeking a reaction from the fascia through a minor puncturing of the skin and prick of the fascia. It is an elegant method of

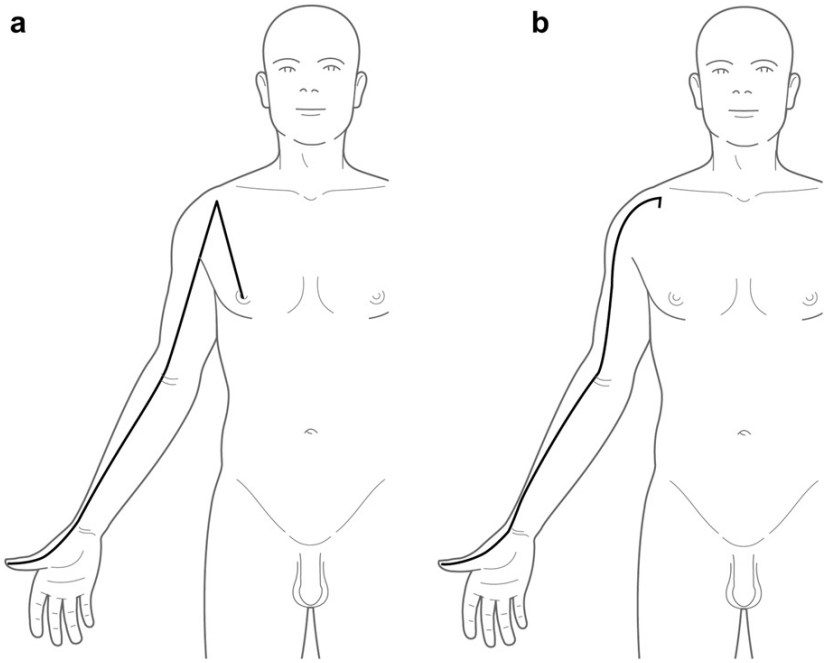

Figure 3 Comparison of fascial plane (a) (based on Myers, 2001) and Lung channel (b).

fascial stimulation, systematically prodding the tissue to correct its deformations and return itself to balanced function.

Fascia based acupuncture

The acupuncture that recognizes the fascia as its mechanism of its action and the basis of both diagnosis and treatment differs from some acupuncture styles in a few basic ways. Fascia acupuncture, first and foremost, relies on the direct experience of the body. This means that skillful, attentive palpation is essential for the practitioner in both treatment and evaluation. In addition to the palpation of channels (fascial planes) and active points, the practitioner palpates the body to assess skeletal structure, fascial deformations, myofascial constrictions and visceral restrictions. Point selection is connected to understanding anatomy, physiology, pathology, fascial planes, fascial sequences and biomechanics as well as basic organ/channel functions and relationships. As in every field, attentive clinical experience enriches and deepens the understanding.

This approach to acupuncture bears great similarity to a number of acupuncture approaches that are not as pervasive as TCM, partially because they require skill sets not readily accessible in mass education settings. In short, it is an acupuncture of touch, of skillful palpation, guided by the maps created by both our current understanding of anatomy and centuries of clinical experience. Just as modern medicine has lost much of the heritage of touch due to technological, social and even legal influences, much of modern acupuncture has wandered from its roots as a palpation-based therapy. In this sense, fascia based acupuncture represents a return to its fundamental principles, one in which the *terrain rather than the map* takes precedence as the focus of treatment.

Future research

Clinical acupuncture research would be better served by the use of palpation-based approaches as the independent variable, rather than standardized treatments from a formulary. Double-blind, controlled designs are a poor fit for the study of any procedural therapy, and are better suited to drug or herbal clinical trials. Multiple regression analysis, identifying significant aspects of treatment, where efficacy as well as effectiveness and individual therapist differences are evaluated, may be a more fruitful approach.

The issues raised by the meta-analyses of clinical acupuncture studies have sparked reconsideration of the value of acupuncture research. An enlightened examination would include the current information available to us regarding this elegant organ, the fascia, and acupuncture's effect on it as a system. Basing future studies on the fascia model represents a new and exciting direction for acupuncture research. In addition, a new avenue for anatomical study could be opened using acupuncture principles previously thought to exist only in metaphor.

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