Soft Tissue: Structure vs. Function?

By Joseph Cimino

A common controversy exists over whether structure governs function or function governs structure. From a comparative anatomist’s point of view, of changes over thousands of years, structure governs function. However, from a chiropractic point of view, the idea that function governs structure may also be valid.

Barring acquired or congenital structural abnormalities which may limit or cause an increase in motion, with regard to the biomechanics of posture and movement, it is the long-termed use of the musculature which will ultimately determine the nature of the structure.

A case in point could be made for the iliopsoas muscle which plays a primary role in determining postural faults and may have a profound effect on the stresses placed on the lumbar spine, ultimately resulting in discopathy.

Although many muscles are responsible for determining equilibrium of the lumbar spine and body, the iliopsoas has multiple functions: bilaterally responsible for flexion movements of the spine and hip joint; maintains the lumbar lordosis and the correct angle of anteversion of the pelvis, as well as act as the lateral stabilization of the spine. If one was limited to directing treatment to a single muscle, probably the most profound effects could result by treating the iliopsoas muscle.

An illuminating description of the role of the iliopsoas in the evolutionary development in man is the subject of the second chapter in A. Michele’s text Iliopsoas. In the other "great apes," gorilla, orangutan, and chimpanzee, the lumbar spine is in a flexed or neutral posture with the shorter lower limbs in a slightly flexed position. Whereas in man, the iliopsoas-induced lumbar lordosis and full extention of the proportionally longer legs are specific and necessary adaptation to bipedal locomotion.

Vladimir Janda and others, categorize iliopsoas as "postural" muscle, which makes it prone to contractures and shortening. Clearly, this may add to the "loading" of the discs and may be implicated in the long-term source of back pain from a disc bulging/protrusion.

Stodolny and Mazur published their findings of a study of low back pain patients which found contractures of the iliopsoas muscle in patients who exhibited the symptoms of low back pain along with signs of lumbar
discopathy. Utilizing post-isometric relaxation exercises, similar to therapeutic muscle stretching techniques, they found an appreciable reduction of contractures within these patient populations. Unfortunately, they did not correlate a relationship to a decrease in symptoms of pain with range of motion. In practice, however, most patients experience a sense of a greater freedom of movement, and often describe a "feeling of being taller" following a therapeutic muscle stretching treatment.

To argue from a different perspective, Godges et al. \(^2\) conducted a study comparing the effects of end-range static stretching and mid-range PNF stretching for improvements in hip range of motion and gait economy. Although only a preliminary study involving seven subjects, it suggests in cases where end-range stretching is contraindicated (joint pathology or other limited factors), improvement in range of motion can be obtained by utilizing a mid-range PNF-type stretching.

In another pilot study, Cibulka et al. \(^3\), compared 20 subjects with hamstring strains. There are many factors which may cause hamstring muscle strains; inflexible hamstring muscles, hamstring weakness, muscle strength imbalances between the quadriceps femoris and the hamstring, etc.

The investigators compared one group, which had received moist heat and passive stretching, with another group which had received moist heat passive stretching and sacroiliac joint manipulation. They conclude that sacroiliac joint dysfunction may predispose the athlete to muscular strain on the side of the anterior and superior ilium, due to the more stretched position of the hamstrings. Their findings suggest a positive relationship that exists between maximally aligned SI joints and peak muscle torque (hamstrings).

It was the assumption of the investigators that the sacroiliac joint dysfunction predisposed the athletes to hamstring strains; however, the case could be made that the muscular imbalance might have precipitated the sacroiliac joint dysfunction. Whether this is a case of the "chicken or the egg?", it is a moot point to the field doctor, who should assess and specifically treat the soft tissue dysfunction, by stretching the shortened muscles and prescribing rehabilitative exercises for their weaker, inhibited antagonists, as well as to manipulate the spinal joint dysfunction.

References


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