Dynamic Chiropractic

"The Motion of Systems and Not Their Anatomy Frequently Defines a Disorder"

Three fascial systems will be introduced and briefly discussed in this article. From the 1992, 1995 and 1998 World Congress on Low Back Pain symposiums, we were introduced to the concepts of Gracovetsky, Vleeming, Snijders, Stoeckart, Dorman, Mooney and numerous other researchers. Shortly after the second conference, the work of Porterfield and DeRosa were published by W.B. Saunders Company as a clear and concise recap of the entire proceedings from the aforementioned symposiums. For a chiropractic point of view, I have written a chapter on this topic in Dr. Warren Hammer's new text. See the preferred reading and viewing list in this month's Dynamic Chiropractic for more information.

The three fascial systems are: (1) the oblique dorsal-muscle fascia-tendon sling (the latissimus dorsi; thoracodorsal fascia; thoracolumbar fascia; the contralateral gluteus maximus; the iliotibial tract and the vastus lateralis muscle); (2) the longitudinal muscle-tendon-fascia sling (the multifidus muscle; the sacrotuberous ligament; the long head of the biceps femoris; the head of the fibula and the arcuate ligament; the popliteus muscle; the peroneus longus muscle; the first ray complex and the tibialis anterior muscle; and the ankle mortise joint); and (3) the oblique ventral muscle-tendon sling (the linea alba; transversus abdominus; inguinal ligament; the internal and external oblique muscles; and the lateral raphe). Clearly, one can visualize a continuum of muscles, fascia and tendons running from the first ray complex (the first cuneiform and the first metatarsal) to the ipsilateral lumbar spine and the contralateral humerus and from the anterior chest wall to the lateral raphe.

The Longitudinal Sling

Consider a patient who presents with a history of thoracolumbar muscle spasm, pain and a loss of ROM. In your case history, you note that the patient, while playing sports, sprained the ankle and sought no treatment for it. Is it possible that this could be a cause of the patient's T-L junction pain?

Pursuing this train of thought further, when the foot and ankle were examined, it was noted that tibial advancement was less than 10 degrees over the talus and that internal rotation likewise was absent. An obvious result of this is the failure of all aspects of the subtalar joint (posterior, middle and anterior and the talocalcaneonavicular joint) to engage thereby preventing calcaneal eversion and causing compensatory hyperpronation of the midfoot (note that the rear foot remains in a "neutral" position). Along with this compensatory hyperpronation will be gross gait abnormalities; a failure of the converging axes of the transverse tarsal joint to converge; inability of the self-locking mechanism of the calcaneocuboid articulation to engage (recall that there are two self-locking mechanisms that have been identified in the human body: the calcaneocuboid articulation and the sacroiliac joint); and failure of the Windlass effect of Hicks to occur. Toe-off will be other than where it should be, and the patient will demonstrate a migration laterally of the weightbearing calluses of the foot.

Does this patient need an orthotic? If time and the accumulative effects of creep, hysteresis and set

have been allowed to occur, then it is likely that this patient may need some type of orthotic device. I would refer the reader to the superb text of Dr. Tom Michaud for the method of casting for the orthotic. However, if this is a relatively new injury, then the orthotic will not be needed as the foot cannot be examined, diagnosed and treated with chiropractic coupled motion adjustments.

The fibula, from heel strike to midstance phase of gait, will, under normal situations, glide inferiorly. However, in the case of ankle sprains this mechanism may be hindered as a function of the loss of tibial advancement and internal rotation. The net effect of this dysfunction will be found at the sacroiliac joint as the fibula, when it drops inferior, loads the long head of the biceps, which in turn is continuous with and tenses the sacrotuberous ligament. The sacrotuberous ligament checks the action of excessive nutation and is continuous with the ipsilateral multifidus. Uncontrolled or excessive nutation will lock up the lumbosacral junction (sacroiliac or lumbosacral junction joint dysfunction complex) and is a possible cause of the patient's presenting complaint. Remember, the multifidus is a posterior sagittal rotator of the spine and its fascicular fibers arise from this region.

It is prudent to recall the innervation to this region. According to Willard,2 "Thus, noxious stimuli in the lower lumbar and sacral levels will ascend in the sympathetic trunk to present to the spinal cord at the thoracolumbar junction. This circuitous route results in referral of pain and subsequent facilitation of spinal segments in the lower thoracic and upper lumbar region from dysfunction of the lumbosacral and pelvic structures."

In other words, a nociceptive response (sympathetic hyperactivity and reflex muscle spasm) at this level. (This sort of reminds me of the words of Clarence Gonstead: "Find it, accept it where you find it, fix it and leave it alone.")

From this statement, and considering the muscle-fascial-tendon interconnections described whose impact is at the pathobiomechanics of the sacroiliac joint and lumbosacral junction. It should be crystal clear that the fascia slings and their connections should be a part of your every day differential diagnosis when presented with a patient whose case history displays an absence of back trauma or organic disease. Once again, I would refer the reader to the work of Dr. Warren Hammer in treating the fascial planes.

Please keep in mind that this is a very simplified example and that the total package is indeed an extremely complicated clinical evaluation of the neuromusculoskeletal system.

In the next article, I will attempt a short review of the biomechanics of the oblique slings and their impact on the chiropractic patient.

References

1. Frazier SH. Introductory remarks. Perspectives in Biological Dynamics and Theoretical Medicine: Annals of New York Academy of Sciences. New York Academy of Science, 1987, 504 VII.

2. Willard FH. The lumbosacral connection: the ligamentous structure of the low back and its relation to pain. Second Interdisciplinary World Congress on Low Back Pain, Part I: The Integrated Function of the Lumbar Spine and Sacroiliac Joint. San Diego, November 9-11, 1995. Andry Vleeming, et al. Publication via an educational grant from Philips Medical Systems.